REGIONS 4FOOD
Interreg Europe

European Union
European Regional
Development Fund

Strategic Policy Recommendations
to EU Digitization Strategies in the Agri-Food Value Chain

OCTOBER 2021

Junta de Andalucía
Consejería de Agricultura, Ganadería,
Pesca y Desarrollo Sostenible

Région PAYS DE LA LOIRE

SeAMK
SEINÄJOEN AMMATTIKORKEAKOULU
SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

ART-ER
ATTRACTIVENESS
RESEARCH
TERRITORY

provincie limburg

SOUTH TRANSDANUBIAN RIA

REPUBLIC OF BULGARIA
Regional Administration
Pazardzhik

TABLE OF CONTENTS

REGIONS 4FOOD
Interreg Europe

I. INTRODUCTION

The rise of the digital economy is one of the defining features of the 21st century and the agri-food industry cannot be lagged behind. Data has become a key asset for the food industry which is leading to innovations in technology and the development of new tools and skills. However, the large volume and diverse nature of food value chains data and actors call for specific integration and management procedures to make the most of the new economic opportunities based on information, data and cognitive technologies and to promote innovation-driven growth.

Beyond the technology it's necessary to take into consideration the regional approach of how to facilitate the process of digitization; which entities are involved, how the systems they provide are funded, what expertise is offered, how is knowledge exchanged and forwarded, how are stakeholders invited to participate in innovation activity and events. The difficulty to unlock the information treasure to the regional stakeholders, simply because of the language threshold, needs also to be taken into consideration when tackling innovation in agri-food policies and strategies.

The European Commission's Communication 2030 Digital Compass: the European way for the Digital Decade has set its vision and targets for a successful digital transformation of Europe by 2030. This Digital Compass for the EU's digital decade evolves around four cardinal points:

- Skills
- Digital transformation of businesses,
- Secure and sustainable digital infrastructures
- Digitalisation of public services.

This vision will be implemented, among other complementary instruments, through the new **Digital Europe Programme (DIGITAL)**, which is a new EU funding programme focused on bringing digital technology to businesses, citizens and public administrations. The Digital Europe Program will provide strategic funding to answer these challenges, supporting projects in five key capacity areas: in supercomputing, artificial intelligence, cybersecurity, advanced digital skills, and ensuring a wide use of digital technologies across the economy and society, including through Digital Innovation Hubs.

REGIONS 4FOOD
Interreg Europe

Complementarily, **the EU's long-term EU budget**, also known as the multiannual financial framework, will boost digital technologies and aid in recovery from the COVID 19 pandemic. The new budget for the Union includes a specific and ambitious **Recovery and Resilience Plan** for the next years, which establishes the obligation for national recovery and resilience plans to allocate at least 20% of expenditure to the digital transition.

Digitalization, on the other hand, is also a key element of the new **Cohesion Policy**. The regional smart specialization strategies can play a central role in the new Cohesion framework 2021-2027 to enhance research and innovation capacities; and to promote the uptake of advanced technologies, the digitalisation and the development of skills, or the scale up of innovative ideas and technologies. The updated Industrial Policy is expected to be instrumental in this approach, and a reinforced collaboration between clusters, Digital Innovation Hubs and S3 interregional partnerships will be promoted.

On the other hand, the new Cohesion Policy and all the EU policies in the coming years will be informed by the **Green Deal**, adopted by the Union in 2019 as an ambitious strategy for reaching climate neutrality by 2050. One out of the five cohesion policy objectives in the current funding period is entirely dedicated to a greener Europe and fosters investment in clean energy, the circular economy, climate change mitigation and sustainable transport.

The new growth strategy for the EU provided by the Green Deal and the Digital Programme has implications in the agri-food sector, which will need be fit for this twin green-digital transition. The whole agri-food value chain will have to be aligned as well with the **Farm to Fork Strategy** for a fairer, healthier and more environmentally friendly food system; and with the Biodiversity Strategy, which addresses the key causes of biodiversity loss in the EU, to establish binding targets for 2030 and new ways to implement existing legislation in this field more effectively.

According to this green, digital and inclusive vision established by the EU for the coming years, regional administrations such as the partners included in REGIONS 4FOOD play a major role in encouraging digital and sustainable innovation. With the aim to address this issue, seven European regions decided to join efforts to face new challenges regarding ICTs and data with the overall objective of maximising the innovation potential of all actors of this strategic EU value chain.

The intention of this document is, jointly with the information collected in the project's application form and during its different phases, and the commitment and agreement from each seven European partners, to provide a set of strategic policy recommendations to inspire the design of future European digitization policies and strategies in the agri-food sector.

REGIONS 4FOOD
Interreg Europe

II. REGIONS 4FOOD PROJECT

The project arose as a proposal within the partner regions' Smart Specialisation Strategies (RIS3), where innovation and the ICT sector are key factors, and where the Thematic Partnership on Traceability and Big Data (S3P T&BD) has been framed since 2017. https://www.traceabilityandbigdata.eu

