

# Farming the Future

Future of Agriculture in Western Balkans: Report on Twin (Green Digital)  
Transformation in WB Agri-Food Sector

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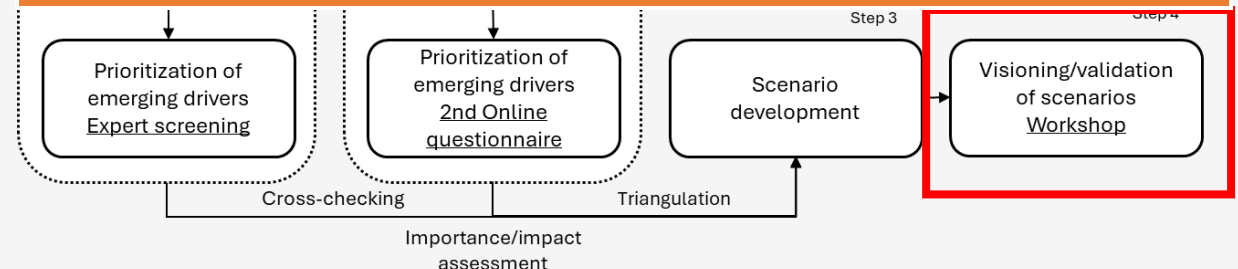
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# About report

- The regional report "Sustainable digital and green agri-food transformation/ Twin (Green Digital) Transformation in WB Agri-Food Sector" was developed within the framework of the regional project "SMARTLABOR - Strengthening Alliances for Policy Development and Testing in the domain of Innovation, Digitalization, and the Labor Market in the Western Balkans"
- **Foresight approach implemented.**
- Technical and technological advancements, political feasibility, and social and economic acceptance.

- The foresight approach is a **process of visioning alternative, possible, probable, and preferable futures.**
- Drive transformational change.
- Identifying and seizing opportunities – emerging drivers (so-called weak signals) for positive transformation within the food system.

Aim of the workshop is to validate scenarios with specific focus on policy framework.



# Study results – major challenges

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- Agri-food sector is undergoing a profound transformation driven by demographic shifts, technological innovation, climate change, and evolving consumer demands.
- Workforce shortages and skills mismatches remain persistent bottlenecks that undermine the sector's capacity to adapt and thrive.
- **Complex interplay of social, economic and infrastructural factors**
- Depopulation of the countryside is happening not only because of an insufficient number of jobs but also because of an **insufficient number of prestigious and well-paid jobs**, and **limited possibilities to make a career**.
- **Skills gaps and changing skill requirements** - the sector is experiencing a high rate of skills misalignment, including both over- and under-qualification, making it difficult to match available workers to evolving job requirements.
- **Weak innovation ecosystem** that is reflected in a lack of integration in niche markets and regional food systems, or low diversification of farm activities, i.e., a lack of new business models such as agroforestry, care farms, and agrotourism.
- ***Fragmented knowledge networks*** and poor connection which is later reflected in poor collaboration and undeveloped social capital between actors.

# Country Snapshots – quick overview

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- Policies are designed to prioritize the agri-food sector (i.e., strategies for agricultural development and strategies for economic development), but implementation is rather weak.
- Such a „traditional“ environment is facing numerous challenges in terms of climate change adaptation, and rapid technological innovation, all of which require a higher level of knowledge and more active information sharing (participation) among all the value chain actors.

# Scenario 1 - Asymmetric market power and participation

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- This scenario is centered around the idea of **investing in the large, often vertically integrated companies and farms**, aiming to maximize yields and reduce the cost of production. This initiative focuses on developing the existing “core business” by enhancing efficiency and effectiveness, aiming to maintain and defend “successful practices”.
- Strategic decisions are done by large farms, while others are not involved in such processes resulting in **low diversity of the system**, solution and focus is usually on technical solutions and not on mind setting all consequently leading to low level of resilience and sustainability of the system. **Community** is having **limited engagement** particularly affecting local rural economies because of power imbalances, government provide subsidies that large farms and achieve food safety and environmental compliance.

