



Action Plan

**South Transdanubian Regional Innovation
Agency**



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PART I – INTRODUCTION

General information of the Partner

PROJECT	REGIONS 4FOOD (REGIONal Strategies 4 FOOD 4.0 Revolution)
DEVELOPMENT POLICY INSTRUMENT	Economic Development and Innovation Operational Programme (GINOP) Economic Development and Innovation Operational Programme Plus (GINOP PLUS) Digital Agricultural Strategy of Hungary (DAS)
PARTNER ORGANISATION CONCERNED	South Transdanubian Regional Innovation Agency Nonprofit Ltd.
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REGIONS 4FOOD Project

Objectives

REGIONS 4FOOD project focusses on maximising the innovative potential of all actors of the agri-food value chain through improving regional policy instruments to promote digitisation and better face new challenges in relation to ICTs.

The aim of REGIONS 4FOOD project is to better exploit ICTs potential and deliver innovation to agri-food industry and hence, smart progress and growth.

Specific objectives of REGIONS 4FOOD project are:

- To bring together regional authorities / RIS3.
- To involve quadruple helix actors of the agri-food value chain and connect the world of research and agri-food companies.
- To guide future agri-food policies and strategies.
- To generate added-value from R&I and Smart Specialisation to agri-food industry.
- To promote public-private governance mechanisms.

Outputs and outcomes

For each region, the issue of digital innovation in the agri-food sector has been approached in relation to the specific policy instrument addressed.

The learning process throughout the project lifetime has concluded with the preparation of regional 7 Regional Action Plans to improve these Policy Instruments which are the main output of the project.

Other outcomes to be highlighted which have arisen from the REGIONS 4FOOD learning process are:

- An increase in the professional capacity at all levels: staff, organisational, regional and beyond the project.
- A reinforcement of cooperation among quality helix actors, both at regional and interregional level.
- Contribution to the new programming period by providing strategic recommendations.

To achieve those objectives and results, relevant regional policy organisations from seven EU countries have worked together to exchange their experiences and share practices on the above-mentioned policy issue.

The REGIONS 4FOOD partnership is a balanced combination of regions of varying development levels and also in terms of geographical coverage.

As a result of intensive work lasting over three years, partners have produced their regional Action Plans.

Overall and specific objectives of the Action Plan

"Overall objective of the Hungarian Action Plan is to support digitization of the agri-food sector through awareness raising and capacity building".

Specific objectives are the following:

- Capacity building of agri-food enterprises
- Increasing agri-food sector's competitiveness through encouraging co-operations between agri-food stakeholders
- Increasing efficiency through using digital technologies

PART II – POLICY CONTEXT

The Policy Instrument

The Action Plan aims to impact:

- Investment for Growth and Jobs programme
- European Territorial Cooperation programme
- Other regional development policy instrument

Name of the policy instrument (s) addressed:

Investment for Growth and Jobs programmes:
Economic Development and Innovation Operational Programme (GINOP); Economic Development and Innovation Operational Programme Plus (GINOP PLUS)
Other regional development policy instrument:
Digital Agricultural Strategy of Hungary (DAS)



Background and rationale

- The regional policy context of the agri-food sector

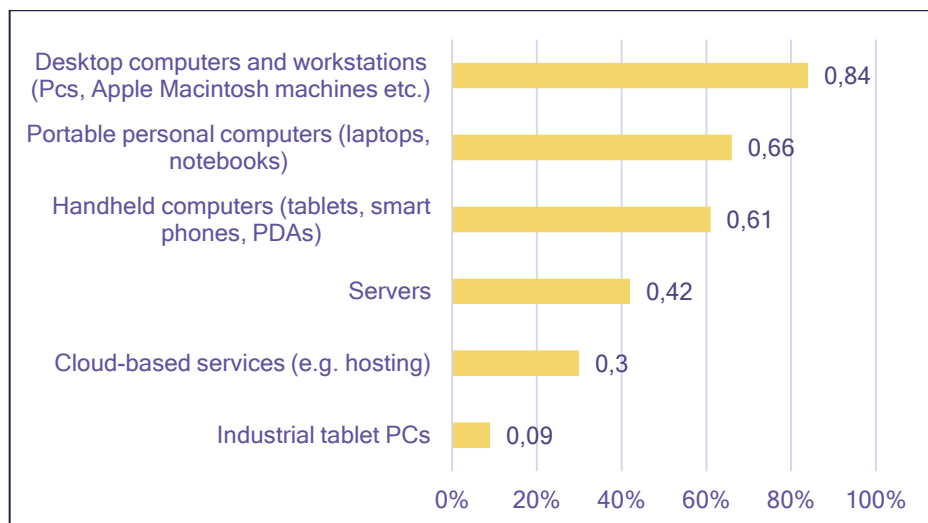
The spread of digital solutions at the level of agricultural production in Hungary started in the 1980s, mainly in the field of animal husbandry and horticulture. Initially, the main direction was automation, but mainly in animal husbandry, data collection and together with it decision support applications also emerged. The large-scale development in digitalization began in the 2000s, when the decreasing technological costs, the development of wireless data transmission and global positioning, and the dropdown of their costs allowed the rapid spread of precision technology.