This strategic alliance of 22 regions and other entities, works with the aim of contributing to the digitisation of the agri-food value chain through the adoption of digital technologies and the value creation from data. Recognised by the European Commission for its distributed and solid leadership and framed in a multilevel governance model involving quadruple helix actors in each regional node, it represents an added-value to their regional ecosystems.
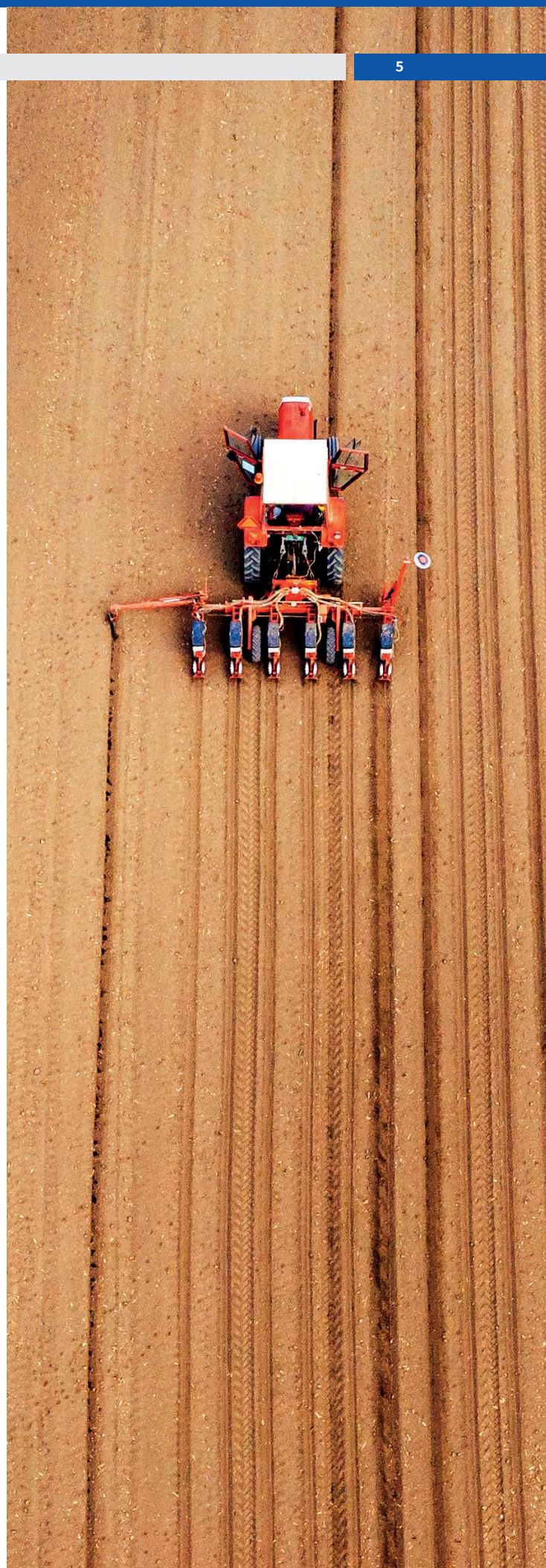
Some of the S3P T&BD Thematic Partnership partner regions identified the need to exchange experiences, ideas and best practices to improve their regional strategies and policies aimed at maximising the innovative potential of the agri-food value chain, and also, to bring together relevant actors of the quadruple helix model into this learning process. Thus, they decided to join forces and set up the REGIONS 4FOOD project.

REGIONS 4FOOD aims at promoting the digitization of the agri-food value chain in order to maximise the growth potential of the digital economy and tackle future challenges in this sector improving the implementation of regional policy instruments.

To achieve this objective, each project partner identified a policy instrument to be improved, according to its capacity to contribute to promoting innovation in the agri-food industry and consequently, progress and growth.

Approved by the Interreg Europe cooperation program with a total budget of 1.502.890,00 Euro, the project started in June 2018 and is due to end in May 2023.

REGIONS 4FOOD counts 7 partner regions, which are mostly regional authorities competent and relevant for improving policies aiming at promoting

REGIONS
4FOOD
Interreg Europe

innovation opportunities in the agri-food industry, technology transfer and economic exploitation of research results. It is a balanced partnership from North, South-East and West Europe with varying development levels regarding the innovation policies implemented in their region that have worked together with the same goal: to face new challenges in relation ICTs and data with the overall objective of maximising the innovation potential of all actors of the agri-food value chain by improving regional policy instruments.

- Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development of Andalusia (ES)
- Pays de la Loire Regional Council (FR)
- Seinäjoki University of Applied Sciences (FI)
- ART-ER Stock Joint Consortium (IT)
- South Transdanubian Regional Innovation Agency (HU)
- Province Limburg (NL)
- Pazardzhik Regional Administration (BG)

To reach the targeted objective, REGIONS 4FOOD project partners developed and implemented an exchange of experience approach and work plan which allowed them to learn from each other, creating synergies and opportunities leading to the elaboration of an Action Plan in each region aiming at improving the policy instrument addressed by the project.

Partners have worked in close cooperation with their **regional stakeholders**: quadruple helix actors involved at different stages in the food value chain to interconnect regional innovation ecosystems playing each one, a specific role regarding the policy instrument tackled. For each partner region, the issue of digital innovation in the agri-food sector has been approached in relation to the specific policy instrument addressed.

The project counts two phases: the 1st one (3 years) devoted to the interregional learning and exchange of experiences leading to the elaboration of the Action Plan, which is implemented in phase 2 (2 years).

During the first semester, project partners **implemented 2 methodologies** elaborated in the frame of the project:

- Methodological guide for the identification of barriers, needs, relational capital and good practices related to the agri-food digitisation;
- Methodological guide to create data and technologies catalogues in the agri-food sector.

