

Selected Insights from Farm Surveys and Interviews across the Western Balkans

Introduction and methodological note

With the support of the European Union, EFSE and its Development Facility (DF) conducted a series of market studies between 2023-2026 to assess sustainable agriculture investment needs, feasibility, and opportunities in Albania, Bosnia and Herzegovina (BiH), Kosovo, North Macedonia, and Serbia. Implemented by expert consultancy firms commissioned through EFSE DF, the studies combined desk-based policy review, sector and market analysis, stakeholder consultations, and primary research among farmers and agri-businesses through targeted surveys and interviews.

The studies examined the state of sustainable agriculture in the region, identified emerging investment trends and opportunities, and assessed the drivers, barriers, capacity needs, and enabling conditions for broader adoption. The findings aimed at informing the development of evidence-based financing and technical assistance (TA) solutions and the calibration of EFSE's sustainable agriculture eligibility criteria to local market contexts.

The farmer surveys and interviews underpinning the studies were designed as targeted market assessments rather than statistically representative country-level analyses. They relied on a limited

number of respondents and focused on sub-regions, sub-sectors, and market segments relevant to EFSE and its local partner financial institutions, including small, family-owned, medium-sized farms and agri-businesses, as well as larger commercial farms. Given differing country contexts, sampling approaches, sample sizes, and questionnaires varied across countries. In BiH, Kosovo, and Serbia, primary research combined computer-assisted farmer surveys with telephone and on-farm interviews. In Albania and North Macedonia, the analysis relied on semi-structured interviews with farmers and agri-businesses and is therefore qualitative in nature. These interviews were supplemented by consultations with farmer associations. Surveys and interviews in BiH and Kosovo followed a common methodology and standardized questionnaire, and thus, findings from these two countries are often presented in aggregated form.

EFSE's Financial institutions contributed through interviews, portfolio and market assessments, and the review and validation of findings. Several institutions also facilitated engagement with their agri-clients for surveys or interviews. EFSE gratefully acknowledges their valuable contributions.

PRIMARY RESEARCH OVERVIEW

- 239** Farmer Survey Participants
- 84** Semi-structured interviews with farmers and Agri-businesses
- 40+** Key informant interviews (policy-makers, agri-experts, financial institutions etc.)

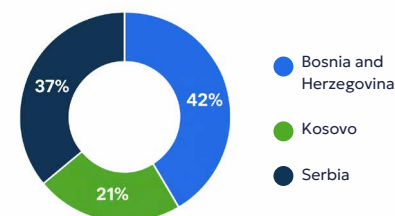
COUNTRY COVERAGE

Albania
Bosnia and Herzegovina
Kosovo
North Macedonia
Serbia

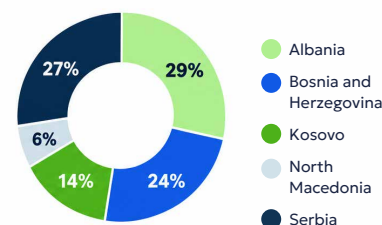
Study Period: 2023 -2026

Selected demographic and structural profiles of the surveyed and interviewed farms and agri-businesses

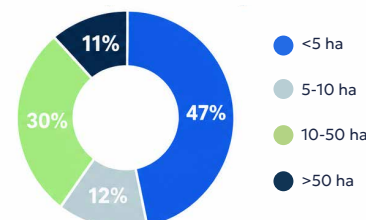
SURVEYED FARMS BY COUNTRY



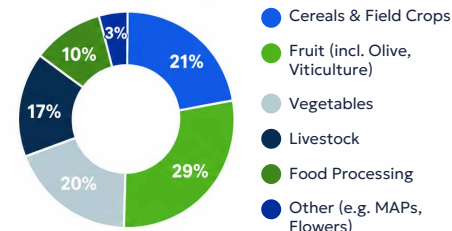
INTERVIEWED FARMS/AGRI-BUSINESSES BY COUNTRY