In addition to automation, robotics has emerged, and the amount and quality of data collected and the frequency of collection have increased exponentially. It has become possible to develop real decision support algorithms, automatic interventions can already intervene based on real predictions, not just based on sensors that sense the immediate environment. Economic and market impacts appeared as decision criteria in the forecasts. In the middle of the 2010s, digitalization was a part of the management and decision-making tasks of plants and product lines. Agricultural digitalization has started in the direction of the development of Industry 4.0, which also supports the relationship between consumers and producers and the organization of consumer needs based production.

Some of the enterprises operating in the Hungarian agricultural economy have already started to exploit the opportunities offered by digitalization due to the advantages of technology and the pressures of the market. However, this process is mainly observed at larger, more capital-intensive and innovative companies. The digitalization of smaller economies is a slower and more demanding process. The situation is similar for food businesses. This is also shown by the results of a 2019 national questionnaire survey examining the digitalization of enterprises in the sector.

The aim of the survey was to learn about the digitalization of domestic food companies concerning IT infrastructure and Internet use, corporate governance systems, the use and role of decision support and business analysis tools, and the change-over to Industry 4.0 technology.

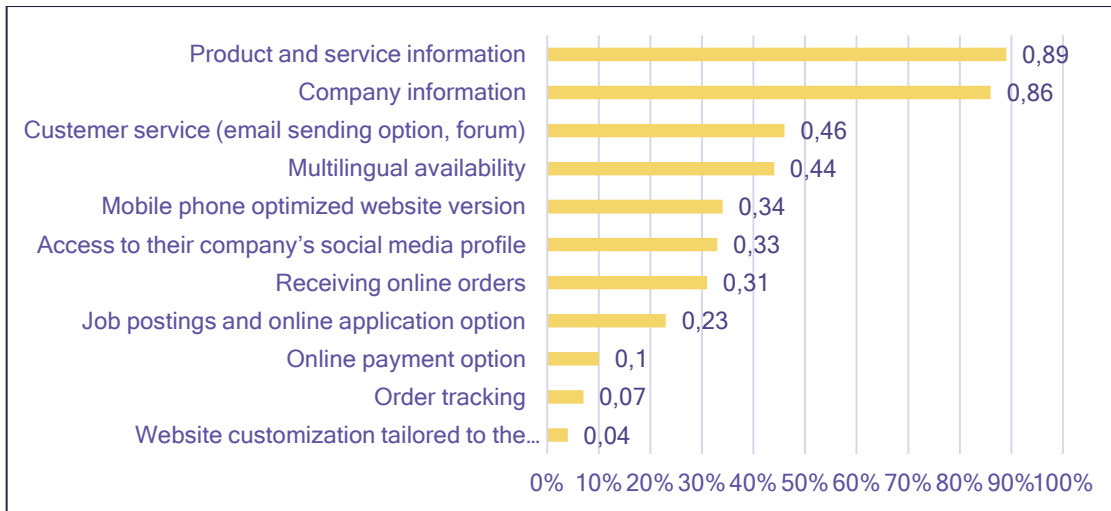
The use of information and communication tools



Source: National data collection, University of Debrecen Károly Ihrig Doctoral School, National Agricultural Research and Innovation Centre, National Chamber of Agriculture, 2019

It can be seen that more advanced digital technologies are used by a negligible proportion of respondents. Concerning the use of the Internet for business purposes, it can also be said that sales, market monitoring and marketing activities are typical for a smaller proportion only, the Internet is used mainly for correspondence, banking and e-government services. 72% of the responding companies have a website, which they use for the following activities:

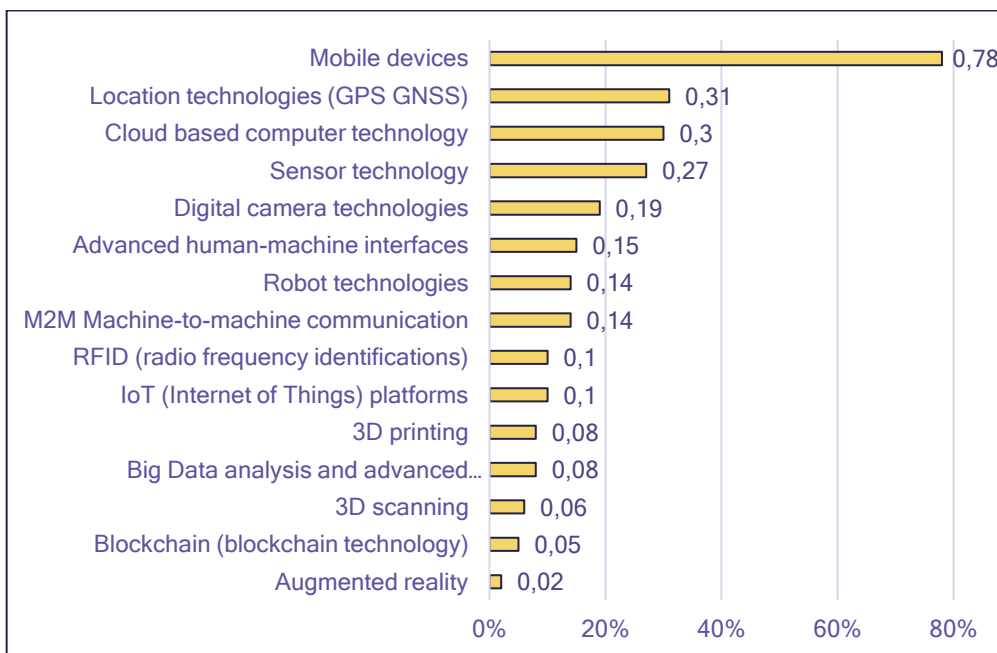
Options offered by the website of businesses



Source: National data collection, University of Debrecen Károly Ihrig Doctoral School, National Agricultural Research and Innovation Centre, National Chamber of Agriculture, 2019

It is also interesting to see which of the digital tools currently used by businesses contribute to the implementation of Industry 4.0.

