Action Plan

Seinäjoen ammattikorkeakoulu
Seinäjoki University of Applied Sciences

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PART I – INTRODUCTION

General information of the Partner

PROJECT	REGIONS 4FOOD
PARTNER ORGANISATION CONCERNED	SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES
COUNTRY	FINLAND
NUTS2 REGION	LÄNSI-SUOMI
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REGIONS 4FOOD Project

Objectives

REGIONS 4FOOD project focuses 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 quadruple 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

Regional objectives of the REGIONS 4FOOD -project and therefore the objectives of this Action Plan are to find solutions that utilises co-operation between the stakeholders from private, public and academic sectors:

- Strengthen the national and international level innovation of the agri-food cluster.
- Promote business activities involving users, companies, researchers and public operators. Promote a dynamic primary production, food system know-how, diverse investments, development platforms, user networks and national and international networking.
- Promote the know-how and innovation environments for new sources of growth in the different components of food systems and their interfaces.
- Find new projects financed as a result of the interregional and intraregional learning process.
- Bring improvements in terms of in-depth cooperation and improved governance through the Regional Strategy of South Ostrobothnia by the Action Plan.

"To strengthen the national and international level of innovation of cluster specialised in food systems."

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 addressed:
- **Regional Strategy of South Ostrobothnia**
- **Regional Rural Development Programme for South Ostrobothnia**

Background and rationale

Overview of the regional agri-food sector

The area of South Ostrobothnia is 14 000 km², which is 4.14 % of Finland's total area. Population of the region is 193 207, which is 3.5 % of the total population of the country. The role of the food industry is particularly important in South Ostrobothnia. The region is known for its strong agricultural and agrotechnology companies, food industry and entrepreneurial spirit.

South Ostrobothnia has the highest employment in agriculture and food industry, therefore agri-food sector plays an important role in the region. Agriculture and food industry employ almost 21 % of all employees in South Ostrobothnia in 2014. In comparison, the labour of food sector in Finland on average was 13 % of all labour. 16 % of the entire country's food industry turnover is situated in the South Ostrobothnia region. Agriculture and food industry summed GDP is 25% of the entire region's GDP. Development of food systems is strong in South Ostrobothnia and the region has remarkable food companies and food sector expert and training organisations. The region has declared to be the Finland's Food Province (Ruokaprovinssi) on the basis of its national importance and strong specializing in this sector.

Food Province has its own label for food products, which indicates that the company is located in the region and the ingredients are produced in South Ostrobothnia. The key values of the Food Province label are "Better, South Ostrobothnian and Togethermade". The applicant of the label may be from HORECA sector, a rural tourism company, a food production or processing plant, food retailer, food-related event producer, primary producer, agri-food RDI organisation or other food related operator. The label can be applied for an entire company, part of it, part of its operations or for an individual product. An agri-food committee supervises the use of the label, audits and grants new candidate companies.

Research, development & innovation

RDI in South Ostrobothnia region

As a key field of entrepreneurship, agri-food sector is one of the key focus areas of RDI in the region. South Ostrobothnia has a strong common will for the development of an agri-food innovation ecosystem, and it has been pursued by several initiatives during the years. Cooperation among different sectors is the significant strength of the region. A networked higher education model has been created in the province, including SeAMK, University Consortium of Seinäjoki (UCS), South Ostrobothnian University Network (EPANET) in strong cooperation with municipalities, SMEs, public funders, and other educational institutions. The objective of the regional RDI is to strengthen applied research, studies, experiments and promote service and commercialization processes. The key actors have jointly recognized strategic goals of RDI.

Agri-food sector creates the base for wider food system interfaces of different sectors in South Ostrobothnia, both to businesses and RDI. Regional strengths are healthy primary production, exceptional level in food safety, good knowledge and competence of food systems, versatile investments, availability of development platforms and active national and international networks. Focus of development in agri-food sector is in new systems and solutions in agrotechnology, food safety, expert services and consumer and experience-oriented products with high added value.

In order to achieve the RDI objectives pursued by the Finnish Government, strengthen the top competences and increase the effectiveness of measures, there is a new innovation ecosystem agreement for the city of Seinäjoki which strategically guides the allocation of public and private RDI funds. Name of the innovation ecosystem agreement is Smart Green Growth for the period 2021-2027. Even though the agreement is written by the City of Seinäjoki, the effect of the actions will reach to entire region. There are two strategic priorities: 1) Food ecosystem sustainable renewal (Food Team) and 2) Intelligently regenerating industry (Tech Team). The ecosystem agreement is based on South Ostrobothnia's regional strengths, including a strong tradition of entrepreneurship, multidisciplinary and widely networked higher education activities and close cooperation between various parties.

RDI in Seinäjoki University of Applied Sciences

Seinäjoki University of Applied Sciences (SeAMK) conducts research, development and innovation (RDI) with a distinctly practical emphasis, serving teaching and supporting small and medium enterprises (SME) and service production, especially within South Ostrobothnia region. Therefore, SeAMK's RDI supports the implementation of Smart Specialization Strategy of South Ostrobothnia.

RDI is carried out in co-operation with regional, national, and EU level enterprises and organizations. In 2020, SeAMK implemented 115 RDI projects, of which a quarter were with international partners. The total RDI funding was around 7 million euros, of which external funding amounted to 4 million euros. The number of publications reached close to 700 in 2020. Around 100 people contribute to the RDI activities of SeAMK annually.

SeAMK's RDI focuses on growth entrepreneurship and business transfers, digital manufacturing and industrial Internet, wellbeing technology and food safety. SeAMK has Finland's most extensive food chain know-how ecosystem, covering agro and food laboratories, simulation and sensory evaluation environments, and intelligent educational restaurant. Agri-food sector projects cover wide range of topics from field to fork: from precision farming to preventing surplus food and from alternative protein sources to circular economy.

Digitalisation in agri-food

Agri-food sector digitalisation is widely seen as a great possibility. As a result of national studies that apply also to South Ostrobothnia, it has been seen that the baseline for digitalisation is even reasonably favourable. In general, actors have decent level of readiness for digital transformation, and the digital services are developing. Due to the challenging natural circumstances of farming, the digital solutions are needed and found interesting. There is also already long history of collecting data and using digital solutions in agri-food sector.

The biggest possibilities are seen in smart farming, utilizing data for decision making and optimizing production, working in sustainable and effective ways, and developing new methods for production. Technology is already used for traceability and food safety and combining data can be used to create added value. Digitalisation applies to the whole food

value chain and stakeholder groups, and lots of possibilities can be seen in multidisciplinary cooperation.

Of course, digitalisation requires knowledge, education and new kind of understanding. The development has been restrained by the price of technology and weak profitability of farming. Currently there is also a problem with silo effect of data. National standards and legislations are developing. There is need for support in different fields for enhancing the possibilities of digitalisation, such as financial and educational.

SWOT analysis

Strengths:	Weaknesses:
• Quadruple helix network, strong cooperation between key actors • Good relations and trust between regional actors including enterprises and stakeholders • Jointly recognized strategic goals • Strong educational foundation • Decent level of digitalisation and readiness to adopt new technologies • SME's are used to collecting data • Very high level in traceability in food supply chain • Motivated actors	• Relatively low population, low number of actors in the region • Lower number of companies active in R&D • Modest resources of the SME's • Lack of knowledge about the actions and technology-related plans of other actors in food chain • Lack of clear long-term continuity in development of the agri-food sector • Challenges in combining data at operational level • Low attraction of the agri-food sector for new generation • Comparatively very low regional ERDF budget
Opportunities:	Threats:
• Strengthening the agri-food cluster • New and closer cooperation between research and business • Growth due to innovations • Better utilization of data • Capacity building at all levels	• Possible difficulties in funding of new projects due to change of funding programmes • Possible low implementing of actions in SME's due to lack of resources • Continuity of actions in the future is unsure

Policy instruments addressed in REGIONS 4FOOD

Interreg Europe projects are traditionally focused on having an impact on regional development policy instrument. In Finland, those upper-level policy instruments are Sustainable growth and jobs 2014-2020 - The Finland's Structural Funds Programme and The Rural Development Programme for Mainland Finland 2014-2020. Based on these national strategies, each region in Finland has drawn up their own regional strategies with regional focus points.