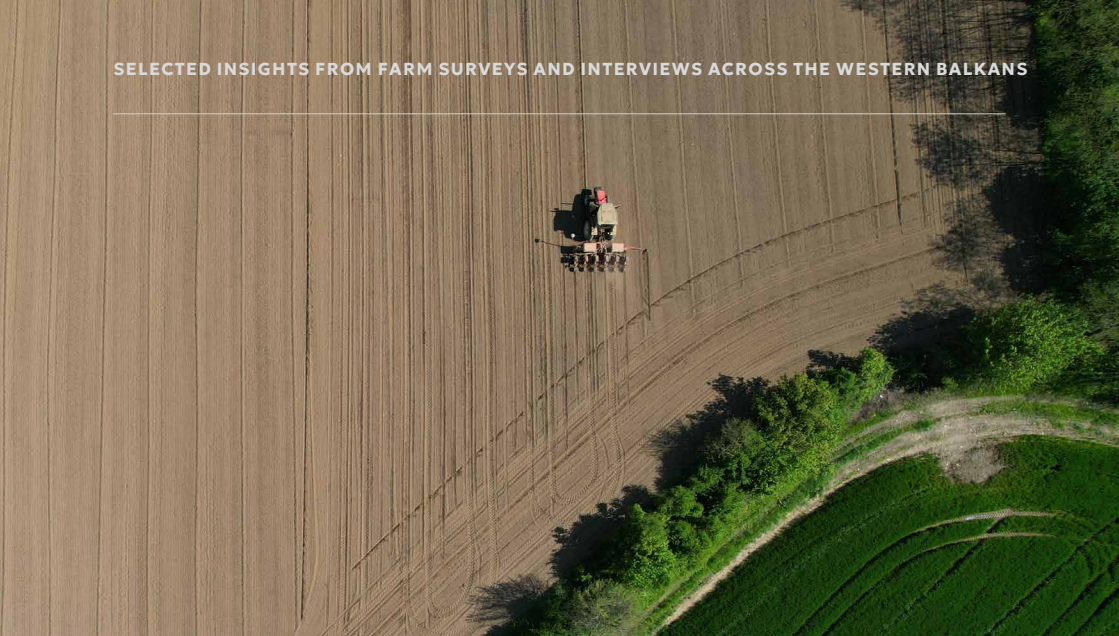
SURVEYED FARMS BY SIZE (IN HA)



SUB-SECTOR DISTRIBUTION ACROSS ALL PARTICIPANTS¹



¹ Distribution reflects the combined sample of survey and interview participants and is intended to illustrate an approximate sub-sector representation within the research samples. Approximately 28% of all participants are engaged in mixed agricultural production.



This report presents selected findings from surveys and interviews with farmers and agri-businesses across the region. Given the targeted nature of the research, the findings provide indicative market insights into common trends & select country-/sector-specific characteristics, while offering practical reflections for stakeholders engaged in sustainable agriculture development.

SUSTAINABILITY AWARENESS AND MOTIVATION

- Awareness of sustainable agriculture is growing across the surveyed and interviewed market segments, as farmers increasingly associate sustainable practices with productivity, cost efficiency, and long-term viability. Adoption is also advancing, including, among smallholders, but remains uneven. The uptake, particularly of advanced measures, tends to increase with farm size, value addition, and market orientation, with larger farms, integrated producer-processors, and exporters leading investment. Farmers aged 30-50 and those with higher education also tend to place greater importance on sustainability and show greater willingness to adopt new technologies.

- Economic considerations are the primary drivers of sustainability investments, followed by growing efforts to manage climate-related risks. In BiH and Kosovo, improved yields and cost savings were cited as key motivations by 87% and 63% of surveyed farmers. Farmers in Serbia



and North Macedonia likewise prioritize productivity gains (incl. improved market prices) and lower energy and input costs, while increasingly investing to mitigate drought and other climate risks. In Albania, sustainability is further linked to competitiveness, as exporters, supermarkets, and EU buyers require certification, traceability, and compliance with food safety and environmental standards.

- **Public support schemes** (incl. those enabled through the EU Instrument for Pre-Accession Assistance for Rural Development (IPARD)), **regulatory and export-market/buyer requirements, and value-chain relationships** (e.g. contract farming in Kosovo) are cited as major enablers of sustainable investments. Reflecting their importance, 75% of surveyed Serbian farmers identify government subsidies and incentives as a key mechanism for enabling investment in sustainable equipment, followed by bank loans with more favorable and tailored terms (58%), while 82% of surveyed farms in BiH and Kosovo identify insufficient government support as a barrier to implementing sustainable practices. Domestic demand for sustainably produced food remains at an early stage of emergence.