Which digital technologies contribute to the realization of your company's Industry 4.0?



Source: National data collection, University of Debrecen Károly Ihrig Doctoral School, National Agricultural Research and Innovation Centre, National Chamber of Agriculture, 2019

Background studies show that the following factors are of paramount importance for the modernization of the agri-food industry and the achievement of the expected benefits for businesses and service providers:

- Awareness-raising: introducing food processing companies and their suppliers to the opportunities offered by Industry 4.0 and digitalization, and to Industry 4.0 providers of digitalization knowledge and solutions to the practical problems of food industry for which they currently offer and develop applicable solutions and making them aware of the market opportunities offered by food industry.
- Higher professional training: elaborating educational materials and provision of training on Industry 4.0 and digitalization technologies, their enabling functions and existing solutions, and elaborating educational materials and provision of training for Industry 4.0 and digitization knowledge and solution providers on food industry issues and the operating conditions for food processing.
- It is worthwhile launching pilot projects for food processing companies in a number of areas, under conditions suitable for food handling, so that they could learn about and try out different Industry 4.0 and digitization solutions.
- Community building with the involvement of food processing companies, industry problem-solving organizations, and industry 4.0 and digitization solution providers and R&D professionals to establish and maintain mutual dialogue and work.
- Identifying and systematic coordination of common usable methods, best practices, common tasks and actions with Industry 4.0 and digitization knowledge and solution providers through collaboration between companies. Formalizing collaborations.

A short introduction of South Transdanubia

The region covers the south-western part of Hungary (Baranya, Tolna and Somogy counties), occupying 15% of the country. It has a population of 886,640 and a steady decline due to outmigration and natural population decline. Its population density is significantly lower than the national average and is also the lowest in comparison to the seven Hungarian regions. Despite all this, about one-fifth of the country's settlements are located in this region, which is mainly due to the small-village settlement structure of Baranya and Somogy counties. The settlement network of the region is highly polarized. In addition to the small village settlement structure, there is a lack of medium-sized towns. According to some analyses, the interconnection between the development differences within the region and

the settlement structure of the region is evident. The development of the urban area of large cities and the micro-regions along Lake Balaton is in sharp contrast to the underdeveloped micro-regions lining up along the block of Drava river and those located in a mosaic-like pattern on the inner borders of the two counties.

The region is one of the least developed and least industrialized regions both in domestic and international comparison.

The region's economic character is heterogeneous, with several dominant sectors characterizing the economic activity. The RIS3 Strategy of Southern Transdanubia identifies the following leading economic sectors:

- Food and agro-industry
- Healthcare and Biotechnology
- Environment and Energy
- Mechanical engineering, electronics, electrical engineering and metalworking
- Information and communication technology industry
- Creative Industry

Of these sectors, the specifics of the food and agro-industry closely related to the project are highlighted below.

The region's agro-ecological potential is better than the national average. The plant structure is still dominated by small plant sizes, whose competitiveness is unsatisfactory. The situation is further complicated by the high proportion of the unskilled labour and the fact that the average age of those working in the sector is increasing year by year, currently 30% of them are over 60 years old.

The lack of expertise is a problem not only for employees but also for a significant part of managers: most of them have some theoretical or practical lack of expertise in terms of mechanical, technical knowledge, plant protection and nutrient replenishment. In addition to this, foreign language skills, computer and IT skills, and administrative and legal skills required for business management are the most lacking elements at the management level. Surveys also highlight that the willingness of agricultural actors to cooperate is low, so many are limited to the production of raw materials and the number of value-added products is few.

The region's natural conditions and the agro-ecological potential are favourable for both for crop production and animal husbandry. The presence of higher education institutions, research institutes and professional organizations is also favourable, as well as the

participation of these institutions in international networks, which can create a basis for higher value-added agri-food production for the region as a whole.

- SWOT analysis

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> ▪ Rich natural resources, agricultural industry with good natural endowments ▪ Favourable effects of the southern shore of Lake Balaton ▪ Proximity to a country border ▪ Competitive research base ▪ Advanced higher education system ▪ Heterogeneous economic character ▪ Favourable agro-ecological potential ▪ Highly qualified ICT and healthcare professional with international achievements 	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> ▪ Low level of digitization ▪ Peripheral situation ▪ Less developed, less industrialized region ▪ High number of small villages, underdeveloped micro-regions ▪ Small farm sizes, fragmented agricultural areas ▪ High rate of unskilled labour ▪ Emigration of young workers with higher education ▪ High average age of workers in the agri-food sector ▪ There are few value-added products ▪ Lack of financial resources
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> ▪ Creating a more competitive agri-food sector ▪ Start-up ecosystem development ▪ Retaining the workforce ▪ Shaping the attitude of the young generation ▪ Strengthening cooperation ▪ Increasing the competitiveness of relevant actors ▪ Creating competitive products ▪ Diversification of the agricultural economy ▪ More efficient implementation of incubation 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> ▪ High proportion of forced enterprises ▪ Uncertain innovation policy and sources of innovation ▪ Emigration of skilled labour ▪ Low willingness to invest ▪ Low willingness of SMEs to cooperate ▪ Low demand for innovation by SMEs

- Lessons learnt from other REGIONS 4FOOD partners.

