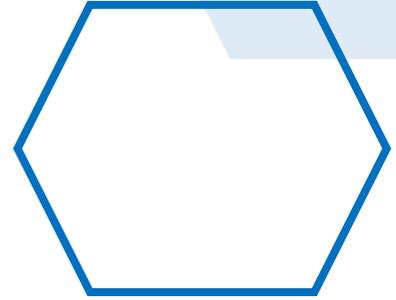
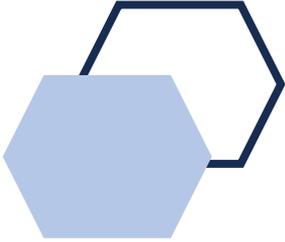
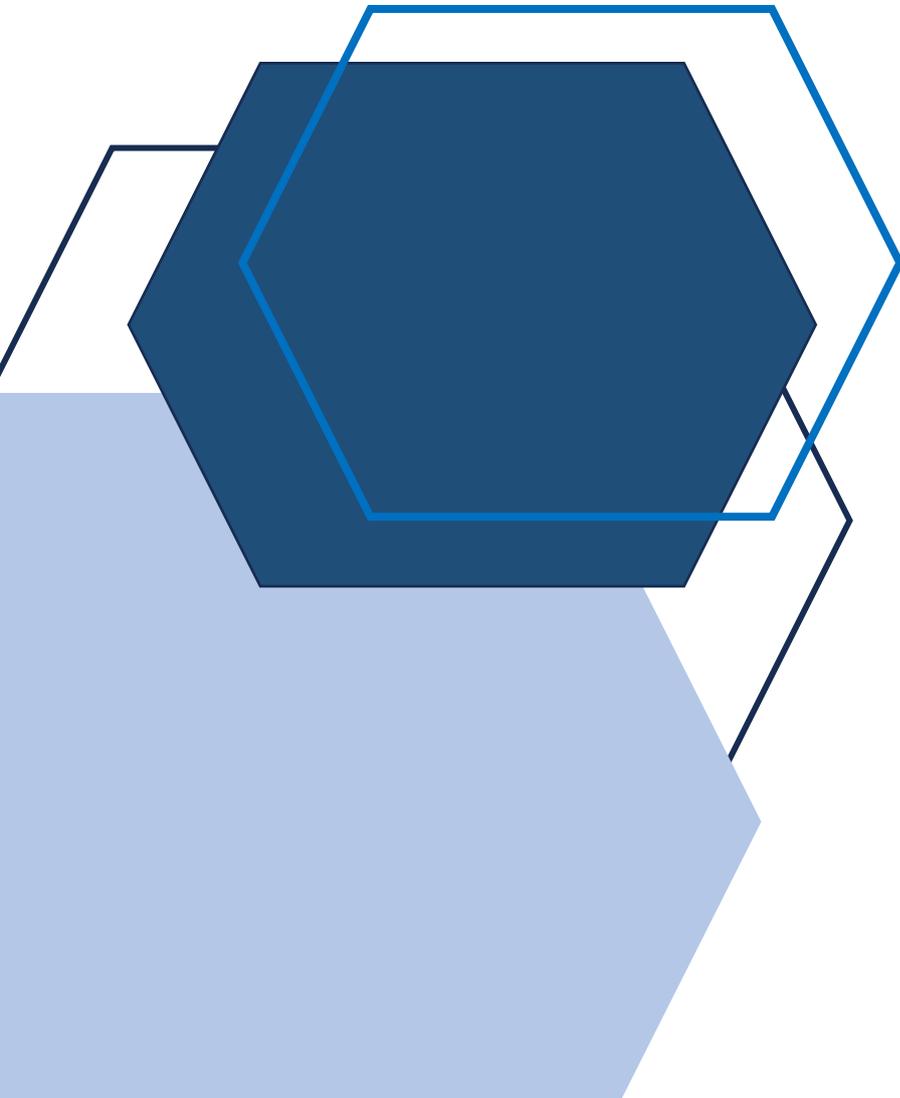




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Ministria e Bujqësisë, Pylltarisë dhe Zhvillimit Rural
Ministarstvo Poljoprivrede, Šumarstva i Ruralnog Razvoja
Ministry of Agriculture, Forestry and Rural Development



DIGITAL AGRICULTURE PROGRAMME AND ACTION PLAN 2025 – 2028





Republika e Kosovës - Republika Kosova - Republic of Kosovo
Ministria e Bujqësisë, Pylltarisë dhe Zhvillimit Rural
Ministarstvo Poljoprivrede, Šumarstva i Ruralnog Razvoja
Ministry of Agriculture, Forestry and Rural Development

DIGITAL AGRICULTURE PROGRAMME AND ACTION PLAN 2025 – 2028

June 2025

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The document is developed through a consultative process led by an inter-ministerial Working Group appointed for the formulation of the Programme for Digital Agriculture in Kosovo, which brought together representatives from key institutions, namely:

- Ministry of Agriculture, Forestry and Rural Development
- Strategic Planning Office – Office of the Prime Minister
- Ministry of Finance, Labour and Transfers
- Agency for Development of Agriculture
- Agency for Information Society
- University of Prishtina – Faculty of Agriculture and Veterinary
- University “Haxhi Zeka” in Peja – Faculty of Agribusiness
- Private sector, Civil society organizations and farmers’ associations
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), office in Kosovo
- EU Office in Kosovo
- UN Development Coordinator’s Office in Kosovo

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Acronyms

Acronym	Full Description	Acronym	Full Description
ADA	Agricultural Development Agency	GAEC	Good Agricultural and Environmental Condition
AI	Artificial Intelligence	GDP	Gross Domestic Product
AIP	Information and Privacy Agency – Agjencioni për Informacione dhe Privatësi.	GDPR	General Data Protection Regulation
AKIS	Agricultural Knowledge and Innovation System	GIS	Geographic Information System
AMIS	Agricultural Market Information System	GPS	Global Positioning System
AMR	Antimicrobial Resistance	GSA	Geospatial Application System
AMS	Area monitoring system	IACS	Integrated Administration and Control System
ANC	Areas with Natural Constraints	IADK	Iniciativa për Zhvillimin e Bujqësisë në Kosovë
API	Application Programming Interface	IAIS	Integrated Agricultural Information System
ARDP	Agriculture and Rural Development Programme	ICT	Information and Communication Technology
AVUK	Agjencia e Veterinarisë dhe Ushqimit në Kosovë	ID	Identifier
CAP	Common Agricultural Policy	IIS	Institutional Information System
DAS	Digital Advisory Services	IPARD	Instrument for Pre-Accession Assistance in Rural Development
DEAAS	Department for Extension and Advisory Services	ISA	Information Security Authority (or similar)
DG	Directorate-General	IS	Information System
DPI	Digital Public Infrastructure	IT	Information Technology
DTAS	Department of Technical and Advisory Services	KSA/KAS	Kosovo Statistics Agency
DTASP	Digital Agricultural Technical and Advisory Services Platform	KEPA	Kosovo Environmental Protection Agency
EAFRD	European Agricultural Fund for Rural Development	KFIS	Kosovo Forest Information System
EFA	Ecological Focus Areas	KWN	Kosovo Women’s Network
EIP	European Innovation Partnership	LAG	Local Action Group
EU	European Union	LEADER	Liaison Entre Actions de Développement de l'Économie Rurale
FADN	Farm Accountancy Data Network	LPIS	Land Parcel Identification System
FAO	Food and Agriculture Organization	MAFRD	Ministry of Agriculture, Forestry and Rural Development
FSDN	Farm Sustainability Data Network		
FVA	Food and Veterinary Agency		

Acronym	Full Description
MEA	Monitoring, Evaluation and Accountability
MESP	Ministry of Environment and Spatial Planning
MSSQL	Microsoft Structured Query Language
NIF	National Investment Framework
NIS2	Network and Information Systems Directive 2 (EU)
OTS	On-the-Spot
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PMEF	Performance Monitoring and Evaluation Framework

Acronym	Full Description
RICA	Réseau d'Information Comptable Agricole
sLPIS	Simplified Land Parcel Information System
SMS	Short Message Service
SWOT	Strengths, Weaknesses, Opportunities, Threats
TA	Technical Assistance
TV	Television
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
WIS	Water Information System

1. Executive Summary

1.1. A short description summarizing the nature of the problem being addressed by the strategic document

Kosovo's agricultural sector is vital to the economy and rural livelihoods, serving as a primary source of employment and income across rural areas. However, it faces challenges such as limited access to modern technology and low productivity. Farm advisory services are underdeveloped, particularly in remote areas, hindering farmers' ability to improve their practices. Rural population also struggles with limited access to public services, barriers to obtaining financial support, and restricted market opportunities, which result in a high degree of outmigration. While Kosovo is leading in internet connectivity, farmers are yet to fully embrace the benefits of digital technologies, often due to a lack of digital skills. The limited supply of digital tools in the local market restricts farmers' access to innovative solutions tailored to their needs. However, there is recognition of the potential benefits of digitalization, as 67% of farmers surveyed in an FAO-IADK study in 2022 consider investing in ICT important for improving their agricultural practices and livelihoods.

As a potential candidate country for European Union membership, Kosovo is actively working toward EU integration, particularly following the signing of the Stabilization and Association Agreement. The country is aligning its agricultural and rural development policies with the EU's [Common Agricultural Policy](#) (CAP), with the goal of enhancing competitiveness in both the regional and EU markets.

In 2021, Kosovo adopted the Strategy for Agriculture and Rural Development (2022–2028), aligning its objectives with the EU's Common Agricultural Policy. Additionally, Kosovo's National Rural Development Programme (2023–2027), which includes [Instrument for Pre-Accession Assistance in Rural Development](#) (IPARD)-like measures, is currently in progress but not yet fully compliant with EU regulations. Over the years, Kosovo has been implementing agricultural policies using information systems that contain valuable data on agricultural resources which are based, but not fully compliant with EU standards. This data provides a solid foundation for the establishment of a Digital Public Infrastructure for Agriculture (DPI-Agri) and the digitalization of services in the agriculture sector.

The Kosovo Digital Agriculture Programme and Action Plan 2025-2028 aims to:

- Provide the Government of Kosovo, particularly the Ministry of Agriculture, Forestry and Rural Development, with a multiannual programme for the digitalization of agriculture and rural areas
- Guide adjustments to information management systems to align with the CAP and serve as an action plan for adopting the Acquis under Chapter 11
- Demonstrate how digital technologies can improve the efficiency of pre-accession (IPARD) and future CAP Strategic Plan measures, in line with Article 114 of EU Regulation 2115/2021
- Deliver a roadmap for digital transformation under Chapter 10 to reduce administrative burdens and support implementation of the e-Government strategy in agriculture
- Promote rural populations' access to digital services and development of digital skills

1.2. A list of the key objectives of the strategic document

The strategic and specific objectives of the Programme for the digitalization of agriculture and rural areas are developed based on a comprehensive analysis of the challenges and their underlying causes:

Strategic Objective 1: Establish and improve e-government and data infrastructure to enhance efficiency and data-driven decision-making in agriculture and rural development

Specific objective 1.1: Strengthen and integrate key agricultural information systems in line EU CAP
Specific objective 1.2: Digitalize and simplify agricultural and rural development interventions

Strategic Objective 2: Create an inclusive functional network of digital services for agriculture and rural areas

Specific objective 2.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration
Specific objective 2.2: Streamline agricultural public services delivery
Specific objective 2.3: Advance digital inclusion in rural areas

Strategic Objective 3: Develop the human capital for the digital transformation of agriculture

Specific objective 3.1: Strengthen digital skills for rural people
Specific objective 3.2: Foster multi-stakeholder collaboration

1.3. A short summary of agreed actions to address the problem and the rationale beyond this approach

The Programme focuses on addressing the needs and objectives outlined in the [Strategy for Agriculture and Rural Development 2022-2028](#) and the [National Rural Development Programme 2023-2027](#), with an emphasis on achieving these goals more efficiently through the use of digital technologies. At the same time, the programme supports the implementation of Kosovo's digitalization strategies, including the [Kosovo Digital Agenda 2030](#), the [e-Government Strategy Kosovo 2023-2027](#), and the [Administrative Burden Prevention and Reduction Programme 2022-2027](#). It is also aligned with the actions under [Kosovo's Reform Agenda](#).

The proposed actions under the Programme are covering:

Under Strategic Objective 1: Establish and improve e-government and data infrastructure to enhance efficiency and data-driven decision-making in agriculture and rural development

Specific objective 1.1: Strengthen and integrate key agricultural information systems in line EU CAP

The actions under this specific objective focus on the **phased alignment, integration, and enhancement of key agricultural information systems in accordance with the EU CAP acquis**. This includes systems such as the Integrated Administration and Control System (IACS), the Farm Accountancy/Sustainability Data Network (FADN/FSDN), the Register of Organic Production, the Register of Traders of Fresh Fruits and Vegetables, and the Policy Monitoring and Evaluation Framework Information System (PMEF-IS). They will be made - interoperable with each other as well as with related agricultural databases—such as agricultural statistics and the Vineyard Register—and relevant official registers. and their interoperability with other agriculture related registers and data collections – such as Statistics and Vineyard Register. Where technically and legally feasible, data will be made accessible in line with open data principles, public sector information re-use policies, and established standards for interoperability and data protection. These efforts will contribute to the establishment of a Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri) aligned with CAP requirements. The DPI-Agri will help reduce administrative burdens in the implementation of policy measures, develop user-friendly e-services for farmers and rural stakeholders, and provide the core data infrastructure to develop digital services for farmers' access. At the same time it will provide insights guiding data-driven policy making, monitoring of policy impact and inform subsidy allocations.

Specific objective 1.2: Digitalize and simplify agricultural and rural development interventions

The actions under this specific objective relate to the advancement of **digitalization and simplification of the application process for farmers to agriculture and rural development interventions**, such as rural development grants and climate-related payments. This includes a simplified application processing through

digitalized public services, leveraging data from the DPI-Agri. Among these actions, the necessary review and adjustment of the policy measures are envisioned to ensure full alignment with the Instrument for Pre-Accession Assistance for Rural Development (IPARD) III program. This specific objective aims to improve smallholder farmers' access to policy incentives, to reduce the administrative burden on implementing institutions and to support the design of IPARD measures that can later re-used and accredited under the Common Agricultural Policy (CAP) framework after EU accession. These efforts will be conducted in strict adherence both local and EU data protection standards, ensuring for secure processing of farmers' basic and personal data, as well as the proper management of consent.

Under Strategic Objective 2: Create an inclusive functional network of digital services for agriculture and rural areas

Specific objective 2.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration

This specific objective supports the development of the **Digital Agricultural Technical and Advisory Services Platform (DTASP)**, as outlined in the Strategic Plan of the Kosovo Advisory System for Agriculture and Rural Development 2023–2027 and led by the Department of Technical and Advisory Services (DTAS) under MAFRD. As a central element of Kosovo's Agricultural Knowledge and Innovation System (AKIS) and aligned with EU Regulation 2021/2115, DTASP will serve as a mobile-first, user-centric hub for agricultural knowledge, advisory services, and collaboration. It will feature a registry of certified advisors, a digital library of curated resources, online learning and certification, webinar-based group trainings, and access to FADN/FSDN data to support tailored advice and research. The platform will also facilitate participation in research and innovation aligned with the European Innovation Partnership (EIP), include internal management tools for advisors, and gradually integrate real-time data on weather, pests, animal diseases, soil, markets, and funding opportunities—potentially enhanced by AI and teleadvisory services. Addressing outdated advisory models and gaps in timely information, DTASP aims to improve productivity, climate resilience, and innovation. It will be developed collaboratively with farmers, advisors, NGOs, and the private sector, with targeted outreach to women, youth, elders, and vulnerable groups to ensure inclusive access and long-term impact.

Specific objective 2.2: Streamline agricultural public services delivery

This specific objective supports the development of the **e-Agriculture Portal (eBujqësia)**, which will serve as a centralized, one-stop digital platform that consolidates all agriculture-related public and administrative services in Kosovo into a single, user-friendly access point. Fully integrated into the e-Kosova service catalogue and interoperable with national digital infrastructure, the portal will allow farmers, agribusinesses, and rural stakeholders to easily access key services such as farm and land registration (e-Farm, e-LPIS), applications for grants and subsidies (e-Grant), submission of farm-level data (e-FADN, e-Statistics), and registration of organic producers (e-Organic). It will also offer timely notifications, access to official documents, and features for requesting certifications and support program enrollment. A dedicated Open Data section will provide public access to essential agricultural datasets, supporting transparency, innovation, and informed decision-making. Designed to be mobile-first, intuitive, and in line with data protection standards, eBujqësia will simplify interactions with government, reduce administrative burdens, and modernize public service delivery in the agricultural sector.

Specific objective 2.3: Advance digital inclusion in rural areas

This specific objective supports the **establishment of Digital Village Centers** in rural municipalities to ensure equitable access to digital agricultural services, including the e-Agriculture Portal (eBujqësia) and the Digital Agricultural Technical and Advisory Services Platform (DTASP). By equipping public spaces such as advisory offices and community centers with digital infrastructure—including reliable internet connectivity, computers or tablets, printers, teleconferencing equipment—these centers will enable farmers, especially those in remote or underserved areas, to access online services, receive hybrid advisory support, and participate in

training and innovation activities. Aligned with the EU LEADER approach, the initiative also includes a **Smart Village pilot**, which will co-develop and test locally driven, digital solutions that reflect rural needs and priorities. These pilots will focus on applying technology to enhance agricultural productivity, promote environmental sustainability, improve access to services, and strengthen local economies. Implemented in close collaboration with municipalities, farmers, and local stakeholders, the Smart Village approach will serve as a model for integrated rural development that can be scaled across other regions.

Under Strategic Objective 3: Develop the human capital for the digital transformation of agriculture

Specific objective 3.1: Strengthen digital skills for rural people

This objective focuses on **developing digital skills and capacities across the rural population**—empowering farmers, advisors, agribusinesses, and rural residents, including youth, women and marginalized groups, to effectively use digital tools and services in agriculture and rural life. Through inclusive, blended training programs and awareness campaigns, it supports both basic digital literacy and advanced competencies such as precision agriculture, farm management software, and e-commerce. Delivered via Digital Village Centers and existing training facilities such as Technical and Vocational Education and Training (TVET), universities and demonstration plots, these efforts aim to foster long-term digital engagement, promote innovation, and strengthen rural communities' readiness for a digitally enabled agricultural future.

Specific objective 3.2: Foster multi-stakeholder collaboration

This objective supports the establishment of a **collaborative Digital Agriculture Innovation Hub** as a key component of Kosovo's Agricultural Knowledge and Innovation System (AKIS). The hub will serve as a network that will connect actors across the agricultural ecosystem—public institutions, farmers, advisors, agribusinesses, researchers, and technology providers—to foster innovation, promote climate-smart technologies, and accelerate the adoption of digital solutions. Aligned with EIP-AGRI principles, it will enable co-creation, knowledge exchange, and joint problem-solving through farmer-led trials, living labs, and demonstration activities. The network will also pilot and implement IPARD Measure 13 (M13) with dedicated funding, and align with European initiatives such as the European Digital Innovation Hubs and Horizon Europe to enhance access to advanced technologies and international collaboration. Anchored in training centers and Digital Village Centers, it will provide local spaces for learning, experimentation, and peer engagement—operationalizing Kosovo's AKIS and driving its transition toward a more innovative, sustainable, and digitally enabled agriculture sector.

2. Introduction

2.1. How the strategic document relates to Government priorities

The Kosovo **Digital Agriculture Programme and Action Plan 2025-2028** aligns with key priorities outlined in the [National Development Strategy 2030](#), particularly:

- Developmental goal 1 “Digital, circular, and competitive economy”, specifically Strategic goal 1.8: Improving productivity and sustainability in agriculture. This is further detailed in the sector strategic framework for agriculture and rural development outlined in the Strategy for Agriculture and Rural Development of the Republic of Kosovo (2022–2028).
- Horizontal agendas under Kosovo's Digital agenda (6.1), emphasizing digital transformation efforts across sectors. This strategic direction is expanded upon in the cross-sectoral document, the Digital Agenda of Kosovo 2030.

The Kosovo Digital Agriculture Programme and Action Plan 2025-2028 provides a strategic framework for advancing digital technologies in agriculture and rural areas. It aims to improve the effectiveness and efficiency of interventions outlined in the [Strategy for Agriculture and Rural Development of the Republic of Kosovo \(2022–2028\)](#) and the [National Rural Development Programme \(2023–2027\)](#). The Programme is also aligned with the [National Programme for European Integration \(2023–2027\)](#) and supports Kosovo's broader digitalization efforts, including the [Kosovo Digital Agenda 2030](#) and the [e-Government Strategy Kosovo \(2023–2027\)](#), within the agricultural and rural sectors. Additionally, it contributes to the implementation of the [Kosovo Reform Agenda](#) under the [Reform and Growth Facility](#).¹

To ensure effective implementation, the strategy must be aligned with the broader strategic framework, while the legal framework should provide the necessary support through clear regulations, policies, and enforcement mechanisms. The Digital Agriculture Programme and Action Plan is thus embedded in the following regulatory framework:

- **LAW ON AGRICULTURE AND RURAL DEVELOPMENT** (Law No. 08/L-072 Official Gazette of the Republic of Kosovo 8/23, 30 March 2023), which outlines the objectives related to agriculture and rural development:
 - competition in agricultural and rural production that increases its competitive ability in both domestic and foreign market, that is enabled through increase of the productivity and efficiency of the economic activities in rural areas;
 - increase of the incomes for rural population by increasing their welfare through improvement of the working and living conditions, as well as creating equal opportunities for all marginalized groups;
 - economic stability, by ensuring that agricultural production is sustainable;
 - sustainable environment protection;
 - convergence that aims to reduce differences between different levels of development of different regions, by developing alternative and complementary activities that generate employment in order to encourage people living in rural areas and support small and medium businesses;

Furthermore, the Law regulates registers and databases to be established by the Ministry of Agriculture, Forestry and Rural Development (MAFRD). These are:

- the farm registers
- the register of producers and processors of agricultural and food products
- the register for agricultural land use
- the livestock register, among others..

- **National Development Strategy 2030**, in which relevant for agriculture and digitalization are the following development and strategic goals:
 - Related to agriculture, Development goal 1: Innovative, circular, and competitive economy:
 - Strategic objective 1.8 Improve productivity and sustainability in agriculture and,
 - Strategic objective 1.9 Build lasting links between farmers, processors and retailers.
 - Related to digitalization, Development goal 1: Innovative, circular, and competitive economy, Development goal 2: Quality, sustainable, and integrated infrastructure and Development goal 4: Accessible and quality education:
 - Strategic objective 1.2 Acceleration of digital transformation and innovation in SMEs and startups,
 - Strategic objective 2.6 Develop high quality broadband electronic communications networks and services,
 - Strategic goal 4.2 Improve inclusive access and digitization of educational services.
- **Strategy for Agriculture and Rural Development 2022-2028** provides MAFRD and stakeholders with a multi-year framework to guide rural development. Its vision is a competitive, innovative agri-rural sector rooted in modern knowledge, technology, and standards—delivering quality products and supporting sustainable resource use, economic activity, employment, social inclusion, and rural quality of life. In terms of digital agriculture, the Strategy highlights the following challenges:
 - Very poor digitalization of agriculture and few farms with precision agricultural technology,
 - Failure to keep records by most farmers,
 - Limited financial capacity to invest in new technology and increase farm size due to low profit margin,
 - Low productivity of the processing sector due to outdated technology,
 - Low research and development involvement and slow pace of innovation penetration in the agri-food sector,
 - Insufficient knowledge, information and skills for modern farm management, domestic and EU standards; poor compliance with standards,
 - A horizontal gap is related to the digitalization of the institutions (including their relation with the public / farmers) and the weak inclusion of the innovation into knowledge transfer networks.
- The **Digital Agenda of Kosovo 2030** is a strategic document “covering the development of Kosovo towards a digitally developed society” and outlining the requirements such as additional investments in human capital as well as direct investment to generate development. The Agenda fully recognizes that the ICT sector in Kosovo represents “an important part of the economy on which Kosovo must build its development potential”. It recognizes important challenges, such as:
 - Moderate performance of the broadband networks,
 - Mobile networks suffer from a lack of capacity and a low quality of services,
 - Poor digitalization of companies, and low engagement of the citizens in the digital economy,
 - Poor digital skills of women and men,
 - Unequal number of women knowledgeable and involved in the ICT sector, among others.