29 good practices were identified as a result of the methodologies implementation, which led to their **study visit**. These enabled project partners to better understand their scope and to obtain further details about their implementation and the results they bring to the region. **13 of them are included in the Interreg Europe Policy Learning Platform**, which recognizes their value and learning potential for other European regions. They can be found at https://www.interregeurope.eu/policylearning/

As an outcome of the interregional learning obtained thanks to the study visits and the implementation of the above-mentioned methodologies, project partners elaborated a **first draft of their Action Plan** aiming to improve the targeted policy instruments.

This 1st draft of the Action Plan was reviewed by the project partners owner of the good practices having most inspired the actions included in the Action Plan. Thus, through a **peer review process**, project partners improved their first draft by including the recommendations and suggestions given by the reviewing partners.

Finally, the **7 Action Plans** approved by the Joint Secretariat at the end of phase one, that will improve these policy instruments by their implementation during phase 2, are the main outcome of the project.

Furthermore, the interregional learning has been reinforced thanks to **5 interregional seminars** hold in the frame of the project.

Other outcomes to be highlighted which have emerged from the project's learning process are:

• Around 100 persons have increased their professional capacity at all levels due to their participation in interregional cooperation activities;

• Cooperation between quadruple helix actors, both at regional and interregional level has been reinforced;

• We have contributed to the new programming period by providing the **6 strategic policy recommendations** to EU digitization strategies in the agri-food value chain included in this document.

REGIONS 4FOOD
Interreg Europe

III. PROCESS OF ELABORATION OF THE STRATEGIC POLICY RECOMMENDATIONS

The work to obtain the strategic policy recommendations to European policies has been carried out on the basis of a methodology based on the participation of all the partner regions in all stages of the work and which has been a key factor for the success and consensus. Also, partners' regional stakeholders have been directly involved in the discussions.

As a result of the reflection and learning obtained by the implementation of the 2 methodologies described in the precedent section, project partners identified conclusions and policy recommendations which were presented and debated in the 2nd Interregional Seminar in Pays de la Loire, in May 2019.

2nd Interregional Seminar: Nantes (FR): 28 May 2019

Taking into account all project partners contributions, the Lead Partner elaborated a first draft of the joint strategic policy recommendations that was presented in Pazardzhik in November 2019 during the 3rd Interregional Seminar.

Project partners presented and debated these first joint conclusions with their stakeholders.

3rd Interregional Seminar: Velingrad (BG): 26 November 2019

Project partners' input to the first draft of the joint strategic policy recommendations was shared during the Interregional Capitalization Seminar held online on November 30th 2020. Guided by an EU innovation expert, project partners together with experts and policy makers debated and reflected on these strategic policy recommendations.

INTERREGIONAL CAPITALISATION SEMINAR AGENDA
30th November 2020

Afternoon Session: Strategic Recommendations

14h00 – 14h15	**Strategic Recommendations: background, rational** *Mrs. Esperanza Perea Acosta. Coordinator of REGIONS 4FOOD project. Vice Minister's Technical Counsellor. Andalusia Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development*
14.15h – 14:45	**Presentation of Draft of Strategic Recommendations and their contribution to the challenges related to the European Digital Transition** Mrs. Cecilia Gañán de Molina Expert on EU Innovation policies
14.45h – 15:00	**Presentation of best practices matching the Recommendations.** **Discussion on the opportunity of including them in the final document.** Mrs. Cecilia Gañán de Molina Expert on EU Innovation policies
15.00h – 15:35	**First round of interventions with the partners** **5` intervention per partner region** All partners
15.35h – 16:30	**Debate and exchange on the amendments proposed.** Guided by Mrs Cecilia Gañán de Molina (with open questions and participatory tools). All partners and stakeholders participate
16.30h – 16:45	**Virtual Coffee - break**
16.45h – 17:00	**Preliminary conclusions** Mrs Cecilia Gañán de Molina Expert on EU Innovation policies
17.00h – 17:15	**Next steps & Wrap up**

Agenda of the 4th Interregional Seminar (online) 30 November 2020

The document with the conclusions and additional information obtained thanks to the Interregional Capitalization Seminar was presented and debated in each region with the partners' stakeholders.

The outcomes of these regional discussion was presented at the Interregional Political event held in Brussels on October 19th 2021. During this event the 6 Strategic Policy Recommendations presented in this document were agreed.

Interregional Political Seminar: Brussels, 19th October 2021

IV. STRATEGIC POLICY RECOMMENDATIONS

The intention of this document is to draw strategic recommendations aiming at influencing policies at European level on innovation and digitization in the agri-food value chain tackling the current framework (2021-2027).

These strategic recommendations are the result of project partners' shared vision that started with the identification of the needs and barriers related to the digitisation of the agri-food sector in the frame of the REGIONS 4FOOD project.

As a result of the interregional learning, REGIONS 4FOOD project partners consider that new cross-over connection between sectors formerly disconnected needs to be enhanced as well as interregional cooperation: a global vision "the agri-food value chain must be addressed as a whole. Also, a combination of EU policies is necessary.

Based on the learnings, debates and exchanges of experiences among project's partners and their stakeholders -policy makers and experts in innovation and digitization of the agri-food value chain, and taking into account the experience of the 7 European regions participating in this Project, and the relevant role of regional authorities in the improvement of public policies aiming at promoting innovation opportunities in the agri-food industry,

REGIONS 4FOOD project's partners consider that:

• The policy mix is an appropriate approach to promote the digitization. EU policies should tackle the challenges that digital innovation represent concerning the regulatory frameworks. Digital technologies develop faster than their regulations and policy mix can be a suitable approach to tackle this concern

• The global vision of the value chain needs to be strengthened to make progress in the challenges of digitization and overcome the atomization of agri-food sector. European regions need European policy measures that ensure their support to the agri-food value chain

• Promote the digitization through process simplification or mandatory requirements would be useful for accelerating digital transformation processes along the value chain. To stay competitive, it is important to find ways for ITC companies to simplify processes. This will bring them closer to the final user

• The improvement in interoperability, digital infrastructures and open data is strategic, in addition to awareness-raising actions and strategic field for public action

• The design and implementation of a strong, shared, and non-stop digitization roadmap at the regional level should be ensured. Developing European regions' digital economy across all sectors brings significant economic benefits, primarily due to the resulting productivity gains.