This Action Plan focuses on the strategies and funding sources chosen as the policy instruments addressed by the REGIONS 4FOOD -project.

Regional Strategy of South Ostrobothnia

The Regional Strategy of South Ostrobothnia 2018-2021 is a separate policy instrument with tight connection to the national Structural Funds Operational Programme. The policy instrument is financed through the Operational Programme and it defines the objectives of the Operational Programme at regional level. The objectives of the Regional Strategy of South Ostrobothnia are clearly in line with the future actions identified during REGIONS 4FOOD project.

The Thematic Objective of the Regional Strategy of South Ostrobothnia to be addressed is Target no.1 (Regenerative Local Industry and Commerce), and particularly Target 2 (Selections of Focus Areas for Commercial and Industrial Life). And the Investment Priority is Creating sustainable and efficient food systems and new bioeconomy solutions (IP 1). Measure concerned: To strengthen the national and international level of innovation of cluster specialised in food systems.

Sustainable growth and jobs 2014-2020 - The Finland's Structural Funds Programme
European Regional Development Funds (ERDF) and the European Social Fund (ESF) are funded from the Sustainable growth and jobs 2014-2020 - The Finland's Structural Funds Programme. The total budget of structural funds in Finland is 1,3 billion euros and 716 million euros is allocated to ERDF. South Ostrobothnia's share of ERDF (EU + national public funding) during 2014-2020 is almost 25 million euros.

The programme has 5 priority axes and 13 specific objectives. Priority axes no. 1. Competitiveness of SMEs and priority axes no. 2. Producing and using new information and knowledge are financed by the ERDF programme. In South Ostrobothnia region, priority axes 1. is carried out by Centre for Economic Development, Transport and the Environment of South Ostrobothnia (ELY Centre) and the second priority axes is managed by the Regional Council of South Ostrobothnia. Specific objectives of the priority axes, especially 1.1 Generating new business, 2.1 Development of the centres of research, expertise and innovation on the basis of regional strengths and 2.2 Strengthening innovation in enterprises enables achieving the aims set in the REGIONS 4FOOD project.

South Ostrobothnia – Smart & Outstanding: Strategy for Smart Specialisation

Strategy for Smart Specialisation is closely joined with the combined strategic programme of South Ostrobothnia and regional plan and to other regional programme lines. Focus points of the strategy are:
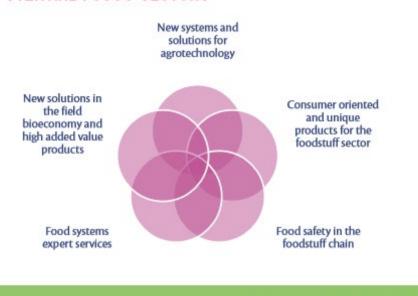
1. Sustainable food systems and the regeneration of the bioeconomy
2. Smart and energy efficient systems
3. The regeneration of service and experience production

Potential focus sectors of Sustainable food systems and the regeneration of the bioeconomy are presented below. They are also in line with the Regional Strategy and with the objectives of REGIONS 4FOOD and this Action Plan.

SUSTAINABLE FOOD SYSTEMS AND
THE REGENERATION OF THE BIOECONOMY

POTENTIAL FOCUS SECTORS

New systems and
solutions for
agrotechnology

New solutions in
the field
bioeconomy and
high added value
products

Consumer oriented
and unique
products for the
foodstuff sector

Food systems
expert services

Food safety in the
foodstuff chain

South Ostrobothnia - Smart & Outstanding. Strategy for Smart Specialisation.

Regional Rural Development Programme for South Ostrobothnia

The Rural Development Programme for Mainland Finland 2014-2020 directs the agricultural payments paid by EAFRD. In Finland, EAFRD includes funding for rural enterprises, rural development and Leader-association funding.

Regional Rural Development Programme for South Ostrobothnia is a policy instrument which is financed through the Rural Development Programme for Mainland Finland. It defines the objectives of the programme at regional level. The role of the regional rural development programme is very significant in South Ostrobothnia region since it allocates more funding to development of the regional agri-food sector compared to the Regional Strategy of South Ostrobothnia (ERDF) policy instrument.

The Regional Rural Development Programme for South Ostrobothnia has four priority axes:

1. Development of the Food Province
2. Diverse exploitation of forest resources
3. Promotion of rural entrepreneurship
4. Increase of regional attraction.

Especially axis no 1. promotes the aims of REGIONS 4FOOD-project. Development of the Food Province is based on EU's rural area development priority to promote of knowledge transfer and innovation in the agriculture and forestry economy in mixed rural areas. Food Province emphasizes development of profitable, competitive and strong agri-food sector. Especially specific objective exploitation of development work generated by innovation systems in the agrobioeconomy is in line with the actions identified in REGIONS 4FOOD-project.

The European agricultural fund for rural development (EAFRD) - The Rural Development Programme for Mainland Finland

The EAFRD or Rural Programme is the funding instrument of the CAP that supports rural development strategies and projects. The programme period is 2014-2020 and implementation of the programme will continue until the end of 2023. The program is carried out in the entire Finland except the centrums of the biggest cities. The program offers project funding for companies and associations located in the rural area. The overall amount of the public funding of The Rural Developing Programme for Mainland Finland is 8,25 billion euros.

Regional Rural Development Programme for South Ostrobothnia is a regional policy instrument which is financed through the Rural Development Programme for Mainland Finland. It defines the objectives of the programme at regional level in South Ostrobothnia. The role of EAFRD is very significant in South Ostrobothnia region since the amount of allocated ERDF funding in the region is relatively minimal. South Ostrobothnia's share of the total EAFRD budget is over 83 million euros which is approximately 58 million euros more compared to regional ERDF budget. The programme is managed by the Centre for Economic Development, Transport and the Environment of South Ostrobothnia (ELY Centre).

Other regional and national level funds and strategies

There are a variety of regional and national funding programmes that direct their funding to promoting the digitalisation of the agri-food value chain in order to maximize the growth potential of the digital economy and tackle future challenges in this sector. They are potential funding sources for future initiatives raising from the actions of this Action Plan, to gain wider influence.

Business Finland

Business Finland offers innovation activities, internationalization, investments and tourism promotion especially to Finnish SMEs. Services can also be provided to research organisations and public organisations collaborating with companies. Business Finland is a member of Team Finland-network. Business Finland has 5 main programs and 3 cross-sections. One of the cross-sections is Digital Transformation. In addition to national funding, Business Finland also funds innovation and product development projects in South Ostrobothnia region via ERDF.

Sitra

Sitra (The Finnish Innovation Fund – Suomen itsenäisyyden juhlarahasto) operates under the Parliament of Finland. According to Sitra, "Sitra is an accountable and independent future-oriented fund that is influential nationally and internationally and acts as a think tank, promoter of experiments and operating models and a catalyst for co-operation. In being accountable to Parliament, Sitra's future-oriented work is funded with returns on investments based on endowment capital received originally at the behest of Parliament. Sitra is building a successful Finland for tomorrow". Sitra's strategic themes for 2021-2024 are Sustainability solutions, Fair Data Economy and Democracy and Engagement. Sitra starts and implements project related to these themes with private, public and third sector operators.

Contribution of the Action Plan to the improvement of the policy instruments

The main contribution of the Action Plan to the policy improvement is by new projects to be financed through the regional funding of ERDF and EAFRD. This is a concrete way of policy improvement, agreed with the managing authorities and in line with regional resources and objectives. The Action Plan has also potential for remarkable influence on the regional development through strengthening the innovation level of agri-food cluster, quadruple helix operations and promoting the know-how and innovation environments for new sources of growth in the different components of food systems and their interfaces. The main objective is the number of new projects financed as a result of the interregional and intraregional learning process (4). These new projects in this Action Plan also aim to generate further development in the theme and thus more effect to the policy instruments in the future by emphasizing the project objectives and generating future actions.