Policy interventions are focused but not limited to:

- Support large input-intensive farms (monoculture), followed by support to obtain adequate machinery; support to obtain **cooling and storage facilities** to ensure product quality and better prices.
- Establishment of specific **financial insurance lines** for farmers because of reduced heterogeneity and intensification of farming activities, there is increased vulnerability to agricultural pests and diseases, as well as greater flood risk, climate change effects, etc.
- Support in development of **locally adapted and more resistant to climate change effects varieties** – there is a necessity to form a public-private partnership to investigate into the locally adapted seeds and seedling materials, to ensure yield stability and quality of the products, as well as to reduce strong dependency on foreign inputs.
- Support for **phytosanitary measures**, as with the increase of monoculture, the emergence of new pathogens is evident.
- Support to **diversify farm activities** and introduce crop rotation to mitigate the potential for rapid disease spread.

## Scenario 2 - Technology-enriched food system

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- This scenario focuses on a transparent and traceable system, strongly supported by technology.
- This system is designed to have different layers of food nets. The lower layer consists of a usually distributed net of **interconnected, interrelated short food supply chains, food hubs, and individual actors**. In contrast, the higher food-net layer driving strategic transformation and development consists of a partly decentralized network of **more powerful payers**. Their power is based on either market power, innovation/technology strength, or better connections with the community.
- Community engagement is facilitated through **digital platforms and local innovation hubs**, while the government supports innovation, equitable technology access, and data privacy.

Policy interventions are focused but not limited to:

- Establishment of **pilot farms** for knowledge and practice exchange – to foster peer-to-peer education, facilitate technology uptake – this approach is needed to provide “role model”, demonstration sites that are open for experimentation with adopting new, innovative, eco-friendly methods.
- **Public education campaigns and hackathons** with the aim: to raise awareness and build trust and collaboration among the actors which is seen essential for technology adoption, to attract funding; to attract talents – farmers, researchers, technologists, entrepreneurs to jointly develop innovative solutions tailored to local food system challenges; to support community engagement, networking, etc.
- **AI-driven platforms** – provide actionable insights and recommendations,
- **Automation**: AI-powered robots, autonomous tractors, and drones can automate planting, weeding, spraying, and harvesting, significantly reducing dependence on manual labour while helping to improve quality and safety control.
- Big data management: **integrated to make more informed decisions** about i.e. planting, crop stress, input management - nutrition deficiencies, irrigation, pest management, harvesting, etc.

## Scenario 3 - Integrated participatory approach

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- This scenario is centered around the idea of a system that promotes environmental, social, economic, and nutritional values **tailored to the needs and values of the local community**.
- It integrates sustainable agricultural practices, supports local farmers and communities/economies, while providing fresh and nutritious food to the community and the region.
- This scenario is based on a **profound transformation of the role of each person, actor, and group** that is driven by a changed “mindset”, not only technology.
- It fosters highly exploratory activities that involve investing in **next-generation innovations** i.e. social innovations driven by technology.

Policy interventions are focused but not limited to:

- **Establish food policy councils** or advisory groups to help **align goals** and share resources among different actors, is reflected in social capital increase, increase in trust; support value chain collaboration with chefs, retailers, institutional buyers – initiate green public procurements.
- Introduction of income **Support for Young Farmers (CISYF)**; support for rural business start-ups, introduction of cooperation schemes, establishment of Biodistricts, maximise the economic and sociocultural potential of the territory.
- **Investment into the soft and hard infrastructure** – opening up the attractiveness of rural areas (digital nomads), pilot initiatives i.e., sustainable energy cooperatives, mobility of people.
- **Cooperation with scientific, education, business and agricultural holdings** to facilitate transfer of simple-to-use innovative and environmentally friendly technologies and farming methods;
- **Upskilling and reskilling strategies** among local farmers/actors: targeted training programs to improve capacity building with a focus on digital, technical, and management skills.
- **Public education campaigns** to raise community engagement and awareness: promotion of food, cuisine, region, as well as promotion of **diverse career opportunities in agri-food sector**, promote direct sale of the local products through different innovative short food supply chains.

Thank you for your attention!

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