

S3P AGRIFOOD THEMATIC PARTNERSHIP ON “TRACEABILITY AND BIG DATA”

Action Plan
26/03/2018

FINAL VERSION

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Introduction

Internet and digital technologies are radically changing the life of European citizens and entering all aspects of their life, therefore, the European Commission has made the creation of a digital Single Market a priority.

According to AEMETIC, by 2025 a high level of digitalisation in Europe would contribute 2.5 billions euros to the economy, would reduce of 20% the Public Administration costs and increase the productivity of the industry up to 20%.

The agrifood sector is a strategically relevant economic sector for the European Union (EU). However, the sector faces new challenges and these include the potential that information and communication technologies (ICT) offer but also the disruptive effects they can have on the current practices and habits of agrifood value chain actors (farmers, food manufacturers, transport, retail and of course consumers).

In this context, digital transformation will play a crucial role for companies located in rural areas and for the agrifood sector, where the growth of rural economy will increasingly depend on digitalization, as well as qualified professionals who make the most of digital transformation and improve rural production in a sustainable way.

This has been recognized by the Cork 2.0 declaration "A better life in rural areas" that develops measures to establish an innovative, coherent and integrated rural and agricultural policy in the European Union. Emphasizes the need for investments to overcome the digital gap and develop the potential offered by connectivity and digitalization of rural areas. It also highlights the importance of promoting research and innovation to ensure that rural businesses, including farmers, have access to appropriate technologies, state-of-the-art connectivity and new management tools to obtain economic, social and environmental benefits.

On the other hand, to ensure that Europe is ready for growth in the emerging markets for digital products and services, on May 6th, 2015, the European Commission (EC) adopted an ambitious strategy to achieve the "Digital Single Market (DSM)" for Europe. The DSM strategy covers the competitiveness of Europe in all sectors, including the agrifood sector.

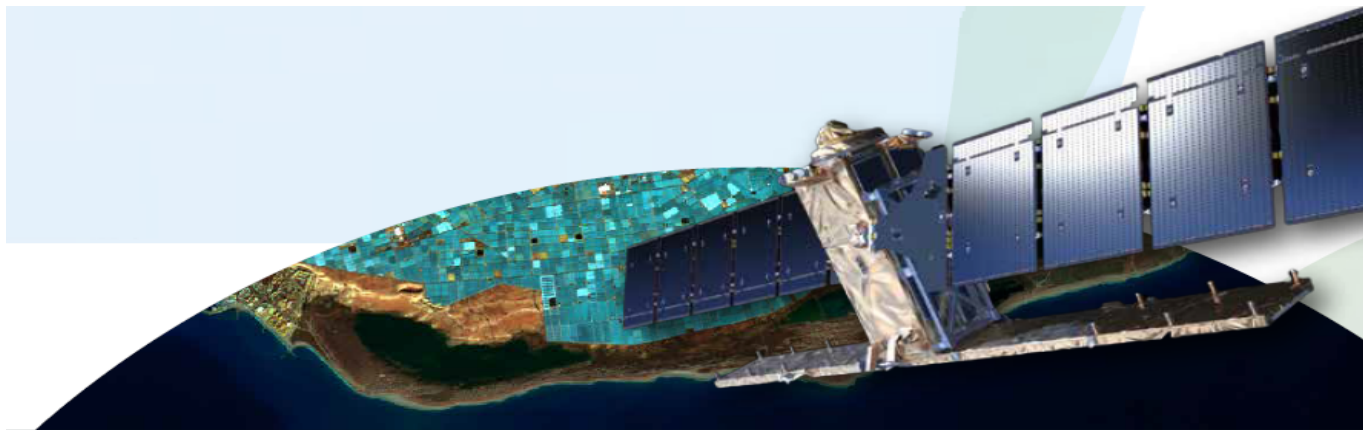
In general terms, this strategy aims to promote new investments in industrial sectors by promoting greater grouping and alignment of resources. This includes working with Member States to focus investment on public-private partnerships; pooling resources for pioneering developments in digital platforms and technologies that include a world-class cloud infrastructure for science and innovation, as well as large-scale test banks to accelerate the establishment of standards.

As part of this strategy, on April 19th, 2016, the EC launched the Communication on "Digitising European Industry" (COM (2016) 180). The general objective of the Communication is to ensure that "any industry in Europe, large or small, wherever it is located and from any sector, can fully benefit from digital innovations to update its products, improve its processes and adapt its business models to digital age".

This requires the full integration of digital innovations in all sectors of the economy, including the agrifood sector. For this, the development of Digital Innovation Hubs (DIH) in Europe constitutes one of the main pillars of the Communication of the European Commission on Digitising European Industry.

Technological innovation advances faster than ever and it is necessary to ensure that the agricultural sector can take full advantage of the "digital revolution". Both agricultural companies and ICT developers strive to understand what technologies to invest in, when to invest and to what extent. The DIHs can help both agricultural enterprises and ICT companies to become more competitive through digital technology.

The DIHs allow any company to access the latest knowledge, experience and technology to test and experiment with digital innovations. They provide connections with investors, facilitate access to finance and help connect suppliers and users of digital technologies in agriculture throughout the value chain.



It is important highlight the various national initiatives which several EU member states have developed to promote the digitisation industry, such as Industry 4.0 (DE, AT), Intelligent Industry (NL, SE), Industrie du Futur (FR), Connected Industry 4.0 (ES) and Industry 4.0 (IT). All of them aim at taking advantage of the opportunities offered by digital innovations in the industry. These initiatives showcase the commitment existing throughout Europe to take advantage of the digital opportunities.

In short, the Commission is using its policy instruments, financial support, coordination and legislative capacities to mobilize public and private investments in all industrial sectors and create the framework conditions for the digital revolution. According to the report of the European Parliament on May 5th, 2017, the EC is also empathizing its social dimension: this includes the right to training and capacity building, the promotion of continuous learning and ensuring that digital skills are taught from an early age and included in school curricula. In addition, digital skills must be promoted transversely, in both large and small companies, and the craft sector. Likewise, it is essential, to combine digital skills and professional training.

The European agrifood sector is key to employment and future growth in many regions, as showcased by the following figures: 10.8 million farms, 290,000 agrifood industries, 129.000 million Euros of European goods exported to the rest of the world (figures collected in 2015) and 500 million consumers.

European agrifood sector:

- * 10.8 million farms
- * 290,000 agrifood industries
- * 129.000 million euros of European goods exported



In the agrarian context, digital technologies play an increasingly important role in agriculture ("Smart Agriculture"), but these technologies are being used in a very incipient way, without taking advantage of their maximum potential and with a very fragmented development. Greater connectivity and interoperability between the different agents of the agrifood value chain and technology suppliers is considered necessary.

According to the report “Dynamics of Smart Specialisation agrifood Trans-regional Cooperation”, (Ciampi-Cavicchi, 2017), currently, more than 120 RIS3 strategies are being implemented in Europe to strengthen regional innovation potentials and increase their competitive advantages. It is estimated that they can draw more than 250 billion euros from different funds, such as the European Rural Development Fund (EAFRD), Structural Funds for Regional Development (ERDF), Horizon 2020, COSME, national and regional public funds and private investments, to develop projects and initiatives such as incubators of new companies and startups, crowd-sourcing platforms, clusters, technology transfer services or collaborative spaces.

In this context, the development of European territorial policies based on similar processes and patterns is essential to promote innovation and to develop appropriate methodologies and tools for the implementation of RIS3 strategies.

■ Smart Specialization Platforms.

Considering the great interest of countries and regions in some common areas, such as energy, industrial modernization and agrifood sector, and in order to boost the economic development of the Member States through innovation, the European Commission (EC) decided to give a boost to the RIS3 defined by the European regions and to create the Smart Specialization Thematic Platforms:

- S3P Energy (2015)
- S3P Agrifood (2016)
- S3P Industrial Modernisation (2016)

By creating these Thematic Platforms at European level, the EC's objective is to support and encourage joint investments for development and innovation in these strategic sectors, as a means to achieve economic and social growth in the European regions.

These Thematic Platforms provide a framework to guide public policy decisions towards innovation and to create an investment pipeline of projects in new growth areas across the EU, by providing tailored advice and helping regions establish links with the business and research communities.

At the same time, the key objective of the S3P Agrifood Platform is to help regions promoting alliances for interregional cooperation in agrifood value chains (thematic partnerships), it also helps the participants to exploit the existing sources of funding, such as European Regional Development Funds (ERDF), national and regional public funds and private resources, in order to diversify their investment risks and increase their profits.

Through the S3P Agrifood, EU regions and Member States are able to implement more efficiently their smart specialisation strategies, and regional stakeholders benefit from the new cooperation opportunities with partners from other regions.

At this moment, four partnerships emerge in the S3P Agrifood: "Hight Tech Farming" led by Toscana (Italy), "Bioeconomy" led by Lombardy and the Ranstad region (Holland), "Smart Sensors Systems 4 agrifood" led by Flanders (Belgium) and the one concerning us in this action plan: "Traceability and Big Data for the EU agrifood value chain" led by Andalusia (Spain).

■ Thematic Partnership on "Traceability and Big Data" in the agrifood value chain.

In order to respond to this demand of digitisation of the agrifood sector which has been previously exposed in the different international strategic frameworks reviewed, the Thematic Partnership on "Traceability and big data" in the agrifood value chain (hereinafter TP T&BD) is created.



This Partnership arises from the thematic proposal submitted by the region of Andalusia to an open call of the European Commission for Expressions of Interest in July 2016.

Subsequently, this Partnership was approved at the kick-off meeting of the S3 agrifood Platform held in Florence on 6-7 December 2016 and its Governance and Management Framework was approved in Helsinki on June 2, 2017.

The S3P Thematic Partnership on “Traceability & Big Data” brings together public and private stakeholders for traceability and big data in different EU regions at the level of public administrations, universities and technology centres, as well as private companies from the ICT and agrifood sectors and civil society organisations (i.e. consumers’ associations).

This partnership is intended to encourage the creation of an ecosystem to promote interregional commitment supporting digital innovation and the promotion of improvement actions through digitalisation throughout the agrifood chain, from the field to the final consumer, in all stages of the value chain.

Common guidelines for a data driven agrifood chain include:

- More and better-quality information available for consumers.
- Smart information systems for companies and public administrations.
- Regional cooperation as the groundwork for transferring technology and research results between experts and researchers, and also between companies, in regions sharing a common interest in the same thematic area.
- Shared value. Generating added value for all stages of the chain, enabling this added value to impact on the society and the regions.
- Improving companies’ competitiveness and creating new businesses.

Composition of the Partnership

TP T&BD is an open partnership, formed currently by 20 regional partnerships, formed in turn by public institutions with political decision-making capacity, knowledge agents, private companies and consumer representatives, following the necessary approach of the quadruple helix that supports the philosophy of smart specialization strategies.



In addition to the 20 regions, 4 public-private clusters and 3 research centres are included in the international partnership.

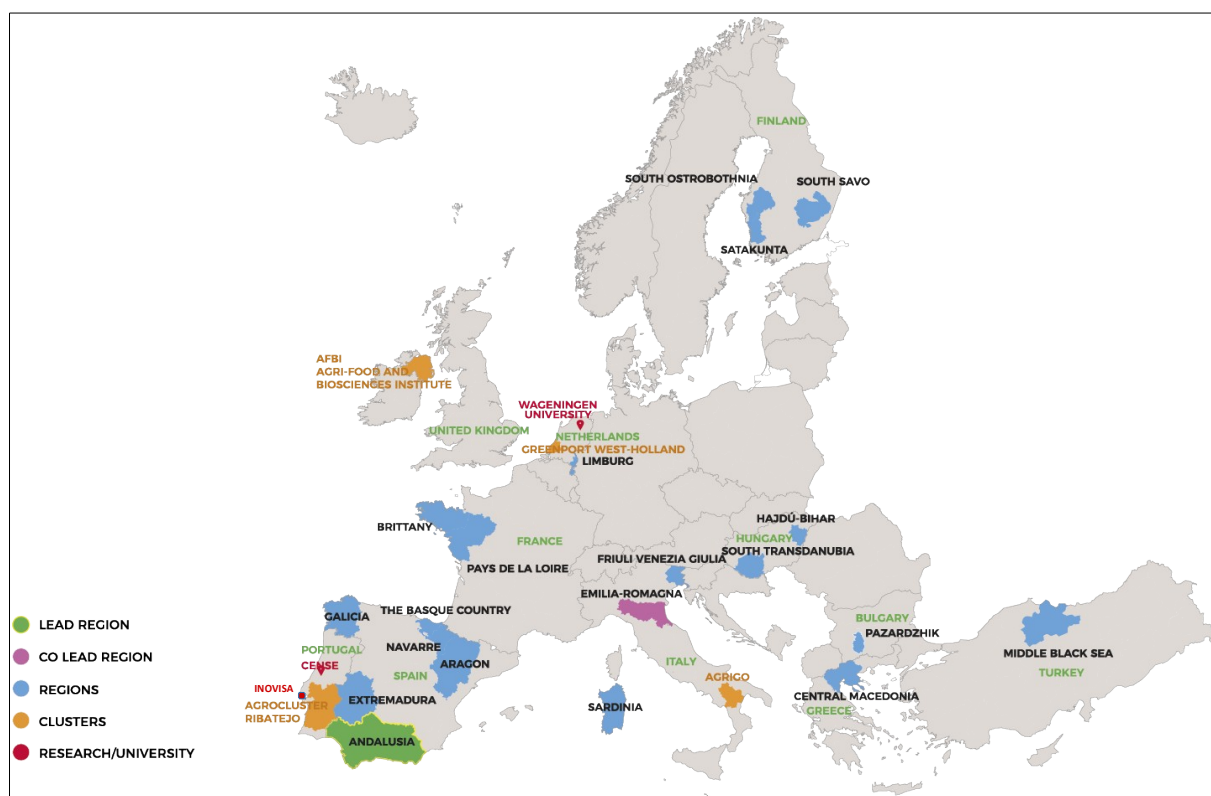


Figure 1: Map of partners

The Thematic Partnership on "Traceability and Big Data" has a three level structure:

- **Network of regions:** represented by their provincial, regional and national governments.
- **Regional Partnerships:** each regional government has established a regional partnership (node, cluster, hub, association, etc.). These regional partnerships include companies from the agricultural sector and the ICT sector, technology centres, universities and research centres, agricultural organizations, consumer and user associations, etc. These partnerships will play the role of regional ecosystem towards digitisation and sharing needs and solutions for the agrifood sector. In addition, they represent an enabling environment for capacity mapping and for new projects and technology solutions.
- **Associate members:** from the field of knowledge and not included in any regional partnership. The objective is to involve those centres of expertise, technology transfer and research which are not members of any regional partnership because their regional authorities have not yet joined the thematic Partnership on "Traceability and Big Data" but whose know-how and experience bring a clear added value as advisers of the partnership.