PATTERNS AND TRENDS IN SUSTAINABLE AGRICULTURE ADOPTION

- Basic methods of sustainable soil management are the most common entry point to sustainable agriculture. Across surveyed farms in BiH and Kosovo, sustainable soil management practices such as composting, mulching, protein crop production, and cover cropping are adopted by 14-34% of farms, with uptake also evident among the smallest holdings (12% of farms under 1 ha). In Serbia, >60% of surveyed

farms report implementing soil conservation measures, including the use of reduced tillage equipment. In Albania, composting, biological pest control, and soil regeneration are also expanding, esp. among certified and export-oriented horticultural producers. However, reliance on mineral fertilizers and pesticides remains high across the region, indicating that the adoption of sustainable soil management practices remains partial rather than systemic, while agroforestry is rarely observed outside larger farms.

- **Irrigation infrastructure remains underdeveloped, while adoption of water-efficient technologies is still limited.** Drip irrigation is nevertheless emerging as the leading solution, primarily among fruit producers, used by 36% of surveyed farms in BiH and Kosovo, including 12-17% of farms under 1 ha. In Serbia, adoption stands at 25%, although 65% of surveyed farms report using no irrigation systems at all. Simple rainwater harvesting is also present, while more advanced solutions (e.g. fertigation, automated controls, sensors, water reuse systems) remain mainly concentrated among larger farms. Interviews in Albania similarly point to growing uptake of drip irrigation among fruit, olive, vineyard, and greenhouse producers in response to increasing water stress and groundwater salinity.

- **Adoption of digital and precision technology remains at an early stage, particularly among smaller farms, limiting opportunities to improve efficiency and productivity.** In BiH and Kosovo, only 15% of surveyed farms report using GPS systems, drones, or crop-monitoring software (highest prevalence in 5ha-20ha size segment, where 29% use GPS, 26% - drones and crop monitoring software), while adoption in livestock production is virtually absent, with no respondents reporting automated feeding,

milking, or livestock-tracking systems. Uptake of digital technologies appears somewhat more advanced in Serbia, where drones are emerging as a key investment priority and interest in automated milking and manure management technologies is growing. Adoption nevertheless remains limited and is constrained primarily by high investment costs. In Albania, interviews point to visible, increasing adoption of soil-moisture sensors, weather stations, sensor-based fertigation, traceability software, and automated climate controls, particularly among larger and export-oriented producers (e.g. of citrus).

- **Food safety, environmental, and social certifications are pronounced among higher-value as well as export-oriented producers.** In Serbia, 25% of surveyed farms report holding a sustainability and/or food safety certification. In BiH and Kosovo, uptake of GLOBALG.A.P. (good agricultural practices and food safety certification, commonly requested by EU buyers) and HACCP (food safety management system, widely mandatory for food processors under EU-aligned regulations) remains limited, although 14% of surveyed farmers hold Organic certification. While no primary data was collected for North Macedonia, organic farming covers around 1% of arable land, and opportunities exist to grow organic production in fruit, fodder, and livestock sectors. In Albania, certification and traceability are gaining importance in horticulture and MAP value chains (especially, export-oriented clusters), although certification costs remain a major barrier for small farms. These patterns highlight that sustainability-related standards are increasingly becoming a prerequisite for market access (both export and domestic premium markets), competitiveness, and participation in higher-value value chains, underpinning the demand for tailored investment finance.

- **Basic circularity practices are common, but renewable energy investments are low.** In Serbia, >70% of surveyed farmers use farm residues for composting or organic fertilizer, but 10% use renewable energy or energy efficient technology; uptake of renewables is 8% among surveyed farms in BiH & Kosovo. In Albania, interest in solar PV, manure valorisation, and waste-to-fertilizer solutions is growing with greenhouse operators, processors, and larger livestock farms. However, the productive use of biomass is limited across the region, and residue burning persists, highlighting a missed economic and sustainability opportunity.

- **Livestock upgrades remain limited and focused on lower-cost measures,** with rotational grazing and manure composting being more common across surveyed farms in BiH and Kosovo than advanced housing, feeding, or waste management solutions. Reflecting this modernization gap, North Macedonia's dairy sector faces acute needs



in feed and heat stress management and food safety. In Serbia, as noted above, the use of manure as organic fertilizer is relatively widespread, but investment in advanced livestock housing remains limited, with production largely centered on conventional systems. At the same time, farmers demonstrate clear interest in modern livestock technologies, such as automated milking and manure management systems. In Albania, larger dairy & poultry farms invest in automated milking, cooling, shelters, ventilation, and feeding systems, while smaller farms rely on basic infrastructure and manual practices.