REGIONS
4FOOD
Interreg Europe

These five points are aligned to the relevant messages coming from:

2021-2027 Cohesion Policy

The new Cohesion framework 2021-2027 include among its objectives to enhance research and innovation capacities; and to promote the uptake of advanced technologies, the digitalisation and the development of skills, or the scale up of innovative ideas and technologies.

Recovery and Resilience Facility (RRF)

The RRF is the key instrument at the heart of Next Generation EU, the EU's plan for mitigating the economic and social impact of the coronavirus pandemic and making European economies and societies more sustainable, resilient and better prepared for the green and digital transitions.

Common Agricultural Policy (CAP)

There is a general objective to build trust within the EU and amongst all citizens, farmers and non-farmers alike. Being one of the EU's most important policies, it plays a key role in supporting the EU's farming sector and rural areas with the aim of ensuring a sustainable agriculture with respect to economic, social and environmental aspects.

EU Digital Europe Programme

There is a commitment to set global standards for emerging digital technologies that allow the development, deployment and uptake of technology in a frictionless single market, where companies can compete on equal terms and boost their productivity and global competitiveness, and consumers can be confident that their rights are respected, by making the digital transformation process respectful with European values and fundamental rights, and a main contributor to a sustainable, climate-neutral and resource-efficient economy.

Horizon Europe Programme

There is a global call for further simplification under Horizon Europe programmes by highlighting the importance of having simpler rules and clearer guidance, especially regarding personnel costs and beneficiaries' usual accounting practices; by ensuring equal opportunities between applicants; and by enhancing synergies between different EU funding programmes.

REGIONS 4FOOD project's partners feel entitled to make the following recommendations to the European national and regional authorities:

REGIONS 4FOOD
Interreg Europe

RECOMMENDATION 1.
CREATE LEGAL FRAMEWORKS FOR DATA AVAILABILITY, MANAGEMENT, ANALYSIS AND SHARING: MORE PUBLIC OPEN DATA PLATFORMS AND INTEROPERABILITY IN COHERENCE WITH EUROPEAN CODE OF CONDUCT.

REGIONS 4FOOD project partners consider this recommendation to have a high priority: the development of a clear and common direction for agri-food sector digitization. The agri-food sector is moving into an era of digitally enhanced farming, where data is generated during the various stages of agricultural production and all related operations. This data is collected, transferred, processed and analysed, remaining the farmers at the heart of this process. Collaborative agri-business models play a key role in ensuring that data driven strategies add value to the agri-food chain.

The key idea from this legal framework is to share definitions and prescribe specifications to enhance interchangeability of data, but also the access to data, assuring, for example, easy access to data resulting from public funded. Data should allow to achieve local ambitions and needs, especially the ones from farmers.

An appropriate open data policy should be designed taking into consideration criteria for data collection, data protection, regulation for data exploitation and ethical aspects. Experts in the specific domain should be involved in this process.

Data protection and data security concerns arising with data processing and data sharing should be analysed at central level: concrete policy implications should be suggested.

At the start of any project an agreement should be made on:

- Ownership of intellectual property rights;
- What data are open for sharing and which are private;
- When sharing non open data, who is paying what price for either data or processed data outcome.

In this sense, particular effort should be invested in a legal routine that enables farmers to protect data-ownership and puts them in a position to earn income by making their data or their knowledge available for the industry, retail, trade or logistics.

Linking current public agri-food databases, digital registers, spatial land registers and ICT systems together into a unified single national public agri-food ICT system should be considered in order to boost the bonding social capital between agri-food public bodies for facilitating the introduction of digitization on a national scale;

The European Code of Conduct from COPA-COGEGA, which represent the united voice of farmers and agri-cooperatives in the EU on agricultural data sharing, looks at general principles for sharing agricultural data. It constitutes a joint effort from signatory organizations to shed greater light on contractual relations and provide guidance on the use of agricultural data.

https://copa-cogeca.eu/img/user/files/EU%20CODE/EU_Code_2018_web_version.pdf

REGIONS 4FOOD
Interreg Europe

So, an open digital ecosystem is also needed to enable European companies and business models to compete globally. The European project GAIA-X was initiated by Europe for Europe and aims at developing common requirements for a European data infrastructure by connecting centralised and decentralised ones in order to turn them into a homogeneous and user-friendly system. This project is the cradle of an open, transparent digital ecosystem, where data and services can be made available, collated and shared in an environment of trust. https://www.data-infrastructure.eu/GAIAX/Navigation/EN/Home/home.html

In the frame of the project, different good practices identified and exchanged are good examples of how public policies need to play a major role by creating the necessary legal frameworks for data management.