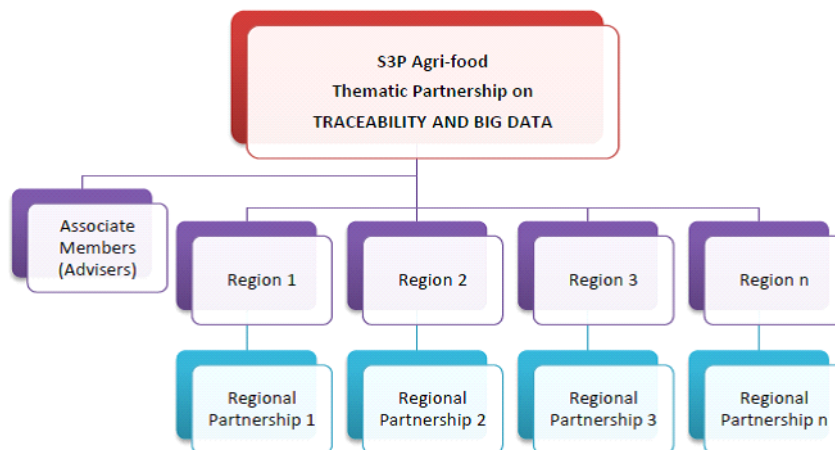


Figure 2. Structure of the thematic partnership

Scope

Digitisation involves all the actors in the value chains. In the agrifood industry, the collection and use of data involves input suppliers, farmers, food processors, software suppliers, logistics solutions providers, retailers and consumers. Digitisation adds value to the data collection process by feeding the different algorithms (machine learning, artificial intelligence, predictive models, etc.) with data from different sources, to make them more accurate.

The agrifood value chain should always be considered as a complex and dynamic system. Special attention should be paid to those technologies, actions and strategies aimed at promoting real-time information in decision-making, to external systems and to the experiences of the consumers and key players in the agrifood value chain.

Thus, the Thematic Partnership on Traceability and Big Data will develop actions for the incorporation of digital technologies based on data in the area of the agrifood value chain, including all the activities of the value chain from farm to fork.

Traceability, in the scope of this thematic partnership must be understood in its widest sense, covering both products and processes and also data and data sets which are traceable with a purpose. It should not be restricted only to the field of food and food security.

The concept of **Big Data** refers to both data-based technologies, including Internet of Things, data mining and technologies that enable content management, business intelligence or cognitive technologies that allow predictions and behavioural models, the tools and technologies necessary for their capture (sensory, wireless) and the technologies developed based on their applications (robotics, artificial intelligence, machine learning, etc.).

Objectives

The mission of the Thematic Partnership on Traceability and Big Data is to establish a collaboration framework for the digitisation of the agrifood value chain through the adoption of digital technologies and the creation of value from data, to contribute to greater efficiency, equity and transparency of the value chains of the agrifood sector. This includes simulation, visualization, Big Data, data analysis, cyber-physical systems, laser-based manufacturing, 3D printing, robotics, sensor technology, Internet of Things, predictive systems, decision-making systems, etc.

All this will contribute to promoting interregional cooperation in the application of data-driven business models to strengthen the competitiveness and equity of agrifood chains in Europe.

To this end, the partnership will commit investments in joint demonstration projects, in order to encourage public and private investment in this area, through the promotion of new inter-regional agrifood value chains.

The Partnership's main objectives are:

- Improving the competitiveness, resilience and sustainability of the agrifood sector.
- Achieving a transparent, collaborative and balanced agrifood value chain and promoting an economy of shared value.
- Accelerating the adoption of ICT, improved data management and interoperability in the agrifood sector.
- Fostering exponential innovation in all stages of the agrifood value chain.
- Developing new business models and market opportunities, including but not limited to quality job creation.
- Establishing creative designs for decision making based on data management and the creation of decision support systems and ecosystems.
- Ensuring the inclusive governance of data and knowledge flows.
- Improving the synergies between public institutions, knowledge agents, civil society, companies and farmers.

- Sharing best practices and developing standards and benchmarking in relation to agrifood value chain development based on the digital economy.
- Promoting cooperation between different disciplines and areas, as well as between regions taking advantage of common interests and market opportunity niches.
- Promoting the incorporation of the agrifood sector into ICTs and the digital economy.
- Facilitating the development of the economy linked to "open data" and learning and support for the same.
- Improving coherence and strategic alliance with the objectives of the Commission on the strategy for smart, sustainable and inclusive growth.

Challenges and Opportunities

The actions to be implemented under this work plan of the Thematic Partnership on Traceability and Big Data and its objectives, respond to identified challenges and needs.

The main challenges of the EU agrifood sector are:

- 1.- To ensure sustainable growth based on a low-carbon and more efficient economy.
- 2.- To improve competitiveness and redress the imbalances in the agrifood value chain through innovation.
- 3.- To ensure healthier and safer food for all citizens and fitted to their new life style and habits.

On the other hand, the following needs that focus the T&BD thematic partnership strategy:

- Establish interregional cooperation as a basis for specialization and smart growth in Europe.
- Identify existing initiatives at regional, national and European level related to digital technologies and agrifood value chains, in order to identify complementarities and synergies.
- Work from the quadruple helix approach, involving all the stakeholders of the value chain: private sector, public administrations, knowledge agents and citizens.
- Establish regional public-private partnerships including regional technology and knowledge transfer agencies and competence centres.
- Development of pilot and demonstration projects at small and / or large scale.
- Encourage the development of Digital Innovation Hubs specialized in agrifood.
- Training to reorient the agrifood companies and their workers towards the digital economy.
- Connect agrifood and technology companies, focusing on the need for inter-sector technology transfer, detection of needs and opportunities of agrifood industries (for example, showing practical experiences in Open Living Labs will help producers and agro-

industries to see how new digital technologies can help them to increase their sustainability and competitiveness).

- To search for synergies with other complementary public-private European initiatives and partnerships, combining efforts and complementing actions.
- To identify instruments and financing tools to develop partnership actions, which by their nature can find opportunities in the Structural Funds, particularly in the European Fund for Rural Development, Public Procurement for Innovation and the Horizon 2020 Programs. Nevertheless, they must also be able to attract private investment and to combine funds from different sources of financing.



Structure

The structure of the work plan of the partnership on traceability and big data in the agrifood sector is shown below.

This work plan comprises seven chapters that contain the actions to be developed in this plan. They have been separated and grouped in work packages according to their topics. Moreover, ten annexes are also included.

- Chapter 1: Governance, coordination and management.
- Chapter 2: Analysis and diagnosis.
- Chapter 3: Strategic connectivity and funding.
- Chapter 4: Capacity building.
- Chapter 5: T&BD Partnership Working Areas:

Working Area 1: Life-cycles of the value chain.

Working Area 2: Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.

Working Area 3: Incorporating consumer experience & different operators in food chain decision making processes.

Working Area 4: Open data, interoperability, data governance and information security, cyber security.

- Chapter 6: Communication and dissemination.
- Chapter 7: Monitoring and Evaluation.
- Annex I: List of Regional partnership/DIH (to date: 20th of March, 2017).
- Annex II: Framework Working Area 1: Lifecycles of the value chain.
- Annex III: Framework Working Area 2: Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.
- Annex IV: Framework Working Area 3: Incorporating consumer experience & different operators in food chain decision making processes.
- Annex V: Framework Working Area 4: Open data, interoperability, data governance and information security, cyber security.
- Annex VI: Successful Projects.
- Annex VII: Pilots Actions Working Area 1.
- Annex VIII: Pilots Actions Working Area 2.
- Annex IX: Pilots Actions Working Area 3.
- Annex X: Pilots Actions Working Area 4.

In addition to the contents, each chapter includes a brief introduction to contextualize it and some specific and concrete strategic actions in order to give succinct answers to the needs of the partnership.

The first four chapters correspond to horizontal aspects that affect, in general, the performance of the work plan. At the same time they are necessary to support the four priority working areas, included in Chapter 5 and which will be explained further below and in their corresponding chapter.

The communication and dissemination actions, Chapter 6, and those concerning monitoring and evaluation, Chapter 7, will also support the entire structure of the partnership.

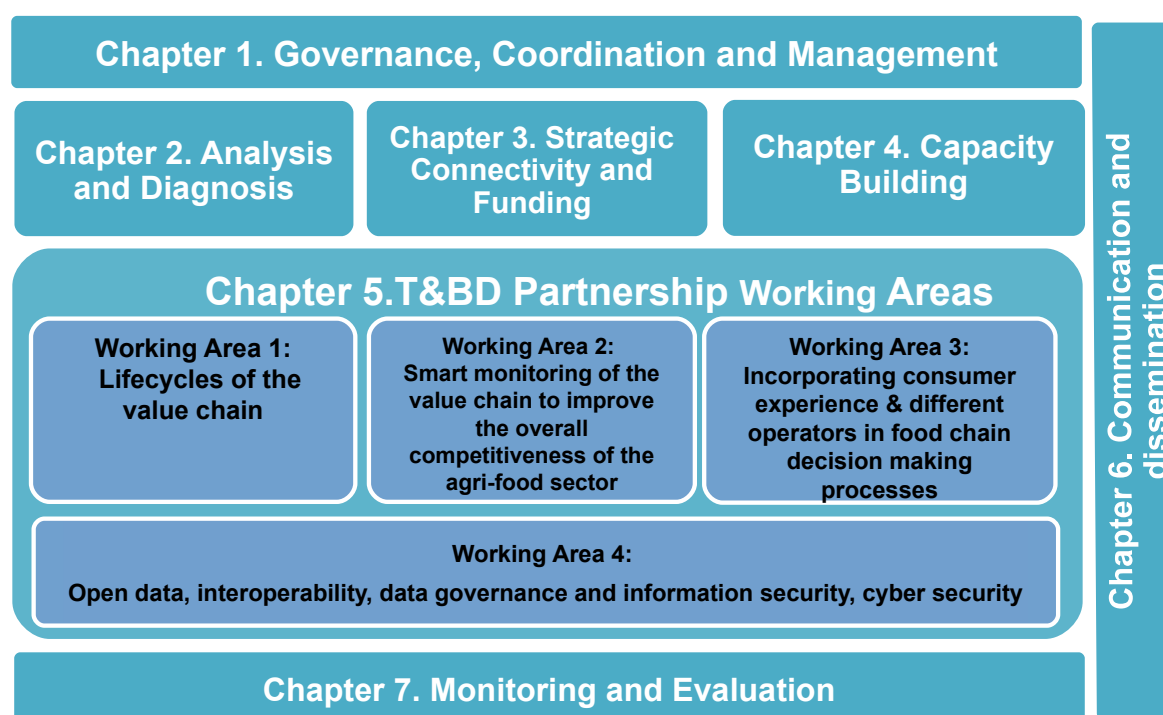


Figure 3. Structure of the T&BD Partnership's work plan.

Chapter 5, in turn, has been broken down into four subsections that include the four specific working areas of the partnership.

Chapter 5: T&BD Partnership Working Areas:

- **Working Area 1.** Life-cycles of the value chain.
- **Working Area 2.** Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.
- **Working Area 3.** Incorporating consumer experience & different operators in food chain decision making processes.
- **Working Area 4.** Open data, interoperability, data governance and information security, cyber security.

A series of actions to be developed will be defined for each of these areas. In particular, a series of demonstration pilot cases related with the topic and the approach of each of these work packages will be carried out.

The annexes include the information of interest related to the work plan of the partnership generated for each working area.

On the other hand and in terms of organisation, each chapter will have a Leader, as shown in table 1, who will be responsible for leading, promoting, developing and coordinating the actions included in the particular chapter, but taking into account that all members of the partnership will participate and collaborate to develop said actions.

Structure	Responsible Region
Chapter 1. Governance, Coordination and management	Andalusia
Chapter 2: Analysis and diagnosis	Andalusia
Chapter 3: Strategic connectivity and funding	Andalusia
Chapter 4: Capacity building	Andalusia
Working Area 1. Lifecycles of the value chain.	Emilia Romagna (supported by Aragón)
Working Area 2. Smart monitoring of the value	Pays de la Loire

chain to improve the overall competitiveness of the agrifood sector.	
Working Area 3. Incorporating consumer experience & different operators in food chain decision making processes.	Friuli Venezia Giulia
Working Area 4. Open data, interoperability, data governance and information security, cyber security	Friuli Venezia Giulia
Chapter 6: Communication and dissemination	Emilia Romagna
Chapter 7: Monitoring and Evaluation.	Andalusia

Table 1. Responsible Regions for the work plan.

A description of the specific tasks that each WA Responsible Region should assume through their Technical Secretariat has been included:

Description of the Working Areas Technical Secretariat's tasks and Action Plan for Working Areas:

According to the Governance document:

- *Each Task Group will have a Technical Secretariat funded with its own resources or project-funded. They shall keep the Technical Secretariat of the interregional Thematic Partnership constantly up to date.*
- *Regions co-leading Task Groups shall take the initiative of these groups, and also bear the costs for developing their work, meetings and events with their own resources or project-funded.*

The WA's Technical Secretariat is the body in charge of taking the initiative and developing the activities of the WA.

Responsible Regions will establish an annual action plan for their WA; WA's Technical Secretariat will be in charge of its development, execution and follow-up.

Besides, it would be convenient to set a specific coordination communication channel among the WA Responsible Regions in order to develop similar activities for each WA and sharing the work approach.

Also, as mentioned in the governance document, Responsible Regions will support the costs for developing the work with their own resources (or financing obtained through cooperation projects or other).

To guarantee the correct execution of the tasks, the Responsible Region will appoint at least one person in charge of the Technical Secretariat.

Responsible Regions will send this person's contact information to the Andalusia Regional Ministry of Agriculture, Fisheries and Rural Development, as well as the members of its WA, for their information.

The Working Area Action Plan will include at least the actions set out below, to be undertaken by the WA Technical Secretariat. Responsible Regions may add other actions, the structure exposed below may be considered as a groundwork.

- Select, through the contributions of the partners involved in the working area, project proposals within the framework of that WA.
 - **Output:** at least **5 demonstration pilot cases**.
- Inform the partners involved in its WA about the proposals received and coordinate the support these proposals may have from partners in order to materialize the proposals into a cooperation project. At least three demonstration pilot cases should receive the support of at least 3 partners in its WA in order to start the procedures of materialization into a cooperation project.
 - **Output:** **list of proposals** with at least 3 WA partners interested in participating.
- Once the project proposals identified and established that there is interest from the regions to implementation of a demonstration pilot case, the Responsible Region, by means of its technical secretariat will implement the necessary actions to materialize these pilot cases involving the group of interested region (or at least 1 per WA):
 - **Output:** list of **demonstration pilot cases with WA's support** where final European program proposal will be submitted.
- Identification of calls, workshops, seminars etc. in the frame of the topic of its WA and dissemination to the partners of T&BD (ie. events organized by partners in their regions, in the frame of the topic of the WA or events organized by European bodies such as EIP Agri, ERIAFF, JRC...). Although the identification of the event may be made by any partner of

the WA, the dissemination should be done, unless otherwise agreed between the two of them, by the Responsible Region through the Technical Secretariat. Also the Technical Secretariat will keep informed to the partnership leader.

- **Output:** at least **1 event identified** in the frame of the thematic area with the participation of at least 3 partners of the WA.
- Organization of at least one workshop or seminar in the frame of the WA. Telematic participation should be possible but at least once a year all partners of the WA should gather. This workshop or seminar could be useful to advance in the tasks of the WA and to take decisions about the next steps to take in its frame.
- **Output:** at least **1 event organized** by the responsible in each WA.
- Elaboration of the WA yearly report. This report will include the activities carried out in the WA: demonstration pilot cases identified, projects submitted, seminars/events organized or participated in... The report will be sent to the Andalusia Regional Ministry of Agriculture, Fisheries and Rural Development before march 31st of the current year.
- Output:** elaboration of **1 report** by each WA responsible.
- The Technical Secretariat will keep the partnership leader, Andalusia Regional Ministry of Agriculture, Fisheries and Rural Development, constantly up to date of all activities and initiatives undertaken in the frame of its WA.

Chapter 1. Governance, Coordination and Management

To successfully achieve the goals of such a multi-sectoral and multi-stakeholder plan like this one, it is essential to ensure the proper coordination of tasks involving all the partners and the specific actions that will be developed in the working areas. This will ensure the compliance with the governance framework and its updating.