Explaining the actions in detail, we referred to the lessons learned used, such as good practices and study visits in Spain, Finland, France and the Netherlands. Contribution of the Action Plan to the improvement of the policy instrument.

The Economic Development and Innovation Operative Program (GINOP) aims to stimulate the economies of the less developed regions in Hungary. Its most important priorities are the competitiveness of small and medium sized enterprises, research and innovation, and employment. The programme also aims to develop the tourism industry, enterprises' energy efficiency, and information and communication technologies.

The next planning period offers similar challenges. The challenges of the 21st century will require Hungarian businesses to change their technology, strengthen their digitalisation and innovation capabilities, and train their employees to increase their productivity and added value. The Economic Development and Innovation Operational Programme Plus (GINOP PLUS) for the period 2021-2027 aims to build on the achievements of the Economic Development and Innovation Operational Programme (GINOP) 2014-2020 and support Hungarian businesses. The interventions of GINOP PLUS contribute to the development of a more favourable position of enterprises in the domestic and international markets through the renewal of their technologies. The implementation of the Action Plan is expected to have an impact on both planning periods.

The following calls are those that may still be affected by the actions:

Action 1:

- GINOP 2.2.1-18: R&D competitiveness and excellence collaborations,
- GINOP 1.2.8-20: Supporting developments to adapt micro, small and medium-sized enterprises to modern business and production challenges,
- GINOP PLUS-1.2.1-21: Supporting developments to adapt micro, small and medium-sized enterprises to modern business and production challenges;

Action 2:

- GINOP 1.2.10-19: Support for technological modernization of micro, small and medium-sized enterprises,
- GINOP 1.2.9-20: Supporting the development of micro and small enterprises in disadvantaged settlements,

- GINOP PLUS-1.2.1-21: Supporting developments to adapt micro, small and medium-sized enterprises to modern business and production challenges.

The Action Plan also includes - as the third and self-reliant action - the Pilot Action that was approved by the Interreg Europe Monitoring Committee on 13 August 2021. This Pilot Action addresses Regions 4Food relevant ag-tech higher education issues by transferring Master in “Digital Agriculture and Agri-Food Innovation” of University of Sevilla in South Transdanubia to test a new higher education approach. The relevant policy is the Digital Agricultural Strategy of Hungary which is a national strategy with relevance for years the 2019-2022.

Action 3:

- The Pilot Action addresses the educational dimension of the agricultural digitisation, namely under the DAS horizontal objective called “Development of digital competences”. The dedicated measure of this objective is called “Development of agricultural higher education”, and that is the closest in scope to the implementation of this Pilot Action.

PART III – METHODOLOGICAL APPROACH

Challenges/needs addressed

Data has become a key asset for the economy and our society. The need to make sense of “Big Data” is leading to innovation in technology and the development of new tools and skills. Generating value at the different stages of the data value chain will be at the heart of future knowledge economy.

Within the agri-food value chain, Big Data is gaining ground in areas such as security and traceability, customer services, or production improvements.

Big Data has also contributed to balancing the agri-food value chain.

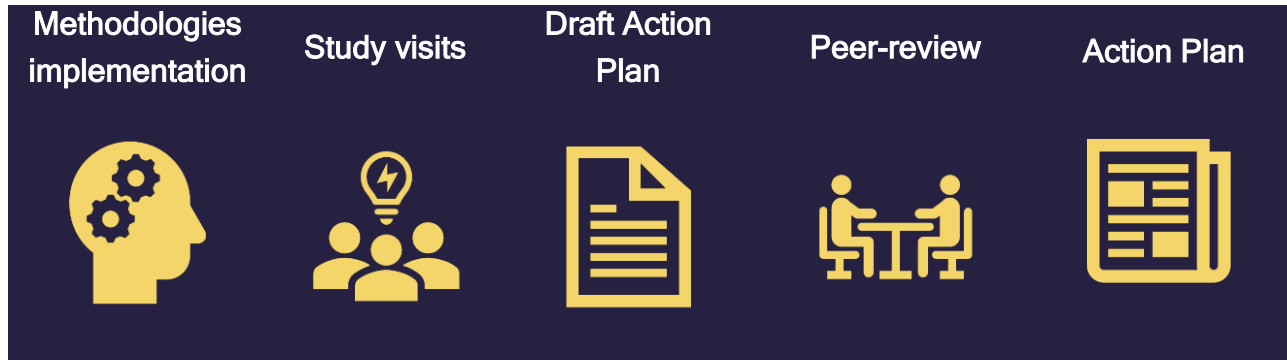
The large volume and diverse nature of data of agri-food value chains call for specific integration and management procedures to make the most of the new economic opportunities based on information, data and cognitive technologies and promote innovation-driven growth.

As a result of involving relevant regional authorities, the research sphere, ICT and agro businesses, and civil society in the exchange of experience process, partners have prepared action plans to include measures that will improve the technology transfer, close the gap between research and markets and display the greatest potential of innovation opportunities and smart specialisation areas.