There is also an updating of both addressed policy instruments going on, and there is a good possibility to have additional regional influence through this process. SeAMK plays a crucial role in both planning and implementing the Regional Strategic Programme and the Rural Development Programme for South Ostrobothnia, as it is the only university in the region and a remarkable R&D actor. SeAMK also plays an important role in planning and updating these particular policy instruments as part of working groups organised by the policy responsible organisations. Responsible persons from other organisations are also part of the regional stakeholder group of REGIONS 4FOOD.

In cooperation with other EU projects, there is an aim to present the objectives and outcomes of REGIONS 4FOOD to the key working group of updating the Regional Strategic Programme in a common workshop during spring 2021 to have additional influence.

Outcomes of the regional mappings of REGIONS 4FOOD in South Ostrobothnia

During the 2nd semester of the project in spring 2019, the partner regions of REGIONS 4FOOD implemented regional mappings for identification of barriers, needs, relational capital and good practices related to the digitalisation of the agrifood sector, as well as creation of catalogues for data and technology usage in the priority value chains in the agri-food sector of the region. The methodology is further explained in PART III of this document.

The results of the mappings formed the base for the Action Plan, as they indicated the current situation and future needs of the sector; insights on how to design efficient regional policies promoting the digitisation of the agrifood value chain; and thus, what the Action Plan should focus on. The results of South Ostrobothnia are summarized below.

Data-Tech Catalogues results

The value chains included in the Data-Tech Catalogue in South Ostrobothnia were poultry meat, pig meat and milk products. Since there are nationally important factories producing food in these value chains in South Ostrobothnia, they cover combined estimated as much as 80 % of the regional market share of all agri-food value chains.

The catalogue assessed e.g. data utility, data usage, traceability, technology maturity, interoperability and technical surveillance.

Most relevant results for South Ostrobothnia considering data were exceptional traceability, where over 75 % of the collected data was linked with other phases of the value chain through unique identifiers: 38,5 % with one other phase, and 37,5 % with two or more phases of the value chain. Also data quality was very good, 88,3 % of the answers indicated "no different units/data missing/different data sources" in value chain. Data in the value chains was also used mostly to both processes and strategic decisions (42,0 %), and additionally high percentages to either of them. Data was mostly stored on internet privately (user & password), 76,9 %.

Catalogue diagnosis report points were 5/5 for traceability, 4/5 for both data utility and interoperability and 3/5 for data usage, technology maturity and technical surveillance. Diagnosis reliability score was 4,79/5.

Recommendations and directions of further improvements raised from the process:

- Improvements are targeted mostly to SME's, who have significantly more needs in digitalisation than bigger companies.
- Lots of data is being collected – more could be analysed for advantage
- Improving technical ability to combine data from different technologies would enable better utilizing of technologies already in use, and analysing bigger entities for example in farming
- Traceability and well-organized collecting of data are strengths that should be utilized more
- Further education and cooperation to improve the result

Barriers and needs related to the digitisation of the agrifood sector

The mapping operated in five different dimensions, which are the key enablers of the digitisation process: legal, technical, organizational, economical-financial and educational. The mapping included a national level document review, surveys and semi-structured interviews with key actors. The regional results were finalized with the regional stakeholder group of REGIONS 4FOOD.

Key needs identified:

Multidisciplinary cooperation throughout the agri-food sector and key stakeholders of the sector. (Organizational)

Ability to combine data from different technologies. (Technical)

Education for farmers and other SME's how to use new technologies and get the best possible benefit from it. (Educational)

Knowledge about best new technologies, advantages and usefulness. Useful for both RDI and farmers. (Educational)

Data ownership, understanding what could be done with open data, developing cooperation. (Legal)

Key barriers identified:

Lack of knowledge throughout the agri-food sector (Educational)

Inoperability of technologies (Technical)

Financial challenges of SMEs to purchase new technologies (Economic/financial)

Low interest towards agri-food industry for the digitalization experts and new generation (Organizational/educative)

Fragmented sector, lack of knowledge about what others are doing (Organizational)

Conclusions:

As main conclusions from the key barriers and needs presented above, the following targets were distinguished: closer cooperation of the actors in agri-food sector; multidisciplinary cooperation with ICT-sector; closer cooperation of RDI and enterprises of these sectors; education for new technology; improving agri-food sector attractiveness for new generation.

Relational capital related to the digitisation of the agrifood sector

Part of the mapping was the identification of the main actors, skills and commitments considering relational capital related to the digitisation of the agrifood sector. The key actors and their roles identified:

- SeAMK: higher education throughout the food value chain and technology, active RDI
- Frami Community: local network in RDI of agri-food sector, significant wider networks and knowhow: University Consortium of Seinäjoki, Into Seinäjoki, Natural Resources Finland (LUKE)
- Large local companies of food industry: pioneers in traceability, common platforms with the rest of the food supply chain
- Technology & ICT- companies: offering solutions, cooperating
- Local lead-users in agriculture: leading the way, teaching and encouraging others by their example

Main conclusions and future needs considering the relational capital related to the digitisation of the agrifood sector:

This is in line with other parts of the mappings and supports the development of the Action Plan.

Policy recommendations related to the digitisation of the agrifood sector

In the process of the mappings, also policy recommendations were collected from the viewpoint of agri-food sector digitalisation. In South Ostrobothnia, the actors and stakeholders emphasized the importance of the following possibilities for policy recommendations:

- Encouraging actors of the agri-food sector to closer and multidisciplinary cooperation and networking, creating funding / financing projects to help this happen
- Education for SME's to a) learn the possibilities of new technology – what technology is available and actually useful, b) technical guidance on how to use it to get all the benefits
- Developing the image of modern agri-food sector - gaining new knowhow and experts from ICT/technology sector and new generation
- Developing clear, common direction for agri-food sector digitalisation
- Allocating R&D funds specifically to agri-food sector digitalisation

Lessons learnt from other REGIONS 4FOOD partners

The interregional learning process is an important part of the project. The most relevant lessons learnt considering influencing the addressed policy instruments by the Action Plan, were the good practices visited that were in line with the regional barriers and needs. They considered developing the regional agri-food cluster, education and know-how in agri-food sector digitalisation and projects combining data from different sources.

In addition to the study visits and peer review process leading to this Action Plan, which are further examined under each action (PART IV), the process has offered additional interesting ideas, lessons and good practices. The target of policy improvement also aligns the Action Plan, and additional lessons learnt might be realized later on in more general frame. Examples of these additional Good Practises, that did not take shape as an action in this Action Plan, but include valuable lessons, were learnt in e.g. Pays de la Loire, a mobile app for traceability, to create added value from traceability and branding it: Monagriculteur.coop. Also, Weenat Weather station and mobile app was seen as a useful target solution for a stakeholder, that was not foreseen in the project. Educational Good Practices of Andalusia and Emilia-Romagna considering agri-food sector digitalisation had lots of similar goals and activities as education of SeAMK. These include even more potential for learning and cooperation in the future, than taking shape yet in this Action Plan. Also fruitful contacts between other stakeholders were made during study visits.

Interesting lessons learnt are connected to the interregional meetings as well, where we have been able to see the differences and similarities in regional needs, challenges, situations and ways of work to develop the regional agri-food clusters and learn from each other in more informal ways. In South Ostrobothnia, it has for example offered a sight to different ways of developing agri-food clusters with more resources, but at the end, similar other challenges. Importance of the existing cooperation and trust have accentuated.

Capacity building at all levels is one of the aims of REGIONS 4FOOD, and through interregional and regional cooperation, communication and different ways of participating the project, better understanding the current state of digitalisation in the agri-food sector is an important lesson learnt at several levels.

PART III – METHODOLOGICAL APPROACH

This section presents the common strategy that partners have implemented although with regional specificities to address the challenges of this project.

Challenges/needs addressed

Data has become a key asset for the economy and our society. "Big Data" is leading technological innovation and the development of new tools and professional skills, so it has become a new challenge and also a need to tackle.

Generating value at the different stages of the data value chain will be at the heart of future knowledge economy, and to achieve this, "Big Data" has to become a major tool for fast data processing and analysis, which will help the decision-making with the aim of increasing productivity and profitability.