It is also necessary to ensure an effective and transparent decision making process in order to carry out the representation role of this partnership at all levels.

Actions

- Design and planning of the Work Plan of the partnership and the revisions it may need.
- Coordination and strategic monitoring:
 - ✓ Implementation of the agreements adopted in the Governance and Management Framework agreed in Helsinki on 2 June 2017.
Among them, it is worth highlighting the organization and call for regular meetings of the General Assembly (biannual) and the Governing Board (annual).
 - ✓ Preparation and submission of periodic progress reports, both at partner and EC levels.
 - ✓ Coordination of the general administrative and financial issues of the partnership.
 - ✓ Evaluation of the quality of the technical reports of all documents framed within this partnership.
 - ✓ Organisation of events involving all partners as well as monitoring and supporting the different co-leaders regarding the specific events.
 - ✓ Coordination of synergies between the different regions, thus ensuring the exchange of information, experiences and good practices between the working areas and pilot projects, avoiding duplication. Moreover, participation and contribution to the horizontal tasks of the working groups and their demonstration cases.
 - ✓ Cooperation with other international partnerships and platforms.

Chapter 2. Analysis and Diagnosis

To develop the partnership's actions to meet the challenges posed in this plan, it is necessary to carry out a previous analysis, mapping and diagnosis of the baseline information and its state of the art. This will allow the partnership to assess the level of digitisation in the value chain of the agrifood sector, across different regions.

At the same time, it is really important to know the nature, intensity, capacities and level of strength of the connections existing between the various stakeholders who are members of each regional node/cluster/hub, as well as between regions. In order to be able to identify synergies and opportunities for collaboration or joint projects from that knowledge previously obtained.

Actions

- Catalogue of the Inventory of Data:
 - ✓ Literature review of the open data web sites and previous experiences as well as of Open Data policies and initiatives.
 - ✓ Inventory of open and available data for the purposes of the partnership.
 - ✓ Analysis of the opening status.
- Catalogue of technologies:
 - ✓ Identification of the digital and auxiliary technologies that can contribute to the digitisation of the agrifood chain.
 - ✓ Analysis and evaluation according to their level of development and their application in the agrifood sector.
- Identification of the needs and barriers for the digitisation in the agrifood sector:
 - ✓ Interviews and meetings with producers and agribusinesses in each partner region.
 - ✓ Service of technological surveillance during the development of the partnership's activities. This will allow to identify opportunities for technological innovation in the digital field for the agrifood sector.
- Development of regional relational capital maps and identification of synergies between them.

Chapter 3. Strategic Connectivity and Funding

In this chapter, it is intended to identify synergies or existing connections between this partnership's thematic and three strategic levels: the political framework of the EU, other European associations/partnerships and the search for public and/or private funding instruments. The purpose of this search is to create alliances, joint efforts, exchange experiences and maximize the impact of the partnership's objectives.

Actions

- Analysis of innovation policies related to digitisation and the agrifood sector:
 - ✓ Analysis of the structural funds (EAFRD, ERDF and ESF) and those existing in each region.
 - ✓ Exchange of experiences between regions and supported by structural funds.
- Adjustment to strategic policies:
 - ✓ Identification of possible amendments to be introduced in regional funding programs to support the partnership's objectives.
 - ✓ Matching the approach and work of the partnership with the strategies of European policies.
- Search for synergies: Identify and engage synergy opportunities with other international partnerships with related topics and objectives in order to establish contacts and alliances. Associations such as EIP-Agri, Industrial Data Space, Global Open Data Initiative for Agriculture and Nutrition (GODAN) have been identified among others together with public-private partnerships that develop innovative projects such as KICFOOD, Big Data PPP, euROBOTICS, etc.
- Working Plan's Funding:
 - ✓ Search and identification of funding instruments. Ongoing analysis of opportunities.
 - ✓ Coordination and development of joint proposals. Monitoring and coordination of the ones approved.
 - ✓ Promotion of the specific support for partnership funding.

Also redirecting and adapting the European funds programmes to meet the needs of the partnership.

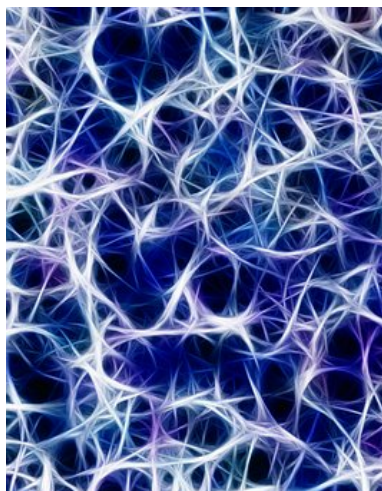
Chapter 4. Capacity building

In order to reduce the digital gap between the different agents of the agrifood value chain, it is considered necessary to promote training actions which can improve their capacity. This measure, together with a proper integral approach through the establishment of networks that connect and offer services, will guarantee the creation of a correct ecosystem of digital innovation. Likewise, this figure will enable the immersion of the agrifood sector actors in the digital culture.

Furthermore, promotion actions for new initiatives or start-ups, which are usually the pioneering sources of emerging technologies, will also be included.

Actions

- Provide training to the actors of the agrifood value chain for the digital age through training programmes: organization of seminars and workshops, identification and creation of a catalogue of successful cases, exchange of experiences, etc.
- Promotion of mentoring tools such as living labs or start-ups, with special emphasis in acceleration programmes, internationalisation, financial incentives for the creation of business incubators.
- Development of Digital Innovation Ecosystems:
 - ✓ Creation of regional nodes/DIH-
(Annex I shows the list of the nodes/HUBs within the partnership, up to the date of publication of this document).
 - ✓ Establishment of a network of DIH specialized in agrifood at European level.



Chapter 5. T&BD Partnership Working Areas.

Four thematic areas containing the fields of action of the major specific working groups of the partnership have been identified. In addition, they are aligned with the reflections of the working groups of the strategy of Digitising European industry (WG 1 “Digital Innovation Hubs: Mainstreaming Digital Innovation Across All Sectors” and WG 2 “Digital technologies and in Digital industrial Platforms across value chains”) and with the needs identified in order to improve the competitiveness and sustainability of the agrifood sector.

These thematic areas, adopted in Florence in December 2016, have been defined through a process of joint mapping of needs and challenges, following a bottom-up approach, involving all the participants in the value chain experts, public administrations, universities and research bodies and agrifood industries, both at regional and inter-regional levels.

The thematic areas are:

- **Working Area 1.** Lifecycles of the value chain.
- **Working Area 2.** Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.
- **Working Area 3.** Incorporating consumer experience & different operators in food chain decision making processes.
- **Working Area 4.** Open data, interoperability, data governance and information security, cyber security.

Each region responsible for these working areas, with the contributions received from each of the interested regions, has developed a working framework (scoping note or framework) based on the corresponding topic. These documents have been included as Annexes II, III, IV and V respectively, for each working area. Also, a fact sheet for each area has been extracted as a summary following the outline of the rest of plan’s chapters that will be shown in the following sections.

Furthermore, the successful demonstrative cases with thematic related to the partnership, executed for each working area have also been analysed.

A table showing these successful cases has been included as Annex VI of this document.

The analysis of these successful cases has been used as starting point for the common proposal of projects in order to suggest future demonstrative actions.

On the other hand, a series of demonstration pilot projects, selected from all the projects proposed by each of the regions, have been defined. The development of each of these pilot projects as well as the criteria used by the regions for their selection are included in Annexes VII, VIII and IX and X, separated by thematic area.

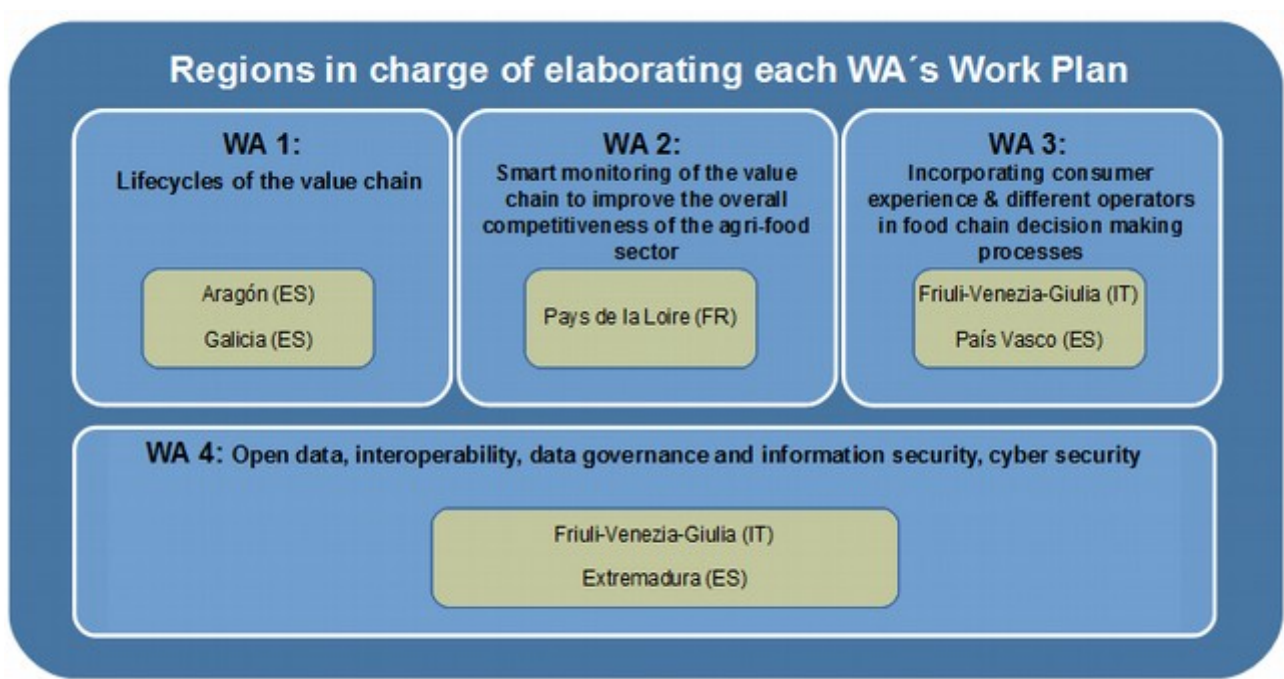


Figure 4. Regions in charge of elaborating each Working Area's Work Plan up until now.

Additionally, among all of the projects presented and taking into account the previous selection of these demonstration projects mentioned above by working area, the projects considered more feasible to be developed as a priority have been selected, according to the following criteria:

- Its approach meets the specific objectives of this partnership.
- More than two partner regions have expressed their interest to participate in the development of the project.
- The idea is fully in line with the elements required by the call published by the funding sources, such as a topic of the Horizon 2020 European Framework Program.

The pilot projects selected are shown in the next table:

Action Plan	Topic	Pilot Proposal	Interested Region
T&BD Partnership Working Areas			
WA1	SFS-05-2018-2019-2020: New and emerging risks to plant health.	Development of a system that help to the rapid detection and control of new pest or/and disease based in BD technology.	Aragon Andalusia Emilia Romagna Pays de la Loire
WA1	SFS-06-2018-2020: Stepping up integrated pest management	Development of a pest management alert system based in predictive models, to help the decision making process in advance.	Aragon Andalusia Emilia Romagna Pays de la Loire
WA1	PRIMA Initiative Section 1. Topic 1. Water reuse and water desalination for agricultural and food production. SFS-08-2018-2020: Improving animal welfare (B. (2019) precision livestock farmin (IA)	Optimizing the water use along the pig production and reuse of treated waters in agriculture. The Animal Science group is interested in coordinating/developing a pilot focused on the pork production chain, including traceability and big data. Animal welfare and particularly antibiotics reduction.	Aragón Andalusia Emilia Romagna Extremadura Pays de la Loire
WA1	PRIMA Initiative Section 1 Topic 2 Improving the sustainability of Mediterranean agro-ecosystems.	Lifecycles of the value chain: Life Cycle Assessment as standardized methodology and tool to include sustainability issues and indicators in traceability systems. Lifecycle Tools of a gathering process, analysis and management about the information coming from the chains of production of the agrifood products. Lifecycle assessment tools and adaptation to viticulture.	Andalusia Emilia Romagna Ribatejo Basque Country Friuli Venezia G. Galicia Extremadura Pays de la Loire
WA1	PRIMA Initiative Section 2 Topic 1.2 Sustainable, integrated	Doing more with less. Smart data analysis to reduce use of natural	Andalusia Emilia Romagna

	water management.	resources, water consumption and to fight the loss of bio-diversity in soils.	Pays de la Loire Friuli Venezia Giulia
WA2	RUR-04-2018-2019: Analytical tools and models to support policies related to agriculture and food	Establishment of the European Agro Prices Platform to increase the value chain and the decision support in the agrifood trade sector. Implementation of Innovation and decision making tools.	Interesting for all regions.
WA2	DT-ICT-08-2019: Agricultural digital integration platforms or DT-ICT-12-2020	Development of a specific AgroTech Platform to collect all the generated systems, applications, data, etc. between key stakeholders that can help the agrifood sector to become more sustainable, to enhance traceability and to strengthen competitiveness of farming and food chains, as for example different technologies like Internet of Things (IoT) devices, cloud, photonics, networks, geolocalisation and robotics combined with applications based on data analytics and knowledge management. Serious Game: simulation for management Novel Spatial planning platform to assist all value chain actors. Tool that automatically manages various data into management tool and decision/innovation support. Decision support system aim to establish a regional model using resources in a sustainable way Technologies to optimize process control with the aim of homogenizing traditional production.	Emilia Romagna Andalusia Extremadura Aragon Basque Country Galicia Friuli Venezia G. Pays de la Loire Ribatejo Latvia Hajdu Bihar C. S. Ostrobothnia

WA2	ICT-04-2018: Photonics based manufacturing, access to photonics and connected lighting.	Proposal from Emilia Romagna: Design of ultra-low power circuits. Mixed signal interfaces. High-speed digital design. Application on lighting in plant production.	Emilia Romagna Agrocluster Ribajeto Pays de la Loire Friuli Venezia Giulia
WA2	ICT-09-2019-2020: Robotics in Application Areas ICT-10-2019-2020: Robotics Core Technology	Design and development of robots and drones with specific sensors, data processing, storage system, and real time communication for farm maintenance operation, weeds treatment, detection of crops stress, nutrition and irrigation management, and data collection for traceability.	Emilia Romagna Extremadura Andalusia Pays de la Loire Friuli Venezia Giulia
WA2	PRIMA Initiative Section 1 Topic 3 Implementing innovation in Mediterranean agrifood chains by smallholders and SMEs.	SLP2 – Small Local Productions. The project standardized the production processes of a homogeneous group of farms through the use of simplified procedures to ensure the safety and competitiveness of local production (fruit and vegetables, meats, dairy and bakery products) .	Friuli Venezia G. Andalusia Emilia Romagna Extremadura
WA2	PRIMA Initiative Section 2 Topic 3.2 Food safety and quality in local food chains.	Development of contamination flora traceability tools, allowing to reduce food processing, especially heating (goals: better sanitary and organoleptic quality and better economic profitability) and ultrasonic humidification system to remain the quality and organoleptic properties of fresh food. Processing optimization to reduce processing impact, heat damage, by means of application of mild and non thermal technologies, pre-treatments,	Pays de la Loire Andalusia Emilia Romagna Pays de la Loire Friuli Venezia Giulia

		active packaging etc. Detection of quality and organoleptic properties in vegetal base products.	
WA3	There is no concrete topic within H2020. Keep looking for possible funding	Development of ITC tools and systems to obtain feedback on consumer's experience in real time (e.g. cheese and milk sector or another one). Consumer studies for different sectors including the use of vegetal proteins.	Friuli Venezia G. Andalusia Basque Country Pays de la Loire Emilia Romagna Ribatejo Galicia S. Ostrobothnia Hajdú-Bihar C. Extremadura
WA3	DT-SFS-14-2018: Personalized Nutrition or DT-ICT-11-2020	Human energy consumption measurements techniques. Diet based on human metabolism. Individual differences in the acceptability of healthy foods. Data format harmonization in order to strengthen database interoperability and open data. Knowledge of quality products with data on climate variations, raw materials; Classification of food products with a multivariable data tool, Visual monitoring of food quality during packaging processes. Chemical markers for the territorialities certification.	Emilia Romagna Pays de la Loire S. Ostrobothnia Friuli Venezia Giulia
WA4	DT-SFS-26-2019: Food Cloud demonstrators. Other topics identified by Extremadura: - ICT-11-2018-2019: HPC and Big Data enabled Large-scale	Implementation of an open data platform that includes data mining: Modelling of data collected from different sources and devices on an open source platform, with protocols and communication standards that	Friuli Venezia G. Emilia Romagna Andalusia Extremadura Pays de la Loire