The following good practices can be an inspiring example of digital innovation for all those regions where traditional sectors of agri-food and fisheries are affected by dispersed data: a more efficient data management, open data platforms and interoperability can open new business opportunities for entrepreneurs, being at the same time a useful resource for public administration in managing sectoral strategies:

- Andalusian Phytosanitary Information and Alert Network (RAIF), from Andalusia. https://www.juntadeandalucia.es/agriculturapescaydesarrollorural/raif/
- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/
- Fiware Zone, from Andalusia. https://andaluciasmart.es/fiware-zone
- Digital Farm, from Pays de la Loire. https://n9.cl/64qa4
- Utilizing data animal welfare verification and tracking, from South Ostrobothnia. https://www.sikava.fi/PublicContent/IntroductionInEnglish
- Cluster Agri-food, from Emilia Romagna. https://agrifood.clust-er.it/en/
- IRRINET , from Emilia Romagna. https://www.retealtatecnologia.it/en/node/21257
- Digitisation for the enhanced output performance of dairy cow farming from South Transdanubia. https://www.facebook.com/Bos-Frucht-Agr%C3%A1rsz%C3%B6vetkezet-101255174760444/
- Green TechLab, from Limburg. https://bron.fontys.nl/venlo-helpt-noord-limburg-op-weg-naar-topstatus/

REGIONS 4FOOD
Interreg Europe

RECOMMENDATION 2.
CREATE INNOVATION ECOSYSTEMS, CONSOLIDATE AND COORDINATE THE EXISTING ONES; PROMOTE CO-DESIGN AND CO-DEVELOPMENT OF INITIATIVES AMONG ALL RELEVANT ACTORS.

Digital technologies such as High Performance Computing, Internet of Things, Big Data, blockchain, robotics and artificial intelligence allow businesses to produce higher value products and improve production processes. However, European companies are not making the most of all the opportunities digital has to offer. This slow uptake of digital technologies poses a risk to the European Union's ability to compete in the global economy, to create new jobs and to grow.

Digital Innovation Hubs (DIHs) having by definition the role to support SMEs in benefiting from advanced digital technologies (including Artificial Intelligence, Cybersecurity and digital skills) are very powerful policy tools for national/regional policy makers that search ways to support the enhancing of the digitization processes in their territories. By providing access to technical expertise and experimentation as well as the possibility to "test before invest", European Digital Innovation Hubs (EDIHs) help companies improve business/production processes, products, or services using digital technologies. They also provide innovation services, such as financing advice, training, and skills development that are needed for a successful digital transformation.

Innovation ecosystems such us European DIHs, Clusters or the Smart Specialization interregional partnerships have the potential to generate opportunities for the stakeholders to co-design and co-develop initiatives and programmes in the agri-food sector.

Furthermore, they are key structures to provide economic inclusion and integrated support to disadvantaged small-scale farmers and agri-businesses both online and on the spot. They allow as well the setting-up of co-creation spaces where providers and users are encouraged to work together on the development of new solutions for the agri-food sector. REGIONS 4FOOD partners consider that the benefit of European projects based on this approach needs to be stressed.

Additionally, cross-platforms and cross-ecosystems collaboration should be considered as a useful tool for the exchange of experiences. Also demo farms organized in interactive thematic networks involving all types of relevant actors should be enhanced.

European and cross-border structures, finally, should be promoted, even when the policy instrument applied is meant for national or regional development, making use of multiple policy instruments.

REGIONS 4FOOD
Interreg Europe

REGIONS 4FOOD project partners have identified several good practices that illustrate the role of innovation infrastructures to anchor the innovation process, in this case in the agri-food sector. They highlight the importance to provide support services with outstanding demonstrators, in addition to innovation infrastructures:

- Boosting Technology-Based Entrepreneurship: Andalucía Open Future (AOF) and Minerva, from Andalusia. https://andalucia.openfuture.org/, https://www.programaminerva.es/?lang=en

- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/

- Fiware Zone, from Andalusia. https://andaluciasmart.es/fiware-zone

- Technocampus Alimentation TCA, from Pays de la Loire http://capaliment.fr/en/Cap-Aliment-who-are-we

- Frami Campus and Food Forum, from South Ostrobothnia https://www.seamk.fi/en/

- Agroliving Lab, from South Ostrobothnia https://silo.tips/download/a-bright-future-of-seinjoki-region-in-finland

- Cluster Agri-food from Emilia Romagna. https://agrifood.clust-er.it/en/

- Forum S3 from Emilia Romagna https://www.aster.it/news/forum-s3-2019-i-clust-er-e-lo-sviluppo-sostenibile-ricerca-e-innovazione-per-le-sfide-di-agenda

- Industry 4.0 sample factory training and demonstration project for food industry companies from South Transdanubia. http://www.ipar4.bme.hu/mintagyar-projekt/#page-content

- Green TechLab, from Limburg https://bron.fontys.nl/venlo-helpt-noord-limburg-op-weg-naar-topstatus/

RECOMMENDATION 3.
INCREASE OF PUBLIC AND PRIVATE INVESTMENT TO PROMOTE DIGITAL TRANSFORMATION PROCESS.

The agri-food sector is confronted with escalating, multifaceted challenges that demand systemic solutions. Multidisciplinary science, research and innovation (R&I) are key drivers of the much-needed transition to sustainable, healthy and inclusive food systems. A rich and comprehensive set of policies and instruments are in place to support this priority. The core European Commission instruments to support R&I activities in the agri-food sector are the European Agricultural Fund for Rural Development (EAFRD) and the European Regional Development Fund (ERDF), among others.

It is necessary to develop further the inter-regional and cross-border dimension by creating interregional investment opportunities to facilitate scaling up regional and local innovation. In this sense, the new EU funding instrument Interregional Innovation Investments (I3) is expected to provide significant support to business cases and investments arising from S3 partnerships.