Within the agri-food value chain, the large volume and diversity of data generated requires designing and implementing specific integration and management procedures that let us take full advantage of the new economic opportunities (security, traceability, customer services, quality, etc.) based on information, data and cognitive technologies, and promote innovation-driven growth, where "Big Data" will play an essential role.

As a result of the participation of relevant regional authorities, the research sphere, ICT and agro-businesses, and civil society in the exchange of experience process, project partners have elaborated 7 regional Action Plans (1 per partner/region) which include measures that improve the technology transfer, close the gap between research and markets, and enhance innovation opportunities and smart specialisation areas.

The project also contributes to addressing the major challenge to digitisation which is to connect directly producers with consumers, and also agro-businesses with tech sector companies and the academia 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:

  o Needs, barriers, relational capital and good practice related to the digitisation of the agri-food sector.

  o Catalogue of data and technologies in the agri-food sector.

- Exchange of experiences and good practices

The results of these mappings were presented, shared and discussed within the framework of the interregional seminars organised jointly with the steering committee meetings.

The exchange of good practices has been carried out through study visits, where both project partners and stakeholders participated. Prior to the visits, project partners had identified among the good practices proposed, the ones that were most interesting to them in terms of their capacity to improve the policy instrument tackled.

- Preparation of Action Plans draft

Following the template prepared by the Lead Partner, the first Action Plans draft included the lessons learnt from previous stages, the interregional activities, and the learning at

all levels. Project partners also met with their stakeholders to assess the results of these previous works and contribute to the elaboration of their Action Plan draft.

- Peer-review

The overall objective of the peer reviews was that the partner owner of the good practice inspiring the actions of another partner Action Plan draft evaluated it, taking into consideration the partner context on innovation strategies. It must be highlighted that 27 online (due to COVID-19) peer reviews have been organised from June to November 2020. 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 specific action(s).

Second, partners sent to peer the Action Plan draft with the instructions on what to review, that is, the whole Action Plan or just specific action(s).

Third, the peer identified the key actors and stakeholders involved in the concerned good practice.

Four, once these agents read the draft Action Plan, both project partners met online for ideas exchanging, the document assessment, and if needed, for further improvements to reach the final objective: improving the partner policy instrument tackled by the project.

Finally, the peers drafted a review report with suggestions to improve the draft Action Plan reviewed.

These suggestions were discussed with the stakeholders and 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: Developing the regional agri-food cluster

In this Action Plan, we refer to cluster as defined in EU S3 Platform pages' S2E_Fiche_Clusters -document, Version: June 2016: CLUSTERS Definition and context Implementation:

"The term business cluster, also known as an industry cluster, competitive cluster, or Porterian cluster, was introduced and popularized by Michael Porter in The Competitive Advantage of Nations (1990). Cluster organisations are public-private partnerships.

- *Clusters are geographic agglomerations of companies, suppliers, service providers, and as-sociated institutions in a particular field, linked by externalities and complementarities of various types.*
- *Cluster initiatives are organised efforts taken by actors in a cluster to increase the cluster's growth and competitiveness.*
- *Cluster programmes are organised efforts taken by government to increase the growth and competitiveness of clusters in its constituency."*

In South Ostrobothnia, the regional innovation ecosystem / agri-food cluster has been developed actively during the years, and several cluster projects have been implemented. Branding the region as Ruokaprovinssi (Food Province) has started in the 90's, and beginning ca. 2010, the cluster has been actively developed with cluster programme and initiatives. There is no active cluster programme in agri-food sector at the moment, and the work is based on the active cooperation and initiatives of the public and private actors of the sector. The new innovation ecosystem agreement "Smart Green Growth" supports this work and brings possibilities for further development.

Innovation community of Frami Campus and Food Forum was also presented as a Good Practice in REGIONS 4FOOD -project, where the emphasis was on the tight cooperation between organizations that continues beyond funding. Actions developed during regional development projects are continuing as part of organizations own activities, and the region has gained national visibility as Food Province of Finland. The Good Practice was seen

suitable especially for small regions with limited resources, where this practice can be considered as potential model of cooperation of key actors, solutions of RDI and multidisciplinary education for building the cluster. Cooperation of key actors is remarkable strength for the region, and common goals and personal contacts are important for developing the sector together. Win-win thinking helps everyone, and boosts innovativeness.

Next step is to strengthen the knowhow and visibility and specify the operating model to support the sector best way possible. In this, a common roadmap, a concrete physical operating environment, networks and new resources are needed. Development of the regional agri-food cluster, Food Province, is in top priorities in the regional ERDF and EAFRD programs.

Relevance to the project & background

Developing the regional agri-food cluster was emphasized already in the application form of the REGIONS 4FOOD project in both project level and regional level. Maximizing the innovation potential of all actors of the agri-food value chain is one of the key issues addressed in the project.

Of the project level main outputs and results, the following consider this Action:
- Reinforcing cooperation between research and business sectors and therefore, to improve the economic exploitation of R&D results.
- Better exploiting ICT's potential and deliver innovation to food industry and hence, smart progress and growth.
- Support capacity-building at all levels

Additionally, in project level operational objectives the Action is connected to:
- Reduce the distance between the world of research and companies, so that knowledge is oriented to a better exploitation of market opportunities.
- Interconnect regional innovation ecosystems and bring together the "quadruple helix" of actors involved at different stages in the food value chain.
- Make visible the capacities and strategic lines that are being investigated and may be of interest to the agri-food industry.

- Generate added-value from existing knowledge through innovation and smart specialisation in the agri-food industry.
- Promote public-private governance mechanisms to link capacity building with technological offer and agri-food industry and consumers demands.

In South Ostrobothnia, the measure concerned in the REGIONS 4FOOD -project was to strengthen the national and international level of innovation of cluster specialised in food systems. Also the need to find solutions that requires co-operation between the stakeholders from private, public and academic sectors to promote business activities involving users, companies, researchers and public operators; and promote the know-how and innovation environments for new sources of growth in the different components of food systems and their interfaces was stressed.

Concerning the improvement of the policy instrument addressed, it was also noted that one of the aims of the Regional Strategic Programme is to promote "Sustainable and Efficient Solutions for Food Systems" through international funding. Strengthening the regional agri-food cluster; promoting activities involving researchers, public operators and companies; and promoting the know-how and innovation environment related to food systems were also highlighted in the connection of how REGIONS 4FOOD project brings improvements in terms of in-depth cooperation and improved governance to South Ostrobothnia, clearly linked to the South Ostrobothnian Regional Strategy.

These objectives were supported by the regional mappings, where the most important need for developing the agri-food sector digitalisation was "Multidisciplinary cooperation throughout the agri-food sector and key stakeholders of the sector. Strengthening the Ruokaprovinssi (Food Province) –cluster also in digitalisation. Key point behind this is to have better knowledge what other actors are doing, and to develop the digitalisation of food value chain together. Wider scale of actors is needed, especially from technology/ICT-sector. In key barriers, they were correspondingly "Fragmented sector, lack of knowledge about what others are doing". It can be concluded that this action has great importance in the region, where several measures have been taken to build the cluster to support this key field, strongly further proceeding.

In REGIONS 4FOOD -project and in Traceability & Big Data network, developing regional clusters has focused with good reason mostly on digital innovation hubs (DIH's). South Ostrobothnia can learn a lot about these Good Practices. Becoming a DIH itself is not possible for the region at the moment, since there are national scale actions and coordination going on regarding DIHs in Finland. However, cooperation with DIHs in regional, national and interregional scale is very important, and implementing the concrete actions where suitable.

The Good Practices to inspire and implement Action 1 are:
- The Andalusian Agrotech Digital Innovation Hub
- The ClustER Associations in Emilia- Romagna - ClustER Agrifood
- Technocampus Alimentation

The Good Practices were familiarized during study visits to Pays de la Loire on May 2019, Andalusia on September 2019 and Emilia-Romagna on October 2019 with stakeholders and regional project manager of REGIONS 4FOOD in South Ostrobothnia. All the potential Good Practices were reported and discussed further in the regional stakeholder meetings, compared to the target of policy improvement and regional needs, as well as considered the possibilities of execution in the region. They were also discussed in the staff meetings in SeAMK. Initial plans of the action were included in the draft Action Plan and proceeded to peer review process with The Andalusian Agrotech Digital Innovation Hub and The ClustER Associations in Emilia- Romagna - ClustER Agrifood. Involved in the online peer review were also R&D manager of SeAMK Food and other R&D actors. Important feedback was received, and the action was further developed in the process.