- **Post-harvest and processing investments offer a clear pathway to modernization and value addition.** Investment in cold storage, sorting, grading, drying, processing, and packaging equipment is most pronounced among commercially oriented farms and agribusinesses seeking to reduce losses, stabilize production, and meet buyer

requirements. This is evident, for example, in Albania's horticultural regions, where cold-chain, packaging, and processing capacity are expanding. In BiH and Kosovo, among surveyed farms engaged in farm-gate processing, packaging is the most widely adopted practice (64%), followed by product labelling, while investment in conservation and storage is limited (18%), highlighting one of the key bottlenecks to reducing post-harvest losses and capturing greater value along the supply chain.

CLIMATE, PRODUCTION, AND ADOPTION CONSTRAINTS

- **Climate change is now a major production and investment risk across all markets.** It is the most cited challenge in Serbia (77%), followed by input-price volatility (70%). Farmers in BiH and Kosovo also report water scarcity, declining soil fertility, land degradation, and late frosts, while Albanian respondents note drought, flooding, hail, extreme temperature, and rising pest/disease pressures.

- **Overall farm mechanization remains limited and often reliant on ageing equipment, constraining labour productivity, timely operations, and farmers' ability to use inputs efficiently and adapt to climate risks.** Serbia has a comparatively large and commercially developed agricultural sector, and the survey indicates widespread ownership and use of machinery: 92% of surveyed farmers reported owning tractors, 67% seeders, and 31% combine harvesters. Much of this machinery is ageing, however, with 33% between 10 and 20 years old and a further 24% over 20 years old. **Infrastructure gaps further heighten vulnerability:** insufficient irrigation and storage limit farmers' ability to manage drought, reduce post-harvest losses, and mitigate price

volatility. **Labour shortages**, reported widely in Albania and by 40% of Serbian farmers, along with **weak market access and declining yields**, further constrain productivity.

- **Significant knowledge & technical capacity gaps exist, especially among smaller farms.** In BiH & Kosovo, lack of knowledge emerged as a key barrier to adoption across multiple sustainable agriculture measures, cited by up to 89% of non-adopting farms, depending on the measure. Albanian interviews further point to gaps in climate adaptation, certification readiness, and financial literacy. Interviewed farmers across countries highlight limited



access to advisory and capacity-building support and express a need for stronger engagement from agribusiness partners, incl. input suppliers, buyers, distributors, extension services, and cooperatives, in providing technical assistance, training, and market linkages.

FINANCING SOURCES, GAPS, AND INVESTMENT NEEDS

- **Farmers draw on a mix of own funds, formal and supplier credit, public and EU / donor-backed programs (incl. IPARD), and value-chain arrangements**, though reliance on these sources varies across countries and producer segments. Commercial bank lending is most visible in Serbia, where 58% of survey respondents use bank loans, mainly for machinery and equipment (47%) and working capital (33%). Across the region, MFIs and specialized agri-lenders help finance smaller-scale investments, complemented by supplier credit for seasonal needs, but investment financing gaps persist. In Albania, exporters, particularly in the MAP value chains, also play a financing role by pre-financing seedlings and machinery.

- **Access to finance remains a major constraint to sustainable agriculture investment.** In BiH and Kosovo, insufficient financing is a recurring barrier to investment, cited by 51% of farms not using efficient irrigation and 42% of those not using digital or precision tools. At the same time, many farmers report difficulties securing external financing when seeking credit. Surveyed Serbian farmers identify high equipment costs as the main barrier to buying modern or sustainable equipment (85%), while high interest rates (73%), and complex application procedures (49%) are the main constraints to accessing credit. Albanian respondents further highlight collateral requirements, land-

title issues, and banks' continued perception of agriculture as a high-risk sector (esp. for smaller farms) among access-to-finance challenges.

- **While smaller producers face the greatest overall barriers to accessing finance, financing gaps become increasingly pronounced as investment size, complexity, and repayment horizons increase.** Small farms are often constrained by limited collateral, land-title issues, informality, and weaker financial records, which restrict access to formal credit and often, public support programs. At the same time, larger, more commercially oriented farms and agri-SMEs, while generally better positioned to access finance, face challenges securing appropriately structured financing for larger and longer-term investments in advanced production technology, renewable energy and post-harvest infrastructure, as well as advanced certification. Across countries, farmer interviews point to a need for more tailored agricultural finance solutions. Smaller producers require accessible products that can accommodate varying collateral availability and levels of financial documentation, while larger and more commercially oriented farms and agri-SMEs need longer-term financing aligned with cash flows, scales, investment horizons, and risk profiles of more complex investments.