The project has also contributed to addressing the major challenge to digitisation which is to connect directly producers with consumers and also agrobusinesses with tech sector companies and with knowledge sector.

Approach to the preparation of the Action Plan

REGIONS 4FOOD has a well-defined methodological approach with the following stages:



- Identification

The Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development of Andalusia, as REGIONS 4FOOD Lead Partner, prepared two methodologies to be implemented by project partners with the support of their stakeholders with the aim to identify in each partner region:

- Needs, barriers, relational capital and good practice related to the digitisation of the agri-food sector.
- A catalogue of data and technologies in the agri-food sector.

- Exchange of experiences and practice sharing

The results of these mapping works have been shared within the partnership in the interregional seminars organised back-to-back the steering committee meetings.

Good practice sharing has been implemented through the study visits, where both the project partners and their stakeholders took part. Partners had previously identified those practices that were the most interesting for them in terms of their capacity to improve the policy instrument addressed.

- Preparation of draft Action Plans

Following the template prepared by the Lead Partner, the first draft Action Plans included the lessons learnt from previous stages, the interregional activities, and learning at all levels. Stakeholder groups also met to analyse the findings of previous work and contribute to the preparation of the draft Action Plan.

- Presentation of first draft Action Plans

The REGIONS 4FOOD partners presented their first draft regional Action Plans during the Capitalisation Seminar held in May in South Transdanubian (Hungary).

- Peer-review

The overall objective of the peer reviews was that the partner owner of the good practice inspiring the actions of other partner's Action Plan draft evaluates it taking into consideration this partner's context on innovation strategies.

The process has been carried out as follows:

- First, each project partner determined if the peer review concerned the whole Action Plan draft or just one concrete action,
- Second, partners sent to peer the Action Plan draft with the instructions on what was to be reviewed (the whole Action Plan or just specific action(s)),
- Third, the peer identified the key agents and/or stakeholders involved in the good practice that had most inspired the action(s),
- Four, one these agents had read the Action Plan draft, an online meeting was scheduled among both project partners. In that meeting, there was exchange of views, assessing the document and when needed, how it could be improved in order to obtain the final objective: improving the partner's policy instrument tackled by the project,
- Finally, the peers drafted a review report with suggestions in view of improving the Action Plan draft reviewed,
- These suggestions were later discussed with the stakeholders and were considered in the drafting of the final Action Plan.

- Presentation of the second draft Action Plan

During Semester 6, the project partners' Action Plans (second draft) have been completed considering the suggested improvements of the peer-review process. They have been presented in their regional stakeholders' group meetings.

- Action Plans

This methodological process concluded with the submission at the Interreg Europe Joint Secretariat of the seven Action Plans (1 per partner/region) for validation by the end of Phase I.

PART IV – ACTIONS

ACTION 1.

Name of the action: Encouraging cooperation between agri-food stakeholders

Relevance to the project & background

The background of the action is the low willingness to cooperate in the Hungarian agri-food sector. Our background analyses showed that despite the existence of formalized collaborations (e.g. thematic cluster organizations), the fragmentation of resources among enterprises, the majority of enterprises with only 1-2 employees, the high proportion of family enterprises, the lack of skilled entrepreneurs with complex knowledge are more typical. It is typical that businesses and entrepreneurs tend to operate in isolation, want to control all processes themselves, and are motivated by competition rather than collaboration.

During the project, it was interesting to learn about those successful collaborations, which were organized either on the common infrastructure or on the common interest representation, or along common professional goals or development ideas. The first of these is the Frami Campus and Food Forum, which is primarily a higher education and R&D collaboration, but the local public sector and local businesses have also been involved in joint project generation. Good practice started from bringing together local organizations, so knowledge and trust in each other was given from the beginning. This is one of the keys to successful collaboration. On the other hand, the project generation, which is induced by local needs, is noteworthy, so everyone formulates their own role and goal in the cooperation, starting from the same conditions. Another successful collaboration with elements adaptable in Hungary is the Agro Living Lab & eLiving Lab project, which means the organization of a common infrastructural background for local farmers. The good practice offers an opportunity to test, try and later use digital technologies on the one hand, and to ensure the exchange of experience for farmers with different farm sizes, activities and different stages of the product life cycle. The third inspiring initiative is the ResQ Club, which contributes to food waste reduction by creating a new kind of value and generating collaborations.

Nature of the action

The Action aims to promote and implement collaborations, thus helping to improve the competitiveness of enterprises and reduce their fragmentation and isolation. In the second phase, the action enables the relevant actors to be addressed, introduces them working collaborations, international and domestic good practices, professional actors, helps to learn the areas where cooperation would be most needed, and then to coordinate and encourage them.

Activities performed under the Action

- Organizing workshops, online meetings and digital technology testing for relevant stakeholders,
- Collaboration generation, collaboration facilitation;

The workshops and the online meetings as collaboration platforms will provide an opportunity to meet the target group organizations with the goal of exchanging good practice experiences, getting to know the needs of different stakeholder groups, connecting different territorial needs and challenges, as well as to evaluate the implemented projects in the policy instrument addressed. As a concrete policy change measure on GINOP and GINOP PLUS implementation, the outcomes of the workshops and the meetings will be summarized annually, and the summary report will be forwarded to the policy responsible body as a systematic feedback. As such, the result of the action is clarifying the goals for businesses to be achieved independently and in collaboration, creating an effective environment for tendering and continuously formulating development objectives for GINOP and GINOP PLUS. The Action has a direct impact on GINOP PLUS-1.2.1-21 (Supporting developments to adapt micro, small and medium-sized enterprises to modern business and production challenges) by increasing the number of project ideas generated by collaborations and improving the elaboration of project ideas, as well as their effective implementation and maintenance.