Furthermore, funding and support for legal setting-up and operation of farmers' cooperatives and joint agri-food associations to boost the bonding social capital in order to strengthen collective implementation of new digitization projects and also initiatives should be encouraged;

Public financing for e-commerce platforms by integrating e-payment, advisory and informational services for agri-food producers and consumer-delivery actors should be considered. In this sense, it is important to provide support and guidance on what digital technologies farmers should invest in, and what the Return of investment would be. It is important to recall the opportunity provided by the Recovery and Resilience EU funds (grants and loans) to support digitisation: at least 20% of the related-recovery investments should be made in relation with digitalisation.

On the other hand, the speed of development of new ICT tools and technology often outruns the regular financial amortization of the investment. The joint-research together with the bank sector on new investment and amortization schemes that make it easier for farmers to quickly update their systems must be promoted.

Finally, Innovative Public Procurement (CPI), increasingly present in public investments, to promote digitization and competitiveness needs to play a major role to promote the digital transformation process; attention should be paid to the European "Next Generation" and "Recovery" funds (as digitization is a key aspect of these), and also to the new framework, future regulations, instruments and other funds for the 2021-2027 programming period.

Several good practices identified in the frame of REGIONS 4FOOD by Andalusia and Emilia-Romagna regions project partners showcase good examples of how these regions have addressed the challenge of designing and projecting policies shaped on the needs and goals of the quadruple helix:

- Boosting Technology-Based Entrepreneurship: Andalucía Open Future (AOF) and Minerva, from Andalusia. https://andalucia.openfuture.org/, https://www.programaminerva.es/?lang=en
- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/
- Cluster Agri-food, from Emilia Romagna. https://agrifood.clust-er.it/en/
- Joint large scale R&D strategic projects, from Emilia Romagna https://www.interregeurope.eu/news-and-events/news/5872/good-practices-on-agrifood-digitisation/
- "16plus1Cloud" Digital E-commerce Logistic Hub from Pazardzhik. https://16plus1cloud.org/

REGIONS 4FOOD
Interreg Europe

RECOMMENDATION 4. PROMOTE TECHNOLOGICAL SOLUTIONS AND SPECIALIZED HARDWARES AND SOFTWARES IN AGRI-FOOD SECTOR BY ITC COMPANIES AND ENHANCE DIGITAL INFRASTRUCTURES ACROSS EUROPE.

Project' s partners have identified the need to provide a work plan at European level to:

a. stimulate the agri-food industry, with public policies that promote and increase the demand from farmers and include a continuous support and guidance on this field;

b. encourage ICT companies to develop specialised agri-food ICT solutions and software by implementing specific measures while involving farmers, food producers and agri-food educational institutions, in order to offer solutions adapted to the sector. In this context the adoption of digital technologies like blockchain improves security and quality of data, thus increasing performance.

c. promote use validation by the end-users.

Industrial research policies are a key factor to enhance and foster innovation in the agri-food value chain. By fostering this type of policy, regions can achieve a critical mass of demo cases along the value chain, to be taken by the agri-food industry.

Cooperation among the different actors, providers of technological solutions and their consumers leads to a better usability of new technologies. Several examples of how public initiatives succeed when promoting technological specialized solutions for agri-food sectors have been identified in the frame of REGIONS 4FOOD.

- Boosting Technology-Based Entrepreneurship: Andalucía Open Future (AOF) and Minerva, from Andalusia. https://andalucia.openfuture.org/, https://www.programaminerva.es/?lang=en

- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/

- Fiware Zone, from Andalusia. https://andaluciasmart.es/fiware-zone

- Technocampus Alimentation TCA, from Pays de la Loire http://capaliment.fr/en/Cap-Aliment-who-are-we

- Digital Farm, from Pays de la Loire. https://n9.cl/64qa4

- Agroliving Lab, from South Ostrobothnia https://silo.tips/download/a-bright-future-of-seinjoki-region-in-finland

- Utilizing data animal welfare verification and tracking, from South Ostrobothnia. https://www.sikava.fi/PublicContent/IntroductionInEnglish

- Cluster Agri-food, from Emilia Romagna + Joint large scale R&D strategic projects https://agrifood.clust-er.it/en/

- Successful, sensor and data driven plant growing with 17 years of success from South Transdanubia. https://www.interregeurope.eu/policylearning/good-practices/item/3713/successful-sensor-and-data-driven-plant-growing-with-17-years-of-success/

- Green TechLab, from Limburg https://bron.fontys.nl/venlo-helpt-noord-limburg-op-weg-naar-topstatus/

- Treemania, from Limburg https://www.giqs.org/en/projects/treemania/

REGIONS 4FOOD
Interreg Europe

RECOMMENDATION 5.
DEVELOP MULTIDISCIPLINARY RESEARCH, TRAINING AND CREATE NEW PROFESSIONAL PROFILES ON INNOVATION.

Implementing measures to encourage agri-food educational institutions and academia to involve the ICT business when they develop and introduce curriculums with digitization courses and interdisciplinary training should be considered.

Organizing ICT career extra-curriculum training for high-school students from non-specialised ICT high schools, particularly, agricultural profile schools should be encouraged.

Support the organization of demo centres in agricultural and food universities for e-commerce and foreign trade training in agro-food products should be reinforced.

The "Farmer of the Future" does not only grow food but also is a provider of intelligence, energy, public health and biobased materials. He/she has to be an analist, marketeer, communicator. And this requires a different set of skills and expert support for this transition.Furthermore, targeted education for SMEs to: a) learn the possibilities of new technology (which is available and actually useful); and b) technical guidance on how to use it to get all benefits should be ensured.