It defines five strategic objectives to tackle the above, all of which are of relevance for digitalization efforts in agriculture:

- Advanced secure digital infrastructure

- Digital transformation of businesses
- Digitalization of public services
- Digital skilled population and innovative R&D ecosystem
- Sustainable cybersecurity ecosystem

The Ministry of Economy is accountable for ongoing monitoring of the implementation of the strategic document and its corresponding Action Plan.

- The **e-Government strategy 2023-2027** is a strategic document that emphasizes key facets of digital transformation in the public sector, aimed at realizing the vision outlined in the Digital Agenda of Kosovo 2030. It includes aspects of e-government coordination both on strategic and operational levels and underlines the understanding that achieving substantial progress in digitalization is facilitated by prioritizing a more efficient "whole of government" enterprise architecture, reinforced by adherence to standards and technological frameworks.
- The **Strategic Plan of the Kosovo Advisory System for Agriculture and Rural Development 2023-2027** defines the long-term goals and priorities of the policy for the development of advisory services, as well as facilitates the implementation of sectoral policies. Outlining clear objectives and foreseeing the implementation of actions that enable the achievement of priorities in the field of development of the agricultural advisory system and rural development. One of its specific objectives is the "Advancement of Information and Communication System for Advisory Services". It underscores digitalization as "one of the biggest requirements for future rural activities, including agriculture and forestry". However, there is a perceived lack of knowledge on the subject.
- The **Green Agenda for The Western Balkans** is an initiative that aims to support the transition of the Western Balkan countries towards a more sustainable and green future, in line with the European Green Deal. It focuses on key areas such as climate action, air quality, circular economy, biodiversity, and sustainable agriculture, among others, with the goal of promoting environmental protection, sustainable development, and alignment with European Union standards and policies. The primary objective is to attain carbon neutrality by 2050 and synchronize with the fundamental components of the European Green Deal. The Agenda, included within the Economic and Investment Plan for the Western Balkans, seeks to invigorate the region's economy, align it with EU environmental standards and climate goals, eradicate corruption, and enhance democratic practices.

2.2. The reasons for initiating the drafting of the strategic document including reference to any laws or documents that authorized the drafting of the strategic document.

The drafting of the Digital Agriculture Programme and Action Plan was initiated to support Kosovo's EU integration process and advance institutional reforms in agriculture and rural development. Several key legal and strategic frameworks authorize and guide its development:

- The document is based on the relevant provisions of Law No. 08/L-218 on the Organization of the Market for Agricultural Products (Official Gazette of the Republic of Kosovo No. 2/09.01.2024), as well as Law No. 08/L-072 on Agriculture and Rural Development (Official Gazette of the Republic of Kosovo No. 8/30.03.2023), which provide the fundamental framework for rural development and agricultural support in line with the principles and objectives of the digitalization process

- National Programme for European Integration 2023–2027: Adopted in June 2023, it affirms Kosovo’s commitment to aligning with the EU Acquis and requires significant institutional adaptation.
- Strategy for Agriculture and Rural Development 2022–2028: Under Strategic Objective IV, it prioritizes:
 - Reorganization and operationalization of the Agriculture Development Agency (ADA) as an IPARD agency.
 - Entrustment for budget management and implementation of IPARD III measures.
 - Advancing digitalization and knowledge transfer in the sector.
- Law on Agriculture and Rural Development (Articles 19, 32 and 33): Mandates the establishment of agricultural registries and their interoperability with other databases to enable seamless institutional data exchange.
- Kosovo Reform Agenda, aligned with the Western Balkans Growth Plan, outlines key digital governance objectives:
 - Reducing administrative burdens.
 - Implementing electronic identification.
 - Enhancing interoperability between government systems.
 - Ensuring at least 50% of public services are available online by 2027.
- Supporting strategies, including the e-Government Strategy (2023–2027) and the Administrative Burden Prevention and Reduction Programme (2022–2027), further underscore the importance of digital transformation across sectors, including agriculture.

Together, these frameworks provide the legal and strategic basis for initiating the Digital Agriculture Programme and Action Plan 2025–2028.

3. Methodology

3.1. Brief description of the analytic approach or methodology used and the process for drafting the strategic document

The development of the Digital Agriculture Programme and Action Plan followed a structured approach, consisting of the following key stages:

- Analysis of the current situation
- SWOT analysis and identification of needs
- Definition of objectives
- Development of intervention logic with measurable indicators
- Estimation of budgetary impact
- Establishment of monitoring and evaluation mechanisms
- Development of an action plan

To facilitate this process, MAFRD established the Working Group for the development of the Digital Agriculture Programme and Action Plan, which held its inaugural meeting in December 2024. Comprising of 25 representatives from government institutions, NGOs, academia, and the private sector, the Working Group was tasked with drafting the Digital Agriculture Programme and Action Plan 2025–2028. FAO experts supported the process by facilitating five thematic workshops between January and February 2025. These workshops focused on:

- Strengthening collaboration between agricultural stakeholders to advance digital transformation
- E-governance systems and digital public services for agriculture
- Developing skills and building capacity for digital agriculture
- Digitalization of knowledge ecosystems and agricultural innovation (toward EU AKIS)
- Digital tools and platforms for market access in the agricultural sector

The assessment of digital agriculture in Kosovo identified key gaps and opportunities through expert input, institutional reports, and stakeholder consultations. It focused on the following areas:

- Digital infrastructure in agriculture: A gap analysis evaluated current systems against EU CAP Acquis requirements, using stakeholder interviews and reports from the European Commission Office in Kosovo.
- E-governance and administrative efficiency: The review analyzed document flows, web platforms, and IT systems through interviews with ADA, ASHI, and other relevant institutions.
- Knowledge transfer: The role of advisory services and academic institutions (e.g., University of Prishtina) was assessed, complemented by insights from a working group on innovation ecosystems held during the Inception Workshop.
- Food supply chains and cooperation: FAO's 2022 research informed analysis on digital tools for improving supply chain efficiency and multi-level collaboration.
- Digital adoption in rural areas: Focus group discussions under FAO research highlighted barriers and opportunities for digital uptake, especially in remote regions.
- Climate change and risk management: The analysis drew on national strategies and the Digital Agenda 2030, emphasizing the need for localized data and digital tools for early warning, irrigation, and adaptive advisory systems. Findings were benchmarked against the Green Agenda and EU environmental standards.

A SWOT analysis and intervention logic were developed through stakeholder consultations. FAO provided technical assistance throughout the process, ensuring coherence with Kosovo's digital transformation goals in agriculture.

4. Problem analysis

4.1. Current state and problem definition

Agriculture remains a critical pillar of Kosovo's economy, contributing 7.4% to the country's GDP and providing employment to a significant portion of the population. Over 130,000 households, accounting for approximately 270,000 individuals, are directly involved in agricultural production, with a notable share of small-scale farmers. However, the sector has seen a gradual decline in its contribution to economic growth and employment, posing significant challenges to the long-term viability. A high proportion of farmers manage less than 5 hectares of land, and the landholdings are often fragmented, making efficient farming practices difficult to implement. Despite the central role of agriculture in Kosovo's rural communities, the sector faces numerous obstacles that hinder its growth, productivity, and sustainability.

One of the most pressing issues is the low productivity and limited innovation in agricultural practices. Although nearly a third of Kosovo's farmers are under 44, the shift towards modernization and digitalization is slow. Many young farmers still rely on traditional methods, and productivity remains low. This resistance to change is compounded by a lack of digital skills among farmers, particularly older farmers. Limited digital literacy, along with a general perception that new technologies are difficult to learn, discourages farmers from adopting innovative tools that could improve their productivity and efficiency. While a large share of

farmers express a willingness to adopt new technologies, the widespread uptake of digital tools remains limited, especially for managing farm operations beyond basic administrative tasks like subsidies. Women represent just 5% of registered farmers, with limited access to land ownership, agricultural machinery, and financial resources. These barriers restrict their ability to participate fully in agricultural innovation and growth. Additionally, women's limited involvement in decision-making processes and their disproportionate share of unpaid farm labor and domestic responsibilities hinder their access to training, employment, and digital tools. Another significant challenge is the environmental degradation caused by unsustainable farming practices. The increasing frequency of natural disasters, including floods, droughts, and hailstorms, exacerbates this vulnerability. Although climate-smart farming practices could mitigate these risks, they remain underutilized, particularly among smallholders. Kosovo's agricultural sector is ill-prepared for the environmental challenges it faces, with insufficient disaster risk management systems in place to address the specific needs of farmers.

Despite progress in expanding internet access, digital infrastructure remains insufficient to fully support the agricultural sector. Although 98.6% of households have internet access, the adoption of digital technologies in farming remains low. Farmers often lack the necessary resources and training to use digital tools effectively, and those who are interested in digital solutions face significant barriers, including high costs and a lack of availability in certain areas. The need for digital proficiency in agriculture is evident, yet only 2% of farmers are aware of capacity-building programs that could help them bridge the skills gap. Moreover, Kosovo's agricultural sector faces challenges in aligning with the European Union's requirements for digitalization under the Common Agricultural Policy (CAP). While Kosovo has taken steps toward digital governance, including adopting an e-Government Strategy, the availability of online public services remains limited. Only 10% of public services are accessible online, and the lack of a comprehensive information system to support advisory services for farmers further hinders efforts to modernize the sector. There is also no structured exchange of knowledge between farm advisors, researchers, and other key stakeholders in the agricultural knowledge and innovation system (AKIS), preventing the flow of critical information that could drive innovation and best practices in farming.

In summary, despite the sector's ongoing importance in terms of employment and GDP contribution, agriculture faces numerous challenges related to low productivity, limited adoption of digital technologies, gender inequality, environmental degradation, and inadequate digital public infrastructure. The country's efforts to modernize the sector are hindered by a lack of digital skills among farmers, inadequate support and training, and limited financial resources.

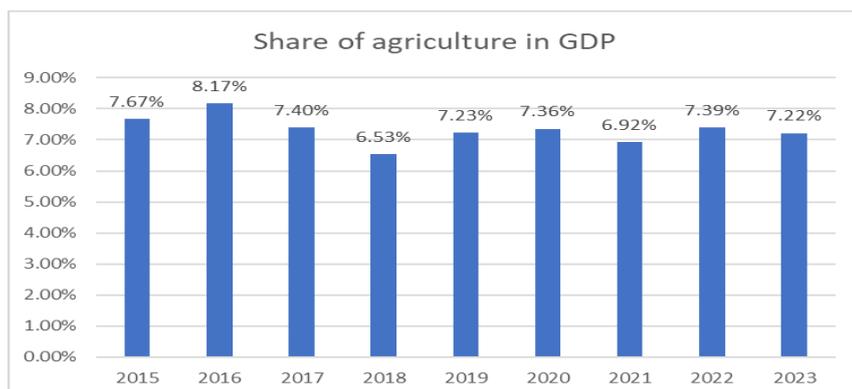
This chapter provides a detailed analysis of the challenges facing Kosovo's agricultural sector, with a particular focus on digitalization and the barriers that hinder key actors from embracing transformative change.

4.2. Agriculture and rural areas in Kosovo

Agriculture plays a significant role in Kosovo's economy, contributing both to its gross domestic product (GDP) and employment. With a contribution of 7.4% of GDP, agriculture is the fourth-largest sector in the country.

Beyond its economic significance, agriculture plays a vital social role in Kosovo, serving as a safety net for much of the population. Over 130,000 households, comprising approximately 270,000 people, are directly engaged in agricultural production as farm holders. Of these, 91.4% are small-scale farmers, managing less than 5 hectares of land. In addition to these farm holders, agriculture supports a wide range of employment, including contracted and paid workers, unpaid family members, and more than 17,000 individuals employed by 3,164 agri-businesses.

Figure 1: Share of agriculture in the GDP of Kosovo, 2015-2023

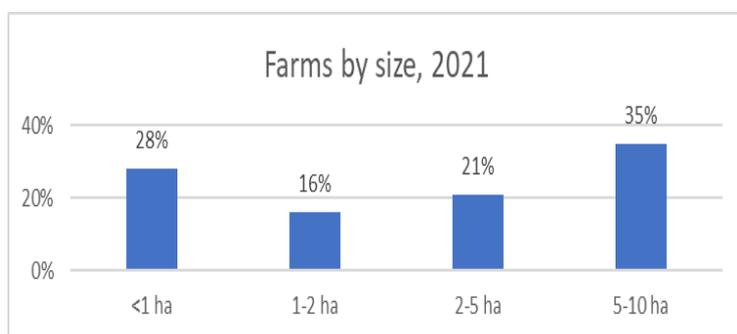


Source: Trading Economics, May 2025

Farm structure and key agricultural value chains

Kosovo's agriculture sector is characterized by family farms with relatively small land and fragmented landholdings. Compared to all other similar economies, the proportion of farms that are classified as "very small" is notably higher in Kosovo (UNDP, 2022). In 2023, 420,688 hectares of land in Kosovo were agricultural. per capita, 0.11 hectares were at the disposal of farmers in Kosovo. Based on the categorization of farm size, the highest percentage of farms fall into the small category. Specifically, 30.4% of farms have a land size of 0 to less than 0.5 hectares, 23.0% have a land size of 2 to less than 5 hectares, 21.9% have a land size of 1 to less than 2 hectares, and less than 0.5% have a land size of 20 hectares or more (FAO and IADK, 2022).

Figure 2: Farms by size in 2021



Source: Kosovo Agriculture in Numbers, 2021

Rural areas and population

The total land area in Kosovo is divided into the following main categories¹: agricultural land (38.53%), forests and forest land (44.11%), urban land (4.40%), and other categories (12.96%). Of this, 420,688 hectares² have been identified as utilized agricultural land. Meanwhile, the most recent data from the 2024 Population, Households and Housing Census indicate that 49.8% of Kosovo's total population—i.e. 789,939 inhabitants—

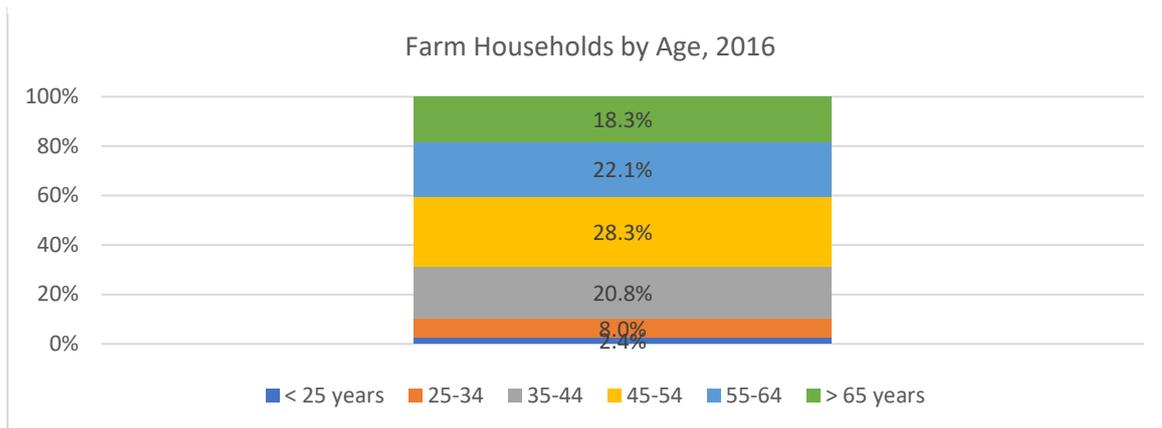
¹ Agriculture and Rural Development Strategy 2022–2028

² 2023 Agricultural Holdings Survey conducted by the Kosovo Statistics Agency (KSA)

reside in rural areas, specifically in proximity to these agricultural zones. These individuals are distributed across a total of 1,425 settlements, of which at least 50 are currently abandoned.

Kosovo has a relatively high share of younger farmers, with nearly a third of them being below 44 years of age. Kosovo also has the youngest population in Europe, with more than half of its residents being under the age of 25 (UNDP, 2022). Despite the youthful demographic in Kosovo, which would typically suggest a greater inclination towards innovation and digitalization, this trend has yet to manifest significantly in the agriculture sector while labour productivity remains low. (UNDP 2022).

Figure 3: Farm households by age, 2016



Source: The World Bank

As of 2018, women constituted a mere five percent of registered farmers, highlighting the persistent gender disparity in agriculture (KWN, 2018). Women face limitations in property ownership and access to essential agricultural machinery and inputs, such as all-terrain vehicles and mechanized equipment. These constraints hinder their eligibility for loans, grants, and subsidies. Additionally, women encounter challenges in accessing financial support due to a lack of soft skills and knowledge. They often struggle with writing proposals and completing applications, leading them to avoid applying for grants, loans, or subsidies. One of the major obstacles to women's participation in the labor force and agriculture in rural areas is the inadequate availability of care services. Additional domestic responsibilities and unpaid farm labor restrict women's participation in formal employment, training, and education (FAO, 2024).

Rural areas in Kosovo play a critical role in the country's economy, particularly in agriculture and natural resource management. However, the continued depopulation of certain rural settlements presents challenges for local development and the sustainability of agricultural activities. Economic constraints, limited income-generating prospects, and disinterest in engaging in agricultural activities and living in rural areas result in high levels of outmigration. There is a growing trend of individuals abandoning rural communities and traditional livelihoods due to a reluctance to invest time and resources in agricultural endeavors, given the perceived challenges associated with agricultural work. This shift away from agricultural activities highlights the need for targeted interventions and strategies to rekindle interest, provide alternative income-generating opportunities, and create an enabling environment for sustainable agricultural development in rural areas (FAO, 2024).

Environmental and climate-related risks

Kosovo's agricultural sector faces increasing environmental pressures that undermine its long-term sustainability and resilience. Unsustainable farming practices—such as the overuse of chemical inputs, poor soil fertility management, and inefficient irrigation systems—are contributing to the gradual degradation of land and water resources. Despite the clear environmental stakes, the adoption of climate-smart and resource-efficient practices remains limited, particularly among smallholders farmers.

Climate change impacts are increasingly visible. Farmers report a growing frequency of erratic rainfall, prolonged dry periods, delayed frosts, and other extreme weather events that significantly disrupt production cycles. However, the lack of localized climate data and insufficient meteorological infrastructure limit farmers' ability to adapt. Adaptation techniques such as drought-tolerant crop varieties or efficient irrigation schedules are not widely adopted, due to weak advisory services, limited demonstration efforts, and a lack of incentive mechanisms. Natural disasters—including floods, hailstorms, and droughts—further increase agricultural vulnerability. Kosovo's geography and hydrological profile make it susceptible to these hazards, but the current disaster risk management systems remain underdeveloped for the agricultural sector. Although a national strategy exists, agriculture-specific emergency response is fragmented, and early warning systems are not well integrated with the needs of farmers. Municipal-level preparedness is also weak, with poor coordination, low institutional memory, and limited capacity for rapid response. With flooding identified as a recurring threat across multiple regions, Kosovo is increasingly vulnerable to climate-induced natural disasters affecting its agricultural sector and food production. The need to modernize Kosovo's early warning systems and disaster data infrastructure has been identified; yet agricultural vulnerability is still not adequately embedded into national risk platforms or digital preparedness tools, as highlighted in the same report.

As a result, the sector is increasingly exposed to climate-related shocks, while mitigation and adaptation mechanisms remain underutilized, fragmented, or absent. Environmental sustainability and disaster preparedness are not yet systematically embedded in Kosovo's agricultural development, slowing progress toward alignment with the EU Green Agenda and broader climate goals.

4.3. ICT and its use in agriculture

Dynamics related to the adoption of ICT in agriculture in Kosovo

ICT infrastructure and rural connectivity

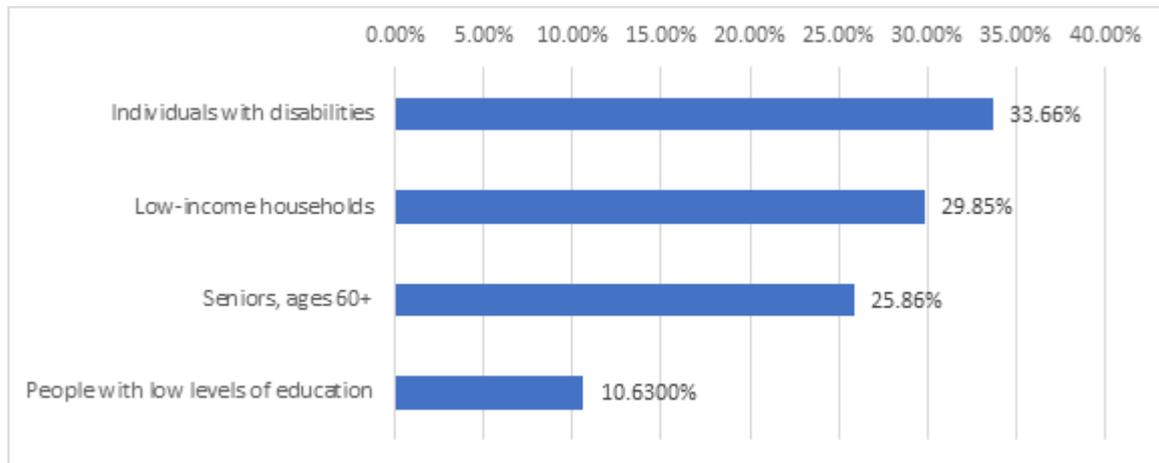
In recent years, Kosovo has made significant strides in improving its information and communication technology (ICT) infrastructure. The European Commission's 2024 report on Kosovo highlights that 98.6% of households had access to the internet in 2023, an increase from 97.9% in 2021. Additionally, Kosovo achieved 100% broadband coverage in 2023.

A UNDP survey conducted across Kosovo in April 2022 gathered responses from 2,400 households, aimed at assessing their experiences and perceptions regarding the accessibility, usage, and affordability of digital tools and services. Key findings include:

- Internet access in Kosovo is nearly universal, with 99.7% of households connected— the highest rate in the Western Balkans. Daily internet use is widespread (96.6%), but digital exclusion persists among seniors (especially 75+), people with disabilities, low-income households, and those with limited education.
- Digital devices are widely owned and generally considered affordable in Kosovo. Smartphones are the primary means of internet access (95.8%), followed by digital TV (71.8%) and laptops (65.5%). Nearly all households own a digital TV (99.7%) and a smartphone (98.7%), while laptop ownership stands at 68.6%. Mobile phones (37.8%) and desktop computers (37.3%) are less common.
- There are no major digital divides in device ownership by gender or location—about 98% of both men and women own mobile phones, with minimal differences between rural and urban areas (UNDP, 2022b). Few rural residents perceive gender-based disparities in digital access. However,

Roma, Ashkali, and Egyptian communities—especially women—face limited access due to economic hardship; only 1.25% of rural Ashkali women own a smartphone (KWN, 2024).