Stakeholders involved

It is planned to involve the following organizations in the implementation of the Action:

- Institute of Agricultural Economics Nonprofit Ltd. (The Institute is a government scientific institute supervised by the Ministry of Agriculture. As a leader in the digitalisation process of Hungarian agriculture, it operates and is engaged in the further development of EU and national agricultural information systems of

outstanding importance, i.e., the Farm Accountancy Data Network (FADN), the Market Price Information System (MPIS), and the Agricultural Statistical Information System (ASIS). By the extensive collection and processing of data, policy analysis and decision support, the Institute provides valuable assistance for progressing agriculture and strengthening rural livelihoods. Source: <https://www.aki.gov.hu/en/about-the-institute/>).

- Campden BRI Hungary Nonprofit Ltd. (Campden BRI Hungary is one of the most significant independent European service providers in the food and drink industry, including agriculture and related sectors. Campden BRI Hungary with a 100 years of industry and R&D experience supports its partners and offers client specific packages. Source: <https://campdenbri.hu/en/en-magyarorszag.php>).
- Hungarian Chamber of Agriculture (The Chamber covers the whole domestic food chain, the agricultural production activity and the field of rural development through its members. As a flexible and professionally qualified public body, it has been working since its foundation to give a new impetus to the Hungarian agri-food economy. Source: <https://www.nak.hu/english>).
- local SMEs (Agri-food small and medium size companies represent the agriculture-forestry and food processing sectors and are located in South Transdanubian and other parts of Hungary. As daily users of digital solutions available on the market they provide valuable contribution to widening the uptake of digitisation in the Hungarian agri-food sector.).
- Higher educational institutions, research institutes (Within South Transdanubian the key Hungarian agri-food university, the Hungarian University of Agriculture and Life Sciences (MATE - <https://uni-mate.hu/en>) as the largest Hungarian agricultural-focused, multi-disciplinary higher education is located. Simultaneously, several domestic agri-food research institutes contribute to developing new digitisation solutions and services for agrifood farms and companies.).
- Start-uppers (Agri-food start-up companies belong here that target market niches such as data visualisation systems, digital training solutions for farmers and agri-food businesses, or individual billing and tracking of agri-food products based on the blockchain technology. These businesses have special needs that effectively support the cooperation of various professional and agri-food related farms, consultants, etc.).

The facilitator of the Action will be the South Transdanubian Regional Innovation Agency Nonprofit Ltd.

Timeframe

2021-2023

Indicative costs

10 000 euros/year

Indicative funding sources

- Contribution from South Transdanubian Regional Innovation Agency,
- Application resources;

Output and result indicators

- Number of workshops: 2 workshops,
- Number of participants at the workshops (8 participations/workshop),
- Number of new projects generated by collaborations (1 project).

ACTION 2.

Name of the action: Supporting the agri-food sector by encouraging digital technologies

Relevance to the project & background

When founding the action plan, we encountered an astonishingly low digital technology use activity by the relevant stakeholder groups. This may also be due to a lack of information, inadequate skills, the aging of the generations working in the sector and inadequate funding and development policy backgrounds.

However, we know the Hungarian experts in the field, we see the background of higher education and research and development, and by learning from the experience of international cooperation we see that the lack of financial background is not always a deterrent to encouraging the use of digital technologies. We believe that it is worthwhile to pass on and show international good practices to Hungarian farmers and entrepreneurs, which also inspired the development of this action. In each case, technology-based activity

and management is the key, resulting in more balanced yields, reduced use of chemicals, keeping pests away and healthy farmed animals without having to be treated with antibiotics. The good practices considered in designing the Action are as follows:

- Data in animal welfare: comprehensive data collection in pig farming, its main results are animal health protection, prevention and early intervention.
- YOOKR Dashboard: a wireless smart device, a sensor that can increase and optimize yields and adapt to climate change by influencing and regulating environmental factors.
- Tree Mania: sensor technology that monitors the roots of trees based on changes in soil, water management and microbiological processes, enabling the necessary interventions. The main results are keeping pathogens away, healthier and more tolerant plants, and reducing the amount of chemicals applied.

Nature of the action

The aim of the Action is learning, introducing and disseminating new technologies that will determine the future development of the agri-food sector.

Activities performed under the Action

- Organizing workshops, attitude-forming events and webinars,
- Higher educational attitude formation;

The Action therefore is aimed at expanding the capacity of agri-food enterprises and expanding knowledge. The planned activities will contribute indirectly to the realization of GINOP and GINOP PLUS, to increase the digital competencies through the awareness raising of agri-food enterprises.

The action is directly linked to the GINOP 1.2.9-20 (Supporting the development of micro and small enterprises in disadvantaged settlements) framework. Through the workshops and webinars, agri-food businesses will be able to formulate their digitalisation development goals, review the pre-qualification system of tendering schemes, and successfully participate in tenders and implement new projects.