Some relevant good practices have been identified in REGIONS 4FOOD that illustrate the importance for agricultural regions to promote the development of new skills to remain competitive in the agri-food-sector. These initiatives participate in the transformation of the agri-food sector into a sector that is increasingly digitalised and using industry 4.0 technologies:

- Master Degree in Digital Agriculture and Agri-food Innovation, Univesity of Seville, from Andalusia, https://master.us.es/agrodigital/
- Master Degree in Digital Transformation in Agri-food and Forestry, University of Cordoba, from Andalusia, https://www.uco.es/organiza/departamentos/agronomia/en/master-en-transformacion-digital-en-el-sector-agroalimentario-y-forestal
- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/
- Frami Campus and Food Forum, from South Ostrobothnia https://www.seamk.fi/en/
- Agroliving Lab, from South Ostrobothnia https://silo.tips/download/a-bright-future-of-seinjoki-region-in-finland
- Green TechLab, from Limburg https://bron.fontys.nl/venlo-helpt-noord-limburg-op-weg-naar-topstatus/

RECOMMENDATION 6.
INCREASE COMMUNICATION AND AWARENESS IN THE AGRI-FOOD SECTOR.

Building awareness and a critical mass on these subjects by locating and gathering experts or agri-food tech enthusiasts, in order to exploit the networking effect and more effective communication on this matter should be encouraged. In this regard, farming entities and organizations representing both the agriculture and the agri-food sector can be very valuable agents to promote communication and awareness in this field. Complementarily, improving the participation of farmers and primary production to EU projects on innovation should be promoted to connect them with good practices and experts in other EU regions;

Promoting the image of modern agri-food sector gaining new know-how and experts from ICT/technology sector and new generation; and taking advantage of the good image that the agri-food sector has experienced due to the COVID-19 in terms of health, food safety and sustainability (where digitization plays a relevant role) should be considered.

It is necessary to ensure enough funding and support for wide public communication activities, based on an understandable language and accessible messages, to raise awareness and motivate farmers and food producers for digitalization, on the one hand; and on the other, it is important to communicate the importance of the agri-food sector contribution to a wider audience including children and youth.

We can find some good examples in good practices identified by REGIONS 4FOOD project partners that support the importance of promoting and raising awareness regarding the different value chains of the agri-food sector:

- Digital Innovation Hub Agrotech, from Andalusia. https://www.andaluciaagrotech.com/
- Digital Farm, from Pays de la Loire. https://n9.cl/64qa4
- Agroliving Lab, from South Ostrobothnia https://silo.tips/download/a-bright-future-of-seinjoki-region-in-finland
- Cluster Agri-food, from Emilia Romagna https://agrifood.clust-er.it/en/
- Forum S3, from Emilia Romagna https://www.aster.it/news/forum-s3-2019-i-clust-er-e-lo-sviluppo-sostenibile-ricerca-e-innovazione-per-le-sfide-di-agenda
- Joint large scale R&D strategic projects, from Emilia Romagna : https://www.interregeurope.eu/news-and-events/news/5872/good-practices-on-agrifood-digitisation/
- Land Source of Income Foundation from Pazardzhik http://landsourceofincome.org/en/

REGIONS 4FOOD
Interreg Europe

V. CONCLUSIONS

The improvement of European policies should have in consideration the barriers identified and the recommendations proposed in this document, contributing thus to the success of the digitization of agri-food sector and, as a consequence, to the performance and competitiveness of each European region.

REGIONS 4FOOD project partners would like to highlight that in order to achieve the digitization of the agri-food sector, that:

1. A combination of policies to improve the digitization of the agri-food sector" is needed.

2. A global vision needs to be assured.

3. Open, accessible and responsible data systems should be promoted; together with the good use of solutions already available in industry; and the adequate treatment of data coming from individuals or the private sector.

4. Innovation ecosystems such us European DIHs, Clusters or the Smart Specialization interregional partnerships have the potential to generate opportunities for the stakeholders to co-design and co-develop initiatives and programmes in the agri-food sector.

5. Interregional dimension is key to boost digitisation and allows for a new cross-over connection between sectors and actors. However, it must be done with a place-based approach, paying attention to specificities at every territorial level.

6. Innovation in the agri-food sector can no longer be a top-down process, but a co-creation model involving all stakeholders of the quadruple helix.

7. The promotion of the digitization through process simplification or mandatory requirements can be useful for accelerating digital transformation processes along the value chain (open industry standards needs to be used).

8. Strengthening the link between agri-food policy and industrial policy as a key factor to enhance and foster innovation and ensure critical mass to assure agri-food demo cases along the value chain to be taken by the agri-food industry.

9. Digitalisation roadmaps need sufficient investment on education, research and training, including the clarification of the return of investment in digitalization.

10. Wide public communication activities, using an understandable language, need to be promoted to raise awareness and motivate farmers food producers, and the society in general, about digitisation, taking into account that there is no one-fits-all solution to be implemented, and therefore targeted campaigns must be designed for different audiences.