Figure 4: People most vulnerable to being digitally disconnected



Source: FAO and IADK, 2022

Despite progress, Kosovo faces challenges in expanding high-speed broadband due to limited private investment, outdated cable infrastructure, and delays in 5G rollout. While the legal framework for broadband cost reduction aligns with the EU acquis, administrative hurdles persist. Key actions include adopting the new Law on Electronic Communications, aligning with the EU Gigabit Infrastructure Act, EU Connectivity Toolbox, and simplifying 5G regulations. The telecom regulator remains under-resourced, and Kosovo must also align with the Digital Services Act and Digital Markets Act to support its growing ICT sector.

Digital identity, trust and cybersecurity

Despite progress, Kosovo must further align with the new EU Digital Identity Framework and roll out a digital identity wallet. Currently, 1 million eID accounts are registered with the Agency for Digital Society. The Kosovo Reform Agenda sets the following targets:

- By June 2026: Achieve compliance with the EU Digital Identity Regulation.
- By December 2027: Fully implement eIDAS-aligned legislation, attain mutual recognition readiness, request inclusion on the EU trusted list, and prepare to join the Balkan Identity Wallet initiative.

Kosovo enacted the GDPR-aligned Law on Personal Data Protection (No. 06/L-082) in 2019. The Information and Privacy Agency (AIP) oversees compliance and certifies data processors, though registration is not mandatory. Cybersecurity has improved through the partially EU-aligned Law on Cybersecurity and the National Cybersecurity Strategy (2023–2027). However, alignment with the NIS2 Directive and child online safety measures remain priorities.

In January 2025, the Working Group tasked with developing the Digital Agriculture Programme and Action Plan voiced concerns about data privacy and security, emphasizing the need to safeguard farmers' sensitive information and clarify data ownership.

Digital skills

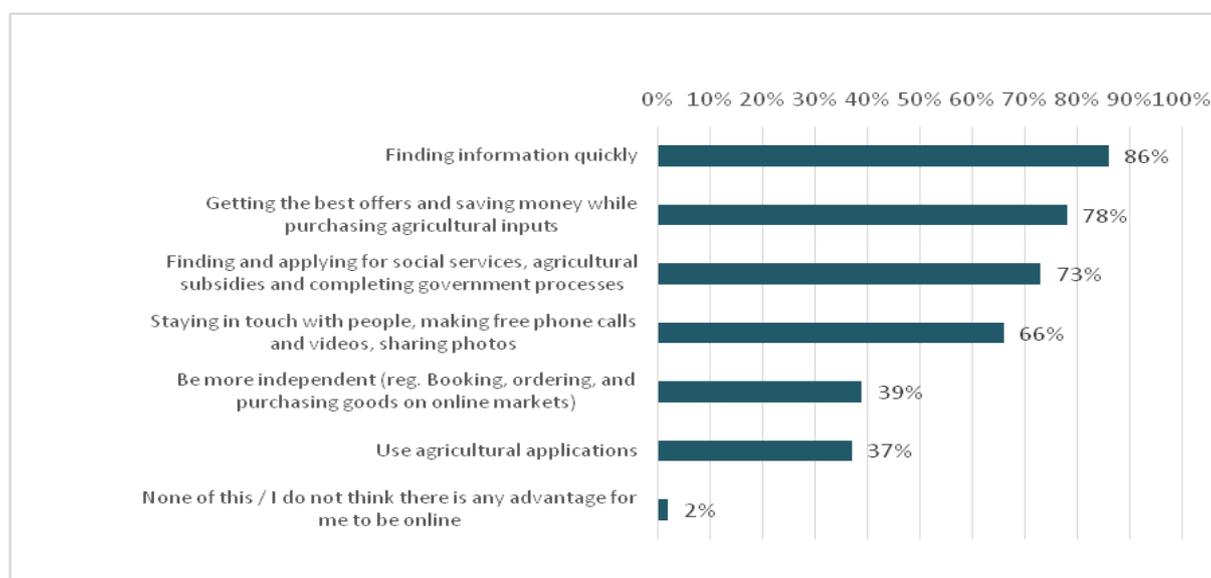
Farmers and rural population

The adoption of digital technologies in Kosovo’s agriculture is limited by low digital skills among many rural residents. While 98% of both women and men have smartphone and internet access, 23% of rural women and 20% of rural men feel they lack the knowledge to use digital tools (KWN, 2024). Farmers often struggle to learn new technologies, slowing adoption. Their top priorities include quick access to information and saving on input costs. A major barrier remains the lack of training opportunities (FAO & IADK survey with 203 farming households, 2022).

Key observations of the survey done in 2022 include:

- Limited digital proficiency: Limited digital literacy restricts their ability to leverage digital tools in various aspects of life, including agriculture. However, 60% of farmers express motivation and willingness to adopt new technologies, indicating strong potential for increased digitalization in agriculture.
- Perceived learning barriers: Farmers often perceive new digital technologies as difficult to learn, which discourages adoption. The average age of agricultural household heads in Kosovo is 52, and many older farmers hesitate or refuse to use digital tools due to these perceived difficulties.
- Key digital competencies priorities: Farmers see quick access to information as their top priority for improving digital skills, followed by a desire to have information how to purchase cheaper agricultural inputs. Respondents also acknowledged that digital skills could help them access social services, apply for agricultural subsidies, and navigate other administrative processes. However, interest in developing digital skills beyond these specific needs remains lower.
- Lack of availability and awareness of training opportunities: The vast majority (96%) of respondents are unaware of any capacity development programs aimed at enhancing digital skills. Only 2% of them reported the existence of either private or public-funded programs in their area.

Figure 5: Key reasons for using digital tools and services for farmers in Kosovo



Source: FAO and IADK survey with 203 heads of farming households, 2022

Public officials and IT staffing

Kosovo’s public sector lacks the digital workforce and skills needed to support its digital transformation. Only 0.5% of public employees are IT specialists—far below the 2–3% recommended internationally to maintain

and develop digital systems. This shortage stems from the absence of a comprehensive digital skills assessment and the inability to offer competitive salaries, with public sector wages significantly lower than in the private ICT sector.

Most public officials lack the digital skills needed to use e-services or guide citizens in using them. Those in charge of digital transformation often lack the technical capacity to lead it effectively. In agriculture, digital skills gaps are especially pressing: although the Agency for the Development of Agriculture (ADA) is tasked with managing digital systems for agricultural policy, these have not yet been established. With post-accession CAP implementation on the horizon, developing certified IT systems will require new staffing structures and extensive training.

Digital skills requirements in government institutions for policy design and the management of CAP information systems have not been addressed so far, as there were no information systems needed for the IPARD agencies to implement pre-accession support. However, the CAP requires that information systems be in place and certified for the management and implementation of measures after the post-accession period. This will necessitate appropriate organizational structure, adequate staffing, and intensive training for staff at various levels.

Stakeholders	Possible approach	Result
Managing authority Policy makers (decision makers) Policy analysis, programming, monitoring	Awareness raising trainings on the use of digital technologies in policy actions linked to CAP	Inclusion of use of digital technologies in policy actions, particularly those which contribute to better cooperation and better life in rural areas
	Trainings in policy analysis, scenario testing and programming with use of EU compliant methodologies	Skills in CAP programming and coordination of tasks regarding CAP strategic plan management information system
Agricultural economics and statistics	Trainings in compilation and validation of agri- statistical data with use of official statistics and agri-databases	Skills in preparation of EU reports and coherent data platform for the policy analysis
FADN Liaison agency	Trainings in organization of FADN collection campaign, preparation of specifications for FADN, validation of FADN collections, and data exchange with statistics and RICA	Advanced skills in preparation of specifications and test scenarios for FADN, validation of FADN data, transmission of data to RICA, and organization of data collection campaigns.
FADN data collectors – agricultural advisory	Trainings in FADN data collections follow-up communications with farmers	Advanced skills in collection and use of FADN data in advisory activities
FADN data analysis for researchers	Trainings in FADN data analysis, follow-up communications with advisory services	Advanced skills in analysis of FADN results and follow-up actions
Researchers	Trainings in use of AI and innovative approaches in agriculture	Advanced skills in acquisition of updated information on use of AI and innovative approaches in agriculture

Stakeholders	Possible approach	Result
Collection and reporting of agricultural market prices	Trainings in EU market price reporting, use of advanced tools for validation of prices	Advanced skills in management of collections of market prices, validation of collections and regular reporting to EU
Paying agency governance and management	Trainings in best practice in management of information systems for design and management of information systems for management of CAP	Design of information systems strategy linked to achievement of CAP objectives and policy actions Design of information security management policies based on threats and risks
Paying agency IT management staff	Trainings in organizational setup of IT management structures	Design of organizational setup, manuals, procedures, job descriptions for IT staff with the individual position training programme linked to risks
Paying agency IT staff responsible for technical support	Training in the use of manuals and procedures	Skilled technical services for management of confidentiality, availability and security, including end-to-end information assets management, incident management, capacity management, user's and software administration;
Paying agency business owners and IT staff responsible for software development	Training in manuals and written procedures in end-to-end software development life-cycle	Paying agency staff trained in software development life cycle management and methodologies including initiation of projects, preparation of users and technical specifications, test scenarios and testing, protocols for deployment and change management;
Paying agency IT staff responsible for system and database administration	Training in systems and database administration roles and manuals	System's and database administrators trained in protocols and operations including preparation and administration of separate test, stage and production environment, management of versions and maintenance
Paying agency IT staff responsible for coordination of IT security policies, operations and supervision	Trainings in internal monitoring and supervision and coordination of information security management processes	Operationalization of routines and protocol for information security management, supervision of
Paying agency staff responsible for procurement and contracting	Trainings in procurement of information assets	Paying agency staff strained in preparation of user's and technical specifications for procurement of information assets and services. More efficient procurement and procurement specifications prepared on the basis of proven needs

Stakeholders	Possible approach	Result
Paying agency staff responsible for procurement and contracting	Training in design of Memoranda of understanding and outsourcing contract with external institutions and contractors and their supervision	Paying agency staff strained in preparation design of memoranda of understanding and agreements in-line accreditation criteria for Paying agencies
Paying agency staff responsible for IT audits within Internal audit units	Training in Information system's audit of the information systems of the CAP paying agencies	IT auditor skilled in specifics of the CAP information systems

Educational institutions relevant for the digitalization of agriculture

Educational institutions in Kosovo currently play a limited role in advancing digital agriculture, as both university and vocational education programs largely do not integrate digital agriculture into their curricula. This gap means that students receive little formal training on digital tools and technologies relevant to modern farming. Additionally, many professors and instructors themselves lack the necessary skills and knowledge to teach digital agriculture effectively. As a result, the education system is not fully preparing future professionals to support or drive digital transformation in the agricultural sector. This lack of integration slows the development of a skilled workforce capable of adopting and promoting digital innovations on farms. Without targeted capacity building for educators and updated curricula, Kosovo will continue to lag behind in modern agricultural practices and struggle to improve its competitiveness in the regional market.

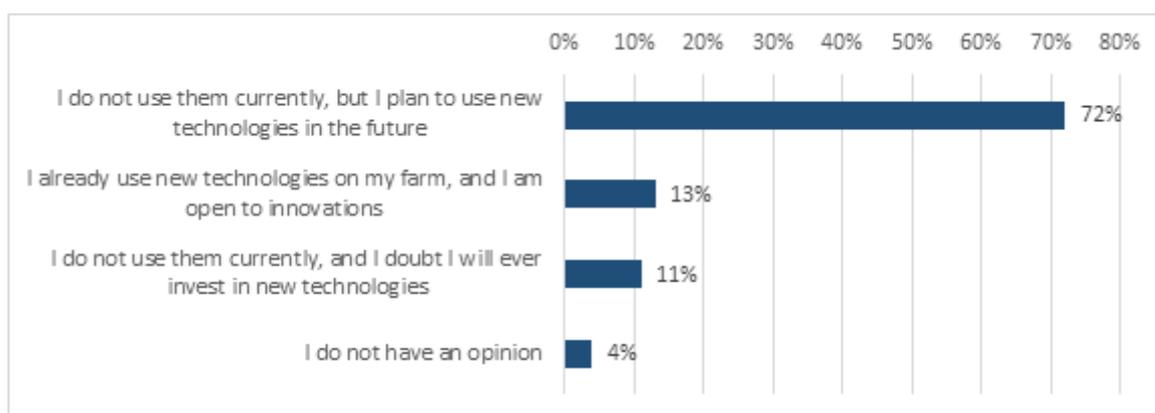
Use of digital technologies in agriculture

Use of digital technologies in agriculture by farmers

The use of ICT in agriculture can drive significant changes in how information is accessed, shared, and applied across the sector. It supports more informed decision-making, fosters innovation, and strengthens the inclusion and competitiveness of rural communities. Digitalization in agriculture in Kosovo remains at an early stage, with limited uptake of digital tools and technologies among small and medium-sized farmers. Although awareness of the potential benefits of digitalization is growing, implementation remains limited and inconsistent. Widespread adoption continues to be hindered by several challenges, including inadequate infrastructure, high costs, and low levels of digital literacy among farmers. (IADK, Brini, 2023).

In Kosovo, the adoption of ICT in agriculture remains limited, but there is strong interest in future use. Currently, only 13% of surveyed agricultural household representatives report using new technologies on their farms and being open to innovation. However, 72% of farmers do not yet use ICT but express an intention to do so in the future, indicating a general openness to digital transformation (FAO and IADK, 2022). The data also reveals a positive correlation between farm size and openness to innovation, with larger agricultural households more likely to adopt new technologies. This suggests that smaller farms may face barriers such as limited financial resources or a higher degree of risk aversion, which could impact their productivity and competitiveness.

Figure 6: The use of digital technologies for agriculture in Kosovo and willingness to invest in them in the future



Source: FAO and IADK, 2022

Approximately 33% of both women and men respondents use ICTs to access weather information, and 26% use them to obtain market price information. Fewer individuals use technology to access agricultural information—10% of men and 6% of women—or to find nearby markets, with 9% of men and 8% of women doing so. While gender differences are minor, women commonly use social media for personal communication, they rarely use it to advertise their products, preferring instead open-air markets and fairs. This represents a potential missed opportunity.

While the adoption of digital technologies in agriculture, with the exception of searching for information online, is limited in Kosovo, farmers are interested in using various technological tools and applications. Currently, they focus mainly on using them to handle online requests and report subsidies, which is done by only 14% of farmers. Despite the limited use of digital technologies in their agricultural work, farmers in Kosovo demonstrate a keen interest in various technological tools and applications.

Only a small proportion of agricultural businesses (12%) reported using online channels to sell their products or services. It points out to the fact that many of these households may not have the necessary technical skills or resources to create and manage their online presence. Additionally, some farmers may prefer traditional methods of selling their products, such as through local markets or direct sales to customers, which may not require an online presence.

Use of digital technologies in agriculture for climate change mitigation and environmental sustainability

While environmental and climate-related challenges are increasingly evident across Kosovo’s agricultural landscape, the use of digital technologies to mitigate these risks and promote sustainable practices remains limited and fragmented. The following sections lay out the identified trends and barriers:

Limited adoption of digital tools for climate adaptation: Farmers in Kosovo lack access to accurate, localized climate information and tools necessary for short- and long-term decision-making. Current meteorological systems are insufficient for practical purposes to agriculture and the absence of micro-climate-specific data hampers adaptation to unpredictable conditions like erratic rainfall, prolonged dry periods, and sudden frosts. Climate risk maps, mobile advisories, and digital forecasting models exist only in fragmented or donor-led pilot projects. As a result, most farmers continue to rely on anecdotal knowledge or reactive behaviors, rather than proactive and data-informed planning. Moreover, adaptation practices are rarely institutionalized, due in part to limited demonstrations, weak advisory coverage, and absence of incentive mechanisms. These gaps expose farmers to avoidable losses, reduce climate resilience at household and municipal levels, and undermine food security in vulnerable regions.

Lack of an integrated digital disaster risk management system: Kosovo’s

topography and hydrological patterns make it inherently vulnerable to natural disasters, including floods, droughts, and hailstorms. However, the country lacks a comprehensive digital disaster risk management framework for agriculture. Monitoring systems based on IoT (Internet of Things) technologies are either absent or remain confined to isolated pilot areas. Real-time agricultural risk monitoring (e.g., via IoT sensors, mobile platforms, and satellite data) should be integrated into Kosovo's national emergency response infrastructure. At present, such data systems remain fragmented or underutilized. There is currently no unified platform for aggregating disaster risk data or coordinating agricultural response strategies. Fragmented digital knowledge sharing and innovation ecosystem: Opportunities for digital knowledge sharing and innovation remain underutilized. Effective sustainability in agriculture requires strong collaboration between research institutions, digital innovators, farmers, and policy makers. However, Kosovo's innovation ecosystem remains fragmented. While some individual initiatives have attempted to connect universities, agritech startups, and farmer organizations, there is no institutionalized framework for regular collaboration or co-creation of climate-smart solutions. Knowledge transfer mechanisms, especially those supporting peer-to-peer learning or intergenerational exchange, are limited in scope and largely disconnected from digital platforms. Barriers to uptake of precision and sustainable digital solutions: The adoption of precision agriculture technologies—such as satellite monitoring, automated irrigation, or sensor-based fertilization—remains limited. High entry costs and the absence of shared service models or bundled solutions make these tools largely inaccessible to smallholders and subsistence farmers. Public extension systems often lack the digital capacity, training, or equipment to promote these tools effectively, and demonstration activities are geographically sparse and project-dependent. Additionally, public-private partnerships that could support sustainable digital innovation in agriculture remain underdeveloped.

Digital solutions and services offering in agriculture

Farm advisory services

The Kosovo Advisory Service operates as a Directorate under MAFRD. The advisory service is structured at both central and local levels, with regional offices currently being established. At present, the department consists of 13 staff members at the central level and 38 at the municipal level, with seven regional coordinators. Training centers have been identified in Lipjan, Peja, and Rahovec. Advisory services in Kosovo can also be provided through individual advisors or public-private partnerships, following a licensing procedure. Private advisory services for agriculture and rural development can be offered by private consultants, advisory companies, NGOs, veterinary stations, farmers' associations, agro-processors, and agricultural input suppliers. Certification is not required unless the advisory service is publicly funded. As of 2023, 13 organizations were officially registered to provide advisory services in Kosovo (Kosovo Green Report 2023).

The recently published [Strategic Plan of the Kosovo Advisory System for Agriculture and Rural Development \(2023–2027\)](#) outlines, under Specific Objective 2.1, the development of an Information and Communication System for Advisory Services. In alignment with CAP 2023–2027, advisory services must be strengthened to and integrated into the Agricultural Knowledge and Innovation System (AKIS)n.

Currently, no information system is in place to support advisory services in providing adequate access to farmers. Additionally, there is no structured exchange of knowledge among farm advisors, researchers, farmer organizations, and other key stakeholders within the Agricultural Knowledge and Innovation System (AKIS).

To address these gaps, the National Rural Development Plan 2023–2027 includes measures aimed at strengthening advisory services through:

- Measure 8: Improvement of skills and competencies

- Measure 10: Advisory services
- Measure 13: Promotion of cooperation for innovation and knowledge transfer

Furthermore, measures developed and accredited under IPARD III can be reused under CAP without requiring additional accreditation.

Needs	Example of digital supported activities	IPARD III measure and later CAP
Ensure easy access to all relevant information on knowledge transfer in agriculture	<i>Central page for advisory service and AKIS</i> <i>Example: Croatia</i>	Envisaged under Strategic plan of Kosovo Advisory System
Improve the availability of advisory services by streamlining the certification, registration, and publication of advisors	<i>Web page with list of advisors and their specific expertise, their contacts and possibility to schedule consultations</i> <i>Example: Croatia</i>	
Publish scientific and farm advisory materials tailored for practical use	<i>Publications developed in cooperation between scientific institutions and advisory service</i> <i>Example: Croatia</i>	Measure 10; CAP KNOW(78)
Facilitate knowledge exchange through e-learning platforms and webinars	<i>Webinars and e-Learning: Croatia</i>	Measure 8, Measure 10; CAP: KNOW(78),
Utilize FADN to monitor and assess farm performance	<i>Use of FADN results during individual advisory and analysis of FADN in communications with scientific institutions</i> <i>Individual farm report – Poland</i>	Measure 10; CAP KNOW(78)
Establish regular knowledge transfer channels between scientific institutions and advisory services	<i>Webinars for advisors organized periodically (linked to extension of license)</i>	Measure 10; CAP KNOW(78)
Promote European Innovation Partnerships to encourage the adoption of innovative technologies and digital solutions in agriculture	<i>Registration of interest in participation in EIP initiatives</i> <i>Searching for partners in EIP-Agri initiatives - Ireland</i> <i>Information on results of EIP initiative in use of innovative techniques in agriculture : EU EIP projects</i>	Measure 13; and CAP EIP COOP (77)
Provide assistance in using information technologies and accessing available support programs	<i>Transferring of skills in use of digital technologies to farmers during subsidy campaigns on-line or in person</i>	Measure 10 and CAP KNOW(78)

Source: Authors' own elaboration

The Working Group highlighted a critical shortage of professionals specialized in digital agriculture, which hinders the adoption of new technologies and limits the effectiveness of advisory services. Many advisors lack the skills to support farmers in using digital tools, weakening efforts to boost productivity and informed decision-making. Kosovo also lacks a formal Agricultural Knowledge and Innovation System (AKIS), and while steps are being taken to establish a legal framework for advisory services, existing systems remain fragmented with limited integration and capacity. As a result, stakeholders face uneven access to reliable information. Building a strong AKIS will require long-term investment in training, knowledge-sharing, and improved coordination among public and private actors. Reliable digital platforms and interoperable systems will be essential to support collaboration, disseminate best practices, and improve access to market and technical information.

Digital public services for agriculture

Kosovo has made some progress in digital services, including the adoption of the [e-Government Strategy \(2023-2027\)](#). However, the availability of online public services remains low. Further efforts are needed to align with the EU acquis on open data and the [reuse of public-sector information](#).

A new Agriculture window has been introduced on the e-Kosova portal, along with a service that enables farmers to obtain their registration certificates digitally. Additionally, 28 e-services are in development in the areas of food safety, veterinary, and phytosanitary regulations, aimed at streamlining licensing and permitting procedures in a digitally transformed environment. However, there is currently no service available to facilitate farm registration or the application process for updates related to direct payments and grants.

As per the results of the 2022 survey, a significant portion of agricultural households in Kosovo rarely or never use key digital services. For example, 44% do not use online banking, 65% do not engage in online selling, 40% do not buy products online, 42% do not complete processes or applications online, 22% do not search for information about goods and services, and 18% do not seek information about public services through websites. (FAO and IADK, 2022). The low usage of these services may suggest that there is a lack of awareness or access to such digital platforms and technologies, which could potentially hinder their ability to fully participate in the digital economy and benefit from the advantages it offers.