	<p>Test-beds and Applications</p> <ul style="list-style-type: none"> - ICT-12-2018-2020: Big Data technologies and extreme-scale analytics - RUR-14-2018: Digital solutions and e-tools to modernise the CAP 	ensure interoperability in the IoT environment.	
WA4	DT-SPACE-02-EO-2018: Copernicus evolution – Mission exploitation concepts	Monitoring system to support CAP and with the consequent increase of available open data.	Interesting for CAP regions.
WA4	RUR-14-2018: Digital solutions and e-tools to modernise the CAP.	It shall include a minimum of six relevant national administrations or legal entities designated to act on their behalf.	Galicia Andalusia Emilia Romagna Pays de la Loire
All WA	<p>There is no concrete topic within H2020.</p> <p>We will hopefully have an expert to find the most suitable funding sources if the EC selects our application to the call from the DG Regio.</p> <p>Keep looking for possible funding.</p>	<p>Integral project within the wine sector dealing with aspects such as:</p> <ul style="list-style-type: none"> - Ecological footprint and eco-efficiency analysis in wine sectors: Creation of a database, about life cycle assessment (LCA) in viticulture and simplified LCA calculation software. - Develop a complete traceability, from the roots to the glass on the table - Enhance the consumer's experience through local knowledge, technology and oeno-gastronomic values. - ICT platform and tools that will allow to collect and manage data and information from several public and private database and systems, IoT devices, and the necessary cybersecurity. 	<p>Andalusía</p> <p>Pays de la Loire</p> <p>Friuli Venezia G.</p> <p>Emilia Romagna</p> <p>Extremadura</p>

Transversal Actions			
Chp 2. Analysis and Diagnosis	RUR-02-2018: Socio-economic impacts of digitisation of agriculture and rural areas.	Identification of the economic impacts of digitisation in the agrifood sector (20 regions from 9 countries which form the S3P agrifood T&BD).	Andalusia Emilia Romagna Pays de la Loire Ribatejo Aragon Extremadura
Chp 3. Strategic Connectivity and Funding.	Call for Expression of Interest for Thematic Partnerships to Pilot Interregional Innovation Projects.	Transnational partnerships of regional authorities, which include regional stakeholders (universities, research centres, clusters, SMEs, etc.), willing to pilot interregional innovation partnerships aimed at facilitating the commercialisation and scale-up of inter-regional innovation projects and to incentivise business investment.	Andalusia Pays de la Loire Friuli Venezia G. Aragon Extremadura Pazardzhik S.Ostrobothnia South Savo
Chp 3 & 4	DT-RUR-12-2018: ICT Innovation for agriculture – Digital Innovation Hubs for Agriculture.	Creation of a Digital Innovation Hubs Network for agrifood.	Emilia Romagna Andalusia Galicia Aragon Pays de la Loire Extremadura Friuli Venezia Giulia Another Hub from S3P T&BD
Chp 3 & 4	COS-2017-3-02: European Strategic Cluster Partnerships for Smart Specialisation Investments.	COSME-S3	Emilia Romagna Andalusia Pays de la Loire Greenport West- Holland
Chp 4. Capacity building.	RUR-13-2018: Enabling the farm advisor community to prepare farmers for the digital	Establishment of a network of training institutions connecting the S3P Agrifood T&BD regions in a common	Andalusia Emilia Romagna Aragon

	age	training Framework. Sensibilisation actions ; co-creation of services between digital and agricultural actors.	Hajdú-Bihar C. Extremadura Ribatejo Pays de la Loire Friuli Venezia Giulia
All Chapters	Interreg Europe.	REGIONal Strategies 4 FOOD 4.0. To join efforts to face new challenges in relation ICTs and data of the agrifood value chain. To improve policy instruments in terms of better exploiting ICT's potential and deliver innovation to food industry. Support capacity-building at all levels. Reinforcing cooperation between research and business sectors. Delivering strategic guidelines for new programming period.	Andalusia Pays de la Loire S. Ostrobothnia Emilia-Romagna S. Transdanubian Limburg Pazardzhik Extremadura Friuli Venezia Giulia

Table 2. Potential Pilots Projects Identified and Possible Funding Sources.

■ WA1: Lifecycles of the value chain.

The scope of the work within this subarea is to promote and execute a series of actions aimed at monitoring some processes of agrifood production, evaluating their environmental impact, and developing initiatives that contribute to the minimization of the same.

Due to the multitude of processes and impacts that integrate the different agrifood chains, it is too ambitious, under this platform, to try to approach a pilot project that embraces the whole value chain of an agrifood product. Therefore, within the framework of this document, lines of action will be proposed to reduce the environmental impact of part of the processes of the agrifood chain.

Actions

- Review projects and/or experiences of environmental impact assessment of agrifood industry processes, especially those that use the Life Cycle Assessment or PEF as evaluation methodology.
- Review the progress of European Commission pilot projects, to assess the environmental impact of agrifood processes according to the PEF methodology.
- Review experiences, explore and promote the use of Big Data tools that can contribute to the improvement of sustainability and better traceability of the agrifood chain processes.
- Identify calls/programs/funding opportunities to develop projects that contribute to minimize the environmental impact of the agrifood value chain by using ICT's and big data tools.
- Pilots Actions (please see Annex VII):
 - ✓ Optimizing water use along the pig production chain.
 - ✓ Open pest Management Alert System.

** Additional, Technical Secretariat's tasks and Action Plan for Working Areas (shown in previous "structure section") will be consider as the basis to developing each Working Area Actions.*

■ **WA2: Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.**

Big data and cognitive technologies provide a basis for the development of smart monitoring systems that can enhance the traceability of products and processes. They also provide a basis for new predictive models that improve business intelligence, the capacity to respond and make decisions, businesses competitiveness and processes sensing. All these represent an opportunity to improve traceability, transparency in the value chain and fighting food fraud and unfair competition.

Smart monitoring can address very broad thematic areas that need an analysis of the state of the art and establishing guidelines to accompany the innovation processes in the food chain to foster progress in smart monitoring systems. These areas include: the incorporation of agro-industrial innovation (Smart food, industries 4.0...) with intelligent tools which are integrated into big data; the use of sensor enabling technologies, the development of software to control and treat the signal and its incorporation into the decision-making support systems; the development of logistics, since there are numerous factors which influence the "perfect delivery" and, information and technologies are key to make the process and its deadlines more transparent and traceable.

Actions

- Conduct a state of art in each region: establish a common methodology, mapping, identify the missing bricks.
- Ensure technological watch:
 - ✓ identify international useful good practices and experiences;
 - ✓ share information between all partners (online platform, newsletter...).
- Share the state of art, the good practices and information.
- Develop experimental/research projects.
- Inform and disseminate.
- Pilots Actions (please see Annex VIII):
 - ✓ Development of a "DataAgrilab" platform.
 - ✓ Reducing contaminants in food.

** Additionally, Technical Secretariat's tasks and Action Plan for Working Areas (shown in previous "structure section") will be considered as the basis to developing each Working Area Actions.*

■ **WA3: Incorporating consumer experience & different operators in food chain decision making processes.**

The ability to share information along the food chain, and in particular the ability to incorporate opinions and information from consumers and the distribution sector, is a strategic asset that increases the value of raw materials, processed products and defends the importance of territorial know-how.

This is especially interesting when done in real time.

In order to generate value for all involved parties (primary, secondary and tertiary sectors), the stream of information must be bilateral throughout the chain. Thus, it is also important to return accurate information about the products to the consumer, for example, on the management and quality of the products he is interested in.

Actions

- Knowledge development and standardization of regional BDs and strategies to insert data from territorial silos into the BD Regional building blocks with interoperability characteristics. Managing information enabling overcoming security, privacy, competition and privacy issues.
- Strategies and methodologies capable of engaging and interacting with the consumer in push-pull iterative process. These methods can be based on either active (APP or Fidelity Cards) or passive tools (generic or dedicated social platforms).
- Development of appropriate alignment criteria for information coming from the agricultural sector and the food products transformation of with the consumer's views.
- Development of rating criteria for the information of "input" information sets made visible to consumers in order to stimulate its interaction in providing a judgement.
- Development of a set of tools to protect:
 - the push-pull information system;
 - the veracity, democratization and usability of output data.

managing the collected data in order to make them really available and precious to the operators on in the value chain.

- Pilots Actions (please see Annex IX):

- ✓ BigWine.
- ✓ Milk & Cheese.

** Additionally, Technical Secretariat's tasks and Action Plan for Working Areas (shown in previous "structure section") will be consider as the basis to developing each Working Area Actions.*

■ **WA4: Open data, interoperability, data governance and information security, cyber security.**

The development of big data in the agrifood sector involves adapting the pattern of communications of information security to the agrifood sector. Without appropriate security, interoperability and open data development, the fourth industrial revolution will not be applicable to the sector.

This area contains actions to create the conditions that will favour the development of digital services and to ensure that the conditions for reusing national/regional documents/data are transparent and available to the public.

In the case of private data, the plan's main objective is to develop actions which ensure to improve metadata generation, interoperability, sharing and use open data (i.e. properly handling the data acquisition phase, recognizing discrete data, making it readily accessible and available, while respecting existing privacy, privacy, security and commercial value).

In a nutshell, designing and set-up data governance is necessary to define and implement the required communication tools in order to foster understanding and value giving to the strategic information obtained by BigData analysis.

Actions

- Organization and reorganization of local and regional data already potentially available.
- Development of data storage strategy and data collection systems.
- Development of tools to improve the data analysis and interoperability.
- Definition of governance and policy criteria in information management and network data security.
- Establishment of methods for secured Information Security.
- Pilots Actions (please see Annex X):
 - ✓ EuroRegio AgroBigData.
 - ✓ Identification and Big Data analytics of open data sources in the agrifood sector.

Additionally, Technical Secretariat's tasks and Action Plan for Working Areas (shown in previous "structure section") will be consider as the basis to developing each Working Area Actions.

Chapter 6. Communication and Dissemination.

Communication is a key component to achieve an open and efficient dialogue between all the members of the partnership and also to optimise and enhance the flow of information externally, tackling all the agents involved in the agrifood sector value chain.

On the other hand, the optimal dissemination of the results obtained will allow to raise the awareness of stakeholders and experts in order to actively involve them in the exchange of experience activities. Moreover, it will allow to inform and influence the political strategies of the agrifood sector at regional, national and European levels. It will also persuade the relevant policy makers in the agrifood industry to include the measures of the action plan in future policies; and finally, to disseminate knowledge in order to create ecosystems of innovation, generate added value and reduce the gap between the actors of the agrifood chain, research and markets.

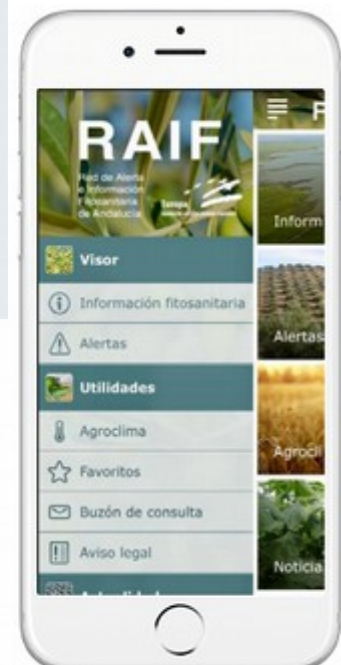
Avoiding duplication and achieving a common line of organisation will be very important to get a package of effective and smooth communication and dissemination measures.

Finally, it is important to differentiate and adapt activities to the various stakeholders in the agrifood chain, since it is a wide network with very different cases and possibilities along it.

Actions

- Development of the Communication Plan.
- Development of communication and dissemination materials: good practices manuals, technical data sheets, publications, newsletters, news releases, brochures, presentations, etc.

- Events participation/organization, conferences and demonstration workshops (regional, inter-regional)
- Active presence on social networks (Twitter, Facebook and LinkedIn).
- Development of a project website.
- Contribution to the regional, national and European strategic frameworks.



Chapter 7. Monitoring and Evaluation.

This chapter aims to ensure the proper development of this work plan of the S3P agrifood partnership on traceability and big data by monitoring its actions and results. Including the possibility of extensions, amendments and/or improvements.

This work package will be collected in a single document entitled **Monitoring and Evaluation Plan**.

The indicators defined in the table below, distributed by chapters, will be used for the evaluation of the consistency and the progress of the actions.

Indicators

- Chapter 1. Governance, Coordination and Management:
 - ✓ Number of entities involved in the partnership.
 - ✓ Number of meetings/activities/events.
 - ✓ Number of events attended.
 - ✓ Number of reports generated.
 - ✓ Number of reports reviewed.
 - ✓ Number of coordination meetings.
 - ✓ Percentage of representation of the European agrifood sector.
- Chapter 2. Analysis and Diagnosis:
 - ✓ Catalogues produced. Number of regional/national/EU open data sets.
 - ✓ Catalogues produced. Number of technologies included in the catalogue.
 - ✓ Reports produced on needs/opportunities.
 - ✓ Regional relational capital maps generated.
- Chapter 3. Strategic Connectivity and Funding:
 - ✓ Strategic frameworks revised.
 - ✓ Number of synergies established.
 - ✓ Number of funding sources revised.
 - ✓ Number of funding proposals submitted.
 - ✓ Number of funding proposals approved.

- Chapter 4. Capacity building:

- ✓ Number of training actions carried out: courses / seminars / workshops / visits to successful cases / exchange of experiences and transfer centres, by region.
- ✓ Number of learning, growth and employment programmes which will implement the measures inspired by the project, by region.
- ✓ Number of Living labs created by region.
- ✓ Number of Start-ups created by region.
- ✓ Number of HUBs created.
- ✓ Number of activities carried out by these HUBs.
- ✓ Number of networks of DIH created.

- Chapter 5. Working Areas:

The indicators for the four working areas of the partnership will be established ad hoc for each pilot project.

However, as a general rule, the following indicators have been established for the four working areas:

- ✓ Number of successful cases identified.
- ✓ Number of pilot projects submitted.
- ✓ Number of pilot projects approved.

- Chapter 6. Communication and dissemination:

- ✓ Number of publications, manuals of good practices, technical data sheets, newsletters, press reports, brochures, presentations, etc.
- ✓ Number of demonstration events/conferences/workshops organised.
- ✓ Number of events attended.
- ✓ Number of impacts on social networks.
- ✓ Number of visits to the website.
- ✓ Number of contributions to the regional, national and European strategic frameworks.