Stakeholders involved

It is planned to involve the following organizations in the implementation of the Action:

- Institute of Agricultural Economics Nonprofit Ltd. (As introduced under Action 1.),
- Campden BRI Hungary Nonprofit Ltd. (As introduced under Action 1.),

- Hungarian Chamber of Agriculture (As introduced under Action 1.),
- local SMEs (As introduced under Action 1.),
- Higher educational institutions, research institutes (As introduced under Action 1.).

The facilitator of the Action will be the South Transdanubian Regional Innovation Agency Nonprofit Ltd.

Timeframe

2021-2023

Indicative costs

8 000 euros/year

Indicative funding sources

- Contribution from South Transdanubian Regional Innovation Agency
- Application resources

Output and result indicators

- Number of events (workshop, attitude-forming events, online meeting): 2 events,
- Number of participants at the events (10 participations/event),
- Number of students involved (5 students),
- The number of new projects generated by the action (1 project).

ACTION 3.

Name of the action: Guidelines for the implementation of an academy program based on the experience of the Master in “Digital Agriculture and Agri-Food Innovation” of University of Sevilla in South Transdanubia to test a new higher education approach

Relevance to the project & background

The Pilot Action is dedicated to testing the feasibility of the knowledge transfer of the new and complex approach of a Spanish higher education Master of Science program called “Digital Agriculture and Agri-Food Innovation” of the University of Seville to South Transdanubia for the purpose of widening and enhancing the digital agriculture and agri-food innovation portfolio of Hungarian higher education organisations. The aim is to demonstrate the added value of this new and complex higher education approach as a potential new eligible activity of the Digital Agricultural Strategy of Hungary (2019-2022).

University of Sevilla (Andalusia, Spain) through its Higher School of Agronomical Engineering offers a Master of Science program (hereinafter referred to as MSc or Master program) in Digital Agriculture and Agri-Food Innovation since 2018 September. It is a mature and complete training program that has 9 modules, including 7 technical modules (1. IT and precision farming, 2. Advance geomatics and drones, 3. Smart system for production monitoring, 4. Data analysis and decision support tools, 5. Smart irrigation systems, 6. Robotics and 3D, 7. Innovation challenges, new business strategy and agricultural digitalization) that are complemented with 1 agri-food digital transformation module and 1 (voluntary for students) internship module. The program also reflects a new approach as it meets the growing demand for new profiles in the agri-food sector while promotes agricultural technology skills. In the implementation of the MSc program 30 lecturers are involved from Spain, Portugal, Germany, Netherlands, and several other European countries. The program is a case of success in Andalusia and the number of students is between 20-24 per academic year, with a growing demand for interest (therefore the Master program has a waiting list).

The Digital Agriculture and Agri-Food Innovation MSc program is a Regions 4Food good practice, which has been identified by the Government of Andalusia, the Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development. The work developed in

this Master program in the legal, technical, organisational, economic-financial and academic aspects is a great advancement, especially in the academic area as a disruptive element for agri-food higher education.

The Pilot Action is focused on the design of the guidelines and a limited testing of the 7 technical MSc modules in the Hungarian agri-food higher education. It does not include the 1 agri-food digital transformation module and 1 (voluntary for students) internship module.

South Transdanubian Regional Innovation Agency (Pécs, Hungary - hereinafter abbreviated as STRIA) is Project Partner 5 of the “REGIONal Strategies 4 FOOD 4.0 Revolution” project, and works in close cooperation with stakeholders to interconnect with regional innovation ecosystems. As a professional innovation agency, STRIA has capacities, experiences and competences in agri-food policy making and influencing. The Kaposvár Campus of the Hungarian University of Agriculture and Life Sciences (hereinafter referred to as MATE [being the official name abbreviation of the university]) is the key regional stakeholder in terms of agri-food higher education. Also, Regional Smart Specialisation Strategy (RIS3) of South Transdanubia by identifying the agri-food-industry as one of the leading economic sectors requires the supply of up to date and tailored agri-food higher education programs. MATE announces several agri-food programs and studies each academic year. At the same time, MATE portfolio lacks such a complex MSc program that addresses digital agriculture and agri-food innovation to meet the growing demand for new profiles in the agri-food sector and to introduce agricultural technology skills. What is more, there are no further Hungarian higher education organisations either where such a complex program is available for students. This fact also provides excellent opportunities for regional/national policy conclusions. The findings coming from the feasibility of transfer of the Spanish MSc program to Hungary must be summarised in a policy paper and that should be proposed for acknowledgement/endorsement by the relevant policy body of the Digital Agricultural Strategy of Hungary (hereinafter referred to as DAS). This acceptance helps the further spread of this new higher education approach in the Hungarian higher education scene, also cross fertilises sectors that are linked to digital agriculture and agri-food innovation.

Nature of the action

Starting of the transfer (1 September 2021 - 15 October 2021)

- Identification of higher education needs for digital agriculture and agri-food innovation in Hungary and in relation to the 7 technical modules.
- Kick-off meeting introducing the US MSc program “Digital Agriculture and Agri-Food Innovation”.

Pilot curriculum development (16 October 2021 - 31 December 2021)

- Workshop to discuss the details of the 7 MSc modules, the methodology and the teaching practice.
- Elaboration of 1 Hungarian curriculum; 7 Hungarian pieces of course descriptions (based on the 7 Spanish MSc modules); and 7 pilot textbooks and presentations for the pilot courses.