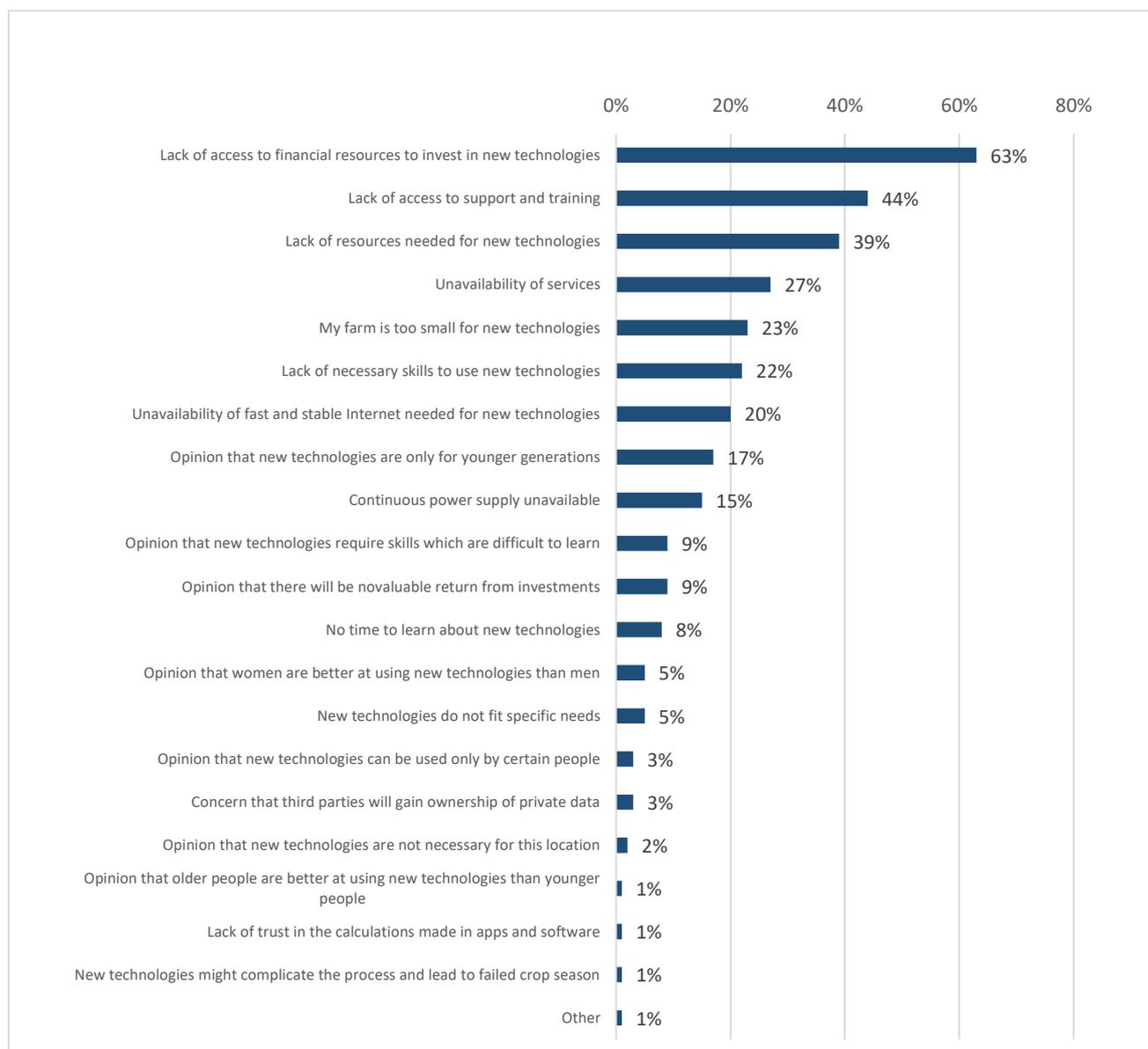
▪ **Key barriers to the uptake of digital technologies in agriculture**

Many agricultural households in Kosovo face challenges in accessing and affording new technologies. This is due to a lack of financial resources, support and training, and resources for new technologies. Additionally, services are often unavailable in certain locations, and some farmers believe that their farms are too small for implementing new technologies. Women farmers are particularly affected, as they are more likely to lack access to support and training. The main recognized factors are the following:

- **Lack of access to financial resources to invest in new technologies:** The lack of financial resources is a significant barrier for farmers to invest in new technologies. This can prevent them from adopting modern farming practices, leading to lower productivity and reduced competitiveness in the market.
- **Lack of access to support and training:** Access to support and training is crucial for farmers to gain the necessary knowledge and skills to effectively use new technologies. Without proper guidance, farmers may be hesitant to adopt new technologies, hindering the potential benefits.

- Lack of resources needed for new technologies: The lack of resources, such as infrastructure and equipment, can also impede farmers' ability to adopt new technologies. Without the necessary resources, it may be difficult or impossible for farmers to use digital tools and techniques effectively.
- Unavailability of services: Unavailability of services, such as access to digital marketplaces or online public services, can hinder farmers' ability to benefit from new technologies. This can limit their access to important resources and opportunities.
- Resistance to Innovation: The dominance of small and traditional farms using basic, conventional agricultural tools and methods is a characteristic feature of rural areas. These farms often show reluctance or difficulty in adopting new technologies and innovations. Encouraging farm profiling could serve as a potential driver for modernization.

Figure 7: Key barriers to the adoption of digital tools and services in agriculture



Source: IADK and FAO, 2022

The Working Group identified affordability as a key barrier to adopting digital technologies in agriculture. Many small-scale farmers cannot afford subscription-based apps or hardware, and unreliable power in rural areas further limits usage. Low digital literacy, mistrust of new tools, and limited awareness of existing platforms like Agro-Dev contribute to slow adoption. These challenges highlight the need for improved infrastructure, clearer responsibilities, and stronger support systems to enable broader digital uptake.

4.4. Kosovo' progress in meeting EU pre-accession requirements

Assessment of Common Agricultural Policy (CAP) mandatory systems and databases

A core component of the EU pre-accession requirements in the agricultural sector is the establishment and operationalization of key systems and databases mandated under the Common Agricultural Policy (CAP). These include the Integrated Administration and Control System (IACS) and other related administrative tools critical for transparent, efficient, and accountable management of agricultural subsidies and rural development funds.

This section assesses the current status of these systems in Kosovo, focusing on their development, functionality, interoperability, and alignment with EU standards. It also considers the institutional and technical capacities in place to manage these systems effectively, including the role of digitalization in enhancing data accuracy, monitoring capabilities, and service delivery. The analysis aims to identify progress made, existing gaps, and priority areas for further investment and reform to ensure Kosovo's readiness for CAP implementation upon EU accession.

Agricultural statistics

The [Kosovo Agency of Statistics \(KAS\)](#) is responsible for compiling agricultural statistics in cooperation with MAFRD—specifically, the Division of Agricultural Statistics (DAS). However, data exchange between institutions is not yet based on web services, limiting efficiency and access.

According to the [2024 EU Kosovo Report](#) on statistical infrastructure, the implementation of Kosovo's legal framework for statistics requires further strengthening. KAS needs to enhance its role as the central authority for official statistics, improve statistical governance, and foster better coordination among institutions within the statistical system. Additionally, KAS must secure more reliable access to administrative data sources. While data transmission to Eurostat is steadily improving, institutional infrastructure, internal processes, and delegated management remain key challenges. KAS launched a new website in July 2023, but further enhancements are necessary to enrich its content and usability.

In the area of agricultural statistics, Kosovo has aligned the preparations for the 2025 Agricultural Holding Survey with the EU acquis, despite delays. However, there have been no significant advancements in the production of agricultural price indices, economic accounts for agriculture, supply balance sheets, or the agricultural labor index, nor in the systematic transmission of agricultural statistics to Eurostat. The requirements for regular data submissions to Eurostat are outlined in the [Statistical Compendium 2024](#).

Kosovo needs to strengthen its alignment with the EU acquis by ensuring full compliance with Eurostat notification requirements, as the Kosovo Agency of Statistics (KAS) has yet to submit the complete set of mandatory agricultural statistics. Improving the interoperability of data systems is also a priority, particularly by enabling seamless data exchange between the Farm Register, Integrated Administration and Control System (IACS), and the Integrated Agriculture Information System (IAIS) to enhance the accuracy and efficiency of agricultural statistics. Additionally, integrating data from the Farm Accountancy Data Network (FADN) would support better sample selection and overall data quality.

Integrated agriculture information system (IAIS)

The Kosovo Integrated Agriculture Information System (IAIS) is an electronic information management system that integrates various existing databases in the agricultural sector in Kosovo and is managed by DAS under MAFRD. The IAIS integrates data on trade exchanges, farmer registrations, direct payments, grants,

agricultural product prices, vineyards and wines, Farm Accountancy Data Network (FADN) data, and data from the Food and Veterinary Agency, among others.

The primary objective of the IAIS is to provide accurate and consistent information essential for analyses, program development, yearly policy outcome assessments, and the generation of annual reports such as the Green Report. By serving as a reliable information source, the IAIS supports evidence-based decision-making, allowing users to generate tailored reports based on specific needs. The system operates on a physical server managed by the Information Society Agency, utilizing a Windows operating system with an MSSQL database and IIS application.

To enhance data collection, the IAIS needs to have a mechanism to conduct cross-checks with databases. It supports the compilation of information from various sources, including statistics, animal register, simplified Integrated Administration and Control System (sIACS), FADN, Customs, and the Agricultural Market Information System (AMIS). It also facilitates data exchange with statistical bodies and aids in the generation of the Green Report. Implementing mechanisms for cross-checking databases and establishing warning systems is crucial to detect significant discrepancies during data collection.

Currently, the IAIS is not interconnected to data sources via web services. To improve efficiency and data accuracy, it is necessary to replace existing data import methods with web services, ensuring alignment of definitions and coherence throughout the system.

Farm accountancy data network (FADN)

The Farm Accountancy Data Network (FADN) is a system for collecting and analyzing economic data from farms in Kosovo. The system gathers data on farm income, production costs, investments, and other key indicators, producing statistical reports that guide policy decisions.

The responsibility for FADN data collection in Kosovo was transferred to a contracted company after 2012, having previously been managed by the extension service. The FADN data collection process follows the European Commission's regulations, incorporating structured questionnaires, validation tests, and data processing tools. It also facilitates real-time communication between interviewers and data controllers. Initially launched as a pilot in 2004 with 50 farms, the sample expanded to 1,250 farms by 2015, covering nearly 2% of observation field farms. However, there is no current maintenance agreement for the FADN software, and while it connects to the statistical farm register, it lacks integration with the agricultural farm register, ADA databases, and animal register databases (FAO 2022).

In 2023, FADN has been improved, and the Kosovo FADN data for the year 2019 (i.e., the latest available data) has been tested and validated according to EU standards of data quality. Recommendations have been provided for further developments in the future. Coherence test limits, selection plan fact-sheet, clustering rules, and standard output coefficient values have been adjusted, and the RICA1 training environment has been established. DG Agriculture has provided DEAAS access to the RICA1 system. As per the assessment report, FADN is of adequate quality and can be used.

The recognized needs include aligning with the EU acquis, particularly ensuring compliance with the Farm Sustainability Data Network (FSDN) requirements outlined in Regulation (EU) 2023/2674. Improving interoperability is also essential, with a focus on streamlining FADN data collection by integrating it with existing administrative databases such as the Farm Register, sLPIS, IACS, and the Grant Management System. To improve data reliability, there is a need to enhance quality control systems by upgrading validation tests and introducing more advanced mechanisms for verifying both farm-level and aggregate-level data in line with updated FADN standards. Key opportunities include utilizing FADN data for advisory services by enabling one-on-one sessions based on farm feedback reports and strengthening monitoring through collaboration with

research institutions. Additionally, developing simple business plan templates can support farmers in evaluating the financial viability of small investments, improving their planning and decision-making capacities.

Integrated administration and control system (IACS)

Electronic farmers register (eFR)

The Electronic Farmers Register (eFR) is a digital database managed by Kosovo's Payment Agency, designed to determine farmers' eligibility for financial support from public authorities and other sources. While registration is optional, it is mandatory for those applying for grants and subsidies.

Launched in 2012, the eFR initially registered 16,608 farmers. By the end of 2019, this number had grown nearly 300% to 66,224 farmers across 37 municipalities in Kosovo. The database stores personal details, contact information, and farm locations (via GPS coordinates or addresses). It also includes data on agricultural land use, livestock numbers, rural development activities, and bank account details. Each farmer is assigned a unique system-generated registration number.

eFR is integrated with the Simplified Land Parcel Identification System (sLPIS) and the Register for Direct Payment Management. These systems streamline the registration process and ensure automatic information sharing. When a farmer registers in eFR, their data is transferred to sLPIS for land parcel digitization and Register for Direct Payment Management for direct payment applications. This integration streamlines the process for farmers and ensures that all relevant information is automatically shared between systems. The EU's [2024 Kosovo Report](#) recommends further steps toward developing an integrated administration and control system.

Farmers in Kosovo register at municipal offices, where authorized staff with ADA-issued accounts process applications using ID card verification. The system generates passwords for online grant submissions, but has several limitations. It is not yet interoperable with the population, business, or bank account registers. Each farm is assigned a unique NIF-ID, essential for reporting and system integration. While farmers declare livestock, this information is not linked to the animal register, preventing verification. Similarly, land use declarations are not connected to the spatial Land Parcel Identification System (sLPIS), allowing ineligible land to be reported. Though land parcels are graphically declared in sLPIS, the final records in the farm register are stored in non-spatial alphanumeric format. Farm machinery is also declared but not linked to machinery grant applications, limiting its usefulness.

Key needs for improving the electronic Farm Register (eFR) include aligning its data with FADN and farm structure surveys, integrating the official animal registry, and linking land-use data with area-based registries, as required under EU regulations. Interoperability must also be strengthened to enable seamless data exchange with population, business, bank, animal, food production, and cadastral records, and to directly incorporate LPIS parcel geometries and attributes.

Direct payment supports system – simplified IACS (sIACS)

The Register for Direct Payment Management serves to manage and process direct payment applications for farmers, including administrative control, field control, payment calculation, and sending of decisions and notifications. This web application consists of two modules: one for municipal offices handling applications and another for direct payment management within ADA. It enables farmers to apply for direct payments related to crops and livestock while integrating with sLPIS for parcel digitization. Additionally, it supports

administrative and field control, payment calculations, list compilation, and notifications via SMS and email for direct payment management (FAO 2022).

Key needs for improving the direct payments system include aligning support schemes with the Common Agricultural Policy (CAP) structure and budget, and integrating CAP performance indicators into the national system. A user-friendly, geo-spatial application is needed to support single aid applications, pre-filled with farm register data, and capable of handling various payment claims, including animal-related support. Once the Land Parcel Identification System (LPIS) is fully operational, it should be integrated into this application. Establishing a quality management system for the geo-spatial application is also essential. Additionally, the overall IACS-like system should be optimized to manage administrative and on-the-spot controls, introduce conditionality checks in phases, and support CAP-compliant interventions. Finally, the system must be able to provide relevant data for performance monitoring and reporting. Improving interoperability is essential for building an efficient and modern direct payments system. This includes enabling seamless data exchange with the farm register, animal database, cadastre, and statistical systems, in line with the 'once-only' principle. Existing e-Kosova services should be leveraged to support this interoperability, with the direct payment application service made accessible through the e-Kosova platform. Furthermore, the system should ensure compliance with public data-sharing requirements and open data principles, while aligning with data needs for farm accounting and monitoring systems.

Simplified LPIS (sLPIS)

Kosovo's Payment Agency (ADA) is responsible for managing sLPIS. This web-based application was developed in 2011–2012 as a system for agricultural parcel declarations. As the name suggests, sLPIS does not fully meet EU requirements but serves as a hybrid system used both as a geographical reference system and for subsidy applications. Over time, with various updates, it has evolved into a geo-spatial aid application (GSA) for graphical subsidy declarations.

The IT department managing sLPIS, along with other databases and IACS applications, consists of only three employees, which is insufficient for proper system maintenance. The Land Parcel Identification System (sLPIS) in Kosovo records agricultural parcels, with each entry representing a single crop, reflecting the country's crop-specific direct payment scheme. While LPIS is mentioned in agricultural and direct payment legislation, there is no dedicated legal framework or rulebook detailing its structure and operation. The system currently covers only arable land and permanent crops, excluding permanent grasslands due to the lack of related subsidies. It does not include environmental data like Ecological Focus Area (EFA) elements or Maximum Eligible Area (MEA) values, so payment declarations rely solely on the graphical area of the polygon. The ortho-imagery (Digital Ortho Photo – DOP) used is outdated, originating from 2012 and no longer accurately reflecting land conditions. However, the Kosovo Cadastral Agency has commissioned new imagery, expected in late summer 2024, with improved resolution and accessibility for ADA.

Key needs for improving LPIS include developing legal methodologies for digitalization, defining agricultural land and reference parcel criteria, and establishing requirements for eligible areas and environmental standards. The LPIS software must be upgraded accordingly, with reference parcels updated at least every three years. Data coverage should expand to include permanent grasslands, and LPIS must be fully integrated with the farm register, grant management system, GSA, and FADN. Staffing should be strengthened to meet accreditation and quality management standards. Interoperability priorities include launching a public LPIS viewer, enabling data exchange with institutions such as cadastre and statistics, and ensuring integration with registers for vineyards, organic production, and fruit and vegetable traders. Geographic data layers—such as ANC, AMR, water bodies, forests, soil, irrigation, elevation, and protected areas—should also be incorporated to support planning and monitoring.

AMS: Area monitoring system

- Currently, Kosovo does not have an operational Area Monitoring System (AMS). The main need is to establish such a system equipped with a quality assurance framework that aligns with relevant EU standards and regulations.

Animal register and register of capacities for food production

The animal register is managed by the Food and Veterinary Agency of Kosovo. Although Kosovo has adopted a new administrative instruction on animal identification and registration, and some systems for food control and laboratory management are operational, animal movement tracking remains inadequate and enforcement controls require strengthening. Currently, there are no digital services enabling data exchange on animal registration or food production capacities with other systems. The main need is to develop and implement such digital services to improve integration and data sharing across administrative systems.

Performance monitoring and evaluation framework information system (PMEF-IS)

The information systems supporting the performance of CAP Strategic Plans need to be established in Kosovo, ensuring that key information on the implementation of the CAP Strategic Plan is recorded for monitoring and evaluation. This includes tracking progress towards objectives and targets, as well as recording information on each beneficiary and operation. The main needs for the PMEF-IS include aligning the system with EU CAP monitoring requirements by integrating indicators from IPARD III and the CAP framework to ensure effective monitoring and evaluation of agricultural and rural development policies. Additionally, the system must be interoperable with all administrative platforms used for approving agricultural and rural support to streamline data collection, improve transparency, and enhance policy implementation and reporting efficiency.

Other registers linked to direct payments

Agricultural insurance system

Kosovo's Agricultural Insurance System allows insurance companies to issue policies and integrates weather data from the Meteo Group. It includes a public website offering price maps, a policy calculator, and a Farmers Forum, though the application itself is not available online. Since 2017, MAFRD has worked with the International Finance Corporation to establish this system, with the first insurance products launched in 2019. The system runs on a virtual server hosted by ISA, using Ubuntu and a MySQL database, and receives weather data via Web API. Although the CAP provides for agricultural insurance under risk management tools linked to land or livestock, such measures are not yet in place in Kosovo. The main needs are to align the system with CAP risk management tools and ensure integration with the administrative support system (GSA) once the intervention is introduced.

Vineyard cadastre and quality control system

The Kosovo Vineyard Cadastre and Quality Control System provides digital vineyard maps and a cadastre for the wine industry, including a tool for monitoring wine quality based on sensory attributes such as taste, aroma, and color. Developed with the Ministry of Agriculture under a project to support the viticulture sector, the system uses Geoserver/PostGIS to build a comprehensive vineyard database. It also supports organoleptic wine quality control and aids in registering protected designations of origin (PDO/PGI). The cadastre supports planning and decision-making in the wine sector. With interventions for the wine sector included in the CAP Strategic Plan and subject to IACS-based implementation, the main needs are to ensure interoperability by

linking the system with the administrative support system (GSA) and to establish a dedicated vineyard cadastre layer within LPIS.

Kosovo Forest Information System

The Kosovo Forest Agency manages forests on public and private lands and oversees non-wood forest products, with partial responsibility for hunting and wildlife. Other institutions involved include the Department of Forestry, park directorates for Sharri and Bjeshkët e Nemuna, and relevant inspectorates. The Kosovo Forestry Information System (KFIS) is a web-based platform integrating forest management, GIS mapping, monitoring, reporting, and user access, structured across database, business logic, and client tiers. Modules include forest management, system administration, GIS, monitoring and evaluation, and external access. The main needs are to improve interoperability by adding forestry data as a layer in LPIS, develop public data exchange services beyond password-restricted access, and prepare KFIS to support direct payment mechanisms for forestry under IPARD III and future CAP interventions.

Water management system

The Ministry of Environment and Spatial Planning (MESP), supported by the Kosovo Environmental Protection Agency (KEPA), is responsible for water resource governance in Kosovo. The Water Information System (WIS), managed by the Division for Water Resources Planning, maintains databases, GIS layers, archived data, and regulatory records. It includes information on water quantity and quality, water permits, pollution registers, hazardous substances, rehabilitation programs, and environmental incidents. The main needs are to improve interoperability by linking water data with LPIS, develop public data exchange services since the system is currently password-restricted, and, under IPARD III, introduce direct payment mechanisms related to water through WIS in line with future CAP interventions.

Kosovo cadastral agency – geo-portal

The Kosovo Cadastral Agency manages the cadastral database, property registers, GIS, the unified address system, and national IT infrastructure. The Kosovo Geo-Portal integrates multiple spatial data layers from various institutions, including water resources, pipelines, irrigation systems, protected areas, and elevation maps. The main digitalization need is to align with EU requirements by ensuring free public access to high-value datasets and promoting the reuse of public-sector information through open data practices.

Register of organic production

Kosovo does not yet have an official register for organic production, although several certification organizations operate alongside the Organica association of organic producers. The National Organic Action Plan (NOAP) 2023–2026 has been published on the MAFRD website. The main needs are to establish a database within MAFRD for registering and certifying organic production, integrate organic production areas as a separate layer within the Land Parcel Identification System (LPIS), and ensure interoperability with geospatial applications using pre-populated data to support monitoring and control.

Register for traders of fruits and vegetables

- Kosovo must establish a register for fruit and vegetable traders to support price data collection and future reporting obligations. The main need is to establish a trader register aligned with EU requirements, following the adoption of relevant marketing standards.

Other relevant EU requirements

Food safety, veterinary and phytosanitary

EU requirements call for the registration of establishments by food business operators, except those exempted under specific provisions. Some countries use detailed facility registers to manage quality schemes. Kosovo still needs to adopt secondary legislation under the Law on Food and develop a strategy for aligning with the EU acquis on veterinary and phytosanitary policy. The Food and Veterinary Agency (AVUK) lacks sufficient resources to fully implement the acquis. While systems for food traceability, control, and laboratory management are in place, further investment is needed to strengthen them.

Following the transfer of 58 inspectors to the Ministry of Health, AVUK must recruit new inspectors, establish an epidemiological unit, and implement risk-based inspections for both domestic production and imports. In phytosanitary policy, Kosovo must improve surveys, early pest detection, and eradication measures, and begin work on the legal framework for novel foods and GMOs.

Under Chapter 12 (Food Safety, Veterinary, and Phytosanitary Policy), key gaps include disease control and animal movement registration. It is also necessary to classify all food establishments and animal by-product facilities, establish a collection and disposal system for by-products, and invest in ongoing staff training and IT capacity at AVUK. Institutional consolidation is needed to monitor pesticide use and secure market access.