Good Practices for Action 1: Developing the regional agri-food cluster	The Andalusian Agrotech Digital Innovation Hub	The ClustER Associations in Emilia- Romagna - ClustER Agrifood	Technocampus Alimentation, Pays de la Loire
Need in South Ostrobothnia potentially addressed by this GP	Developing the regional agri-food cluster, multidisciplinary cooperation throughout the agri-food sector and key stakeholders of the sector. (Organizational)	Developing the regional agri-food cluster, multidisciplinary cooperation throughout the agri-food sector and key stakeholders of the sector. (Organizational)	Developing the regional agri-food cluster, multidisciplinary cooperation throughout the agri-food sector and key stakeholders of the sector. (Organizational)
Potential for implementing /inspiration	Very important benchmark and possible future path for developing the agri-food sector cluster in South Ostrobothnia - Financing, organizing and services	Very important benchmark and possible future path for developing the agri-food sector cluster in South Ostrobothnia - Financing, organizing and services	Interesting focus of agri-food actors and business services, many similarities in actors and goals to our campus and cluster
Learning process	Documents provided, Study visit: Andalusia, September 2019 Peer review on Action Plan draft, online September 2020	Documents provided, Study visit, Emilia-Romagna, October 2019 Peer review on Action Plan draft, online September 2020	Documents provided, Study visit, Pays de la Loire, May 2019

Action 1 is divided to two sub-actions that elaborate Action 1 from different angles: feasibility study for establishing Food Technology Knowledge and Competence Centre and producing common strategy for Food Province.

ACTION 1.1. Food Technology Knowledge and Competence Centre

Nature of the action

In developing the regional agri-food cluster there is a need for an organizational centre, physical premises and concrete services. Food Technology Knowledge and Competence Centre will offer these, and work in many respects like a Digital Innovation Hub would, but in a way that is currently more realizable aim for South Ostrobothnia's agri-food sector to enhance national and international cooperation, knowhow, digitalisation and innovation. The centre will be developed through this action in international scale and in strong cooperation with the quadruple helix to meet the needs of the agri-food sector considering both digital and other development and support.

The Action includes preparation of application and applying project funding for the development of the regional agri-food cluster. Development will be done by preparing establishment of the regional Food Technology Knowledge and Competence Centre. The aim of this feasibility study project is to further identify the operational and economic framework and conditions that will fully enable operation of a nationally significant Food Technology Knowledge and Competence Centre.

The project will include following sub-actions:
- Current state analysis of the knowhow of food technologies together with the SMEs and key operators
- Identifying the prerequisite for operation, effectiveness and growth potential together with agri-food SMEs and other stakeholders
- Strengthen the commitment among RDI and agri-food sector organizations
- Create a clear roadmap and further steps for establishing the Food Technology Knowledge and Competence Centre
- Define the organisational and operational limits and engage key networks both nationally and internationally

As the result of the project, the regional agri-food cluster will be significantly developed and cooperation model between quadruple helix actors of the agri-food value chain and the centre will be formed. In addition, the project will map out new digital solutions and opportunities for the agri-food sector and research institutions. It will offer new innovation-driven opportunities for participating SMEs and larger agri-food sector companies.

Operational model of the Food Technology Knowledge and Competence Centre will be formed during the project. Continuity will be secured by future initiatives applied from ERDF.

Stakeholders involved

The main responsible organization of the action is Seinäjoki University of Applied Sciences (SeAMK). SeAMK will apply for funding and manage the project. Other important core operators are the 18 municipalities in South Ostrobothnia region which later on are the indirect beneficiaries and possible financers of the centre, the Regional Council of South Ostrobothnia and RDI organizations e.g., Foodwest Ltd, University Consortium of Seinäjoki (UCS) and Natural Resources Institute Finland (LUKE). These organizations research and explore new food technologies and form the triple helix base for the regional agri-food cluster.

The key stakeholders are regional SMEs (Juustoportti Ltd, Kyrö Distillery Company, Pirjon Pakari Ltd) and leading national companies (Altia Ltd, Valio Ltd, Atria Plc, HKScan, Fazer, Sinebrychoff). The stakeholders will bring out their needs and they can also offer development pilots and projects to the centre to resolve. Needs of the stakeholders will be constantly collected during the project.

The key networks deepen the share of knowledge and international cooperation. The recognized, international cooperation networks of the project are Aarhus University, Danish Food Cluster, but also Smart Specialisation Platform, Smart Sensors 4 Agri-Food and EIT FOOD. The network will grow as the project progresses.

Timeframe

The application was prepared and applied early 2021. The project has received positive financial decision at the end of February 2021. The project started 15.3.2021 and will end 31.10.2021.

Indicative costs

Preparing the application was managed as part of Seinäjoki University of Applied Sciences' own operations. The funding for the project is 58 349 €. As an output of this project, actions are expected to continue and be implemented in a larger regional project with separate costs applied from ERDF.

Indicative funding sources

The project funding is applied from the Regional Council of South Ostrobothnia as AKKE-funding (national funding for sustainable growth of the regions). After the feasibility study, actions are expected to continue in a larger regional project with funding applied from ERDF or European Union's Recovery and Resilience Facility, RRF (the Facility, part of NextGenerationEU) which is regionally allocated by the Regional Council of South Ostrobothnia. This is the larger scale goal of the action.

Output and result indicators

Outputs of the action are visible in the development of the regional agri-food cluster and thus the whole agri-food sector of the region. As the action aims to providing new resources for the development, it would enable concrete steps towards the next level of the regional agri-food cluster. As concrete outputs with the aim to establish the Food Technology Knowledge and Competence Centre, the action aims to specifying the regional agri-food cluster operating model (written plan) and strengthening the international scale knowhow, competence profile, visibility and international cooperation (visibility, contacts, cooperation).

Concrete outputs and results of the action:
- Interviews for companies in order to set goals and map out point of views. Target: 3 leading companies, 25 SMEs, 2 financier and umbrella organizations, 4 development organizations
- Roadmap document on establishing the Food Technology Knowledge and Competence Centre, (target: 1)
- A larger scale project application to ERDF or RRF (target: 1)

ACTION 1.2. Food Province 2030

Nature of the action

As stated before, agri-food sector is crucial for South Ostrobothnia, and developing the region as Food Province (Ruokaprovinssi) is in top priorities in the regional policies related to food sector. Several different actions and development projects have taken the Food Province forward over the years. However, there has been distinguished a need for clearer common direction and vision on how to develop the regional agri-food cluster to the next level. With this action, the Food Province's strategy will be drawn up and lined considering years 2023-2030. The regional agri-food cluster development will be more targeted, clear and coordinated.

The project *Food Province 2030 - keys to success from field to fork* seeks a common will and direction for development actions. These are formed through a broad participatory process and co-creation involving the quadruple helix -network of key actors in the agri-food sector and consumers. The project will also map the existing agri-food cooperation forums and search for possibilities to streamline the operations of the sector. The first steps of implementation of the strategy will be entrusted and delegated to operators during the strategy process.

The project will be implemented through four work packages:
1. Trace Food Province backgrounds, upcoming trends and existing agri-food sector cooperation forums, creating connections to other national agri-food regions and networks
2. Activate and involve the key operators to the strategy
3. Compile the strategy
4. Produce strategic communication materials

As result of the project, the first Food Province development strategy will be formed and published in close cooperation with the regional agri-food sector. In the upcoming years, the strategy will promote the development of SME's capacity, guide forming of new national and international networks and co-operations, support investments and offer new development platforms both agri-food sector SMEs and public operators. The actions of the strategy are expected to continue and be implemented in larger regional project applied from EAFRD.