Annex I. List of Regional Partnership/DIHs within the T&BD Partnership.

(to date: 20th of March, 2017).

T&BD Partnership

Regional partnership/DIH of Andalusia

[111 partners]
20/03/2018

PUBLIC ADMINISTRATION

1. Consejería de Agricultura, Pesca y Desarrollo Rural
2. Consejería de Economía y Conocimiento
3. Consejería de Empleo, Empresa y Comercio
4. Consejería de Salud
5. Consejería de Medio Ambiente y Ordenación del Territorio
6. Agencia AAC: Andalus del Conocimiento
7. Agencia IDEA: Agencia de Innovación y Desarrollo de Andalucía
8. IFAPA: Instituto de Formación Agraria y Pesquera de Andalucía

CIVIL SOCIETY AND FINAL USERS

1. UCA-UCE Unión de Consumidores de Andalucía

BUSINESS SECTOR

AGRI FOOD BUSINESSES

1. AB Azucarera Iberia S.L.
2. APROA: Asociación de Organizaciones de Productores de Andalucía
3. AGROCOLOR S.L.
4. ASAJA Andalucía
5. C.R. Denominación de Origen Condado de Huelva
6. C.R. Denominación de Origen Protegida Aceituna Aloreña de Málaga
7. COAG Andalucía: Coordinadora de Organizaciones Agrarias y Ganaderas
8. Coexphal: Asociación de Organizaciones de Productores de Frutas y Hortalizas de Almería
9. CAEA: Confederación Andaluza de Empresarios de Alimentación
10. Cooperativas Agro-alimentarias de Andalucía
11. COVAP
12. DOOOP S.COOP. AND.
13. FIAB (Food for Life- Spain)
14. FRESHUEVA
15. Gálvez Productos Agroquímicos S.L.
16. Asociación para el desarrollo del Guadajoz y Campiña Este de Córdoba
17. Grupo de Desarrollo Rural Valle del Guadalquivir
18. Global GAP
19. Global Olive Consulting S.L.
20. Indeco Investigación de Dehesas Ecológicas S.L.
21. LANDALUZ Asociación Empresarial Alimentos de Andalucía
22. RURAPOLIS S.L.
23. Subafresh.com
24. TEPRO Consultores Agrícolas S.L.
25. Tropis
26. UPA Andalucía

ICT BUSINESSES

1. AgroBigData Solutions S.L.
2. AGROSAP Soluciones Agrícolas de Precisión S.L.
3. Alcuza Software S.L.
4. AMETIC: Asociación Multisectorial de Empresas de la Electrónica, las Tecnologías de la Información y Comunicación
5. Anserlog S.A.
6. Aquamática
7. Atos Spain
8. Bioazul S.L.
9. BO TRUE ACTIVITIES SL
10. Co2 Consulting S.L.
11. Dattechs Analytics S.L.
12. Easytosee Agtech SL
13. Eman Ingeniería S.C.A.
14. Asociación Empresarial Eticom
15. Evenor-Tech, SLU
16. Finanzas & I+D+i S.L.U.
17. Gabinete de Iniciativas Europeas S.A. (GIESA)
18. Global InDevices
19. GM V Soluciones Globales Inemet S.A.U.
20. Grupo SEIDOR S.A.
21. Grupo Hispatel Informática Empresarial S.A.
22. Heimdall Technologies
23. IT Corporate Solutions Spain S.L.
24. IBM S.A.
25. INNOVACIONES TECNOLÓGICAS DEL SUR S.L.
26. Internet of Things
27. Inventia Agraria SL
28. IRSOLAV: Investigaciones y Recursos Solares Avanzados
29. Innova Telecom S.L.
30. Kovat Control Biomimético
31. Metadology
32. MGS SOFT
33. MUEVO
34. Naturcode
35. Pri Ops Ciencia de Datos SL
36. RSC Talent 2016, SL
37. Servicios de Desarrollo Orientados a Soluciones S.L.
38. SAIG: Sistem as Abiertos de Información Geográfica
39. Seemotic Innovation S.L.
40. Sigrow Agtech S.L.
41. Singular People Andalusia S.L.
42. Smart Biosystem S.L.
43. Sum inistris s Importaciones y Mantenimientos Electrónicos S.A.U. (Grupo SE RMICRO)
44. Telefónica
45. TIER1 Technology S.L.
46. UTW Unmanned Technical Works
47. Verde Smart corporación S.L.
48. Voda fone España S.A.U.
49. Wellness Telecom S.L.
50. WENDU WE ARABLE SL
51. Zabala Innovation Consulting S.A.

BUSINESSES CONSULTING

1. Angloben Brand&Consulting

RESEARCH

ACADEMIA

1. Andalucía Tech: Campus de Excelencia Internacional
2. CeIA3: Campus de Excelencia Internacional Agroalimentario
3. CeI-mar: Campus de Excelencia Internacional del Mar
4. Universidad de Almería
5. Universidad de Cádiz
6. Universidad de Córdoba
7. Universidad de Málaga
8. Universidad de Sevilla
9. Cátedra Coexphal

RESEARCH AND TECHNOLOGICAL CENTRES

1. ADESVA: Centro Tecnológico de la Agroindustria
2. Andanatura: Fundación Espacios Naturales de Andalucía
3. CATEC: Centro Avanzado de Tecnologías Aeroespaciales
4. CIDAF: Fundación Centro de Investigación y Desarrollo del Alimento Funcional
5. CITIC: Fundación Centro Andaluz de Innovación y Tecnologías de la Información y las Comunicaciones
6. CITOLIVA: Centro de Innovación y Tecnología del Olivar y del Aceite
7. COIAA: Colegio Oficial de Ingenieros Agrónomos de Andalucía
8. CTA: Fundación Corporación Tecnológica de Andalucía
9. CTAQUA: Fundación Centro Tecnológico de Acuicultura de Andalucía
10. FAICO: Fundación Andaluza de Imagen, Color y Óptica
11. Fundación Cajamar
12. GEOLIT: Parque Científico y Tecnológico S.A.
13. Instituto de la Grasa, Consejo Superior de Investigaciones Científicas (CSIC)
14. PITA: Parque Científico Tecnológico de ALMERIA
15. TECNOVA: Fundación para las Tecnologías Auxiliares de la Agricultura



T&BD Partnership

Regional partnership/DIH of
ARAGON

[49 partners]
11/12/2017



PUBLIC ADMINISTRATION

1. REGIONAL GOVERNMENT- RURAL DEVELOPMENT AND SUSTAINABILITY DEPARTMENT
2. REGIONAL GOVERNMENT- INNOVATION, RESEARCH AND UNIVERSITY DEPARTMENT
3. REGIONAL GOVERNMENT- ECONOMY, INDUSTRY AND EMPLOYMENT DEPARTMENT
4. INSTITUTO ARAGONES DE GESTION AMBIENTAL
5. INSTITUTO TECNOLÓGICO DE ARAGON
6. CENTRO DE INVESTIGACION Y TECNOLOGÍA AGROALIMENTARIA DE ARAGON
7. FUNDACION EMPRENDER ARAGON
8. SARGA: Sociedad Aragonesa de gestión ambiental

CIVIL SOCIETY AND FINAL USERS

- 1.

BUSINESS SECTOR

AGRI-FOOD BUSINESSES

1. Federación Aragonesa de Cooperativas Agrarias
2. Cluster aragonés de empresas de alimentación
3. Colegio Oficial de Ingenieros Técnicos Agrícolas y Peritos Agrícolas de Aragón
4. Federación Aragonesa de Cooperativas Agroalimentarias
5. Asociación aragonesa de industrias alimentarias
6. Asociación Española de Fabricantes de Alfalfa Deshidratada (AEFA, <http://www.aefa-d.com>)
7. Asociación Agraria de Jóvenes Agricultores de Huesca (ASAJA Huesca, <http://www.asajahuesca.es>)
8. Asociación General de Productores de Maíz de España (AGPM, <http://www.agpm.es>)
9. Esmedagro
10. Grupo Jorge
11. Magapor
12. Vall Companys
13. Scanfisk
14. Tereos
15. ZINNAE: Cluster for the efficient use of water
16. Tecnopackaging
17. Grandes Vinos y Viñedos
18. Frutaria
19. SAAR

ICT BUSINESSES

1. ICT Cluster TECNARA (Asociación Cluster de Empresas de Tecnologías de la Información Electrónica y Telecomunicaciones de Aragón, <http://www.tecnara.es>)
2. 7eData Business S.L. (<http://www.7edata.com>)
3. GeoSpatiumLab S.L. (<http://www.geoslab.com>)
4. Instrumentación y Componentes S.A. (Inycom, <http://www.inycom.es>)
5. Hiberus Tecnología S.A. (<http://www.hiberus.com>)
6. Centro de arte y tecnología ETOPIA
7. Ayanet
8. ZENITH DRONES
9. Paintec
10. Tecnitop
11. Aeronort
12. Delsat
13. Spazio Dron
14. Adronaragon, Asociación Aragonesa de Pilotos y Operadores de Drones - RPAS.
15. Innovaciones y Desarrollos Aeronáuticos

RESEARCH AND TECHNOLOGICAL CENTRE

ACADEMIA

1. University of Zaragoza
2. Aragón Institute for Engineering Research from the University of Zaragoza (IA3, <http://ia3.unizar.es>)
3. Instituto Universitario Agroalimentario de Aragón, IA2 (<https://ia2.unizar.es/>)
4. The Institute for Biocomputation and Physics of Complex Systems (BIFI) from the University of Zaragoza (<http://www.bifi.es/>)

RESEARCH AND TECHNOLOGICAL CENTRE

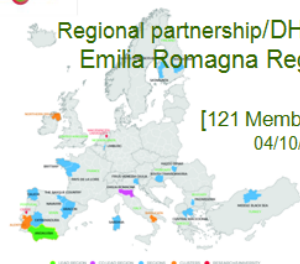
1. Fundación Parque Científico Tecnológico Aula Dei
2. Fundación CIRCE: Centro de Investigación de recursos y consumos energéticos
3. Fundación AITIIP



T&BD Partnership

Regional partnership/DHI of
Emilia Romagna Region

[121 Members]
04/10/2017



PUBLIC ADMINISTRATION

1. Emilia Romagna Region
2. Aster
3. NATIONAL AGRIFOOD CLUSTER CL.A.N. (103 ENTITIES - 15 PUBLIC ADMINISTRATION - INCLUDING EMILIA ROMAGNA REGION)

CIVIL SOCIETY AND FINAL USERS

- 1.

BUSINESS SECTOR

AGRIFOOD BUSINESSES/ICT BUSINESSES

1. REGIONAL AGRIFOOD CLUSTER (5 Business Members)
2. NATIONAL AGRIFOOD CLUSTER CL.A.N. (103 ENTITIES - 53 BUSINESSES / BUSINESS ASSOCIATION)

RESEARCH

ACADEMIA

1. UNIFE - [University of Ferrara](#)
2. UNIMORE - [University of Modena and Reggio Emilia](#)
3. UNIPR - [University of Parma](#)
4. UNICATT - [University Cattolica del Sacro Cuore](#)
5. UNIBO - [University of Bologna](#)
6. REGIONAL AGRIFOOD CLUSTER (Regional Research Members)

RESEARCH AND TECHNOLOGICAL CENTRE

1. CNR (IBIMET) - [National Research Council](#)
2. CRPA - [Centro Ricerche Produzioni Animali \(Research Centre on Animal Production\)](#)
3. CRPV - [Crop Production Research Centre](#)
4. NATIONAL AGRIFOOD CLUSTER CL.A.N. (103 ENTITIES - 35 ACADEMIA AND RESEARCH/TECHNOLOGICAL CENTRES)
- 5.
- 10.



- PUBLIC ADMINISTRATION**
1. Consejería de Medio Ambiente y Rural, Políticas Agrarias y Territorio
 2. Consejería de Economía e Infraestructuras
 3. Consejería de Educación y Empleo
 4. Extremadura Avante, S.L.U.
 5. Sociedad de Gestión Pública de Extremadura
 6. FUNDACIÓN FUNDECYT PCTEX
 7. CONSORCIO FEVAL

- CIVIL SOCIETY AND FINAL USERS**
1. UCE
 2. ACUEX
 3. ASOCIACIÓN REGANTES DE EXTREMADURA
 4. ASEVEX

BUSINESS SECTOR		
AGRIFOOD BUSINESSES		ICT BUSINESSES
1. COPRECA	34. MATADERO DE CASTUERA	1. INDRA
2. ROMA, S.L.	35. CARNICAS JOSELITO	2. VIEWNEXT
3. TEPRO	36. ASOCIACIÓN DE RETINTO	3. ANALYTICALS BIG DATA
4. HACIENDAS BIO	37. SUDOESTE RECURSOS	4. SET, INFORMÁTICA, COMUNICACIONES E INGENIERÍA
5. IBERCOM	38. BORGES AGRICULTURAL AND INDUSTRIAL NUTS	5. AGROCONECTA
6. GRUPO SOVENA	39. CONESA	6. BIOBEE
7. ELAIA	40. TOMATES DEL GUADIANA	7. AGRODRONE
8. AGRUPACIÓN COOP. VALLE DEL JERTE	41. ALSAT	8. DRONEGROUP
9. TANY NATURE	42. PRONAT	9. METEOSPAÑA
10. EXPLUM	43. CASAT	10. SKYDRONEX
11. EXPLOTACIONES AGRARIAS MONTIJO	44. NESTLÉ MIJADAS	11. IAS365
12. GRUPO CAMPO Y TIERRA	45. HERAL ENOLOGÍA	12. FOTEX
13. LOLAFRUTS	46. BIOTERRA	13. HEURISTIC
14. ACOPAEX	47. COOPRADO	14. IBERMÁTICA
15. ABONA GLOBAL	48. TECNOCE	15. SOLUCIONEX
16. ALDEA CONDE	49. QUERCOLOGY NATURAL	16. SNGULAR
17. SOTEX	50. COMPLUS	17. ASTRON
18. AECERIBER	51. NETASA	18. NON ANTS, S.L.U
19. ASICI	52. COOP. VIRGEN DE LA ESTRELLA	19. METAPHASE 07, S.L.
20. EA GROUP	53. DIETA MEDITERRANEA	20. RENACENS SISTEMAS, S.L.
21. GRUPO MONTESANO	54. BODEGAS LOPEZ MORENAS	21. XTREM INDUSTRIA DE SOFTWARE, S.A.
22. ESTIRPE NEGRA	55. ACERNORCA	22. CEDESA DIGITAL, S.L.
23. SEÑORIO DE MONTANERA	56. AFRUEX	23. INFO GUADIANA
24. EMBUTIDOS MALLO	57. CONSERVAS EL CIDACO	24. EXAIR DRONE TECH
25. JAMON Y SALUD	58. NANTA	25. GNUO
26. SIERRA DE BARBELLIDO	59. COOP. SAN MARCOS	26. AIRDRONE VIEW
27. ROLER	60. GEXPURINES	
28. TERNERA DE EXTREMADURA	61. NUGEST	
29. COOP. SIERRA DE SAN PEDRO	62. VEGENAT	
30. WAYU IBERICO	63. VERAVIC	
31. ACOREX	64. QUINTAPLANT	
32. JAMONES Y EMBUTIDOS DON BENITO	65. LABORATORIOS LARRASA	
33. GOLDEN WORLDWIDE TRADE, S.L.		