EU financial support for agricultural and rural development

E-Government in implementation of IPARD towards CAP

Grants register

The Grants Register is an electronic system managed by the Agricultural Development Agency (ADA) to oversee grant applications, approvals, payments, and field inspections under the IPARD-like support programme. Operational since 2014, it includes modules for application intake, payment processing, authorizations, and field control. While Kosovo has made progress in simplifying procedures and allowing online grant applications, subsidy applications are not yet integrated into the e-Kosova portal. A 2024 assessment reviewed the entire grant management process and highlighted areas for digital transformation and alignment with the EU acquis. Applicants currently upload scanned documents through the web system, but payment requests are still handled on paper via local offices. Although administrative controls are conducted digitally, on-the-spot inspections remain paper-based and disconnected from the system. Decision notifications are sent via SMS, but further integration and modernization are needed to fully digitize the process.

Kosovo's IPARD-like programme has supported a limited number of applicants, with relatively high grant amounts per beneficiary. The highest success rate (100%) is seen under Measure 5, where applicants are more experienced. The main challenges include complex application processes, high administrative burdens, and barriers for small farmers.

The Strategy for Agriculture and Rural Development 2022-2028 highlights the need to simplify business plans and increase support for small farmers. To align further with the EU, IPARD-like measures must transition to EAFRD-like interventions, using simplified cost options and integrating with IACS for greater efficiency. Key needs include reducing administrative burdens by reusing data from IACS, the Farm Register, and tax records to enable pre-filled digital forms; digitizing payment requests to allow online submissions; enabling digital signatures for applications and declarations; adopting simplified cost options to reduce documentation and speed approvals; certifying the IPARD agency's IT system to EU security standards; and ensuring interoperability between the Grants Register, IACS, and other government platforms.

Lessons learned and digitalization prospects in IPARD implementation

The experience of the IPARD II programme in the Western Balkans revealed several key challenges, including complex and restrictive procedures, a high rate of incomplete applications, limited administrative capacity, and difficulties related to land ownership documentation and permit acquisition. Farmers also face challenges in pre-financing investments, while advisory support remains weak and there is a risk of inflated claims. Additionally, the lack of quality electronic registers and low digital access hinder efficient programme implementation.

Digitalization offers significant opportunities to address these challenges. Simplifying procedures by introducing pre-filled e-applications using existing data (from farm registers, cadastral, and land parcel information systems) and adopting simplified cost options can reduce administrative burdens and accelerate processing. Open tenders for small investments, improved e-communication with institutions, and expanded e-advisory services can enhance programme accessibility and efficiency. Furthermore, digital access to finance and integration with agri-data systems can facilitate investment financing.

Looking ahead to IPARD III and post-accession CAP alignment, there is a clear need to strengthen digital tools supporting public procurement and rural infrastructure investments. Enhancing digital support for Local Action Group (LAG) establishment, investing in local digital hubs and Wi-Fi infrastructure, and enabling joint investment schemes through digital platforms can improve small farmers' access to funding. The promotion of digital cooperation models—such as virtual producer groups and short supply chains—alongside the use of online training and knowledge exchange platforms, will be critical to fostering innovation and improving programme outcomes.

LEADER

In the context of the European Union, LEADER is an approach to rural development that aims to empower local communities and promote bottom-up, community-led initiatives in rural areas. Under the LEADER approach, funding and support are provided to Local Action Groups (LAGs), which are composed of representatives from local communities, businesses, and public organizations. These groups are responsible for identifying the specific needs and opportunities in their rural areas and developing strategies and projects to address them. LEADER funding can be used for a wide range of initiatives enhancing the overall quality of life in rural communities. In many ways, LEADER approach bears similarity to the 'Smart villages' initiative, further elaborated on in the next chapter.

The 2020 research findings (Krasniqi, 2020) indicated that while the LEADER approach is well-understood in theory in Kosovo, its practical implementation has been lacking. Despite the establishment of LAGs in Kosovo, the development progress of these groups has been limited. Out of the 30 LAGs that have been established, nearly half of them remain inactive. When implementing their projects, they predominantly depend on financial support from MAFRD and municipal authorities. Only in a limited number of instances have they successfully secured project funding from the European Commission and international organizations. Furthermore, the seven key features of LEADER- area-based local development strategies; bottom-up approach; integrated and multi-sectoral actions; local public-private partner-ships; innovation; networking; and cooperation - should be adhered to for the successful implementation of the LEADER approach. The research findings regarding the functioning of LAGs in Kosovo reveal that none of them fully aligns with all seven key features of the LEADER approach.

5. SWOT analysis and identified needs

5.1. SWOT analysis

The Working Group, established in December 2024, aimed to assess the current state of digital agriculture in Kosovo by engaging key stakeholders through five thematic workshops. These sessions revealed a solid foundation with functioning e-government systems, broad internet access, a digitally literate young farming population, and growing political support for climate-smart agriculture. However, challenges remain, including low digital adoption, fragmented advisory services, limited data integration, and insufficient infrastructure and funding. Small-scale farmers face barriers such as costly technology, inadequate training, and complex application procedures, risking exclusion from digital benefits. Additionally, rising climate risks highlight the need for stable funding, better institutional coordination, and practical support for climate-resilient digital solutions. The SWOT analysis below summarizes these insights, guiding targeted interventions to ensure Kosovo's digital agriculture transformation is inclusive, sustainable, and aligned with EU accession goals.

1. Strategic and policy commitment

- Kosovo's alignment with EU digital frameworks, like the Digital Europe Programme and broadband development efforts, demonstrates ongoing commitment to improving digital infrastructure.
- Growing awareness at policy level: Government strategies (e.g., SARD 2022–2028) have embraced climate-smart agriculture and digital tools. (Specific Objective 2.1 in SRARD)
- Emerging digital platforms: Pilot tests for GIS-based data, early warning systems, and climate risk maps provide a starting point.
- Kosovo has adopted the e-Government Strategy (2023–2027), which sets clear milestones for improving online public services, ensuring better digital accessibility

2. Economic importance and rural population potential

- Agriculture remains a key sector, contributing 7.6 % to GDP and employing a significant portion of the population
- Kosovo has a relatively young population, with a third of farmers under 44 years old, as such this is an asset for innovation and digital adoption
- Young population and entrepreneurial spirit: Potentially receptive to innovative solutions for sustainable resource management.

3. Ict infrastructure and rural connectivity

- Kosovo has over 99.7 % internet access, which is the highest in the Western Balkans
- High ownership of smartphones (98.7 %) and laptops (68.6 %) supports the potential for digital tool adoption among farmers and rural populations

4. E-governmental information systems and institutional capacity

- Institutional setup for implementation of agri policies (Operating structure) is well aligned with IPARD requirements, with experienced staff;
- Information systems supporting Agricultural statistics, FADN, SIACS(including slpis, FR and control and penalty system system) are operational and are containing 80% of farmers which represents substantial amount of data to be reused throughout all systems.
- Grant management system is supporting implementation of IPARD like supports, also via online application;
- Farmers are well supported by officials in 35 local offices, who assist with applications and registration
- Policy monitoring and evaluation is currently supported by AIS information system delivering yearly Green report and Agriculture in numbers

5. Advisory services and knowledge sharing

- Kosovo Advisory Services for Agriculture and Rural Development (KASARD) is aligned with EU Farm Advisory Service (FAS); - The existing of 37 Municipal Advisory Information Centers for Agriculture and Rural Development cover the whole territory;
- All necessary AKIS actors are in place with some experience in collaboration;
- There is existing research capacity in agri food sector
- The use of "Agriv" platform, an effective advisory system for more than 200 farmers

6. Educational institutions

- There is a recognized opportunity to integrate digital agriculture modules into vocational and university programs, which can strengthen the overall capacity for digital adoption in the agricultural sector

7. Digital skills of farmers and rural population

- Despite the digital literacy challenges, a significant portion of farmers (60 %) expresses motivation to adopt new technologies

- There is awareness among farmers that improving digital skills could benefit various aspects of their agricultural activities, from accessing subsidies to improving cost efficiency

8. Adoption of digital tools by smallholders

- Applying for grants through consultants available in municipal offices

- Many smallholders show a high level of motivation to adopt new digital tools, especially those that offer practical benefits like access to information, cost savings, and improved market access

- Use of informative agricultural portals (e.g., agroportal).

- Proven benefits of demonstration plots, as farmers and companies drive "copy cat" adoption

1. Economic Structure & Rural Demography

- *The sector's share of GDP has nearly halved over the last decade, indicating a shrinking role in economic growth*
- *Despite Kosovo's young population, digital adoption in agriculture remains low*
- *Land fragmentation limits economies of scale and digitalization*
- *Economic constraints, lack of income opportunities, and disinterest in farming are driving migration*
- *Barriers to land ownership, access to financial resources, and lack of skills training exclude women from agricultural development*

2. EGovernment / InformationSystem Gaps

- *Legal background not aligned with CAP: Interventions are not aligned with IPARD and EU CAP requirements; and the institutional setup ;*
- *Information systems supporting Agricultural statistics, FADN, SIACS (including sLPIS, FR and control and penalty system system) not compliant with IPARD/CAP requirements and are also not certified .*
- *Data collected in the information system might not be up to date: i.e. include also old not updated data*
- *Egovernment systems in agriculture do not utilize published services.*
- *The Register of organic production and CMEF IT system have so far not been implemented*
- *Open data on spatial registers is not freely available.*
- *Lack of funds for maintenance of software, not adequate staffing and skill for management of information systems ;*

3. Digital Public Services & Administrative Burden

- *Only 10 % of public services are available online, which limits the ability of citizens, including farmers, to engage with government processes digitally*
- *Lack of coordination among digital systems from various institutions in Kosovo, and lack of services in agriculture*
- *Complex policies for grant and subsidy applications for primary producers.*

4. Advisory Services & AKIS

- *There is no digital platform which would support simple access to farmers to advisory services*
- *The shortage of specialized professionals in digital agriculture and a lack of sufficiently trained advisors hinder the effective use of digital tools among farmers*
- *There is a lack of existing information management systems and adequate training programs*
- *Existing advisory services and agricultural knowledge systems are fragmented, which reduces their effectiveness and hampers collaboration between key stakeholders*
- *Lack of a coordinating body for AKIS, especially for digitalization efforts. Lack of clarity on who is responsible for AKIS in Kosovo*

5. Education & digital skills deficit

- *University and vocational curricula do not currently integrate digital agriculture modules, which leaves students and farmers underprepared for modern farming practices*
- *Academic staff and farmers receive limited training in digital tools, hindering their ability to guide and support the adoption of digital technologies*
- *A large portion of Kosovo's rural population lacks the necessary digital skills to fully engage*

with and benefit from digital technologies

- *There is a significant shortage of digital skill building programs, with only 4 % of farmers aware of any existing training programs*

6. Ict infrastructure & rural connectivity gaps

- *Small scale farmers face significant barriers to adopting advanced technologies due to the high costs of digital tools be it hardware or software applicable in agricultural practices, which limits their productivity and innovation*
- *The inconsistent electricity supply in rural areas impedes the effective use of digital tools*
- *Vulnerable populations, such as seniors, low income households, and individuals with disabilities, face challenges in accessing digital tools, which limits their participation*
- *While Kosovo has made strides in broadband coverage, challenges remain in developing high speed infrastructure and deploying 5G*

7. Adoption barriers for smallholders

- *The application process (particularly for grants) is complicated and is not used*
- *A significant number of agricultural households face financial barriers to adopting new technologies, making it challenging for them to invest in modern farming practices*
- *The absence of comprehensive support and training services for farmers weakens the ability to use new technologies*
- *Many farmers are unfamiliar with or mistrust digital tools, slowing the adoption of technologies and limiting their impact on farm productivity and decision making; Low level of use of specific digital apps (research FAO)*
- *Lack of information on using digital platforms and its benefits; and lack of easily accessible human centric digital platforms;*
- *Donor driven pilots frequently end when external support stops, lacking stable financing*
- *Fragmented data exchange: No fully integrated system connecting climate data, extension services, and local institutions.*
- *Low adoption of precision agriculture: As a consequence, sensor driven irrigation, remote sensing, and other climate smart tools remain underutilized.*

1. Align agricultural information systems with CAP / build NDISARD

- *Align information systems and their interoperability with CAP and develop Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri)*
- *Align IACS interventions and IACS information system to be fully compliant with IPARD and CAP and establish a single digital platform based on interoperability of external systems and data collections in agriculture which will serve as source for pre populated data to the Government in agriculture;*
- *Update and the data in agriculture registers and cross check / validate them with use of interoperable official registers;*
- *Develop outstanding registers (i.e. Register of traders of fruits and vegetables and Register of agricultural production)*
- *Establish Open data platform which would support also data mining functionalities*

2. Strengthen IPARD standards and staffing

- *Strengthen IPARD operational structure and IPARD programme*
- *Strengthen Managing authority in development of CAP compliant interventions and establish system for monitoring and evaluation;*
- *Adapt standards, definitions and measures, under direct payments and IPARD III for easy access and compliant to CAP interventions*
- *Strengthen ADA digital systems and staff in preparation for entrustment for budget management and implementation of IPARD III program*

3. Establish comprehensive digital AKIS & advisory platform

- *Establishment of digital platform for AKIS & advisory:*
 - *Certification, registration and publishing of advisors, their contacts and possibility of advisory requests;*
 - *Publishing of scientific and farm advisory publications for practical use*
 - *Inclusion of e Learning and e Webinars platform for self-learning, mandatory learning and certification;*
 - *Q/A section for publication of frequently asked questions (forum)*
 - *Innovation platform (Promote European Innovation Partnerships - for use of innovative technologies and digitalization in agriculture)*

4. Enhance digital infrastructure & inclusive skills

- *Supporting training in digital skills*
- *Digital Hubs with free Wifi access and equipment to be available to local population and companies as digital office*
- *Organization of frequent trainings in digital skills in rural areas*

5. Simplify grants, measures, and smallholder access, foster farmer collaboration

- *Simplify and reduce the administrative burden in by adjustment of measures and use of the Government principles in processing of applications for grants through e-Kosova*
- *Adjustment and simplification of interventions and access via e-Kosova for better use of digital technologies by smallholders*
- *Adjustment of IPARD like measures to be accessed easier by small farmers;*
- *Adjustment of IPARD/IPARD like measures for promotion of EIP (M8,10,13) and investment in innovative technologies under M1, 3 and 7.*

- Simplification of registration and application processes for direct payments and grants via e-Kosova

- Establishment of digital environment which would efficiently support farmers in finding partners:

- Adjustment of IPARD measures supporting collaboration (M2) with and amongst small scale farmers (through lead farmers, cooperatives, processors, local institutions, by simple registration of “cooperation”, etc ..);
- Establish digital support for different types of collaboration (in the form of social platform)

6. Create a central one-stop digital service point and rural eservices

- Establishment of central point for farming related digital services which would contribute to awareness of benefits and development of habits in use of digital technologies:

- Fast access to advisory and AKIS
- Digital services in application to supports and agri registers,

- e.g. Developing a set of services that demonstrate immediate benefits to rural users, encouraging habitual use of digital technologies. Such as:

- Subsidy applications; Links to local public pages and private services, and frequently used pages to avoid searching;

7. Scale pilots, PPPs, and smart village support

- Scaling successful pilots like Viva Fresh’s warehouse management or sensor based orchard monitoring (apples, raspberries) in demonstration plots such as of IADK, or provision of advisory services with dedicated information system solutions

- Establishing Public Private Partnerships (PPPs) to create cost sharing models for digital solutions

- Municipalities or central authorities could prioritize or award higher scores for “smart” components in grants, encouraging more farmers to adopt technology

- Through digital Village initiatives support provision of services to population with use of digital technologies

8. Leverage EU alignment & climate-smart partnerships

- EU acquis alignment; potential to tap into European frameworks and funds that prioritize climate mitigation and resilience.

- Public private partnerships: Collaborative arrangements can accelerate scaling of climate smart innovations (weather alert apps integration, early warning IoT networks).

- Knowledge sharing platforms: By digitizing success stories and climate adaptation guides, local institutions can rapidly disseminate best practices.

1. Risks of non-alignment with EU CAP and IPARD

- *Systems not aligned with CAP*
- *At time of accession Kosovo will not have compliant CAP information systems and will not be able to use CAP / IPARD III funds during the pre-accession period.*
- *The use of IPARD-like funds will remain devoted to small number of bigger farmers*
- *IPARD III measures not adjusted to fit simplification*
- *If the simplification is not applied sufficiently, farmers will not be able to apply for grants;*

2. Fragmented digital service landscape and poor accessibility

- *If single point platform not established, searching for services in several places will result in less interest in using the services; It has to be taken into account that farmers are working outside and have limited willingness to search the internet in evenings;*
- *If knowledge ecosystem is not supported by digital technologies, the advisory service will remain hard to access for farmers*

3. Weak support for cooperation and multi-stakeholder engagement, adoption barriers

- *If policy measures related to cooperation are not adjusted, it will cause farmers' lack of interest in joining efforts through collaboration mechanisms;*
- *Without use of digital technologies in practice, supported by assistance and equipment, there will be no progress in use of digital technologies in rural areas*
- *Persistent skepticism among older or small-scale farmers can stall large scale adoption*
- *Limited local purchasing power combined with the regional market price pressure could slow investment in new technologies*

4. Climate change and sustainability risks

- *Intensifying and ever-changing climate hazards. More frequent and out of the pattern droughts, floods, and temperature extremes could devastate unprepared agricultural communities and risk loss of trust towards emerging technologies.*
- *Funding uncertainties: Continued reliance on donors or external financing for climate smart initiatives may prove unsustainable if budgets tighten.*
- *Resistance to new protocols: Some stakeholder groups may view sustainability requirements (e.g., fertilizer regulations) as an extra burden, slowing adoption of innovative solutions.*

5.2. Identified needs

Harmonization of information systems with CAP requirements

- **Need 1:** Harmonize the legal framework for the Integrated Administration and Control System (IACS) and upgrade existing information systems to ensure interoperability and data re-use in line with the EU Acquis.
- **Need 2:** Develop Digital Platform for Agriculture and Rural Development by compiling data from existing sources, ensuring interoperability and coherence across interconnected systems and external data sources.

Link to Strategy for Agriculture and Rural Development 2022-2028: Contributes to Needs 4.1 and 4.2.1 by aligning information systems with EU CAP Acquis requirements and supporting institutional strengthening.

Simplification, reduction of administrative burden, and digital services through e-Kosova

- **Need 3:** Adjust the legal framework for direct payments and IPARD-like measures to align with IPARD III and ensure seamless transition to CAP post-accession while simplifying processes and reducing administrative burdens.
- **Need 4:** Utilize data from the Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri) to pre-populate applications and administrative procedures, enabling digital service access via e-Kosova.

Link to Strategy for Agriculture and Rural Development 2022-2028: Contributes to Needs 4.1 and 4.2.1 by reducing administrative burdens and ensuring simplification (Art. 6(3) of EU Reg. 2115/2021). Also contributes to Needs 1.2, 1.5, and 1.11 by improving access to support for small and medium-sized farmers.

Link to LRGF Kosovo Reform Agenda: Supports Indicator 2.1.1 by enhancing digital service availability.

Enhancing competitiveness and market access through digital innovation

- **Need 5:** Adjust IPARD measures to support collaboration among small-scale farmers through lead farmers, cooperatives, processors, and local institutions, facilitating simple registration of cooperative structures. Develop an e-collaboration platform accessible via e-Kosova.

Strengthening farming advisory services and innovation adoption

- **Need 6:** Develop a digital platform for advisory services and the Agricultural Knowledge and Innovation System (AKIS), centralizing knowledge exchange for stakeholders.
- **Need 7:** Establish a Register of Certified Advisors, including their specializations and contact information, with scheduling support for advisory services.
- **Need 8:** Introduce an e-Learning and e-Webinar platform for self-learning, mandatory training, and advisor certification. Develop and implement training programs under IPARD M8 and M11.
- **Need 9:** Ensure availability of publications developed by farm advisory services and AKIS under IPARD M8 and M11, including a Q&A forum for frequently asked questions.
- **Need 10:** Promote innovative food production approaches through European Innovation Partnerships (EIP) under IPARD M13.

Link to Strategy for Agriculture and Rural Development 2022-2028: Contributes to Needs 4.1, 4.2.1, and 1.13 by strengthening advisory services and AKIS; also supports Need 1.5 by increasing labor productivity through precision agriculture and other innovative technologies.

Link to Strategy for Advisory Services of Kosovo 2023-2027: Supports Specific Objective 2.1 on the development of an Information and Communication System for Advisory Services.

Link to LRGF Kosovo Reform Agenda: Supports Indicator 2.1.1 by expanding digital services for agricultural stakeholders.

Facilitating digital adoption by smallholders and rural communities

- **Need 11:** Establish a central access point (portal) for farming and rural digital services, promoting awareness and encouraging digital adoption among farmers and rural populations.
- **Need 12:** Develop digital infrastructure in rural areas, including digital hubs, free WiFi, and shared digital equipment, to enhance digital literacy and support training initiatives under LEADER.

Link to LRGF Kosovo Reform Agenda: Supports Indicator 2.1.1 by ensuring wider availability of digital services in rural areas.

Supporting climate resilience and adaptation

- **Need 13:** Strengthen capacity for climate resilience and adaptation by developing digital tools for real-time climate data, weather alerts, and irrigation scheduling, and integrating climate risk maps into advisory services. Scale up training on climate-smart practices and use pilot plots to demonstrate adaptive techniques.
- **Need 14:** Promote climate-smart and sustainable agricultural practices by developing localized climate information services tailored to Kosovo's agro-ecological zones. This should be supported by scaling up training programs on climate adaptation and embedding them within extension services, alongside demonstration plots.
- **Need 15:** Enhance disaster risk management through digital innovation by developing real-time early warning systems using IoT sensors and geospatial platforms to monitor key risks. Strengthen institutional capacity for digital risk assessments and create a unified disaster response system.
- **Need 16:** Foster collaboration and knowledge exchange for sustainable practices by creating a centralized, open-access digital knowledge hub that connects academia, research institutes, extension agencies, and the private sector. Integrate sustainability and digital agriculture into curricula, promote intergenerational knowledge exchange through workshops and e-learning.

6. Objectives

The Digital Agriculture Programme and Action Plan provides a strategic foundation for advancing the digital transformation of agriculture and rural development. It promotes the modernization of public administration through improved data infrastructure and digital tools, enhances the accessibility and quality of services for rural populations, and supports capacity development and collaboration across stakeholders. The approach is aligned with EU standards and aims to foster more efficient, inclusive, and knowledge-driven agricultural systems. These priorities are articulated through a set of strategic and specific objectives that guide the implementation of the Programme:

Strategic objective 1: Establish and improve e-government and data infrastructure to enhance efficiency and data-driven decision-making in agricultural and rural development

Specific objective: 1.1: Strengthen and integrate key agricultural information systems in line with EU CAP

Specific objective 1.2: Digitalize and simplify agricultural and rural development interventions

Strategic objective 2: Create an inclusive functional network of digital services for agriculture and rural areas

Specific objective 2.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration

Specific objective 2.2: Streamline agricultural public services delivery

Specific objective 2.3: Advance digital inclusion in rural areas

Strategic objective 3: Develop the human capital for the digital transformation of agriculture

Specific objective 3.1: Strengthen digital skills for rural people

Specific objective 3.2: Foster multi-stakeholder collaboration

The following chapter elaborates each objective in more detail, outlining their scope and content, the specific needs they address as identified in the problem analysis, and the corresponding measurable indicators for monitoring progress.

6.1. Description of the intervention logic

This section presents the intervention logic by detailing the content of each objective, the needs they address as identified in the problem analysis, and the measurable indicators established to track progress toward the intended outcomes.