Stakeholders involved

The project will be implemented in strong cooperation between South Ostrobothnia Rural Women's Advisory Organization (ProAgria Rural Advisory Services South Ostrobothnia) and Seinäjoki University of Applied Sciences.

The project has a steering committee which guides the project, supports, and gives fresh points of view to the realizers. The steering committee consists of the key SMEs in the agri-food sector, BRAHEA Centre for Training and Development (University of Turku), Regional Council of South Ostrobothnia, University Consortium of Seinäjoki (UCS), INTO Seinäjoki Business Development, and Center of Development, Transport and the Environment of South Ostrobothnia (financier of EAFRD).

The project conducts multiple strategic workshops to the quadruple helix network and the key stakeholders of the sector: SME's, primary producers, HORECA, food related event organizations, trade and wholesale sector, tourism operators, agri-food sector developers and RDI organizations and consumers.

Timeframe

The Food Province 2030 - project timeframe is 1.1.2021-31.12.2022. During 2021, first phase includes research to the Food Province backgrounds, other food regions in Finland and upcoming trends in agri-food sector. In the second phase actors will be involved to the strategy process, data will be collected and bid strategic lines will be formed together with the key stakeholder groups. The third step starts in the beginning of 2022 and it consists of concrete strategy compiling process. Fourth phase includes production of multilingual strategic materials and strategy communication. The strategy will be published in Autumn 2022.

Indicative costs

The combined costs of the Food Province 2030 project are 200 000 €. This includes personnel costs, purchases, rents, other costs, and deferred compensation expenses.

Indicative funding sources

The project is completely funded by EAFRD.

Output and result indicators

- 120 interviews to companies of the food chain in order to map out point of views concerning the Food Province strategy, vision and mission.
- Food Province strategy 2022-2030 document, which guides the development of the regional agri-food cluster (Y/N)
- A larger scale project application to EAFRD which takes the strategy into action (target: 1)

ACTION 2: DigiFarmi-project: Education for farmers in digitalisation and new technologies

Relevance to the project & background

Education and knowledge play a central role in addressing the issues of digitalisation in the agri-food sector. It also appears in the project level outputs and results of REGIONS 4FOOD as enabling better exploiting ICT's potential, smart progress and growth, and especially supporting capacity building at all levels. It is clear, that knowhow is a key element in digitalisation of the agri-food sector.

The Action implements several main themes of the Regional Rural Development Programme for South Ostrobothnia, e.g.: developing profitable and competitive food production, sustainable use of natural resources, utilizing appropriate technology, new innovations, networks. Also, the Action implements key elements of the Regional Strategic Programme, as promoting the know-how and innovation environment related to food systems.

The action has also clear link with the regional mappings, where knowledge and education were raised to great importance. In the five key needs were both "Education for farmers and other SME's how to use new technologies and get the best possible benefit from it." and "Knowledge about best new technologies, advantages and usefulness. Useful for both RDI and information for farmers, who easily stay with the old machinery, if they are not sure." Correspondingly in the barriers of agri-food sector digitalisation: "Lack of knowledge throughout the agri-food sector -> doubts, attitude". In these the focus is on the farmers who are already working, not especially in the future professionals.

Education in agri-food sector digitalisation has been well presented in the Good Practices of the project. There were three very inspirational Good Practices for South Ostrobothnia:

- Master "DigitalAgri" Universities of Córdoba and Málaga, Andalusia
- Master in Digital Agriculture and Agri-Food Innovation, University of Seville, Andalusia
- ITS Tech & Food, Emilia-Romagna

These Good Practices included several inspirational viewpoints and experiences to consider. In South Ostrobothnia, coherent to the policy instruments targeted in REGIONS 4FOOD and to the barriers and needs emerged, Action 2 includes additional education for farmers, that does not lead to degree. The Good Practices offered important inspiration and details on study subjects, learning environments and especially cooperation with agri-food enterprises. Also, since the responsible actors of the project are educational institutions who aim to bring together teaching and RDI, this project can have additional effect on degree programme studies. In the future it is also possible to realize more similar learning packages and lines of study.

The Good Practices were familiarized during study visits to Andalusia on September 2019 with stakeholders Tapio Seppä-Lassila (Into Seinäjoki Business Development) and Anu Katila (Head of Degree Programme in Agriculture, SeAMK) and to Emilia-Romagna on October 2019 by the stakeholders Pia Kattelus (Regional Council of South Ostrobothnia) and Juha-Matti Mäntykoski (Wapice Ltd.) and regional project manager of REGIONS 4FOOD in South Ostrobothnia Soila Huhtaluhta (SeAMK) in both study visits. The learning process continued in the regional stakeholder meetings, where the Good Practices were reported and discussed further, compared to the target of policy improvement and regional needs, as well as considered the possibilities of execution in the region. Further discussions were also in internal meetings in SeAMK. Initial plans of the action were included in the draft Action Plan and proceeded to peer review process, where important feedback was received from all the Good Practices. Especially important was the emphasis of the cooperation with technology companies, which is also taken into account in this project.

Good Practices for Action 2: DigiFarmi-project	Master "DigitalAgri" Universities of Córdoba and Málaga and Master in Digital Agriculture and Agri-Food Innovation, University of Seville	ITS Tech & Food, Emilia-Romagna
Need in South Ostrobothnia potentially addressed by this GP	Education for farmers and other SME's how to use new technologies and get the best	Education for farmers and other SME's how to use new technologies and get the best

	possible benefit from it. (Educational) Knowledge about best new technologies, advantages and usefulness. (Educational)	possible benefit from it. (Educational) Knowledge about best new technologies, advantages and usefulness. (Educational)
Potential for implementing /inspiration	Education in agri-food sector digitalisation Similar goals and activities as education of SeAMK Potential learning and cooperation	Education in agri-food sector digitalisation Similar goals and activities as education of SeAMK Potential learning and cooperation
Learning process	Documents provided, Study visit: Andalusia, September 2019 Peer review on Action Plan draft, online September 2020	Documents provided, Study visit, Emilia-Romagna, October 2019 Peer review on Action Plan draft, online September 2020

Nature of the action

DigiFarmi -project aims to increase awareness among farmers about new agricultural technology and improve their capabilities as users of new technology. As a result of the project, farmers who participated in training events understand more about the technology, digital capabilities, and the potential for using data, and are ready to disseminate information to other farmers.

The educational activities are mainly in three dimensions: small groups for peer-to-peer learning, field events for learning and testing machinery, and seminars for larger scale dissemination.

Field events are pragmatically showcasing the activities of certain technologies, particularly focusing on control technology, digital capabilities, and data usage. Machinery for field events is sourced either from advanced farmers, project partners or stakeholders, in particular agricultural machinery companies. As emphasized in the Good Practices, involving companies to cooperate for the availability of new technology is important.

Cooperation with companies is also possible in seminars, that are hosted to maximize the learning potential.

In general, the project aims to encouraging the farmers to take the next step in digitalisation. This requires knowledge about the existing digital solutions for farming; practical examples and possibilities to test the technologies; support, guidance and help; dialogue between companies and end-users. Promoting digitalisation also aims to enhancing the competitiveness of the agri-food sector, where new technology plays an important role. DigiFarmi-project is easy to disseminate to other Leader-areas after successful execution.

Stakeholders involved

The implementing actors are Vocational Education and Training Institute Sedu and Seinäjoki University of Applied Sciences (SeAMK).

Key stakeholders are the participating farmers of the Leader area Liiveri: municipalities Ilmajoki, Seinäjoki and Jalasjärvi, as well as agrotechnology companies (e.g. Hankkija, Dataväxt, Junkkari); The Central Union of Agricultural Producers and Forest Owners (MTK); Centre for Economic Development, Transport and the Environment of South Ostrobothnia (EAFRD funding).

Timeframe

The project time is 1.1.2021 – 31.1.2022, during which all the project activities will be carried out simultaneously and considering e.g. destrictions related to Covid-19 pandemic.

Indicative costs

Budget for DigiFarmi -project is 68 000 €

Indicative funding sources

Project is funded from local Leader-association funding (EAFRD).