RESEARCH	
ACADEMIA	RESEARCH AND TECHNOLOGICAL CENTRE
1. Universidad de Extremadura (UEX)	1. CICYTEX
	2. Fundación COMPUTAEX
	3. CTAEX

T&BD Partnership
Regional partnership/DIH of Friuli
Venezia Giulia Region



PUBLIC ADMINISTRATION

1. Regione Autonoma Friuli Venezia Giulia-
Agricoltura, foresta e itticaultura
2. Regione Autonoma Friuli Venezia Giulia - Public
Health
3. Regione Autonoma Friuli Venezia Giulia-
Industrial Modernization, Grow
4. Regione Autonoma Friuli Venezia Giulia-
University, School & Innovation
5. Regione Autonoma Friuli Venezia Giulia-ICT
6. Regione Autonoma Friuli Venezia Giulia-
Environment
7. Federsanità ANCI FVG
8. APE FVG - Agenzia Per l'Energia del Friuli-
Venezia Giulia
9. Cluster AgroAlimentare
10. AGEA (Agenzia per le Erogazioni in Agricoltura)

BUSINESS SECTOR

AGRI-FOOD BUSINESSES

1. Consorzio DOC FVG – Unione Consortile dei consorzi del Friuli
Venezia
2. Despar
3. Consorzio Montasio
4. Lattarie Friulane
5. Venchiaredo
6. Consorzio Agrario
7. Pezzetta
8. Assenso a.c.
9. Sangoi Green s.r.l.
10. Tecniche Grafiche Tonutti S.p.A

ICT BUSINESSES

1. Eurotech
2. Almaviva
3. Soltec
4. Beantech
5. Asem
6. INSIEL
7. IKON

CIVIL SOCIETY AND FINAL USERS

- 1.

RESEARCH

ACADEMIA

1. Università di Udine
2. Università di Trieste

RESEARCH AND TECHNOLOGICAL CENTRE

1. Friuli Innovazione (Udine)

T&BD Partnership Greenport West-Holland

[51 partners]
07/11/2017



BUSINESS SECTOR

AGRI-FOOD BUSINESSES

Active in this project field:

1. Hortikey
2. LetsGrow.com (Hoogendoorn)

Partner in the cluster:

1. Best Fresh Group
2. BDO
3. Delphy
4. Demokwekerij
5. Duijvestijn Tomaten
6. GroentenFruit huis
7. Hoogendoorn

8. Koppert Biological Systems

9. Lans Tomaten
10. Benefits of nature
11. The New Farm
12. LTO Noord Glaskracht
13. Royal FloraHolland
14. Sion
15. Themato
16. VGB

ICT and other BUSINESSES

Active in this project field:

1. Berenschot

Partner in the cluster:

1. Achmea
2. Rabobank
3. VNO-NCW West
4. LTO Noord Glaskracht
5. Westland Infra
6. Letsgrow.com

PUBLIC ADMINISTRATION

Active in this project field:

1. Municipality of Westland
2. Municipality of Lansingerland

Partner in the cluster:

1. Province Zuid Holland

And municipalities:

1. Barendrecht
2. Brielle

3. DelftMidden
7. Delfland
8. Pijnacker-Nootdorp
9. Ridderkerk
10. Rotterdam
11. Vlaardingen
12. Waddinxveen
13. Westvoorne
14. Zuidplas

CIVIL SOCIETY AND FINAL USERS

1. University hospitals

KNOWLEDGE and RESEARCH

ACADEMIA

Within this project field:

1. TNO

Within the cluster:

1. TU Delft
2. Wageningen University and Research
3. Haagse Hogeschool
4. Inholland

VOCATIONAL EDUCATION

Vocational institutes:


1. EduDelta
2. Lentiz
3. Melanchthon
4. Wellantcollege

RESEARCH AND TECHNOLOGICAL CENTRE

Within the project:

1. Fieldlab FreshTeg
2. InnovationQuarter

BUSINESS SECTOR	
AGRI-FOOD BUSINESSES	ICT BUSINESSES
1. Chambre régionale d'Agriculture 2. Valorial 3. Végépolys 4. Coop de France Ouest 5. Terrena 6. Kuhn Audureau 7. Pack-e France 8. Groupe Doux	1. Weenat 2. Images et Réseaux 3. ADN Ouest 4. Heurisis 5. La Vigne numérique 6. La Cantine numérique 7. Biomérieux
PUBLIC ADMINISTRATION	
1. Conseil régional des Pays de la Loire 2. Bureau de représentation de la Région Pays de la Loire à Bruxelles 3. Conseil Economique Social Environnemental Régional 4. Agence régionale des Pays de la Loire 5. Nantes Métropole 6. La Roche-sur-Yon Agglomération 7. Angers Développement 8. Laval Economie	
CIVIL SOCIETY AND FINAL USERS	
1.	
RESEARCH	
ACADEMIA	RESEARCH AND TECHNOLOGICAL CENTRE
1. Ecole Supérieure d'Agriculture d'Angers 2. ESEO Angers 3. Université Bretagne-Loire 4. Université d'Angers 5. Pôle Agronomique Ouest 6. RFI Atlanstic 2020 7. RFI Food for Tomorrow	1. Angers Technopôle 2. Technocampus Smart Factory 3. Atlanpole 4. Laval Mayenne Technopole 5. 10.


T&BD Partnership
 Regional partnership/DIH of
Pazardzhik
 [43 partners]
 29/08/2017

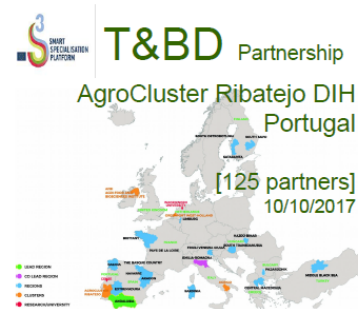


PUBLIC ADMINISTRATION

1. Regional development council of Pazardzhik region
2. Regional directorate "Agriculture" - Pazardzhik
3. Regional representative of the Executive agency for promoting SMEs - Plovdiv
4. Agriculture advisory services - Pazardzhik
5. Mayors of municipalities in Pazardzhik region
6. Municipal services for agriculture Pazardzhik region
7. Regional directorate for Consumer protection, Plovdiv

BUSINESS SECTOR	
AGRI-FOOD BUSINESSES	ICT BUSINESSES
<ol style="list-style-type: none"> 1. Biovet Peshtera Plc. 2. Lodi invest Ltd. Lakrima 3. Ahat-1 Ltd 4. Evromes Ltd. 5. Hris Ltd. 6. Ilma Ltd. 7. Ivan Ivanov & Sons Ltd. 8. Aquafish Ltd. 9. Miracle Krasi maker Ltd 10. Satimex Ltd. 11. Orion 2002 Ltd. 12. Milk grup bio Plc. 13. Bessa Valley winery Ltd. 14. Ina Ltd. 15. Orangerii Gimel Plc. 16. Alexandra Stoyanova 	<ol style="list-style-type: none"> 1. Jar Computers Pazardzhik 2. Elcomp-68 Ltd. 3. Coni-Com Ltd. 4. Ibs Computers Ltd. 5. Dimi-Soft Ltd. 6. Telecable Plc. 7. Iconnect Ltd. 8. Idsoft Ltd.
CIVIL SOCIETY AND FINAL USERS	
<ol style="list-style-type: none"> 1. Association of private entrepreneurs and employers in Pazardzhik 2. Industrial and economic association Pazardzhik 3. Pazardzhik regional representative of the Confederation of employers and industrialists in Bulgaria 4. Active consumers' association 	

RESEARCH	
ACADEMIA	RESEARCH AND TECHNOLOGICAL CENTRE
<ol style="list-style-type: none"> 1. University for food technologies Plovdiv 2. Agricultural university Plovdiv 	<ol style="list-style-type: none"> 1. Institute of agricultural economics Sofia 2. Maritsa vegetable crops research institute Plovdiv 3. Food research and development institute Plovdiv 4. Fruit growing institute Plovdiv 5. Institute of arable crops Chirpan 6. Institute of fisheries and aquaculture Plovdiv



PUBLIC ADMINISTRATION

1. Câmara Municipal de Almeirim
2. Câmara Municipal de Ferreira do Alentejo
3. Câmara Municipal de Mação

CIVIL SOCIETY AND FINAL USERS

1. Associação Industrial Portuguesa - Câmara de Comércio de Indústria
2. NERSANT

CIVIL SOCIETY AND FINAL USERS

1. Convergência - Formadores Associados Lda.
2. Iberscal Consultores, Lda.
3. Latitude Perfeita, Lda.
4. Núcleo Inicial - Formação e Consultoria, Lda.
5. Q-Staff, Consultoria, Lda.
6. RiSA Consulting SA

RESEARCH

ACADEMIA

1. Escola Profissional de Coruche
2. Instituto de Educação e Formação do Sorraia
3. Instituto Politécnico de Santarém
4. Instituto Politécnico de Tomar
5. ISA- Instituto Superiores de Agronomia

RESEARCH AND TECHNOLOGICAL CENTRES

1. Biovolution, Lda.
2. Centro Nacional de Embalagem
3. ISQ- Instituto de Soldadura e Qualidade
4. Labriagro- Laboratório Químico
5. LMV- Laboratório de Medicina Veterinária, Lda.
6. Qualiteste - Análise Sensorial, Lda.
7. TAGUSVALEY- Associação para a promoção e Desenvolvimento do tecnopólo do Vale do Tejo

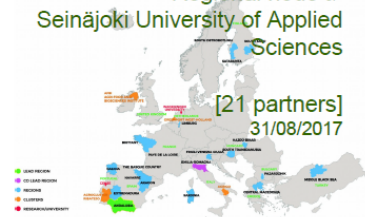
BUSINESS SECTOR

1. Alinomaq, Lda.
2. Agro-Graça, Produção e Comercialização de Produtos Agrícolas, Lda.
3. Agrolux II - Rações Lda.
4. Agromais - Entrepósito Comercial Agrícola CRL.
5. Agropromotora Internacional, SA
6. Aparroz- Agrupamento de Produtores de Arroz do Vale do Sado, Lda.
7. Arrozeiras Mundiarroz, SA.
8. Associação de Beneficiários do Rôxo
9. Avipronto- produtos Alimentares, SA
10. BACEFRUT- Comércio de Batatas, cebolas e fruta, Lda.
11. Bee Iellow, Lda.
12. Benagro- cooperativa Agrícola de Benavente, CRL
13. Bonduelle (Portugal) Agroindústria SA
14. Cabana dos Parodiandes, Sociedade Unipessoal, Lda.
15. Caima- Indústria de Celulose SA.
16. Casal da Coelheira - Sociedade Agrícola, LTD.
17. Cofesa- Conservas da Figueira, SA.
18. Companhia das Lezírias SA
19. Contemp - Companhia dos Têmporos Lda.
20. Cooperfutas - cooperativa de Produtores Fruta e Produtores Hortícolas de Alcobaça, CRL.
21. Culti Frozen Foods, Lda.
22. Dacsa Atlantic, SA
23. DFJ Vinhos, SA
24. Diamantino Coelho e Filho, SA
25. Dinamicas Rotinas, Lda.
26. Ditterra - Comércio agro-industrial, Lda.
27. Divinis, SA.
28. Eduardo Loureiro Unipessoal, Lda
29. Eduardo Nuno Rodrigues e Pinheiro
30. Festivo Começo, SA
31. Fio Dourado- Transformação e Comercialização
32. Produtos Olivícolas, Lda...
33. Friopesca- refrigeração de Aveiro, SA.
34. Fritoformo - Fabrico Caseiro de Salgados, Lda.
35. Frusel - Frutos Seleccionados Lda.
36. Frutacarmo- Comércio e Indústria de Produtos Alimentares, Lda.
37. Greenyard Logistics
38. Henricames Lda
39. Incopil - Indústria e Comércio de Pimentão, SA.
40. Indumel
41. Itacampo Sistemas de Rega, Lda.
42. Italgro, SA
43. ITS
44. Jacinto Pimentel Rego & Cª, Lda.
45. Jerónimo P. M. A. E Lima
46. José Carlos Pinheiro Bairão
47. José Marques Agostinho, Filhos e Cª. Lda.
48. Lactaques - União das Cooperativas de Lactínicos dos Açores, UCRL.
49. Lactínicos do Paiva, SA.
50. Leonor Rodrigues Unipessoal, Lda.
51. LezíriaPlantas- Fornecimento de Produtos e Serviços Agrícolas, Lda.
52. Liporfil, Produtos Alimentares, SA.
53. Magos Irrigation Systems, SA.
54. Margarido e Margarido, Lda.
55. Maxipet, Lda.
56. MCS- Moagens de Cereais Setúbal, SA.
57. Mendes Gonçalves Distribuição SA
58. Mendes Gonçalves SA
59. Monliz - Produtos Alimentares do Mondego e Liz, SA
60. Monte D'Alva Alimentação, SA
61. NaturalCrop Unipessoal Lda.
62. Nobre Alimentação, SA.
63. Nutrigreen, SA.
64. Nutriva Produção e Distribuição Alimentar, Lda
65. Oliveira Velha, Lda.
66. Orbital Courage SA
67. Orivárzea- Orizicultores do Ribatejo SA
68. Paladares Alentejanos, Lda.
69. Parras Wines Unipessoal, Lda.
70. Pitorro - Moagem de Cereais, SA.
71. Protecatur, Exploração Agrícola, Lda.
72. Queijo saloio - Indústria de Lactínicos, Sa.
73. Quinta do Arrobe Unipessoal Lda.
74. Quinta do Vale da Lousa, SA
75. Rações Zêzere
76. Riazor - Azeites e óleos vegetais, SA
77. Rosagro - Sociedade Agrícola, Lda.
78. Salverde, Sociedade Unipessoal, Lda.
79. SAOV - Sociedade Agrícola Ouro Verde, Lda.
80. ScaRegional-Doce e Outros produtos regionais do Ribatejo, Lda.
81. Servipal, Lda.
82. Sizarze - Sociedade Industrial de Cames do Zêzere, S
83. SILVEX- Transformadora de Plásticos SA.
84. SIVAC, SA.
85. Sociedade Agrícola da Quinta do Meirinho
86. Sociedade Agrícola do Vale de Umbria, SA.
87. Sociedade Agro-alimentar da Mascata, Lda.
88. Sociedade Lusitana de Destilação SA
89. Sociedade Panificadora Costa e Ferreira, Lda.
90. Social - Comércio e Indústria Alimentar, Lda.
91. STI- Sistemas e Técnicas Industriais Lda.
92. Sugal Alimentos SA.
93. Sumol+Compal Marcas SA
94. Tecadi Lda.
95. Triplanta- Viveiros do Oeste, SA.
96. True Solutions Unipessoal, Lda.
97. Unicer Bebidas, SA.
98. Uniovo- Ovos e Derivados, SA.
99. Unique Portuguese Taste, Lda.
100. Victor Guedes SA
101. Vinerves, SA.
102. Zerezo- Produção Agrícola e Avícola do Zêzere, SA.
103. Zoopan - Produtos Pecuários SA.