Strategic objective 1: Establish and improve e-government and data infrastructure to enhance efficiency and data-driven decision-making in agricultural and rural development

Impact indicator	Baseline	Interim	Final year	Outcome
CAP mandatory information systems' level of compliance with CAP requirements (%)	30% [2024]	70%	90%	CAP mandatory Information systems 90% compliant with EU Acquis
Number of accredited IPARD measures	0 [2024]	5	10	IPARD III measures accredited by the relevant EU institution

Specific objective: 1.1: Strengthen and integrate key agricultural information systems in line with EU CAP

Description

The actions under this specific objective focus on the phased alignment, integration, and enhancement of Kosovo's agricultural information systems in accordance with the requirements of the EU Common Agricultural Policy (CAP) 2023–2027. This includes the reduction of administrative burden by aligning Kosovo's legal and procedural frameworks for direct payments and IPARD Measures 4 and 11 with the EU Acquis, primarily by defining and applying simplified Good Agricultural and Environmental Conditions (GAEC) and Statutory Management Requirements (SMRs) as conditions for all area-based payments, and integrating Areas facing Natural Constraints (ANC) and Antimicrobial Resistance (AMR) in accordance with EU Regulation 2021/2115, Articles 71 and 72.

Concerning simplified Integrated Administration and Control System (sIACS), progress will be made towards full EU compliance by enhancing the interoperability of the Farm Register with official registers, in line with the Kosovo Reform Agenda. The Farm Register will integrate GAEC information and connect with a simplified Land Parcel Identification System (sLPIS) to enable accurate land use verification. Interoperability will also be ensured with the Food and Veterinary Agency (FVA), the Farm Accountancy Data Network (FADN), the Vineyard Register, Animal Register, and national statistical systems.

To support a fully EU-compliant LPIS, a pilot will be launched and new aerial or satellite ortho-imagery acquired. Methodologies, manuals, and a quality management system will be developed in line with Article 4 of EU Regulation 2115/2021. The Geospatial Application System (GSA) will be upgraded to support CAP compliance. It will be adjusted to pre-fill data from the Farm Register, including farm details, GIS-linked parcels, and animal data. A digital service for application submission via e-Kosova will be introduced for the 2026 campaign. The GSA will be made compatible with EU LPIS and area monitoring systems, and a GSA quality management system will be implemented in line with EU requirements.

Under Specific objective 1.1. Control and penalty systems for payment authorizations will be revised. This includes developing process flows for administrative controls, risk analysis, and on-the-spot controls, with digitized reporting to reduce manual inputs. Furthermore, Area Monitoring System (AMS) will be piloted and operationalized to provide real-time verification of agricultural activity using satellite data. Once functional, the AMS will be integrated with LPIS and used to revise risk analysis procedures for on-the-spot controls, reducing physical inspections and improving efficiency. FADN will be strengthened and gradually transformed into a Farm Sustainability Data Network (FSDN). Interoperability with the Farm Register will be established through APIs, and calculation methods will support simplified business plans and farmers will be able to access their data via e-Kosova.

Interconnectivity with agri-statistics will be enhanced through data exchange services with the Kosovo Agency of Statistics (KAS), supporting alignment, reducing duplication, and enabling evidence-based policymaking. MAFRD systems will be digitalized, and an open data policy adopted in line with EU Regulation 2116/2021 Article 67, the Open Data Directive (EU) 2019/1024, and EU Regulation 138/2023, to enable secure data reuse. A central Register of Organic Production will be established in line with EU Regulation 848/2018 Article 26, fully interoperable with the Farm Register and LPIS. Lastly, Kosovo's Agricultural Information System will be upgraded to include a Policy Performance Monitoring and Evaluation Framework Information System (PMEF-IS), enabling monitoring and assessment of CAP implementation in accordance with EU Regulation 2115/2021 Articles 7 and 130.

These efforts will converge in the establishment of a Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri). DPI-Agri will serve as a unified, interoperable infrastructure supporting streamlined administrative processes, data re-use, and deliver digital services for farmers. This infrastructure will facilitate the pre-population of applications, automate eligibility checks, reduce paperwork, and enhance transparency.

A key design principle of DPI-Agri is data interoperability and re-use, in line with EU standards for open data and public sector information. Where technically and legally feasible, datasets will be made accessible for use in policy monitoring, scientific research, and service innovation—ensuring that data collected once is used many times, across multiple domains.

Needs addressed

Need 1: Harmonize the legal framework for the Integrated Administration and Control System (IACS) and upgrade existing information systems to ensure interoperability and data re-use in line with the EU Acquis.

Need 2: Develop Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri) by compiling data from existing sources, ensuring interoperability and coherence across interconnected systems and external data sources.

Need 3: Adjust the legal framework for direct payments and IPARD-like measures to align with IPARD III and ensure seamless transition to CAP post-accession while simplifying processes and reducing administrative burdens.

Indicators

Indicator	Baseline	Interim	Final year	Outcome
Number of interventions reviewed and adjusted in context of reduction of administrative burden and aligned with EU Acquis	0 [2024]	5	5	At least 5 of direct payments interventions reviewed in context of reduction of administrative burden and aligned with EU Acquis
Decoupled payment per hectare				
Coupled payment per hectare and per head				
Complementary income support for young farmers				
M4 IPARD				
M11 IPARD				
Level of alignment of IACS (Integrated Administration and Control System) with the EU Acquis	40%[2024]	70%	80%	IACS in 80% aligned with EU Acquis by 2027
Level of alignment of FSDN (Farm Sustainability Data Network) with the EU Acquis	80%[2024]	80%	100%	FSDN fully aligned with EU Acquis by 2027
The number of e-services published: e-Farm; e-Direct payments (GSA); e-FSDN; e-Organic; e-Open data; e-Statistics	0[2024]	3	5	At least 5 e-services in the field of agriculture published under e-Kosova by 2027

Specific objective 1.2: Digitalize and simplify agricultural and rural development interventions

Description

The actions under this specific objective center on the digitalization and simplification of the application process for farmers seeking support through agricultural and rural development interventions. These include key instruments such as rural development grants, climate-related payments, and other measures under the IPARD III programme. The focus is on modernizing and streamlining how farmers—particularly smallholders—access policy incentives, making the process more transparent, inclusive, and user-friendly.

A central component of this digital transformation is the simplified application processing through digital public services (e-Grant), made available through eBujqësia (see Specific Objective 2.2) and e-Kosova. These services will be supported by data from the National Digital Public Infrastructure for Agriculture (DPI-Agri), which integrates and consolidates relevant agricultural and rural development data across systems. Leveraging this infrastructure will enable pre-population of application forms, automatic eligibility checks, and improved service delivery, significantly reducing the administrative effort required from both farmers and the institutions managing the programs.

In parallel with digitalization, this objective includes the comprehensive review and adjustment of existing and planned policy measures to ensure full alignment with the IPARD III programme. This involves simplifying currently implemented measures—such as IPARD Measures 1, 3, 5, and 7—with the aim of improving accessibility for small-scale farmers and rural communities, while simultaneously reducing the operational complexity for the implementing institutions. These adjustments are particularly important for increasing uptake among smallholders, who often face higher barriers in accessing support due to administrative burdens and limited digital literacy.

The review will also extend to IPARD measures that have not yet been implemented, including Measures 2, 6, 8, 10, and 13. These measures will be assessed for their potential relevance and feasibility, and where appropriate, redesigned to simplify their structure and align them with Kosovo's institutional and sectoral context. The goal is to ensure that a broader and more inclusive range of support options is available, covering diverse needs in rural areas and fostering sustainable development.

All redesigned and newly introduced measures will be developed with a forward-looking perspective—ensuring compatibility with the EU Common Agricultural Policy (CAP) framework after accession. This strategic approach facilitates a smoother transition to CAP-compliant programming, as Kosovo moves closer to EU membership. Measures developed under IPARD III will be structured to be "CAP-ready," allowing for easier adaptation, scaling, and accreditation under post-accession requirements.

Under this specific objective, a series of measures will be undertaken to improve the administrative control and authorization systems for agricultural support. A specialized unit will be established to manage the configuration of digitalized support schemes, supported by automated cross-checks based on integrated registers and predefined business rules. Digital tools will be developed to rank applications based on eligibility and priority criteria, and paperless communication with beneficiaries will be introduced, including e-signatures for approvals and declarations. A centralized register of beneficiary commitments and supported investments will be created or upgraded to ensure full interoperability with the Farm Register and LPIS. To modernize on-the-spot controls (OTS) and field-level monitoring, a digital OTS module will be developed in line with IPARD III requirements. This will include pre-filled reports to streamline inspections and reduce errors, as well as electronic signing and submission of inspection findings. Core functions of the IPARD Agency will be strengthened through the development of a budget planning system, an interoperable payment authorization system with e-Kosova, and integrated tools for accounting and debt management. A comprehensive reporting system will also be established to fulfill accreditation requirements.

Institutional capacity-building will be supported by enhancing the IPARD Managing Authority’s ability to design programmes aligned with EU policies and by providing training and accreditation support for ADA and its CAP Paying Agency information system.

In terms of institutional impact, these efforts aim to reduce the administrative burden on the structures responsible for implementing rural development and direct payment schemes. The automation and integration of procedures—such as eligibility verification, document handling, and application tracking—will enable institutions to operate more efficiently, improve transparency, and better focus their resources on policy monitoring, guidance, and support.

Importantly, the entire digitalization process will be carried out in strict compliance with both local and EU data protection standards. This includes ensuring the secure processing of farmers’ basic and personal data, robust systems for data storage and management, and mechanisms to uphold user consent. The protection of sensitive information is critical to building trust among users and ensuring reliable and secure systems for public service delivery.

Needs addressed

Need 3: Adjust the legal framework for direct payments and IPARD-like measures to align with IPARD III and ensure seamless transition to CAP post-accession while simplifying processes and reducing administrative burdens.

Need 4: Utilize data from the Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri) to pre-populate applications and administrative procedures, enabling digital service access via e-Kosova.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
Number of interventions reviewed in context of reduction of administrative burden: IPARD measures M1, M2, M3, M5, M6, M7; M8, M9, M10, M13	0[2024]	10		At least 10 IPARD interventions reviewed in context of reduction of administrative burden and aligned with EU Acquis
Number of application forms pre-populated with use of available data	0[2024]	5	10	10 application forms pre-populated with use if available data
Number of digital services launched under e-Grants	0[2024]	5	10	10 measures under IPARD programme launched with use of e-Grants
Share of IPARD measures accredited with the use of an accredited information system	0[2024]	50%	100%	100% IPARD measures accredited with the use of an accredited information system

Strategic objective 2: Create an inclusive functional network of digital services for agriculture and rural areas

Impact indicator	Baseline	Interim	Final year	Outcome
Share of advisory services and AKIS supported with use of digital technologies	0	50%	100%	Advisory services and AKIS supported with use of digital technologies
Share of agricultural public services delivery streamlined digitally	0%	50%	100%	100% of Agricultural public services delivery streamlined digitally
Number of villages where Smart Village approach was introduced	0	1	1	At least one village was actively engaged in local development using the Smart Village approach, linked with LEADER principles

Specific objective 2.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration

Description

This specific objective supports the development of a Digital Agricultural Technical and Advisory Services Platform (DTASP), as envisioned in the Strategic Plan of the Kosovo Advisory System for Agriculture and Rural Development 2023–2027. Led by the Department of Technical and Advisory Services (DTAS) under MAFRD, the platform will serve as a centralized hub for accessing agricultural knowledge, advisory services, and collaborative opportunities. As a key element of Kosovo’s Agricultural Knowledge and Innovation System (AKIS), the platform will align with Articles 15 and 114 of Regulation (EU) 2021/2115, promoting digital knowledge flows and the integration of advisory services into a modern, EU-compliant AKIS.

At the core of DTASP will include a registry of certified farm advisors with their contact details and specific advisory areas of expertise, complemented by a digital library of curated agricultural resources. The platform will also offer a range of online learning opportunities, including online certifications for both advisors and farmers. Advisors will be able to deliver group-based thematic trainings through webinars. The platform will support capacity building through e-learning modules, advisory e-training programs, and skill development tracks for both advisors and farmers. They will also be able to use FADN/FSDN data to enhance individual advisory services and contribute to agricultural research.

Additionally, users will be able to express interest in collaborative research and innovation initiatives, in alignment with the European Innovation Partnership (EIP) model. The platform will also include features to support the internal management of advisory activities, offering reporting and evaluation tools to improve oversight and accountability.

As the platform develops, it will integrate real-time and near real-time data on weather, pests, animal diseases, soil health, market prices, and information on available funding opportunities—potentially enhanced by AI-powered chatbots and a phased rollout of teleadvisory services delivered by certified farm advisors.

This specific objective addresses critical challenges such as outdated advisory models and limited access to timely agricultural information in Kosovo. By making knowledge and services accessible digitally, the platform aims to enhance productivity, build resilience to climate change, and cultivate a collaborative, innovation-oriented ecosystem. Designed as mobile-first and highly user-centric, the DTASP platform will be developed in close partnership with local advisors, farmers, NGOs, and private sector stakeholders to ensure relevance,

accessibility, and long-term impact. Targeted outreach campaigns will accompany the platform's rollout—specifically engaging women, youth, the elderly, and vulnerable groups—to ensure inclusive access to the services and opportunities it provides.

Needs addressed

Need 5: Adjust IPARD measures to support collaboration among small-scale farmers through lead farmers, cooperatives, processors, and local institutions, facilitating simple registration of cooperative structures. Develop an e-collaboration platform accessible via e-Kosova.

Need 6: Develop a digital platform for advisory services and the Agricultural Knowledge and Innovation System (AKIS), centralizing knowledge exchange for stakeholders.

Need 7: Establish a Register of Certified Advisors, including their specializations and contact information, with scheduling support for advisory services.

Need 8: Introduce an e-Learning and e-Webinar platform for self-learning, mandatory training, and advisor certification. Develop and implement training programs under IPARD M8 and M11.

Need 9: Ensure availability of publications developed by farm advisory services and AKIS under IPARD M8 and M11, including a Q&A forum for frequently asked questions.

Need 13: Strengthen capacity for climate resilience and adaptation by developing digital tools for real-time climate data, weather alerts, and irrigation scheduling, and integrating climate risk maps into advisory services. Scale up training on climate-smart practices and use pilot plots to demonstrate adaptive techniques.

Need 14: Promote climate-smart and sustainable agricultural practices by developing localized climate information services tailored to Kosovo's agro-ecological zones. This should be supported by scaling up training programs on climate adaptation and embedding them within extension services, alongside demonstration plots.

Need 16: Foster collaboration and knowledge exchange for sustainable practices by creating a centralized, open-access digital knowledge hub that connects academia, research institutes, extension agencies, and the private sector. Integrate sustainability and digital agriculture into curricula, promote intergenerational knowledge exchange through workshops and e-learning.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
Digital Agricultural Technical and Advisory Services Platform (DTASP) established (% functional)	0%	50%	100%	Digital Agricultural Technical and Advisory Services Platform (DTASP) established by end of 2027
Development of e-Learning, certification and innovation cooperation module(s) within the central advisory platform (DTASP)	0	1	1	e-Learning, certification and innovation cooperation module(s) within the central advisory platform (DTASP) developed

Specific objective 2.2: Streamline agricultural public services delivery

This specific objective supports the development of Kosovo's e-Agriculture Portal (eBujqësia) as a centralized, one-stop-shop and single window that consolidates all agriculture-related public and administrative services into a single, user-friendly access point. The portal will enable farmers, agribusinesses, and rural stakeholders to easily access a wide range of services, including applications for grants and subsidies, registration of farms and land, submission of declarations, enrollment in support programs, access to official documents, requests for phytosanitary certificates, and timely notifications on deadlines and eligibility criteria.

A set of core services will be included on the Kosovo's e-Agriculture Portal, including farm-related registration and declarations (e-Farm), agricultural land parcel management and updates (e-LPIS), access to financial support schemes (e-Grant), submission of farm-level data (e-FSDN, e-Statistics), and the registration of organic producers and certificates (e-Organic). Additionally, the portal will feature a dedicated Open Data section, granting public access to non-sensitive agricultural datasets such as crop statistics, subsidy allocations, climate indicators, market price trends, land use information, and other relevant data sets. This component will foster transparency, support evidence-based policymaking, and enable researchers, innovators, and agritech developers to create data-driven solutions for the sector. In the future, the portal aims to gradually integrate all public services related to agriculture and may also expand to include additional features such as an agrimarketplace.

Fully integrated into the e-Kosova service catalogue, the portal will ensure full interoperability with national digital infrastructure, including authentication systems, thereby promoting transparency, efficiency, and accessibility across government services. Data privacy and protection will be a core principle of the services' design and portal's operation, fully aligned with Kosovo's legislation and EU General Data Protection Regulation (GDPR) standards. Robust safeguards will be implemented to ensure the secure handling of personal and farm-level data, including encrypted data transmission, user consent management, and strict access controls—fostering trust among users and ensuring responsible data governance.

Crucially, the portal will be developed with a strong emphasis on farmer-centric design—ensuring simplicity, intuitiveness, and responsiveness to the actual needs and digital capacities of its users, both women and men. Recognizing that many farmers rely on mobile devices, the platform will be mobile-first and fully responsive, delivering a seamless experience across smartphones, tablets, and desktops. During the rollout phase, well-structured testing and transition periods will support a smooth shift from traditional practices to digital service delivery, with contingency measures in place to allow temporary use of existing offline procedures until full implementation is achieved.

By streamlining administrative processes and reducing the need for in-person visits, the e-Agriculture (eBujqësia) Portal aims to significantly increase public service use in the agricultural sector, empowering all users with timely, relevant information and contribute to the broader goals of digital governance, agricultural modernization, rural development and EU accession in Kosovo.

Needs addressed

Need 4: Utilize data from Digital Public Infrastructure for Agriculture and Rural Development (DPI-Agri) to pre-populate applications and administrative procedures, enabling digital service access via e-Kosova.

Need 11: Establish a central access point (portal) for farming and rural digital services, promoting awareness and encouraging digital adoption among farmers and rural populations.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
e-Agriculture Portal (eBujqësia) established and operational	0%	50%	100%	e-Agriculture Portal (eBujqësia) established and 100% operational in 2027
Number of core public services fully integrated into eBujqësia (e.g. e-Farm, e-LPIS, e-Grant, e-FSDN, e-Organic)	0	3	5	At least five digital services included and accessible through the central farmer's portal (eBujqësia)

Specific objective 2.3: Advance digital inclusion in rural areas

This specific objective supports the creation and enhancement of physical and digital infrastructure in rural municipalities to ensure equitable access to the digital agricultural services developed under Specific Objectives 2.1 and 2.2. While the Digital Agricultural Technical and Advisory Services Platform (DTASP) and the e-Agriculture Portal (eBujqësia) offer centralized access to agricultural knowledge, advisory and public services, the rural infrastructure must evolve in parallel to ensure that all stakeholders—especially those in remote or underserved areas—can fully benefit from these digital advancements.

In alignment with the EU LEADER approach, municipalities will pilot the development of Digital Village Centers by equipping public spaces—such as agricultural advisory offices, community centers, and rural libraries—with essential infrastructure, including computers, internet connectivity, and teleconferencing facilities. These hubs will enable farmers and rural residents to access digital public services, participate in online training, and receive hybrid advisory support, both in-person and remotely.

Additionally, these hubs will function as venues for digital literacy training, workshops, and community-based advisory events tailored to the needs of farmers, youth, and other rural actors. Special emphasis will be placed on inclusivity—addressing digital gender gaps and supporting individuals with limited literacy or digital skills. The initiative will also promote local innovation and peer-to-peer learning by encouraging the use of these hubs for group consultations, community-led research, and support for rural start-ups, aligned with the European Innovation Partnership (EIP) model.

As part of this objective, a Smart Village pilot will be launched in selected locations, in collaboration with the Ministry of Agriculture, and local stakeholders. Based on LEADER's bottom-up methodology, the pilot will co-develop and test smart, locally driven solutions that reflect rural priorities—advancing digital innovations for improved production, environmental sustainability, nutrition, and rural livelihoods. The initiative can also serve as a platform for piloting or implementing IPARD-supported measures, including the measures supporting advisory services (M10), vocational training (M8), and EIP innovation initiatives (M13), thus supporting Public-Private Partnerships.

By bridging the digital divide and building inclusive digital hubs, this action ensures that Kosovo's digital agricultural transformation reaches all rural citizens—empowering them to participate actively in modern agriculture, benefit from public services, and contribute to innovation and growth in the rural economy.

Needs addressed

Need 12: Develop digital infrastructure in rural areas, including digital hubs, free WiFi, and shared digital equipment, to enhance digital literacy and support training initiatives under LEADER.

Need 16: Foster collaboration and knowledge exchange for sustainable practices by creating a centralized, open-access digital knowledge hub that connects academia, research institutes, extension agencies, and the private sector. Integrate sustainability and digital agriculture into curricula, promote intergenerational knowledge exchange through workshops and e-learning.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
Number of operational Digital Village Centers providing access to digital agricultural infrastructure and services	0	3	5	At least five operational Digital Village Centers providing access to digital agricultural infrastructure and services
Number of Smart Village pilot initiatives co-developed and implemented with local stakeholders	0	0	1	At least one Smart Village pilot initiative co-developed and implemented with local stakeholders

Strategic objective 3: Develop the human capital for the digital transformation of agriculture

Impact indicator	Baseline	Interim	Final year	Outcome
Number of actions contributing to the use of digital technologies, knowledge transfer and advisory in agriculture delivered via e-Learning platforms and webinars	1	2	2	At least 5 actions in development and implementation of training programmes developed with use of e-Learning platforms and Webinars
Digital Agriculture Innovation Hub established and piloted	0	1	1	Digital Agriculture Innovation Hub, established and piloted in number of locations

Specific objective 3.1: Strengthen digital skills for rural people

This objective aims to develop digital capacities across all segments of the rural population, enabling farmers, advisors, agribusinesses, and rural residents—both women and men—to effectively adopt and utilize digital devices, services, and tools in agriculture and rural life. It goes beyond basic skills to support both foundational digital literacy and advanced competencies, empowering users not only to access public digital services—such as the Digital Agricultural Advisory Services Platform (DTASP) and the e-Agriculture Portal (eBujqësia)—but also to integrate more sophisticated technologies into their farming and business practices.

The actions under this objective will include development of curricula for both Technical and Vocational Education and Training (TVET) programs, cooperation with universities on the development of higher education curricula, and other tailored digital agriculture training initiatives for farmers, farm advisors, youth, and local agribusinesses, along with awareness-raising campaigns highlighting the benefits of digital tools in farming, business operations, and access to rural services. Special attention will be given to individuals with limited digital literacy, such as elderly farmers and marginalized groups. All activities will be designed to be gender-responsive, with specific measures to include and empower rural women, ensuring that training environments are inclusive, accessible, and responsive to their needs. To ensure flexibility and broad reach, training will be delivered through a blended learning approach, combining in-person instruction with online learning modules integrated in the DTASP.

In addition to basic digital literacy and entrepreneurship, the training programs will also cover advanced topics such as the use of precision agriculture tools (e.g., sensors, smart irrigation systems, drones), farm management software, and digital platforms for marketing, online transactions, and e-commerce in agriculture. Alongside Digital Village Hub facilities, these efforts will leverage the existing training centers, which will serve as regional hubs for delivering digital skills development programs. These centers will also function as demonstration sites, showcasing the practical application of digital tools in real farming contexts to encourage wider adoption and peer learning.