Pilot testing of the elaborated Hungarian MSc curriculum (1 January 2022 - 30 June 2022)

- Recruitment of MATE MSc students for the pilot testing at the Kaposvár Campus of MATE.
- Pilot teaching activities of the 7 modules with the involvement of external lecturers.
- Following pilot teaching the collection of the feedbacks will take place.
- The professional summary on the lessons learnt during pilot testing a report will be elaborated.

Policy improvement to influence the DAS (1 July 2022 - 15 September 2022)

- Workshop in support of policy improvement to influence the DAS.
- Policy paper will be elaborated in close cooperation with DAS in favour of integrating the digital agricultural technology, user and developer knowledge into Hungarian higher education programs. The policy paper will also include the intended policy improvement.

Closing of the transfer (16 September 2022, 31 October 2022)

- Closing meeting of the Pilot Action coupled with communication and dissemination activities.

Stakeholders involved

- the intermediary body of DAS,
- the lecturers and professors at MATE Kaposvár Campus,
- university MSc students,
- the competent line ministries of the Government of Hungary,
- further Hungarian agri-food universities,
- regional agri-food farms and companies,
- agri-food digitisation solution providers.

The facilitator and coordinating partner of the Pilot Action is the South Transdanubian Regional Innovation Agency Nonprofit Ltd. The other partner of the Pilot Action is the Kaposvár Campus of the Hungarian University of Agriculture and Life Sciences.

Timeframe

2021-2022

Total budget of the Pilot Action

74 020 euros

Indicative funding sources

- Own contribution from Pilot Action partners (15% of the total budget),
- Interreg Europe ERFD contribution to the Pilot Action (85% of the total budget);

Output and result indicators

- Given the great variety and significant number of outputs and results defined in the Pilot Action, please contact South Transdanubian Regional Innovation Agency for more details.

PART V – MONITORING SYSTEM

The monitoring period of the Action Plan will be from 1st June 2021 (once validated by the Joint Secretariat) to 31st May 2023. During this period, project partners will report to the Interreg Europe Joint Secretariat on an annual basis.

There will be two monitoring mechanisms for each Action Plan:

- One is common to the seven Action Plans. It has been designed by the Lead Partner to monitor, analyse and report the implementation of actions.
- An additional self-monitoring mechanism is defined by each partner according to their needs and internal structure.

Regarding the joint monitoring mechanism, it includes result indicators. It will allow project partners to measure their results according to their policy instrument tackled to be improved, and their self-defined performance indicators. Project partners will be required to report to the Lead Partner twice a year (each semester) to strengthen the monitoring mechanism and have the capacity to take corrective measures, if necessary. With the information provided, the Lead Partner will prepare a monitoring report per semester. In addition, the results will be discussed in the two project meetings foreseen in Phase 2 (one in Semester 8 and another one in Semester 10) to give project partners recommendations for improvement.

Also, one additional project meeting (not foreseen in the application form) will be organised online by the end of Semester 7 to monitor, evaluate and share information about the situation at the project level.

Additionally, a self-monitoring mechanism has been defined to complement and feed the joint monitoring mechanism and ensure the correct implementation of actions as foreseen, according to our organizational needs and internal structure.

The table below shows the measurable indicators for the implementation of the actions:

Action	Indicator		How	Who
	Measurement unit	Value		
1.	Number of workshops	2	record	STRIA
1.	Number of participants at the workshops	16	record	STRIA
1.	Number of new projects generated by collaborations	1	record	STRIA
2.	Number of events	2	record	STRIA
2.	Number of participants at the events	20	record	STRIA
2.	Number of students involved	5	record	STRIA
2.	The number of new projects generated by the action	1	record	STRIA
3.	Great variety and significant number of outputs and results of the Pilot Action	-	-	STRIA

ANNEXES

Endorsement letters

In this section, partners must attach the endorsement letters of the relevant organisations, including date, name of the organisation and signature and stamp on institutional letterhead.

Endorsement letter from the relevant organisation responsible for the action

Project acronym ¹	REGIONS 4FOOD
Project title	REGIONal Strategies 4 FOOD 4.0 Revolution
Name of the signing organisation (original) including department if relevant	Gazdaságfejlesztési Programok Irányító Hatósága, Gazdaságfejlesztési Programok Végrehajtásáért Felelős Helyettes Államtitkárság, Pénzügyminisztérium
Name of the signing organisation (English) including department if relevant	Managing Authority for Economic Development Programmes, Deputy State-Secretariat of Economic Development Programmes, Ministry of Finance
Name of the policy instrument addressed (original)	Gazdaságfejlesztési és Innovációs Operatív Program (GINOP) Gazdaságfejlesztési és Innovációs Operatív Program (GINOP Plus)
Name of the policy instrument addressed (English)	Economic Development and Innovation Operational Program Economic Development and Innovation Operational Program Plus
Name of partner concerned in the application form (English)	South Transdanubian Regional Innovation Agency Nonprofit Ltd.

We hereby confirm:

- that on the 21 November 2021 we received the Action Plan prepared by South Transdanubian Regional Innovation Agency Nonprofit Ltd. in the framework of the above-mentioned project;
- that we participated in the regional stakeholder group (RSG) of the above-mentioned partner in the project;
- that we are effectively acquainted with the contents of the Action Plan, and we will consider possibilities for implementation of the Action Plan through our policy instrument.

Name of signatory

Peter Keller

Position of signatory

Head of Programme Strategy Department

Date and place

26th November 2021, Budapest

Signature and institution stamp



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