T&BD Partnership

Regional node of
Seinäjoki University of Applied
Sciences



PUBLIC ADMINISTRATION

1. Regional Council of South Ostrobothnia
2. The City of Seinäjoki
3. Viexpo
4. Chamber of Commerce
5. Centre for Economic Development, Transport and the Environment

CIVIL SOCIETY AND FINAL USERS

1. Rural Women's Advisory Organisation

BUSINESS SECTOR

AGRI-FOOD BUSINESSES

1. Honkajoki Ltd

ICT BUSINESSES

1. A-lab

RESEARCH

ACADEMIA

1. University of Helsinki, Institute of Ruralia
2. University Consortium of Seinäjoki

RESEARCH AND TECHNOLOGICAL CENTRE

- | | | |
|--|----|-----|
| 1. Natural Resources Institute Finland | 5. | 10. |
| 2. INTO Seinäjoki | | |
| 3. Finnish Food Safety Authority (Evira) | | |



T&BD Partnership

Regional partnership/DIH of
South Savo, Finland

[32 partners]
26/07/2017



PUBLIC ADMINISTRATION

1. Regional Council of South Savo
2. Centre of Economic Development, Transport and the Environment, South Savo
3. Mikkeli Town Council/ Rural services
4. Savonlinna Town Council/ Rural services

CIVIL SOCIETY AND FINAL USERS

1. Rural Women's Advisory Organization
2. REKO –ruokapiliri
3. Open Knowledge Finland/ South Savo

BUSINESS SECTOR

AGRI-FOOD BUSINESSES

1. Pro Agria – Rural Advisory Services, South Savo
2. The Central Union of Agricultural Producers and Forest Owners (MTK), South Savo
3. PEL –tuote Oy
4. Saimaan Juomatehdas Brewery
5. Itä-Suomen kalatalousryhmä
6. Suhos Farmi
7. Järvi-Saimaan Palvelut
8. Heikkilän Yritystilä

ICT BUSINESSES

1. MPY
2. Observis Oy
3. AgentIT
4. Rock Solid IT
5. Societal Security Solutions
6. Environics
7. OWS Finland
8. Jamix

RESEARCH

ACADEMIA

1. South Eastern Finland University of Applied Sciences
2. University of Helsinki/ Ruralia-institute
3. Natural Resources Institute Finland
4. Finnish Organic Research Institute
5. South Savo Vocational college

RESEARCH AND TECHNOLOGICAL CENTRE

1. Mikkeli Development Miksei Ltd
2. Savonlinna Business Centres
3. Digitalmikkeli
4. Electronics 3 K Factory (Xamk)
- 5.
- 10.

Annex II. Framework. WA 1. Lifecycles of the value chain.

Challenge

The environmental dimension of production, distribution and food recycling is becoming increasingly important and the life cycles concept is a mandatory reference that is being adopted by many production and distribution systems. Improved knowledge of carbon, water and environmental footprints is essential to assess the efficiency, sustainability and competitiveness of a value chain. Moreover, these criteria represent a very important aspect of traceability and such information is increasingly requested by consumers.

The demand and growing concern by consumers of food products which are not only environmentally-friendly but also increasingly healthier and safer and which can prove it throughout its transformation process are also important. Agri-business must adapt to meet these demands and be able to offer this information to consumers in a liable and secure way.

A sufficient and comprehensive quantification of the environmental footprint, traceability procedures and food security and safety along the value chain requires a major effort and the use of tools which enable the mass treatment of structured and non-structured information, such as big data and cognitive techniques.

The exploitation of the potential of the process sensing and monitoring, the analysis of information and the use of big data tools can undoubtedly contribute to quantify the environmental impact of agrifood processes and contribute to the improvement of their sustainability.

It is also necessary to previously understand that the agrifood sector, and, in particular the primary production sector, as it has a number of particularities that make necessary to overcome a series of specific challenges of the sector in order to progress in this process. Some of them are described below:

- Dispersed and atomized sector in general.
- Significant percentage of elderly population, reticent to change and technology incorporation.
- In the agrarian sector, agents who incorporate in their processes machinery equipped with the latest technologies of sensing, geolocation, communication and smart farming, coexist with others whose work processes are much more rudimentary.
- Although it may seem obvious, the use of big data tools requires the availability of data. In this sense, there is a lack of record of historical data of the productions in some occasions, and there are also agents such as Administrations and/ or other actors in the sector, who have data histories (accumulated data from field notebooks) but many of them are not computerized. Its

digitisation, for its correct analysis involves an additional challenge.

- There is a lack of coordinated information and difficulty in selecting technologies that are more appropriate for each situation: There is a general knowledge in the sector of new services being developed for crop monitoring, data collection...etc., but producers receive information from different technology providers in an individual way. Producers lack an overall view of which technologies and/or applications are most appropriate for each particular situation.
- There is machinery developed that incorporates the latest technologies, but the agricultural machinery that does not incorporate so much technology and it is pending amortization can delay the incorporation of technology. It is necessary to facilitate the incorporation of ICTs to those farmers who have the simplest agricultural machinery, pending completion of amortization.
- agrifood production is varied, and processes, especially those corresponding to the primary production system, are not closed systems and so are not very precise as they are affected by multiple variable. Some of those variables are complicated to monitor and/or model. Sometimes, when modeling a particular type of crop, produced in a particular area, in a particular soil, with specific management conditions..., extrapolation to other areas, crops... becomes very complex.
- Lack of availability of wireless networks in some rural areas.
- There is a lack of coordinated information, so that all the coordination initiatives of the different agents involved (farmers, machinery manufacturers, sensor and monitoring technologies providers, software providers, logistics solutions providers, food processors, consumers ...) are of great interest both to bring technology closer to the needs and reality of the sector, to develop versatile applications to be fed by different data sources and to facilitate the interoperability and exchange of data between organizations, especially among SMEs.
- The environmental impacts associated with the agrifood industry are numerous, varied and not always easily quantifiable: Water, energy, fertilizers, herbicides and chemical products consumption, over-exploitation, loss and degradation of soils, loss of habitats, loss of biodiversity, eutrophication, GHG emissions, deforestation, generation of by-products and industrial waste (animal waste, antibiotics, hormones, fertilizers, herbicides and chemical products consumption, over-exploitation, loss, degradation and desertification of soils, loss of habitats, loss of biodiversity, eutrophication, GHG emissions, deforestation, generation of by-products and industrial waste (wastewater, animal waste, antibiotics, hormones, fertilizers, agrifood packaging ...).

In this working area the following sub-areas were distinguished:

- Improve the knowledge about the environmental footprint and the impact of the different processes of the agrifood production chain, identifying those processes that are more relevant from an environmental impact perspective (carbon footprint, water cycle, bioeconomy ...). Identify technologies which can be applied to measure life cycles, methodologies for life cycle assessment, identification of data typology methodologies, raise awareness of the environmental impact of the processes, such as waste water treatment, carbon footprint, food waste reduction, renewable and efficiency energy, etc.
- Use of traceability, BD and LCA tools is a more sustainable and competitive food production (lower consumption of inputs, better conservation of biodiversity, minimization of waste and greater management of the same, contributing to a circular economy ...). Identify and implement innovative initiatives that contribute to develop bio-based products and a more sustainable and competitive food production. Evaluation of the productive improvement using Life Cycle Analysis tools as applicable.
- Use of traceability, BD and LCA tools as a basis for more sustainable and competitive food distribution systems: Use of traceability tools, BD and LCA as appropriate for more sustainable and competitive food distribution systems: Optimization of logistics chains, development of new active and intelligent packaging, with improved ecodesign, for safer and more sustainable transport of food products; Use of BD to reduce spoilage at every step of the food life cycle - production, storage or distribution. Use of sensor data, transport information and consumption numbers to determine the best time to bring food to market. Some experts estimate that just by utilizing big data to reduce spoilage, the worldwide yields can increase from 5 to 15 percent. Some large companies have built solutions for this specific use case that provide guidance on preferred modes of transporting food based on weather data & road conditions.
- T&BD and Lifecycle of the value chain to Improve consumer's access to valuable information about product's life cycle, to promote the consumption of healthier, safer, greener and more sustainable and responsible products ... Nowadays, consumers demand better visibility into their food lifecycle - where is it coming from, how was it produced, how does distribution work, etc. This has led several farms to adopt big data solutions to provide better visibility into the food production & distribution process. Several of these farms are being sponsored by groups of consumers to produce healthier food. The key here is

adopting sustainable farming practices and humane treatment of animals and sharing data & insights with consumers to support these. Some larger retailers are gathering data from multiple sources and providing their customers a better understanding of the journey of their food from the farm to the stores.

Scope

The scope of the work within this subarea is to promote and execute a series of actions aimed at monitoring some processes of agrifood production, evaluating their environmental impact, and developing initiatives that contribute to the minimization of the same.

Similarly, work will be done to understand and harmonize the different methodologies for environmental impact assessment. In particular, impact assessment is envisaged to be done using the Life Cycle Assessment methodology (a thorough environmental impact assessment methodology, widely used in the past and with international recognition), and environmental product footprint (new methodology whose use is being promoted from the European Commission).

Due to the multitude of processes and impacts that integrate the different agrifood chains, it is too ambitious, under this platform, to try to approach a pilot project that considers the whole value chain of an agrifood product. Therefore, within the framework of this document, lines of action will be proposed to reduce the environmental impact of part of the processes of the agrifood chain.

It has been identified 4 sub-areas:

Objectives

The objectives identified in this work subarea are:

- To understand and harmonize methodologies of environmental impact assessment, especially Life Cycle Analysis, and PEF.
- To advance in the understanding and the acquisition of a holistic vision of the global potential of the use of ICT tools and of big data, for the improvement of the sustainability (and the competitiveness, in relation to the area of work 2) of the agrifood processes.
- To identify and select specific priority areas for action among all the processes of agrifood chains. Part of this work has been done through the contributions of the different regions in the development of this subarea, but in this point it is necessary to finish filtering according to regional interests in specific themes, better cost / impact of the pilot activity to develop, greater impact of the action due to the relevance of the process or sub-sector, suggested deadlines or work themes

in the different topics ...

- To identify funding opportunities at regional, national and especially European level to develop collaborative projects to improve the sustainability of agrifood processes through the use of ICT tools and big data.
- To promote and support the realization of work projects to implement these tools to minimize the environmental impact of agrifood production processes.

Results

Some of the expected results in this work subarea are:

- A report identifying projects, studies and work experiences carried out in which an environmental impact assessment of different agrifood production chains has been carried out, especially using LCA and PEF methodologies.
- An updated report on the projects carried out under the auspices of the European Commission, on the application of the PEF methodology in different agrifood sectors. Identification of sectors pendent to be applied.
- Summary document on the potential that the use of ICT's and big data tools offer to the agrifood sector, including an evaluation of the best technologies for the different applications and an identification of the main challenges to be solved.
- Development of one or more (to be determined) pilot actions that contribute to a minimization of the environmental impact of one or several processes of the agrifood production chain.

Actions

In order to achieve the envisioned objectives and results, the following activities need to be carried out:

✓ Action 1: Review projects and / or experiences.

Review projects and / or experiences. of environmental impact assessment of agrifood industry processes, especially those that use the Lyfe Cycle Assesment or PEF as an evaluation methodology.

✓ Action 2. Review the progress of European Commission pilot projects.

Review the progress of European Commission pilot projects (Phase 2), to assess the environmental impact of agrifood processes according to the PEF methodology (http://ec.europa.eu/environment/eussd/smgp/pdf/2017_peer_rev_finrep.pdf)

✓ Action 3. Review experiences.

Review experiences ,explore and promote the use of Big Data tools can contribute to the improvement of sustainability and better traceability of the agrifood chain processes.

This work should be done in collaboration with those responsible of Working Area 2, extending the scope of application of big data tools to improving the competitiveness of the sector. It is necessary to advance in a better understanding of the best technologies applicable in each sector, productive process ..., and the best cost / efficiency ratio that each technology can provide.

It is necessary to gather information on hardware compatibility, software, integration of data obtained from different sources ..., etc. in order to propose a project of application of big data or development of a predictive model for the improvement of sustainability.

It should be contemplated the organization of infodays/ events to promote and sensitize the agrifood sector on the benefits of the use of ICT's and tools of big data.

✓ Action 4. Identify calls/ programs/ funding opportunities.

Identify calls/ programs/ funding opportunities to develop projects that contribute to minimize the environmental impact of the agrifood value chain by using ICT's and big data tools.

✓ Action 5. PILOT ACTIONS

Two proposals for pilot actions are presented in the Annex VII. In order to select the working proposals it has been considered:

- The knowledge of agents and capacities to implement them.
- The economic importance of the agrifood subsectors in Europe, and the relevance of the environmental impacts they generate (Pig Sector has been suggested to develop a pilot action).
- The need to comply with new European legislation (for example, on the sustainable use of pesticides).
- The alignment of both initiatives with social challenges identified in the H2020 program.
- The degree of innovation and impact that both projects involve.

Expected Impacts

Some of the impacts that derive from the application of the described actions are:

- Improved knowledge about the environmental impact of different processes in the agro-food chain.
- Promotion of the use of environmental impact assessment methodologies in the agrifood sector, especially the PEF methodology, promoted from the EC.
- Promotion of the use of ICTs and Big Data tools showing its potential to improve the competitiveness and sustainability of the agrifood industry.
- Reduction of at least 10% of the impact of water management in pig slaughterhouses, through the use of ICTs and big data tools to the process.
- Improvement of pest management procedures and reduction of the environmental impact generated by the use of pesticides and chemical agents in the agrifood sector.

Fuctioning of the WA. Responsibility for each task

The work in WA1 began with 3 regions (Galicia, South Ostrobothnia and Aragon) involved as co-leaders in the development of this working document.

For different reasons, finally Aragon has been the only region, in collaboration with Andalusia, responsible for developing this proposal.

From now on it is necessary to:

- Identify new regions that want to take the lead in the activities of the area.
- Carry out a reassignment of responsibilities in the area to ensure the fulfillment of the tasks foreseen
- Define among all participants which will be the working procedures to be followed
- Define how the rest of participating regions will be involved in the development of the work.

Working and Communication tools

In relation to the previous section, the working and communications tools have to be defined by the new team leading the WA.

Monitoring

The following indicators have been identified to enable proper monitoring of the development of WA1 activities:

Indicators of execution:

- Preparation of a review report of projects / experiences of evaluation of the environmental impact of agrifood production processes: YES / NO
- Elaboration of report on the status of application of PEF methodology in pilot projects: YES / NO
- Elaboration of a report on financing opportunities identified to implement ICT application projects and Big Data tools to improve the sustainability of the processes of the agro-regional chain: YES / NO
- N° of infodays days organized.

Indicators of results:

- N° attending the training days.
- Number of pilot actions / projects promoted under the WA1.

Indicators of impact:

- Evaluation of the environmental improvement obtained through the development of the pilot actions / projects promoted in the framework of this WA1.

Annex III. Framework WA 2. Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.

Challenge

To develop smart monitoring systems (collecting and analysis tools for multi-variated data in real time) in order to:

- improve traceability, security and products quality,
- reduce environmental stress,
- create added value (thanks to decision-making support systems),
- make information available for all and transparent,
- improve agrifood sector with a better economic balance (a better distribution of added value) and with fighting food fraud,
- have a reliable view of the sector in particular for institutional actors.

Scope

Definition of concepts:

Smart monitoring: Transferring measurement data on variables such as electricity, and efficiency. Continuous recording creating visual data on a display.

Value chain: Process view of organisations, based on the idea of seeing a manufacturing organisation as a system, made up of subsystems each with inputs, transformation processes and outputs.

Competitiveness: Ability and performance of a firm, sub-sector or country to sell and supply goods and services in a given market, in relation to the ability and performance of other firms, sub-sectors or countries in the same market.

Areas concerned: all food sectors (plant and animal, fisheries and aquaculture); from upstream to downstream: primary production, agro-equipment, food industry (transformation), logistics-transportation, distribution and consumption.

Field of study: information collecting tools (sensors and others technologies); information analysis tools (software, equipment); impacts of change (economic, social, environmental) and terms and conditions of the change (formation, ownership (familiarization) of the tools, funding...).