The actions under this specific objective, the objective contributes to building a culture of digital readiness and innovation in rural areas, helping rural communities embrace the full potential of digital transformation for productivity, sustainability, and market competitiveness.

Needs addressed

Need 8: Introduce an e-Learning and e-Webinar platform for self-learning, mandatory training, and advisor certification. Develop and implement training programs under IPARD M8 and M11.

Need 12: Develop digital infrastructure in rural areas, including digital hubs, free WiFi, and shared digital equipment, to enhance digital literacy and support training initiatives under LEADER. Link to LRGF Kosovo Reform Agenda: Supports Indicator 2.1.1 by ensuring wider availability of digital services in rural areas.

Need 13: Strengthen capacity for climate resilience and adaptation by developing digital tools for real-time climate data, weather alerts, and irrigation scheduling, and integrating climate risk maps into advisory services. Scale up training on climate-smart practices and use pilot plots to demonstrate adaptive techniques.

Need 14: Promote climate-smart and sustainable agricultural practices by developing localized climate information services tailored to Kosovo's agro-ecological zones. This should be supported by scaling up training programs on climate adaptation and embedding them within extension services, alongside demonstration plots.

Need 16: Foster collaboration and knowledge exchange for sustainable practices by creating a centralized, open-access digital knowledge hub that connects academia, research institutes, extension agencies, and the private sector. Integrate sustainability and digital agriculture into curricula, promote intergenerational knowledge exchange through workshops and e-learning.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
Number of farmers, advisors, and rural residents trained in basic and advanced digital skills	0	150	300	At least 300 farmers, advisors, and rural residents trained in basic and advanced digital skills
Number of e-trainings and on-line advisory activities through webinars and e-Learning platform developed	0	1	3	At least 3 training programmes covering certification of farm advisors, on-line advisory activities, and use of acquisition of skill developed
Number of capacity building actions on digital innovation, sustainability, traceability and risk preparedness conducted	0	2	4	At least 4 capacity building actions on digital innovation, sustainability, traceability and risk preparedness conducted

Specific objective 3.2: Foster multi-stakeholder collaboration

This objective aims to establish a collaborative Digital Agriculture Innovation Hub as a key pillar of Kosovo's evolving Agricultural Knowledge and Innovation System (AKIS)—connecting key actors across the agricultural ecosystem—public sector, advisors, farmers, agribusinesses, universities, research institutions, civil society organizations, and technology providers. The hub will function as a distributed, multi-actor and practice-driven platform to foster innovation, accelerate the adoption of climate-smart technologies, and promote the integration of digital solutions into agricultural practice.

Operating in line with the principles of the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI), the hub will facilitate co-creation, knowledge exchange, and joint problem-solving across disciplines and sectors. It will promote practice-led innovation through collaborative projects, living labs, farmer-led trials, and demonstration activities—bridging the gap between research, advisory services, and farmers. To ensure broad and inclusive stakeholder engagement, mechanisms will be put in place—such as regular workshops, events, and demonstrations—to enable systematic and periodic feedback from participants across the ecosystem, supporting continuous learning and co-development.

Importantly, the implementation of IPARD Measure 13 (M13), which supports innovation and cooperation in agriculture, will be both piloted and operationalized through this hub, with dedicated funding.

The hub will also align with and actively seek synergies with the European Digital Innovation Hubs (EDIHs) initiative, ensuring that Kosovo's actors can benefit from broader European resources, technical expertise, and funding opportunities. This connection will facilitate access to advanced digital technologies (e.g., AI, big data, robotics), training and testing environments, and cross-border collaboration—enhancing the impact and scalability of innovations developed within Kosovo. In addition, the hub will actively support participation in EU Horizon projects, enabling local stakeholders to engage in cutting-edge research and innovation initiatives, strengthen international partnerships, and further accelerate digital transformation in agriculture.

A core focus of the hub will be the development, adaptation, and dissemination of climate-smart digital technologies, including smart irrigation, remote sensing, digital pest and animal disease diagnostics, carbon and soil health monitoring, and renewable energy solutions. Importantly, the hub will be anchored at the community level through the existing training centers, the Digital Village Centers, and the Smart Village pilot. These facilities will serve as local access points for network activities, acting as physical spaces for training delivery, experimentation, demonstration of new technologies, and stakeholder engagement. Validated practices and lessons learned from the hub will be disseminated through the Digital Agricultural Advisory Services Platform (DTASP).

By strengthening linkages between research, advisory services, technology providers, public sector, and rural communities—and by embedding innovation into local infrastructure—this specific objective will drive Kosovo's transition toward a more resilient, technologically advanced, and climate-smart agriculture sector.

Needs addressed

Need 5: Adjust IPARD measures to support collaboration among small-scale farmers through lead farmers, cooperatives, processors, and local institutions, facilitating simple registration of cooperative structures. Develop an e-collaboration platform accessible via e-Kosova.

Need 10: Promote innovative food production approaches through European Innovation Partnerships (EIP) under IPARD M13.

Need 13: Strengthen capacity for climate resilience and adaptation by developing digital tools for real-time climate data, weather alerts, and irrigation scheduling, and integrating climate risk maps into advisory services. Scale up training on climate-smart practices and use pilot plots to demonstrate adaptive techniques.

Need 14: Promote climate-smart and sustainable agricultural practices by developing localized climate information services tailored to Kosovo's agro-ecological zones. This should be supported by scaling up training programs on climate adaptation and embedding them within extension services, alongside demonstration plots.

Need 15: Enhance disaster risk management through digital innovation by developing real-time early warning systems using IoT sensors and geospatial platforms to monitor key risks. Strengthen institutional capacity for digital risk assessments and create a unified disaster response system.

Need 16: Foster collaboration and knowledge exchange for sustainable practices by creating a centralized, open-access digital knowledge hub that connects academia, research institutes, extension agencies, and the private sector. Integrate sustainability and digital agriculture into curricula, promote intergenerational knowledge exchange through workshops and e-learning.

Indicators

Indicators	Baseline	Interim	Final year	Outcome
Number of collaborative projects initiated within the Digital Agriculture Innovation Hub and in the scope of EIP	0	1	2	At least 3 collaborative projects have been successfully initiated within the Digital Agriculture Innovation Hub, aligning with EIP principles
Number of EIP projects supported	0	5	5	At least 10 EIP projects supported

7. Implementation, monitoring and reporting arrangements

This chapter outlines the key activities and indicators for achieving and monitoring the Programme’s strategic objectives. To track progress and enable adjustments, an effective monitoring and evaluation system will be established. MAFRD will oversee implementation and publish annual progress reports for government approval and public access on its website.

Monitoring

Monitoring is an activity that is performed by continuous tracking of the implementation of the Programme. The effectiveness of the implementation of the Programme will be monitored based on progress in achieving the baseline indicators. For the indicators that are not measurable with indicated relevant sources (such as EU progress report) alternative monitoring methods will be implemented, as recommended in the EU Manuals for Monitoring and Evaluation. The commissioning of experts for the assessment of such indicators will be financed from the funds of the TA IPARD measure until accession. Based on the collected data, an annual report shall be prepared. This report, as a separate chapter, can be included in the Annual Report on the work of the MAFRD.

Monitoring Working Group

For the purpose of monitoring the implementation of this Programme, the Government of Kosovo will appoint members of the Working Group at the proposal of the MAFRD, who will discuss the Annual Report on the implementation of the Programme, before sending it to the Government for adoption.

When appointing, it is necessary to adhere to horizontal principles that will ensure a balanced representation of public authorities and intermediary bodies and representatives:

- Relevant bodies at regional and local level, as well as other public authorities, including authorities responsible for digital society;

- The economic and social partners, including representatives of the agricultural sector;
- Relevant bodies representing civil society and, where relevant, bodies responsible for promoting social inclusion, fundamental rights, gender equality and non-discrimination.

This Working Group also consists of representatives of competent institutions, which were involved during the process of drafting the Programme with the Action Plan, through the participation of their representatives. When selecting members of the Monitoring Working Group, gender equality rules need to be adhered to, among other things. The work of the Working Group for Monitoring will be determined by the Rules of Procedure, which will determine the composition of the Board, obligations of members, deadlines, as well as other facts important for the normal functioning of the Working Group. The Monitoring Working Group meets at least once a year and reviews all issues that affect the progress in the implementation of the Strategy, based on the received materials prepared by the MAFRD.

In case of non-fulfilment of the achievements set in the Programme, and in accordance with the dynamics envisaged in the Action Plan, the members of the Monitoring Working Group may propose new dynamics and manner of implementation, so as not to jeopardize the fulfilment of set operational goals.

Since the Action Plan for Digital Agriculture 2025–2028 will be part of the Action Plan of the Agriculture and Rural Development Strategy 2022–2028, it will be monitored through its monitoring mechanisms.

Evaluation

After the expiration of the period for which this Programme was drafted, and before the drafting of a new strategic document, an independent evaluation of the achievements set out in this Programme will be conducted in order to obtain concrete recommendations in the interest of further improving a particular segment. If necessary, especially given the progress of Kosovo towards the EU during the implementation of this Programme, it is possible to make an on-going evaluation, in order to further harmonize the accession activities, i.e. the implementation of activities that must be harmonized with the EU policies.

8. Budgetary impact of Programme implementation

I.	Strategic objective 1: Establish and improve e-governance and data systems to enhance efficiency and data-driven decision-making in agriculture and rural development
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I.1	Specific objective: Strengthen and integrate key agricultural information systems in in line with EU CAP					
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
I.1.1	Legal alignment of direct payments with EU Acquis and review of interventions in context of reduction of administrative burden		190,000	190,000	380,000	TAIEX / IPA. IPARD III TA / Donors
I.1.1.1	Strengthening of GAEC and SMRs		125,000	125,000	250,000	TAIEX / IPA. IPARD III TA / Donors
I.1.1.2	Determination of ANC and AMR in accordance to EU Reg. 2115/2021 Art. 71 and 72.(Soil maps)		35,000	35,000	70,000	TAIEX / IPA. IPARD III TA / Donors
I.1.1.3	Direct payments. M4 and M11 compliant to IPARD III/CAP programme requirements and reviewed in context of reduction of administrative burden		30,000	30,000	60,000	TAIEX / IPA. IPARD III TA / Donors

I.1.2	Further alignment of sIACS towards fully EU-compliant IACS	120,000	522,000	542,000	1,184,000	
I.1.2.1	Adjustment of Farm register in the context of harmonization with EU CAP Acquis and reduction of administrative burden	50,000	100,000	150,000	300,000	TAIEX / IPA. IPARD III TA / Donors
I.1.2.2	Establishment of EU Compliant LPIS and LPIS quality management system.	70,000	100,000	130,000	300,000	Italian Cooperation
			72,000	72,000	144,000	Government budget
I.1.2.3	Alignment of the Geospatial Application System (GSA) With CAP Acquis and establishment of digital service e-Direct payments under e-Kosova		50,000	40,000	90,000	TAIEX / IPA. IPARD III TA / Donors
I.1.2.4	Adjustments of control and penalty system for authorization of payments		80,000	100,000	180,000	TAIEX / IPA. IPARD III TA / Donors
I.1.2.5	Establishment and operationalization of AMS and simplification of on-the spot controls		120,000	50,000	170,000	TAIEX / IPA. IPARD III TA / Donors
I.1.3	Strengthening of FADN and transformation of FADN to FSDN and establishment of digital service e-FSDN under e-Kosova	30,000	30,000	60,000	120,000	IPA III. Government budget. Donors
I.1.4	Strengthening interconnectivity with and personal access to agri-statistics	30,000			30,000	IPA III. Government budget. Donors

I.1.5	Data exchange and re-use as per EU Reg. 2116/2021. Article 67). and Open data directive EU Directive (EU) 1024/2019 with EU Reg. 138/2023		40,000	40,000	80,000	Government budget. Donors. (World Bank)
I.1.6	Establishment of the Registers of organic production and certification with e-service for registration and transmission of organic certificates		30,000		30,000	Donor
I.1.7	Development/Upgrading AIS towards PMEF as per EU Reg. 2115/2021. Art. 7 and Art. 130. supported by data mining tool	30,000	100,000		130,000	Government budget. Donors. (World Bank)
I.1.8.	Digitalize core services for integration in the e-Agriculture Portal (eBujqësia) (Strategic objective 2.2.)	100,000	100,000	100,000	300,000	TAIEX / IPA. IPARD III TA / Donors
Total budget for Specific Objective I.1.		310,000	1,202,000	1,122,000	2,634,000	
Of which capital		310,000	1,130,000	1,050,000	2,562,000	
Of which recurrent		0	72,000	72,000	144,000	

I.2 Specific objective: Digitalize and simplify agricultural and rural development interventions						
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
I.2.1	Strengthening institutions in programming of interventions and accreditation of information systems in agriculture with reduction of administrative burden	120,000	40,000	40,000	200,000	IPA III, Government budget, Donors
I.2.1.1	Strengthening of IPARD MA in programming of IPARD III measures and support for finalization of IPARD III programme	60,000			60,000	TAIEX / IPA. IPARD III TA / Donors
I.2.1.1	Strengthening of ADA in accreditation of information system for IPARD III	60,000			60,000	TAIEX / IPA. IPARD III TA / Donors
I.2.1.3	Certification of ADA information systemm		40,000	40,000	80,000	TAIEX / IPA. IPARD III TA / Donors
I.2.2	Adjustment/development of measures with simplified access and reduction of administrative burden	280,000	170,000	20,000	470,000	IPA III, Government budget, Donors
I.2.3	Strengthening the administrative information systems for efficient implementation of IPARD III measures	40,000	150,000	10,000	200,000	IPA III, Government budget, Donors
Total budget for Specific Objective I.2		560,000	400,000	110,000	1,070,000	
Of which capital		560,000	400,000	110,000	1,070,000	

	Of which recurrent					
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	Total budget for Strategic objective 1	870,000	1,602,000	1,232,000	3,704,000	
	Of which capital	870,000	1,530,000	1,160,000	3,560,000	
	Of which recurrent	0	72,000	72,000	144,000	

II.	Strategic objective 2: Create an inclusive functional network of digital services for agriculture and rural areas					
II.1	Specific objective: Enhance access to agriculture advisory services, knowledge exchange and collaboration					
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
II.1.1	Development of a Digital Agricultural Technical and Advisory Services Platform (DTASP)	60,000	20,000		80,000	IPARD III, Government budget, Donors , IPARD 13
II.1.2	Development of e-Learning, certification and innovation cooperation modules		50,000		50,000	IPARD III, Government budget, Donors

	within the central advisory platform (DTASP)					
II.1.3	Develop DTASP's internal management platform for advisory services		100,000		100,000	Swiss cooperation
II.1.4	Real-time or near real-time data and advisory services (agrometeorological advisory services, prices, etc.) as well as alerts integration in DTASP	20,000	30,000	20,000	70,000	Donors, Government
	Production of localized agricultural risk maps - integrated with DTASP and e-Bujqesia	15,000	10,000	5,000	30,000	Donors, Government
II.1.5	Support continuous design and testing with users, phased roll-out, and outreach	15,000	15,000	15,000	45,000	Donors, Government
Total budget for Specific Objective II.1		110,000	225,000	40,000	375,000	
Of which capital		110,000	225,000	40,000	375,000	

	Of which recurrent					
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II.2		Specific objective 2.2: Streamline agricultural public services delivery				
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
II.2.1.	Development of the e-Bujqësia landing page with integrated service and other information links including operationalization	0	15,000	25,000	40,000	Government budget, donors
	Total budget for Specific Objective II.2	0	15,000	25,000	40,000	
	Of which capital	0	15,000	25,000	40,000	
	Of which recurrent					

II.3	Specific objective 2.3: Advance digital inclusion in rural areas					
Activities						
		2025	2026	2027	Total costs	Sources of funding
II.3.1.	Establish Digital Village centers		100,000	80,000	180,000	Donors
II.3.2.	Launch Smart Village pilot	45,000	45,000	45,000	135,000	Donors

	Total budget for Specific Objective II.3	45,000	145,000	125,000	315,000	
	Of which capital	45,000	145,000	125,000	315,000	
	Of which recurrent					

	Total budget for Strategic objective 2	155.000	385.000	190.000	730,000	
	Of which capital	155.000	385.000	190.000	730,000	
	Of which recurrent	0	0	0		

III.	Strategic objective 3: Develop the human capital for the digital transformation of agriculture					
III.1	Specific objective 3.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration					
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
III.1.1	Design modular, tiered and blended (in-class and online) digital agriculture curricula and certification programs, covering basic to advanced digital skills	30,000	30,000	15,000	75,000	IPARD III M 8,10
III.1.2	Develop digital agriculture curricula for higher education institutions in collaboration with universities, focusing on digital skills, precision agriculture, and agri-tech innovations	20,000	20,000		40,000	IPARD III M 8 and M10
III.1.3	Deliver blended digital skills training programs for farmers and rural residents, integrating online and in-person learning at Digital Village Centers on digital literacy, precision agriculture, farm management software, smart irrigation, e-commerce, and online business tools		40,000	40,000	80,000	IPARD III M 8 and M10
III.1.4	Develop and conduct digital entrepreneurship training at Digital Village Centers to support rural business development, focusing on e-commerce,		25,000	25,000	50,000	IPARD III, Government, Donor

	social media marketing, and digital financial tools					
III.1.5.	Provide digital capacity-building programs for advisory service providers to enhance online advisory services through DTASP and eBujqësia, with blended learning approaches		40,000	40,000	80,000	Donors
III.1.6	Equip demonstration plots at strategic locations to showcase precision agriculture tools, climate-smart practices, and integrate hands-on learning into training programs	25,000	20,000	20,000	65,000	Donors
Total budget for Specific Objective III.1		75,000	175,000	140,000	390,000	
Of which capital		75,000	175,000	140,000	390,000	
Of which recurrent						

III.2	Specific objective 3.2: Foster multi-stakeholder collaboration					
Activities						
No.	Action	Budget			Total costs	Source of funding
		2025	2026	2027		
III.2.1.	Provide support for the establishment and operationalization of the Digital Agriculture Innovation Hub	10,000	10,000	10,000	30,000	Government budget, donors

III.2.2.	Support the establishment of EIP partnerships by facilitating networking among farmers, researchers, advisors, and businesses, providing guidance for project idea development, assisting in partner matching, and supporting the preparation of funding applications	20,000	20,000	20,000	60,000	Government budget, donors
III.2.3.	Design, apply for and implement innovative projects through EIP, including developing and testing digital agriculture technologies, fostering cooperation among farmers, researchers and businesses, creation of public-private partnerships translating research into practice, piloting new approaches, improving resource management and scaling up successful solutions	205,000	210,000	215,000	630,000	Government budget, donors
III.2.4.	Develop technical guidelines to ensure that platforms and tools developed are compatible and interoperable by facilitating collaboration between key partners and conducting joint technical assessments		5,000	10,000	15,000	IPARD III M13, EIP, Horizon
Total budget for Specific Objective III.2		235,000	245,000	255,000	735,000	
Of which capital		235,000	245,000	255,000	735,000	
Of which recurrent						

	Total budget for Strategic objective 3	310,000	420,000	395,000	1,125,000	
	Of which capital	310,000	420,000	395,000	1,125,000	
	Of which recurrent	0	0	0	0	

9. Action Plan

I. Strategic objective 1: Establish and improve e-governance and data systems to enhance efficiency and data-driven decision-making in agriculture and rural development					
No.	Strategic and specific objectives, indicators and actions	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	CAP mandatory information systems' level of compliance with CAP requirements (%)	30% [2024]	70%	90%	CAP mandatory Information systems 90% compliant with EU Acquis
2.	Number of accredited IPARD measures	0 [2024]	0	2	Measures 3 and 10 of IPARD III measures accredited by the relevant EU institution

I.1 Specific objective: Strengthen and integrate key agricultural information systems in line EU CAP					
No.	Strategic and specific objectives, indicators and actions	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	Number of interventions reviewed and adjusted in context of reduction of administrative burden and aligned with EU Acquis <ul style="list-style-type: none"> • Decoupled payment per hectare • Coupled payment per hectare and per head • Complementary income 	0 [2024]	5	5	At least 5 of direct payments interventions reviewed in context of reduction of administrative burden and aligned with EU Acquis

	support for young farmers in support of CAP measures				
2.	Level of alignment of IACS (Integrated Administration and Control System) with the EU Acquis	10% [2024]	30%	50%	IACS in 50% aligned with EU Acquis by 2027
3	Level of alignment of FSDN (Farm Sustainability Data Network) with the EU Acquis	10% [2024]	30%	40%	FSDN 40% aligned with EU Acquis by 2027
4	Number of services published : e-Farm; e-Direct payments (GSA); e-FADN; e-Organic; e-Open data; e-Statistics	0 [2024]	3	5	At least 5 e-services in the field of agriculture published under e-Kosova by 2027

Activities

No.	Action	Deadline	Budget			Source of funding	Lead and supporting institution	Output	Reference to documents
			2025	2026	2027				

I.1.1	Review of legal and normative framework related to direct supports in agriculture in context of reduction of administrative burden	2027		190,000	190,000	TAIEX / IPA, IPARD III TA / Donors	MAFRD, DEIPC, LD	Number of GAEC and SMRs aligned with EU Acquis	SARD, Further EU alignment, Chapter 11
I.1.1.1	Strengthening of GAEC and SMRs	2027		125,000	125,000	TAIEX / IPA, IPARD III TA / Donors	MAFRD, ADA	Number of ANC and AMR determined and digitalized	SARD, Further EU alignment, Chapter 11
I.1.1.2	Determination of ANC and AMR in accordance to EU Reg. 2115/2021 Art. 71 and 72.(Soil maps)	2027		35,000	35,000	TAIEX / IPA, IPARD III TA / Donors	MAFRD, ADA	Number of direct payments M4 and M11 interventions aligned with IPARD III/CAP and reviewed in context of reduction of administrative burden with use of sIACS	SARD, Further EU alignment, Chapter 11
I.1.1.3	Direct payments. M4 and M11 compliant to IPARD III/CAP programme requirements and reviewed in context of reduction of administrative burden	2027		30,000	30,000	TAIEX / IPA, IPARD III TA / Donors	MAFRD, DAPT, LD, ADA	Legal and normative framework related to direct supports in agriculture reviewed in context of reduction of administrative burden	SARD, Further EU alignment, Chapter 11

I.1.2	Further alignment of sIACS towards fully EU compliant IACS	2027	120,000	522,000	542,000				
I.1.2.1	Adjustment of Farm register in context of harmonization with EU CAP Acquis and reduction of administrative burden	2025	50,000	100,000	150,000	TAIEX / IPA, IPARD III TA / Donors	ADA	Farm register adjusted in accordance to EU Acquis, validated, interoperable with core registers and digital service e-Farm register established under e-Kosova; consent from Statistics acquired to use data for Farm register	SARD, Further EU alignment, Chapter 11: RGF Kosovo Reform Agenda: Indicator 2.1.1
I.1.2.2	Establishment of EU Compliant LPIS and LPIS quality management system.	2027	70,000	100,000	130,000	Italian Cooperation	ADA	LPIS and LPIS Quality management system fully compliant with EU Acquis	SARD, Further EU alignment, Chapter 11
		2027		72,000	72,000	Government budget	ADA	LPIS and LPIS Quality management system fully compliant with EU Acquis	SARD, Further EU alignment, Chapter 11