Output and result indicators

Output and result indicators of the action are connected to project activities. The outputs include enhancing the knowledge of the local farmers about digital solutions for farming, and their readiness for using them.

Result indicators:

- Number of demo-events (target: 8)
- Number of project seminars (target: 4)
- Number of participants in project activities (target: 120)
- Number of companies involved (target: 6)

ACTION 3: Developing utilization of data in the food value chain

As stated in the REGIONS 4FOOD project, data has become a key asset for the food industry. There is a need for specific integration and management procedures to make the most of new economic opportunities based on information, data, and cognitive technologies. Large volume and diverse nature of food value chain data is important issue to address by developing data management and analytics. This will also generate added value and efficiency at the different stages of the data value chain. At the same time, it calls for facilitating greater connectivity, collaboration, and data exchange between all actors in the food value chain.

The Action implements several main themes of the Regional Rural Development Programme for South Ostrobothnia, e.g.: developing profitable and competitive food production, utilizing appropriate technology, new innovations, and networks. The Action also implements key elements of the Regional Strategic Programme, as promoting the know-how and innovation environment related to food systems and promoting sustainable and efficient solutions for food systems. Sustainability has headline level emphasis in both policy instruments targeted.

In the regional mappings the themes of combining data emerged from several angles. The ability to combine data from different technologies to enable better utilizing of technologies and analysing bigger entities for example in farming, was identified as one of the main needs. Also data ownership, understanding what could be done with open data and developing cooperation was emphasized. As barriers, inoperability of technologies was identified. On the other hand, in the data-tech catalogue traceability was seen as a strength, that should be utilized more by e.g. data management. The need for utilizing data reached the whole food value chain.

From this angle, there were several suitable Good Practices available in REGIONS 4FOOD. Combining data from different sources and utilizing it for decision making in agri-food sector has been well presented in the Good Practices of the project. The following Good Practices had very interesting points that target the issue in their own fields:

Emilia-Romagna:
- ALADIN; measures the circumstances, coordinates services, formulates suggestions, translates it into commands, and sends it to the user through a mobile application
- MO.RE.FARMING; platform for the management of data and information for decision making in a more efficient and rapid way
- AGRO.BIG.DATA.SCIENCE: data collection and analysis
- IRRINET integrating systems and information from various actors.

Andalusia:
- Geoportal: regional open data portal to combine fragmented data, enable utilizing data and enhancing information and transparency
- RAIF: collects and combines data from various sources, analyses need for actions
- Fiware Zone: offering an open data platform, combining data from various sources to be more manageable, working as "system of systems"

The Good Practices were familiarized during study visits on September 2019 in Andalusia and October 2019 in Emilia-Romagna with stakeholders Tapio Seppä-Lassila (Into Seinäjoki Business Development) and Anu Katila (Head of Degree Programme in Agriculture, SeAMK) and to Emilia-Romagna on October 2019 by the stakeholders Pia Kattelus (Regional Council of South Ostrobothnia) and Juha-Matti Mäntykoski (Wapice Ltd.) and regional project manager of REGIONS 4FOOD in South Ostrobothnia Soila Huhtaluhta (SeAMK) in both study visits. After that, the Good Practices were reported and discussed further in the regional stakeholder meetings, compared to the target of policy improvement and regional needs, as well as considered the possibilities of execution in the region. The final Actions inspired from these Good Practices were included in the Action Plan. Draft actions went through peer review process, where important feedback was received to develop the action.

Good Practices for Action 3: Establishing Regional Data-Cooperative for farmers	Fiware Zone, Andalusia	Projects including combining data: ALADIN, POSITIVE, MO.RE.FARMING, AGRO.BIG.DATA.SCIENCE, IRRINET, Emilia-Romagna
Need in South Ostrobothnia potentially addressed by this GP	Ability to combine data from different technologies. (Technical) Data ownership, understanding what could be done with open data, developing cooperation. (Legal)	Ability to combine data from different technologies. (Technical) Data ownership, understanding what could be done with open data, developing cooperation. (Legal)
Potential for implementing /inspiration	Potential answer to the regional need/barrier of combining data from different technologies Combining data, open data portal," System of systems"	Potential answer to the regional need/barrier of combining data from different technologies Combining data, open data portal
Learning process	Documents provided, Study visit: Andalusia, September 2019 Peer review on Action Plan draft, online September 2020	Documents provided, Study visit, Emilia-Romagna, October 2019

Action 3 consists of two sub-actions that influence the theme of Action 3 from different angles: establishing regional data-cooperative for farmers, and from the other end of the food value chain: combining data to reduce surplus food in public kitchens.

ACTION 3.1: Establishing Regional Data-Cooperative for farmers

Relevance to the project & background

As stated above, the need for "system of systems", common agri-food dataspace was clear for proceeding with the action of combining data from farming and their stakeholders. When cooperation with the national Cinia ValueNet came possible, it was easy to see based on the regional needs and Good Practices, especially Fiware Zone, that this would offer a solution to proceed. SeAMK has been active in building cooperation and implementing activities in the region that answer to the need emerged in the mappings and the lessons learnt in the interregional learning process. Fiware Zone offered also valuable viewpoints in the peer review process of the draft Action Plans in autumn 2020.

Nature of the action

To develop the possibilities of combining data from different sources in agri-food sector and utilizing this data for added value, Action 3 includes preparing an application and applying for ERDF funding for establishing regional data cooperative. Project is strongly connected to existing Cinia ValueNet -network and digital environment, where cooperation is seen valuable. Cinia ValueNet is a digital service that combines the existing and new digital systems and their data. It considers for example IoT-systems, FMIS's, digital markets, analytic services etc., and is based on The European project GAIA-X . Simultaneously with Action 3.1., there is a national project that's funded from Business Finland to develop the food value chain cooperation around Cinia ValueNet.

In Action 3.1., this larger project is backed up by establishing a regional data cooperative, to engage and support farmers and help them get added value by utilizing data and traceability.

In addition to increasing the network, SeAMK can also work to enhance the cooperation of RDI and enterprises and develop the utilization of data in cooperation with the food value chain. It is also important to educate the farmers on how to utilize the data and the network for added value.

Stakeholders involved

Key stakeholders to work as implementing actors in the region are Seinäjoki University of Applied Sciences, ICT-company Cinia, The Central Union of Agricultural Producers and Forest Owners (MTK) and Pellervo Coop Center.

Also Regional Council of South Ostrobothnia (ERDF funding) and other enterprises of the cooperative and actors of the ValueNet -network.

Timeframe

The regional project proposal will be prepared and applied for funding during the year 2021. If funded, the project activities will be carried out during 2021-2023 as far as possible. Timeframe is to be specified when preparing the application.

Indicative costs

Rough estimation of costs for the regional initiative is 200 000/year. The costs will be specified when preparing the application. Separate project application might be prepared for investments.

Indicative funding sources

ERDF funding will be applied for Action 3.1.

Additional funding is possible to be applied from Business Finland, where the national ValueNet -project is funded.

Output and result indicators

The main output of the action is establishing the data cooperative to create better possibilities for the actors of the food sector for combining data from different sources and ability to utilize this data in their business and RDI for added value. To enable this, a project application will be prepared for regional ERDF funding. For the cooperative to work efficiently, it also needs critical mass of actors involved.

Result indicators:
- Number of applications sent/approved (target: 1)
- Data cooperative established (Y/N)
- Number of actors in the cooperative (target: 50)

ACTION 3.2: Combining data to reduce surplus food: PAJATSO

Relevance to the project & background

The PAJATSO proposal is a continuation of the systematic development process that started in South Ostrobothnia with the launch of the Ecowaste4Food (Interreg Europe) project at spring 2017. University of Vaasa (Univaasa) participated actively on the meetings of regional stakeholder group as well as study trips and transnational partner meetings in UK and France. Numerous innovative practices and lively discussions with the members of Ecowaste4Food consortium encouraged researchers and experts from Univaasa, Seinäjoki University Applied Sciences, City of Lapua and other stakeholder groups to submit a new Wasteless project proposal to be included into the Regional Action Plan of Regional Council of South Ostrobothnia. Wasteless project received the funding (total costs for 2-years 470.000 euros, ERDF 70%) and has been the regional 'flagship activity' in efforts to prevent avoidable food waste since March 2019.