REGIONS
4FOOD
Interreg Europe

VI. ENDORSEMENT LETTERS

Mrs. Ana María Corredera Quintana as Vice Minister of the partner

Andalusia Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development,

Together with the following stakeholders:

- Agency for Innovation and Development of Andalusia from the Andalusia Regional Ministry of Economic Transformation, Industry, Knowledge and Universities.
- DG of Digital Economy and Innovation from the Andalusia Regional Ministry of Economic Transformation, Industry, Knowledge and Universities.
- Andalusia Agency for Knowledge from the Andalusia Regional Ministry of Economic Transformation, Industry, Knowledge and Universities.
- Technological Corporation of Andalusia
- DG European Funds from the Andalusia Regional Ministry of Finances and European Funds
- University of Cordoba
- University of Seville

Furthermore, from the Andalusia Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development:

- General Secretary of Agriculture, Livestock and Food
- DG Industries, Innovation and Agri-food Chain
- DG Agri-food and Livestock Production
- Andalusia Institute of Research and Development in Agriculture, Fisheries, Food and Ecological Production

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE

Mr. Frederic Poullain as Director of the Agriculture, Fishery, Aquaculture and Food industry Department of the partner

Region Pays de la Loire

Together with the following stakeholders:

- **The Local Agency for economics in Angers**
- **The Regional Association for Agrifood businesses in Pays de la Loire**
- **Young Farmers'Union of Vendée**

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE:

SIGNATURE

Le Directeur de l'agriculture,
de la pêche, et de
l'agroalimentaire

Frédéric POULLAIN

Mrs. Elina Varamäki

Vice President

of the partner

Seinäjoki University of Applied Sciences, South Ostrobothnia, FI

Together with the stakeholders from the following organisations:

Regional Council of South Ostrobothnia

Centre for Economic Development, Transport and the Environment of South Ostrobothnia

Into Seinäjoki Business Development

ProAgria E-P Rural Advisory Services

University of Helsinki, Ruralia Institute

University of Vaasa

Natural Resources Institute Finland

Etelä-Pohjanmaan Osuuskauppa

Wapice Ltd.

local farmers

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE

Mr. Giovanni Anceschi, as president of the partner
ART-ER S.cons.p.A

together with the following stakeholders:

Clust-ER Agrifood

Clust-ER Innovate

CNR Institute of BioEconomy

CRPA

CRPV

Emilia-Romagna Region

ENEA Traceability Lab

University of Bologna

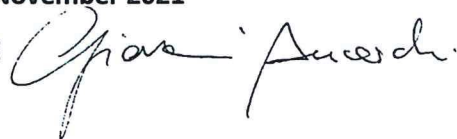**University of Ferrara**

University of Modena & Reggio Emilia

University of Parma

Università Cattolica Piacenza

give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE

ART-ER S.cons.p.a.
sede legale
Via P. Gobetti, 101
40129 Bologna - Italy
CF e P.IVA: 03786281208

Mr. Zoltán János HAÁSZ, managing director of the partner
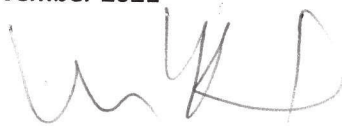South Transdanubian Regional Innovation Agency,

Together with the following stakeholders:

- Managing Authority of the Economic Development and Innovation Operational Programme, Ministry of Finance
- Bos-Frucht Agrarian Cooperative
- Innoskart Ltd.
- Consolidity Ltd.
- Majuko Soft Ltd.

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE

Dél-Dunántúll Regionális Innovációs
Ügynökség Nonprofit Kft.
7621 Pécs, Mária u. 3.
Adószám: 14194799-2-02

Mr. Tom Schulpen, as Director

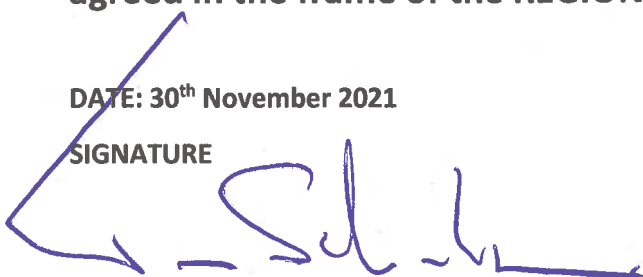**of the partner Province Limburg Regional Ministry**

Together with the following stakeholders;

- **BCGV Brightlands Campus Greenport Venlo**

- **LIOF Regional Development Company**

- **LLTB Limburg Farmers Organisation**

- **Stimulus, body of the Regional Management Authority EFRD OP South**

- **FONTYS University of Applied Sciences / Green Tech Lab**

- **Systestas Cucumber company / representing member of the entrepreneurs in the regional stakeholder group**

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE

Mr. Ivan Dimitrov Vasev as Regional Governor of the partner

Pazardzhik Regional Administration, Bulgaria

Together with the following stakeholders:

Pazardzhik Regional Directorate of Agriculture.
Pazardzhik Regional Directorate of State Fund for Agriculture.
Pazardzhik Regional Directorate of Food Safety Agency.
Pazardzhik Regional Office of the National Agricultural Advisory Service.
Representatives of the regional agri-food business:

      Satimex Ltd.
      Miracle Krasi Maker Ltd.
      Aquafish Ltd.
      Euromes Ltd.

Agricultural University of Plovdiv.
Centre for entrepreneurship with the Plovdiv branch of Sofia Technical University.
University of Agribusiness and Rural Development, Plovdiv, Pazardzhik branch.
Land Source of Income Foundation, Plovdiv.
Local Action Group Strelcha/Lesichovo/Panagyurishte.

Give my support to the STRATEGIC POLICY RECOMMENDATIONS TO EU DIGITIZATION STRATEGIES IN THE AGRI-FOOD VALUE CHAIN agreed in the frame of the REGIONS 4FOOD project

DATE: 30th November 2021

SIGNATURE