I.1.2.3	Alignment of the Geospatial Application System (GSA) With CAP Acquis and establishment of digital service e-Direct payments under e-Kosova	2027		50,000	40,000	TAIEX / IPA, IPARD III TA / Donors	ADA	GSA at 90% compliant with EU Acquis, and digital service e-Direct payments established under e-Kosova	SARD, Further EU alignment, Chapter 11; RGF Kosovo Reform Agenda: Indicator 2.1.1
I.1.2.4	Adjustments of control and penalty system for authorization of payments	2027		80,000	100,000	TAIEX / IPA, IPARD III TA / Donors	ADA	Control and penalty system for authorization of payments fully adjusted	SARD, Further EU alignment, Chapter 11
I.1.2.5	Establishment and operationalization of AMS and simplification of on-the spot controls	2027		120,000	50,000	TAIEX / IPA, IPARD III TA / Donors	ADA	AMS established and at 70% operationalized; On-the spot controls simplified with use of AMS (70%)	SARD, Further EU alignment, Chapter 11
I.1.3	Strengthening of FADN and transformation of FADN to FSDN and establishment of digital service e-FSDN under E-kosova	2027	30,000	30,000	60,000	IPA III, Government budget, Donors	MAFRD, DAEAS	FSDN aligned with CAP Acquis, Interoperable with Farm register as per Art 4. of FSDN Regulation and accessible via e-FSDN under e-Kosova	SARD, Digitalization and knowledge transfer
I.1.4	Strengthening interconnectivity with and personal access to agri-statistics	2027	30,000			IPA III, Government budget, Donors	MAFRD, DAEAS, ADA	Services (APIs) for data exchange with KAS as per EU Reg., established as per Art 67 of EU Reg. 2116/2021; Digital service E-statistics established under e-Kosova	SARD, Further EU alignment, Chapter 11 Chapter 18

I.1.5	Data exchange and re-use as per EU Reg. 2116/2021, Article 67), and Open data directive EU Directive (EU) 1024/2019 with EU Reg. 138/2023	2027		40,000	40,000	Government budget, Donors, (World Bank)	MAFRD	Open-data platform in accordance to EU requirements, established	SARD: Digitalization and knowledge transfer : Digitalization of the MAFRD and open-data policy
I.1.6	Establishment of the Registers of organic production and certification with e-service for registration and transmission of organic certificates	2027		30,000		Donor	MAFRD, DAPT	The Registers of organic production and certification established, digital service for transmission of organic certificates e-Organic published under e-Kosova	SARD, Further EU alignment, Chapter 11 RGF Kosovo Reform Agenda: Indicator 2.1.1
I.1.7	Development/Upgrading AIS towards PMEFA as per EU Reg. 2115/2021, Art. 7 and Art. 130, supported by data mining tool	2027	30,000	100,000		Government budget, Donors, (World Bank)	MAFRD, DAEAS, ADA	AIS developed/Upgraded with use PMEFA indicators as per EU Reg. 2115/2021, Art. 7 and Art. 130 supported by data mining functionalities	SARD, Further EU alignment, Chapter 11
I.1.8.	Digitalize core services for integration in the e-Agriculture Portal (eBujqësia) (Strategic objective 2.2.)	2027	100,000	100,000	100,000	TAIEX / IPA, IPARD III TA / Donors	ADA, MAFRD, DMP, FVA	Core agricultural services digitalized for integration into the e-Agriculture Portal (eBujqësia) e-Farm enables farm registration, updates, and subsidy declarations e-LPIS allows land boundary validation and CAP compliance	SARD, Further EU alignment, Chapter 11; RGF Kosovo Reform Agenda: Indicator 2.1.1

								e-FADN and e-Statistics enable data reporting for policy use	
								e-Organic supports online registration and certificate issuance	
								e-FoodSafety, e-Veterinary, and e-Phyto services gradually digitalized	
	<i>Total budget for Specific Objective I.1.</i>		870,000	1,602,000	1,232,000				
	<i>Of which capital</i>		870,000	1,530,000	1,160,000				
	<i>Of which recurrent</i>		0	72,000	72,000				
I.2	Specific objective: Digitalize and simplify agricultural and rural development interventions								
No.	Indicator	Baseline value	Interim target [2026]	Final year target [2027]	Outcome				
1.	Number of interventions reviewed in context of reduction of administrative burden of the IPARD measures	0 [2024]	10		Up to 10 IPARD interventions reviewed in context of reduction of administrative burden and aligned with EU Acquis				

2.	Number of application forms pre-populated with use of available data	0[2024]	5	10	Up to 10 application forms pre-populated with use if available data
3.	Number of digital services launched under e-Grants	0[2024]	5	10	Up to 10 measures under IPARD programme launched with use of e-Grants
4.	Share of two IPARD measures (M3 and M10) accredited with the use of an accredited information system	0[2024]	50%	100%	100% of the two IPARD measures (M3 and M10) accredited with the use of an accredited information system

Activities

No.	Action	Deadline	Budget			Source of funding	Lead and supporting institution	Output	Reference to documents
			2025	2026	2027				
I.2.1	Strengthening institutions in programming of interventions and accreditation of information systems in agriculture through reduction of administrative burden	2026	120,000	40,000	40,000	IPA III, Government budget, Donors	MAFRD, MA/DRDP, ADA, FVA, APA	Institutions strengthened in programming of interventions in context of reduction of administrative burden and accreditation of information systems in agriculture	SARD, Further EU alignment, Chapter 11

I.2.1.1	Strengthening of IPARD MA in programming of IPARD III measures and support for finalization of IPARD III programme	2026	60,000			TAIEX / IPA. IPARD III TA / Donors	MAFRD, MA/DRDP	Number of officials trained in IPARD III programming	SARD, Further EU alignment, Chapter 11
I.2.1.2	Strengthening of ADA in accreditation of information system for IPARD III	2026	60,000			TAIEX / IPA. IPARD III TA / Donors	ADA	Number of officials trained in management of information systems of IPARD Agency	SARD, Further EU alignment, Chapter 11
I.2.1.3	Certification of ADA information system	2027		40,000	40,000	TAIEX / IPA. IPARD III TA / Donors	ADA	IT system of ADA accredited for IPARD and CAP	SARD, Further EU alignment, Chapter 11
I.2.2	Adjustment/development of measures with simplified access and reduction of administrative burden	2026	280,000	170,000	20,000	IPA III, Government budget, Donors	MAFRD, MA/DRDP, ADA	IPARD measures with use of simplified cost options, pre-populated forms and pre-calculated business plans to be re-used under CAP INVEST (73-74) simplified	RGF Kosovo Reform Agenda: Reform: Indicator 2.1.1.. 100% of the new laws imposing an administrative burden are reviewed in context of reduction of administrative burden RGF Kosovo Reform Agenda: Indicator 2.1.1

I.2.3	Strengthening the administrative information systems for efficient implementation of IPARD III measures	2027	40,000	150,000	10,000	IPA III, Government budget, Donors	ADA	Administrative information systems for efficient implementation of IPARD III measures, strengthened in application/claim submission, administrative and on-the spot controls and authorization of projects/payments; Digital service e-Grants for submission of Applications/payment claims via e-Kosova, established	SARD, Further EU alignment, Chapter 11, RGF Kosovo Reform Agenda: Reform: Indicator 2.1.1 Ensure user friendly digital public service delivery through administrative burden reduction and improved quality and increased number of services available online
	<i>Total budget for Specific Objective I.2</i>		560,000	400,000	110,000				
	<i>Of which capital</i>		560,000	400,000	110,000				
	<i>Of which recurrent</i>								
	<i>Total budget for Strategic objective 1</i>		1,660,000	2,749,000	1,924,000				
	<i>Of which capital</i>		1,660,000	2,677,000	1,852,000				
	<i>Of which recurrent</i>			72000	72000				

II. Strategic objective 2: Create an inclusive functional network of digital services for agriculture and rural areas					
No.	Strategic and specific objectives, indicators and actions	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	Share of advisory services and AKIS supported with use of digital technologies	0	50%	100%	Advisory services and AKIS supported with use of digital technologies
2.	Share of agricultural public services delivery streamlined digitally	0%	20%	40%	40% of Agricultural public services delivery streamlined digitally
3.	Number of pilot villages where Smart Village approach was introduced	0	1	1	At least one pilot smart village was actively engaged in local development using the Smart Village approach, linked with LEADER principles
II.1 Specific objective: Enhance access to agriculture advisory services, knowledge exchange and collaboration					
No.	Indicator	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	Digital Agricultural Technical and Advisory Services Platform (DTASP) established (% functional)	0%	30%	50%	Digital Agricultural Technical and Advisory Services Platform (DTASP) established at least 50% by end of 2027
2.	Development of e-Learning, certification and innovation cooperation module(s) within	0	1	1	e-Learning, certification and innovation cooperation module(s) within the central advisory platform (DTASP) developed

	the central advisory platform (DTASP)								
Activities									
No.	Action	Deadline	Budget			Source of funding	Lead and supporting institution	Output	Reference to documents
			2025	2026	2027				
II.1.1	Development of a Digital Agricultural Technical and Advisory Services Platform (DTASP)	2027	60,000	20,000		IPARD III, Government budget, Donors , IPARD 13	MAFRD, DATS	<p>Central DTASP digital infrastructure established</p> <p>Digital register of certified advisors, including their contact details and areas of expertise, developed and operational</p> <p>Library of scientific and practical advisory materials published and regularly updated</p> <p>Regularly updated relevant information available to farmers</p>	<p>SARD: Advisory services for farmers on farming practices, accountancy, and marketing with the consideration of the innovation</p> <p>Strategic plan of Kosovo Advisory System</p>

II.1.2	Development of e-Learning, certification and innovation cooperation modules within the central advisory platform (DTASP)	2027	50,000			IPARD III, Government budget, Donors	MAFRD, DATS, Academic Institutions	e-Learning and webinars module within the central platform to support both farmer and advisor capacity-building, developed	SARD: Advisory services for farmers on farming practices, accountancy, and marketing with the consideration of the innovation Strategic plan of Kosovo Advisory System RGF Kosovo Reform Agenda: Indicator 2.1.1
						IPARD III, Government budget, Donors, IPARD 13		Digital tools to support partner registration and cooperation under the European Innovation Partnership (EIP) model, interoperable with the Farm Register (FR), developed	
						IPARD III, Government budget, Donors, IPARD M8,10		Certification courses, advisory e-training programs, and skill development tracks for different user group, developed and delivered	
								Thematic webinars and group training sessions for both advisors and farmers delivered	

						IPARD III, Government budget, Donors		Targeted outreach campaigns to promote inclusive access to the platform and its services, with a focus on engaging women, youth, the elderly, and vulnerable groups conducted	
II.1.3	Develop DTASP's internal management platform for advisory services	2027		100,000		Government budget, Donors, Swiss cooperation	MAFRD, DATS,	Internal management platform for advisory services, including reporting, evaluation, and performance monitoring tool, developed and operational FADN/FSDN data used to enhance tailored, data-driven advisory services	
II.1.4	Real-time or near real-time data and advisory services (agrometeorological advisory services, prices, etc.) as well as alerts integration in DTASP	2027	20,000	30,000	20,000	Donors, Government	MAFRD DATS, FVA, APA, DVV, KIA, IT partners	Agricultural efficiencies, climate adaptation and mitigation, access to markets	National rural development plan 2023-2027, RGF Kosovo Reform Agenda: Reform: 2.1.1 Ensure user friendly digital public service delivery

	Production of localized agricultural risk maps - integrated with DTASP and e-Bujqesia	2026	15,000	10,000	5,000	Donors, Government	MAFRD (lead), DAHAST, KIA, DVV, PPI, Local extension agencies	Area-specific climate risk info available to farmers	National rural development plan 2023-2027, RGF Kosovo Reform Agenda: Reform: 2.1.1 Ensure user friendly digital public service delivery
II.1.5	Support continuous design and testing with users, phased roll-out, and outreach	2027	15,000	15,000	15,000	Donors, Government	MAFRD, DATS	DTASP iteratively tested and improved with user involvement, rural outreach campaigns conducted	SARD: Advisory services for farmers on farming practices, accountancy, and marketing with the consideration of the innovation Strategic plan of Kosovo Advisory System
	Total budget for Specific Objective II.1		110,000	225,000	40,000				
	<i>Of which capital</i>		110,000	225,000	40,000				
	<i>Of which recurrent</i>								

II.2		Specific objective 2.2: Streamline agricultural public services delivery							
No.	Inndicator	Baselin e value	Interim target [2026]	Final year target [2027]	Outcome				
1.	e-Agriculture Portal (eBujqësia) established and operational	0%	50%	100%	e-Agriculture Portal (eBujqësia) established and 100% operational in 2027				
2.	Number of core public services fully integrated into eBujqësia (e.g. e-Farm, e-LPIS, e-Grant, e-FADN, e-Organic)	0	2	4	At least four digital services included and accessible through the central farmer's portal (eBujqësia)				
Activities									
No.	Action	Deadli ne	Budget			Source of funding	Lead and supportin g institution	Output	Reference to documents
			2025	2026	2027				
II.2.1.	Development of the e-Bujqësia portal with integrated service including operationalization.	2027	0	15,000	25,000	Governm ent budget, donors	MAFRD DAEAS – ADA, FVA, APA, KIA, DVV	Farmer centric portal with links to available services, established (Farm Register, Direct payments, Grants, FADN, OPR, AKIS accessed through single web page)	National rural development plan 2023-2027, RGF Kosovo Reform Agenda: Reform: 2.1.1 Ensure user friendly digital public service delivery

	<i>Total budget for Specific Objective II.2</i>		0	15,000	25,000				
	<i>Of which capital</i>		0	15,000	25,000				
	<i>Of which recurrent</i>								

II.3	Specific objective 2.3: Advance digital inclusion in rural areas								
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No.	Inndicator	Baselin e value	Interim target [2026]	Final year target [2027]	Outcome
1.	Number of operational Digital Village Centers providing access to digital agricultural infrastructure and services	0	1	2	At least two operational Digital Village Centers providing access to digital agricultural infrastructure and services
2.	Number of Smart Village pilot initiatives co-developed and implemented with local stakeholders	0	0	1	At least one Smart Village pilot initiative co-developed and implemented with local stakeholders

Activities									
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No.	Action	Deadli ne	Budget			Source of funding	Lead and supportin g institution	Output	Reference to documents
			2025	2026	2027				

II.3.1.	Establish Digital Village centers	2027		100,000	80,000	Donors	MAFRD, DATS, Municipalities	At least 5 Digital Village centers established in Kosovo, equipped with internet, devices, and teleconferencing tools; enabled hybrid (in-person and remote) advisory support	National rural development plan 2023-2027
II.3.2.	Launch a Smart Village pilot	2027	45,000	45,000	45,000	Donors	MAFRD, DATS, Municipalities	Launched a Smart Villaged pilot via LEADER approach	National rural development plan 2023-2027
	Total budget for Specific Objective II.3		45,000	145,000	125,000				
	<i>Of which capital</i>		45,000	145,000	125,000				
	<i>Of which recurrent</i>		0	0	0				
	Total budget for Strategic objective 2		155,000	385,000	190,000				
	<i>Of which capital</i>		155,000	385,000	190,000				
	<i>Of which recurrent</i>		0	0	0				

III. Strategic objective 3: Develop the human capital for the digital transformation of agriculture					
No.	Strategic and specific objectives, indicators and actions	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	Number of actions contributing to the use of digital technologies, knowledge transfer and advisory in agriculture delivered via e-Learning platforms and webinars	1	2	2	At least 5 actions in development and implementation of training programmes developed with use of e-Learning platforms and Webinars
2.	Digital Agriculture Innovation Hub, established and piloted	0	1	1	Digital Agriculture Innovation Hub established and operational
III.1 Specific objective 3.1: Enhance access to agriculture advisory services, knowledge exchange and collaboration					
No.	Indicator	Baseline value	Interim target [2026]	Final year target [2027]	Outcome
1.	Number of farmers, advisors, and rural residents trained in basic and advanced digital skills	0	150	300	Up to 300 farmers, advisors, and rural residents trained in basic and advanced digital skills
2.	Number of programs for e-trainings and on-line advisory activities through webinars and e-Learning platform, developed	0	1	2	At least 2 training programmes covering certification of farm advisors, on-line advisory activities and use of acquisition of skill developed
3.	Number of capacity building actions on digital innovation, sustainability, traceability and risk preparedness conducted	0	1	2	Up to 2 capacity building actions on digital innovation, sustainability, traceability and risk preparedness conducted

Activities									
No.	Action	Deadline	Budget			Source of funding	Lead and supporting institution	Output	Reference to documents
			2025	2026	2027				
III.1.1	Design modular, tiered and blended (in-class and online) digital agriculture curricula and certification programs, covering basic to advanced digital skills	2026	30,000	30,000	15,000	IPARD III M 8,10	MAFRD, DATS, Academic institutions	A mapping exercise to identify and select training and demonstration sites based on the existing agriculture-focused TVET centers, NGO-run demonstration plots conducted, and anchored on the newly established Digital Village Centers, establishing partnerships where needed; Modular digital agriculture curricula for TVET institutions and non-formal training (e.g. farmer field schools) covering basic digital literacy and internet use, use of	National rural development plan 2023-2027

								<p>public digital services (DTASP, eBujqësia) and advanced topics (e.g. precision agriculture, farm management software, drones, etc.) designed; Tiered certification programmes, linked to advisory licensing or IPARD-grant eligibility where relevant, and issue digital certificates through the DTASP developed; Training curricula with diverse participant groups (women, youth, elderly farmers, agripreneurs) piloted and feedback sessions conducted, and training modules adapted.</p>	
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III.1.2	Develop digital agriculture curricula for higher education institutions in collaboration with universities, focusing on digital skills, precision agriculture, and agri-tech innovations	2027	20,000	20,000		MAFRD, donors	MAFRD, relevant academic institutions	Created digital agriculture curricula in collaboration with universities, emphasizing digital skills, precision agriculture, and agri-tech innovations	DA Working Group consultation findings
III.1.3	Deliver blended digital skills training programs for farmers and rural residents, integrating online and in-person learning at Digital Village Centers on digital literacy, precision agriculture, farm management software, smart irrigation, e-commerce, and online business tools	2027		40,000	40,000	IPARD III M 8,10	MAFRD, DATS	Blended digital skills training programs for farmers and rural residents offered, integrating both online learning modules and in-person sessions leveraging both existing training centers and the newly established facilities in the Digital Village Centers; basic digital literacy and advanced topics like precision agriculture, farm management software, smart irrigation, e-commerce, and online business management tools	National rural development plan 2023-2027

								included and gender-responsive and inclusive training, with specific measures to support women, elderly farmers, and marginalized groups ensured	
III.1.4	Develop and conduct digital entrepreneurship training at Digital Village Centers to support rural business development, focusing on e-commerce, social media marketing, and digital financial tools	2027		25,000	25,000	IPARD III M 8,10	MAFRD, DATS	Entrepreneurship training programs focused on using digital tools (e.g., e-commerce platforms, social media marketing, digital financial tools) to enhance rural business operations developed and conducted, promoting digital marketing and online transactions as part of the training to help rural businesses thrive in a digital economy	National rural development plan 2023-2027

III.1.5	Provide digital capacity-building programs for advisory service providers to enhance online advisory services through DTASP and eBujqësia, with blended learning approaches	2027		40,000	40,000	IPARD III M 8,10	MAFRD, DATS	Digital skills training for advisory service providers provided to enhance their capacity to deliver online advisory services, leveraging the DTASP and eBujqësia platforms, blended learning integrated to ensure flexibility and broad access for rural advisors	National rural development plan 2023-2027
III.1.6	Equip demonstration plots at strategic locations to showcase precision agriculture tools, climate-smart practices, and integrate hands-on learning into training programs	2027	25,000	20,000	20,000	MAFRD, donors, M13, Horizon, EIP	MAFRD, DATS, DAPT, KIA, DVV, Academic institutions	Demo plots established at strategic locations, including TVET centers and agricultural schools, NGO-run training farms, Digital Village Centers and selected lead farms, demo plots used as experiential learning spaces to showcase precision agriculture tools, climate-smart practices, etc. and embedded demo plot visits into	National rural development plan 2023-2027

								training programmes to ensure participants acquire hands-on experience, understand benefits of digital technologies and learn from early adopters	
	<i>Total budget for Specific Objective III.1</i>		75,000	175,000	140,000				
	<i>Of which capital</i>		75,000	175,000	140,000				
	<i>Of which recurrent</i>								

III.2		Specific objective 3.2: Foster multi-stakeholder collaboration							
No.	Indicator	Baseline value	Interim target [2026]	Final year target [2027]	Outcome				
1.	Number of collaborative projects initiated within the Digital Agriculture Innovation Hub and in the scope of EIP	0	1	1	At least 31 collaborative project has been successfully initiated within the Digital Agriculture Innovation Hub, aligning with EIP principles				
2.	Number of EIP projects supported	0	2	3	At least 3 EIP projects supported				
Activities									
No.	Action	Deadline	Budget			Source of funding	Lead and supporting institution	Output	Reference to documents
			2025	2026	2027				
III.2.1	Provide support for the establishment and operationalization of the Digital	2027	10,000	10,000	10,000	Government budget,	MAFRD, DEIPC	Governance model, coordination mechanisms, and stakeholder roles for the Innovation Hub	Agricultural Knowledge and Innovation Systems (AKIS) in Kosovo, National Report and Proposed Draft Action Plan

	Agriculture Innovation Hub					donors		defined and established	
III.2.2	Support the establishment of EIP partnerships by facilitating networking among farmers, researchers, advisors, and businesses, providing guidance for project idea development, assisting in partner matching, and supporting the preparation of funding applications	2027	20,000	20,000	20,000	Government budget, donors	MAFRD	Functional EIP partnerships formed, with developed project concepts and prepared funding applications	National rural development plan 2023-2027
III.2.3	Design, apply for and implement innovative projects through EIP, including developing and testing digital agriculture technologies, fostering cooperation among farmers, researchers and businesses, creation of public-private partnerships, translating research	2027	205,000	210,000	215,000	IPARD III M13, EIP, Horizon, Government budget	MAFRD, DEIPC, ADA	Innovative EIP projects designed, funded, and implemented, delivering practical solutions for digital agriculture, cooperation, resource management, and scaling of successful practices, public-private partnerships created initiated through targeted events.	Strategic Plan of the Kosovo Advisory System for Agriculture and Rural Development 2023-2027, Working Group consultations with stakeholders, Jan-Feb 2025, FAO inception workshop on DA program Nov 2024, National rural development plan 2023-2027

	into practice, piloting new approaches, improving resource management and scaling up successful solutions								
III.2.4	Develop technical guidelines to ensure that platforms and tools developed are compatible and interoperable by facilitating collaboration between key partners and conducting joint technical assessments	2027		5,000	10,000	Donors	MAFRD, ASHI	Technical guidelines developed and endorsed by public administration institutions to ensure compatibility and interoperability of digital platforms and tools	Digital Agenda of Kosovo 2030, Recommendations from the Working Group consultations with stakeholders, Jan-Feb 2025
	<i>Total budget for Specific Objective III.2</i>		235,000	245,000	255,000				
	<i>Of which capital</i>		235,000	245,000	255,000				
	<i>Of which recurrent</i>								
	Total budget for Strategic objective 3		310.000	420.000	395.000				

	<i>Of which capital</i>		310.000	420.000	395.000				
	<i>Of which recurrent</i>		0	0	0				

Note: Since the Action Plan for Digital Agriculture 2025–2028 will be part of the Action Plan of the Agriculture and Rural Development Strategy 2022–2028, it will be monitored through its monitoring mechanisms.