The learning process that started with the launch of Ecowaste4Food project and has been evolving by the implementation of Wasteless activities, has highlighted the importance European level networking to accumulate critical mass of expertise needed for the development of innovative digital/data-based solutions to reduce food surplus. Following this, it was very natural for the Univaasa to sign up to also become a member of Regional Stakeholder Group of REGIONS 4FOOD project. Univaasa has participated actively on the regional level discussions and development of the Action Plan as a part of the stakeholder group. Furthermore, Univaasa planned to join also events organized by other consortium partners until COVID 19 pandemic postponed the realization of these plans.

PAJATSO in REGIONS 4FOOD Action plan represents synergies between regional and interregional projects, where regional actions and improvements are built resource efficiently to support each other's outcomes and objectives by developing the same policies from different angles and in close cooperation between regional actors. Previous Interreg Europe project produced an ERDF project, which supports the development in another

Interreg Europe project, and produces another ERDF project to take more concrete steps forward.

As stated above, the main point of implementing and inspiration from the Good Practices was combining data from different sources to improve methods and technologies and utilizing data to gain financial benefit and more sustainable ways of work.

Nature of the action

One of the key outcomes of PAJATSO proposal is an advanced prototype version of machine learning based prediction model assisting the prevention of over-production of food at public and commercial kitchens, canteens, etc. The prediction model combines three different types of dataset:

- Data sets collected from public and commercial kitchens (e.g. menus, number of daily customers, amount of food waste)
- Data sets collected from pilot schools (e.g. number of pupils/teachers, school timetables, absence statistics)
- Open, machine-readable data sets published by The Finnish Meteorological Institute (https://en.ilmatieteenlaitos.fi/open-data)

In order overcome some of the challenges identified during the implementation of antecedent Wasteless project, it is planned to build up a 'living lab-type' test environment for the automized food waste tracking/monitoring system (e.g. https://smartkitchen.ioliving.com/en/food-waste-reducing) as one of the main activities of PAJATSO project. The accuracy of prediction model is highly dependent on the consistency of data collection as well as the quality of collected data. Today -at least in those public kitchens we have visited under the Wasteless project – the data collection of food waste is carried out manually that lays the system open to human errors. Even if the benefits of intelligent food waste monitoring systems are rather evident especially the public kitchens seem to hesitate to buy/lease them due to their perceived costs. PAJATSO proposal is planned to provide some hard evidence for decision makers assisting them to evaluate the pros and cons of investments for new technology.

Stakeholders involved

Tentative description of PAJATSO consortium:

- University of Vaasa (lead partner, co-financier)
- Natural Resources Institute Finland (partner, co-financier)
- City of Lapua (partner, co-financier)
- Regional Council of South Ostrobothnia (steering group member, co-financier)
- South Ostrobothnia Chamber of Commerce (steering group member)
- Into Seinäjoki Oy (Regional business development company, steering group member)

PAJATSO-project is closely linked with the implementation 'Food waste monitoring and road map' project (https://www.luke.fi/ruokahavikkiseuranta/en) coordinated by Natural Resources Institute Finland (Luke). Financiers and steering group members of the project are:

- Ministry of Agriculture and Forestry of Finland (MMM) (Main financier)
- Ministry of the Environment (YM)
- Ministry of Economic Affairs and Employment of Finland (TEM)
- Finnish Food and Drink Industries` Federation (ETL)
- Finnish Grocery Trade Association (PTY)
- Finnish Hospitality Association (MaRa)

In addition, Luke and other stakeholder group members have actively contributed the work of EU Platform on Food Losses and Food Waste. Even though the mandate of the Platform will end on 31.12.2021 the various contacts will provide e.g. valuable avenues to also disseminate the results of PAJATSO project.

Timeframe

The project has received positive financial decision at the end of May 2021. PAJATSO project will be carried out 1.8.2021 – 31.12.2022

Indicative costs

The total budget of PAJATSO project proposal is 290 245 €.

Indicative funding sources

- ERDF 232 196 € (80%, Regional Council of South Ostrobothnia)
- Partner's own funding 58 049 € (20%)

Output and result indicators

The main objective of the action is to reduce the amount of surplus food in the participating demonstration kitchen by additional 20 % by efficient integration of various data sets.

PAJATSO project is committed to follow the open source approach. In practice, this means that all algorithms - including anonymized raw data and the documentation in English - will be published at GitHub under the MIT-licence. This is considered as an efficient way to speed up the development of European, data-based solutions and business models greatly needed in the global fight against food surplus/food waste.

Result indicators:

- Amount of surplus food reduced in the participating demonstration kitchen (target: 20 %)
- Producing an advanced prototype for prediction model (Y/N)

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 self-monitoring mechanism consists of monitoring and reporting the implementation in regional scale by by the regional project coordinator of REGIONS 4FOOD, Seinäjoki University of Applied Sciences. The regional stakeholder group will meet yearly, and the actions will be shortly

presented in each meeting by the implementing actor or the project coordinator, to report the progress of the actions. At the end of phase two of the project, final reports of the actions implementation will be compiled. The project coordinator will analyse the overall impact of the action plan in the region. The results will be presented to the regional stakeholder group and reported at interregional level as part of the common monitoring system.

ANNEXES

Endorsement letters

- *Regional Council of South Ostrobothnia*
- *Centre for Economic Development, Transport and the Environment of South Ostrobothnia (ELY Centre).*

Endorsement letter from the Managing Authority

Project acronym[1]	REGIONS 4FOOD
Project title	REGIONal Strategies 4 FOOD 4.0 Revolution
Name of the signing organisation (original) including department if relevant	Etelä-Pohjanmaan liitto
Name of the signing organisation (English) including department if relevant	Regional Council of South Ostrobothnia
Name of the policy instrument addressed (original)	Etelä-Pohjanmaan maakuntaohjelma
Name of the policy instrument addressed (English)	Regional Strategy of South Ostrobothnia
Name of partner concerned in the application form (English)	Seinäjoki University of Applied Sciences

[1] *Information indicated in this table must correspond to the information provided in the application form.*

We hereby confirm:

- that the topic tackled by this project is in line with the regions's policy and strategy,
- that we acknowledge the participation of the above-mentioned partner in the project,
- that we have actively collaborated in the project, exchanging experiences, and elaboration of the action plan in the stakeholder group
- that we agree with the action plan statement,

In this scenario, we endorse the action plan presented by Seinäjoki University of Applied Sciences, in the context of the REGIONS 4FOOD project.

Name of signatory	Asko Peltola
Position of signatory	Region Mayor
Date and place	September 8th, 2021 Seinäjoki
Signature and institution stamp	

**REGIONS
4FOOD**

Interreg Europe

Endorsement letter from the Managing Authority

Project acronym[1]	REGIONS 4FOOD
Project title	REGIONal Strategies 4 FOOD 4.0 Revolution
Name of the signing organisation (original)	Etelä-Pohjanmaan ELY-keskus
Name of the signing organisation (English)	Centre for Economic Development, Transport and the Environment of South Ostrobothnia (ELY Centre).
Name of the policy instrument addressed (original)	Euroopan maaseudun kehittämisen maatalousrahasto (Maaseuturahasto)
Name of the policy instrument addressed (English)	Regional Rural Development Programme for South Ostrobothnia
Name of partner concerned in the application form (English)	Seinäjoki University of Applied Sciences

[1] Information indicated in this table must correspond to the information provided in the application form.

We hereby confirm:

- that the topic tackled by this project is in line with the regions's policy and strategy,
- that we acknowledge the participation of the above-mentioned partner in the project,
- that we have actively collaborated in the project, exchanging experiences, and elaboration of the action plan in the stakeholder group
- that we agree with the action plan statement,

In this scenario, we endorse the action plan presented by Seinäjoki University of Applied Sciences, in the context of the REGIONS 4FOOD project.

Name of signatory	Mika Soininen
Position of signatory	Director-General
Date and place	16th September 2021, Seinäjoki
Signature and institution stamp	