- **Investment appetite is evident across the region, but it is conditional on suitable financing, public support, and technical assistance.** Water management is one of the pronounced priorities across the region; in BiH and Kosovo, 72% of surveyed farms plan to invest in low-intensity tillage practices, 46% in drip irrigation, and 12% in GLOBALG.A.P. certification over the next 1-3 years. Among farms already using water-efficient irrigation, 89% plan to invest in sensor-based or

digital irrigation controls. In Serbia, planned investments focus primarily on improved mechanization (65%) and farmland expansion (49%), followed by improved irrigation (23%), energy or input efficiency (22%), and organic or other sustainability-related certification (12%). Farms across the region also plan investments in renewable energy, processing and storage, and digital tools. Smaller farms tend to prioritize investments that improve productivity, reduce losses, and strengthen access to stable buyers and markets, while larger and more commercially oriented farms increasingly invest in advanced production and processing solutions to enhance competitiveness, increase value addition, and expand into higher-value market segments. Findings suggest that investment appetite is strongest where sustainability-related measures deliver near-term commercial and operational benefits while helping producers meet market requirements and adapt to climate-related pressures (e.g. water scarcity).

“WE HAVE INSTALLED A DRIP IRRIGATION SYSTEM AND SET UP RAINWATER HARVESTING TANKS. THESE INVESTMENTS HAVE SIGNIFICANTLY IMPROVED OUR WATER USE EFFICIENCY. THE INITIAL COST OF SUSTAINABLE PRACTICES CAN BE CHALLENGING, BUT THE LONG-TERM BENEFITS MAKE IT WORTHWHILE.”

Fruit producer (3 ha farm) from Bosnia and Herzegovina

- While financing needs vary considerably across producers, the findings point to **three broad and partly overlapping investment segments**, differentiated by commercialization level, borrower capacity, and investment scale:

» **Working capital and small-scale investment loans** (often below EUR 25k) for seasonal inputs, basic mechanization, irrigation, and productivity-enhancing livestock equipment (e.g. milk coolers and silage mixers), commonly required by smaller and semi-commercial family farms;

» **Longer-term investment loans for more advanced agricultural equipment and technology** (broadly ranging up to EUR 150k) for certification and traceability, advanced irrigation systems, post-harvest handling and storage (e.g. modular cold rooms), digitalization (e.g. GPS-guided variable-rate application technology), and renewable energy, often sought by more commercially oriented and export-linked producers, including, relatively larger family farms, agri-SMEs;

» **Larger, capital-intensive investments**, typically sought by larger and more commercial farms, cooperatives, integrated food processors, and other value-chain actors for advanced greenhouses, cold storage, processing facilities (e.g. fruit drying/freezing facilities), integrated renewable-energy systems, and larger livestock infrastructure.



CONCLUDING REMARKS

This targeted primary research across the Western Balkans points to growing though uneven adoption of sustainable agriculture. The sustainable transition will need to accelerate to meet rising climate, market, and regulatory demands, including those associated with closer alignment to EU standards and value chains. Across the region, farmers and sector stakeholders identify limited access to appropriately structured finance, high investment costs, and knowledge and capacity gaps as key barriers, especially for capital investments such as efficient irrigation, post-harvest infrastructure, renewable energy, and certification.

At the same time, the research reveals substantial investment needs and appetite

for investments that improve productivity, resilience, and market access, alongside a clear willingness among farmers to modernize their operations. This creates a significant opportunity to support the sector's transition towards more sustainable, competitive, and climate-resilient production systems. Financing solutions should be tailored to different farm segments and investment needs, and complemented by targeted advisory support and, where appropriate, risk-sharing mechanisms. The insights presented here provide practical guidance for investors, financial institutions, and other development partners and stakeholders seeking to unlock sustainable agriculture investments, accelerate technology adoption, and help close persistent financing and implementation gaps.

“WE FOCUS ON SUSTAINABLE PRODUCTION, COLLECTING, STORING, FREEZING, COOLING, AND PACKAGING OF NUTS, CHERRIES, SOUR CHERRIES, AND BERRIES THAT WE PRODUCE IN A GREENHOUSE. WE USE ORGANIC TREATMENTS, SOLAR ENERGY, AUTOMATIC CONTROL SYSTEMS AND MACHINERY FOR ORCHARDS”

Integrated producer-processor with greenhouse and orchard operations (25 ha) from Kosovo

The studies upon which this document is based were produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.