Objectives

Objective 1: Get a better knowledge of the different stakeholders (agrifood sector, digital sector, policy makers...) within and between the European regions.

Objective 2: Foster experimentations and implementation of solutions.

Objective 3: Speed up the use of digital solutions and big data in the agrifood sector.

Objective 4: Contribute to the elaboration of the public policies.

Results

The results, arising from the activities detailed below, must let achieve the objectives. Thus, the main expected result is the implementation of partnership projects for the improvement of the competitiveness of the European agrifood sectors by:

- a better control of the production process (agricultural production, transformation and distribution) by the use of digital tools;
- an appropriate response to the consumers' needs (quality, security) to provide a segmented and differentiated European production through digital tools;
- more transparency (data available for all) in order to distribute the benefits among all stakeholders in the food chain.

The operational results expected are:

- Activity 1: Mapping of the competences and successful experiences to achieve objective 1 (better knowledge) and identification of needs and missing bricks (objective 2 and 4).
- Activity 2: A shared and up-to-date technological watch to achieve objective 1 (better knowledge).
- Activity 3: An operational on-line platform to share results of activities 1 and 2 (achievement of objectives 1, 2 and 3).
- Activity 4: Implementation of appropriate partnerships and scientific

publications in order to achieve objective 3.

- Activity 5: Elaboration of a common strategic document to give a support to regional, national and European policy makers.

Actions

✓ Action 1: Conduct a state of art in each region.

- Establish a common methodology.
- Mapping of publications, patents and training catalogue, research programs, good practices, stakeholders... in each region.
- Identify the missing bricks (technological, financial, partnerships...).
- Pool and edit the results.

✓ Action 2: Ensure a technological watch.

- Identify international useful good practices and experiences.
- Share information between all partners (online platform, newsletter...).

✓ Action 3: Share the state of art, the good practices and information.

Pilot Action.

- Edit a common document or set up an online platform.
- Set up meetings between the WA 2 partners and the local partners.
- Set up onsite visits or learning expeditions to share good practices.

✓ Action 4: Develop experimental/research projects. Pilot Action.

- Determine the scope of the projects.
- Identify funding opportunities and potential partners.
- Set up two projects in plant and animal production.

✓ Action 5: Inform and disseminate.

- Communicate with the local stakeholders on the results and the good practices identified within the WA2.
- Identify the relevant networks and provide them useful information on the WA2 activities, results and good practices.
- Take part to the European or national calls for contributions.

Proposal of selection criteria for the Pilot Actions submitted for European funding

- Degree of cooperation between local and EU actors.
- Degree of transferability of the results to the food sectors.
- Degree of innovation (technological and/or social and/or economic).
- Respect of the determined scope (activity 4).

Expected impacts

Dissemination and better knowledge of state of art in the field.

Acceleration of the integration of digital tools and Big Data in the food value chain.

Creation of added value, secured and healthy products.

Functioning of the WA/ Responsibility for each task

What co-leader is going to do be responsible of what task?

Pays de la Loire is the only co-leader. Thus, Pays de la Loire will take in charge all the coordination of the WA2, including relationships between WA2 partners and with the platform co-leaders and the tasks below :

- Joint technical secretariat: coordinate the WA2 schedule, ensure that the contact database is updated, send the invitation to the participants for the meetings.
- Provide the link with the platform co-leaders (Andalusia and Emilia-Romagna).
- Ensures that the activities are consistent with the WA2 and T&BD platform objectives.
- Coordinate the WA2 activities.

How co-lead regions are going to work together and take joint decisions?

Pays de la Loire is the only co-leader of the WA2. Pays de la Loire is going to consult the WA2 partners when it would be necessary to take decisions.

How co-leaders are going to work with participant regions?

- Provide support on every question related to the WA2.
- Meeting every six months (methods of collective intelligence).
- One to one meeting with each partner every three months.
- At least one annual physical meeting.

The WA2 will be subdivided into 4 sub-areas and the partners will be involved as coordinators or referents in each sub-area:

Traceability versus high quality.

Utility of the Big Data in added value creation.

Utility of the Big Data in a better distribution of added value.

Convincing of stakeholders of the importance of smart monitoring in the food chain.

Working and communication tools

The partners will develop a communication and dissemination plan to include the appropriate targeted events, professional organisations, and the policy makers. Each of the partners will participate to at least one national or international conference related to the subject and disseminate the platform's activities.

Internet dissemination, including the development of a common online platform and the distribution of 2 electronic newsletters per year, will allow a broad community of stakeholders to access the platform and its knowledge and be informed about its objectives, achievements and progress. This tool should be developed in the framework of the whole T&BD partnership.

Monitoring

Identify indicators (2 in each of the following categories):

Execution (actions done)

- Number of meetings done and number of stakeholders involved.
- Number of event participations.

Results (results achieved)

- Mapping.
- Number of projects selected in the European calls.

Impacts (measured)

- Quality of interactions between stakeholders of the European regions (through a survey).
- Dissemination of the results: number of communication activities performed.

Annex IV. Framework WA 3. Incorporating consumer experience & different operators in food chain decision making processes.

S3P agrifood traceability and Big Data (T & BD) provide a common framework for regions and stakeholders to work together towards innovation in the agrifood industry. These actors have identified the common needs to be solved by sharing goals and a methodology towards common results and impacts.

The possibility of collecting the information coming from consumer's or user's experience and share it over the agrifood value chain is a very interesting aspect, especially when it is done in real time.

In order to generate value for all involved parties (primary sector agricultural, secondary transformation, tertiary distribution and services to consumers), the stream of information must be bilateral throughout the chain.

This stream allows all the parties involved to take advantage of it by correlating and contextualizing the information related to a specific product, thus creating, only in this way, a real and strategic value in the detected data.

In this democratic and guaranteed logic, the consumer as well as any other subject in the chain is enticed to become involved in the process by receiving and consequently providing information.

Each agrifood product comes from the transformation of primary sector products to by a business entity with a designated as Food Sector Operator (OSA). This subject is, according to law, responsible for his product from every point of view. Normally OSAs, during in the preparation of their products add some secondary component (ingredient, additive, food preparations, package, ...), expressly formulated/prepared and previously managed by other suppliers (OSAs in turn).

All components used for production at a given time contribute to the creation of a “batch” of that product (which must be identifiable by assigning a “batch number”) which is described at the same time by all the data coming from processing techniques and conditions used.

The batch thus differentiates a number of food preparations that may also be apparently equal to

each other by composition and useful life time. This system makes the two basic processes in food safety possible known as “traceability” and “traceability”.

The distribution channels used downstream of production can be different and also structured according to different logistics organizations, depending on the type of product and the reference markets. Products of the same production batch preserved or transported under different conditions might be subject to changes to their characteristics. This will affect the product “shelf life” or its quality as perceived by the consumer.

Even the end user, from the moment of purchase, has an influence on the characteristics of the product before consuming it. Mistakes in the handling of temperature and humidity during transport to the destination but also during home storage can deteriorate the quality in both nutritional and sensory terms.

A Judgment expressed any by the end user has a great value only if done on a product provided with correct and complete information. In fact two commercially identical products coming from different batch will almost certainly have some different components giving different characteristics and having different stories.

Analogously two products coming from the same lot but stored in a different way (for example displayed on the supermarket shelves for 1 or 4 weeks) will not be the same even if tasted before their expiration date.

It is necessary to take maximum care in the collection of the data throughout the production chain up to the processing and packaging. This process is now formally entirely linked to the choices and decisions of a single OSA, also known as “packer”. From a legal point of view, this actor collects, catalogues, and retains information normally referable to each batch of his own production.

The last step before the actual consumption is certainly the most delicate and least verifiable.

After the purchasing process, the responsibility for food management goes to a non-professional figure, normally not properly educated, not equipped with professional tools for transporting and storing the product.

In the final part of the supply chain before consumption there are no further safety checks. None officer goes to private houses to control temperatures or expiration dates of the products before their consumption.

It is therefore important to systematically collect information at this level to mitigate the real dangers in terms of security and to improve the quality and safety of dispensers and refrigerators in private houses. At the same time it is important to provide information to the consumer, being able to interact constantly with him in real time, setting-up therefore a strategic channel in order to both obtain preferences and to provide accurate information on the management of the products he is dealing with.

Challenge

According to the "Business Innovation Observatory", the systematic and "real time" integration of consumers' experience in multiple operational and decision-making centers will be one of the most important innovation-driving processes in the EU and other areas of the world (http://ec.europa.eu/growth/industry/innovation/business-innovationobservatory_es).

This aspect is particularly relevant for the food chain, but it is necessary to consider the level of the challenge and especially the huge amount and variety of the data needed, both structured and unstructured, as well as the procedures and models needed for the creation of useful information. The data analysis and cognitive models applied to this type of BD are not obvious.

The use of "Big Data" and cognitive techniques, in addition to the predictable evolution of supercomputers and high performance computing, is a commitment to the future that can be of great help.

In order to win this challenge, a major cultural change towards a shared digital economy, and a significant interregional cooperation effort will be required.

With regard to the WA3, from the analysis of the Regions positions and their considerations as emerged during the meetings, the following strategic tasks, or challenges, can be identified:

a) Identification and location of available (or procurable) information, access to information sources and development of specific strategies for their management and implementation.

Possible sources of information to manage are:

- Sales data from Department Stores,
- Inventory and Tax Statistics,
- Fidelity cards,
- APP and Electronic Discounts Systems,
- welfare system,

- coupons,
- direct questionnaires,
- sales data and "clicks" of virtual shops on line (with customer profiling),
- Organized Purchase Groups,
- Open data on purchase of government,
- Data Base of trade associations,
- Chambers of commerce and environmental agencies at local and national level,
- Database on chemical traceability produced by research centres.

An assessment on the real relevance of the information collected should be developed from time to time. The availability of data must take in consideration the necessity to go through exportable metadata generated by a Data Ware House like system. Alternatively the orthodox application of Block-Chain systems will be require.

As far as social media analysis is concerned, particular attention should be paid to the identification of "trendy phenomena" and also to the development of analytical algorithms capable of highlighting them or neutralizing their effect.

b) Development of alignment criteria in order to make the information extracted from different silos usable and linkable.

If properly aligned in the food sector a large amount of information are available which can increase the value of the consumer's experience.

Because of this it is essential to develop an appropriate "smart strategy" capable of identifying and using different criteria or alignment mechanisms (smart tools such as RFID, images, lottery smartTAGS). They became smart as long as they can be read or written from several natural "gate" locations along the food chain (logistics systems, POS distribution systems, smart refrigerators, consumer smartphones).

c) Aggregation and interaction of consumers' experience and different operators' informations.

It should be assumed that the process of aggregating and aligning information is an iterative one.

The consumers' response to food or products is stimulated and contextualized by the information received. The response itself, then, might highline the need of further information.

Therefore, the development of strategies and the automation of the integration and alignment of information (related to points 1 and 2) must necessarily take into account two aspects:

- the need to develop real-time interactive platforms capable of stimulating and absorbing

information from the consumer. Consumers should be consulted not only once but multiple times in a constant debate. This methodology is capable of extracting information but at the same time stimulating the consumer.

- the contextualization of opinions with regard to the real or virtual environment in which the consumer is located.

Food consumption can take place in a variety of different circumstances: at home, at the restaurant, travelling, slow tourism experience, and so on. At the same time, the expression of an opinion or the description of an experience can take place in a real area (questionnaire, interview, etc.) or in a virtual area (social media, app, etc.). These circumstances also influence the quality and relevance of the collected data.

Moreover, the ability to correlate different data as different as those that describe several personal opinions based on feelings with the ones coming from an industrial continuous and precise process (such as the I4.0 records), is not trivial.

It will be necessary to develop appropriate algorithms that must be based on information alignment criteria such as those mentioned above. On the other hand, the value of the information is closely related to this ability.

Generally, the better and more effectively this operation will be performed, the greater will be the value of information collected.

Thus The final object of this activity is to operate in an environment where it will be possible to reach a precise opinion on an identified and traced product.

d) Value maximization on decision-making processes.

Considering the huge amount of available related data, in order to allow an effective use of decision-making processes, we must establish analyses and processing systems to be able of use them.

Because of this we need to develop reading or distilling keys operating in a real-time.

Only in this way and from the incorporation of the best data analysis tools it will be possible to maximize the value of the effort made in collecting information. This is the only usable way to make available the BD tool to decision makers in real scenarios. Transferring this process from a static base to a real time one turns out to be fascinating but extremely challenging at the same time.

Scope

The scope of the WA3 is to develop systems able to collect, verify and share information from

inside a value chain consumer comprehensive. Working on this task we should consider some important circumstances.

The agrifood chains are extremely complex and variable structures at the same time.

The product development dynamics are based on concepts of convenience (low added value of food), but also on the basis of seasonality and therefore of the availability of raw materials, ingredients and additives whose origins tend to be more and more global.

Territorialities are often based on strong cultural identities (know how to cultivate, to transform and promote) or protection regimes (IGP, DOP...).

Because of this the amount of information available on the primary production, transformation and distribution stages (if coordinated and accessible) is extremely wide and going rapidly to increase.

We must remember that on real food chains there are some institutional verification and control bodies operating on:

- a. food safety and controls for sale and marketing,
- b. compulsory and optional food certification (gluten free, vegan, vegetarian,),
- c. labelling systems complying with current community and national regulations,
- d. fiscal controls and UE or National funding support aid (CAP 14-20, EAFRD, ...).

All these bureaucratic systems, taken individually or in their intersection, are able to generate and collect a large amount of updated and redundant information.

The substantial disappearance of national boundaries on the European market and the expected reduction of intercontinental protectionist systems, supported by WTO action, have not only significantly expanded the reachable markets, but also accelerated the distribution speed. This opportunity increases the number of potential consumers, located in various markets becoming more wider and different.

The concepts stated above are clearly presenting the greatness of the supposed project and of the consequent upcoming challenges.

Objectives

The ability to share information along the food chain, and in particular the ability to incorporate opinions and information coming from consumers and the distribution sector, is a strategic asset in order to increase the value of raw materials and processed products as well as the one of territorial

know-how.

As a matter of fact, the ability to identify the change of dietary habits or consumers' behaviour in advance allows the primary and secondary productive sectors to align more rapidly.

Going from a "home-and-family" social type of nutrition to an "individual-and-personal" one multiplies the profiles of potential users. Those, then, are dependent from their physiological and social needs (working, ethical, professional).

More over we must add a significant delocalisation of eating possibilities. The progressive estrangement from the concept of home / home cooking towards the emergence of new lifestyles and eating habits. Those are more independent and "social", based on the discovery of different food and wine cultures and the availability of territorial food opportunities.

Due to their different nature, these systems have a considerable evolving capacity which has to be mediated with the natural idleness of agrifood systems. Those are naturally linked to seasonal agricultural cycles historically supporting their resilience.

Therefore, the availability of information allows us to reach the fundamental goal of making agrifood systems and local clusters more competitive and resilient because of a better and faster adaptive capacity.

If systematically reached this target will be extremely important. Today, even if the "Big Data" tool has not been activated yet, multiple local subjects are trying to provide information about evolution of lifestyles and consumer needs.

The major problem is related to their liability especially when coming to investment issues.

The possibility to redistribute information through a shared, continuous and democratic stream will make the food production and distribution system inevitably transparent and understandable. Transparency can be assured both through a specific information analysis or thanks to the redundancy. Even not precise or complete but repeated data (due to confidentiality reasons) may allow to highlight starting of macro-phenomena or triggering deviations from the standards.

On a long-term basis, this democratic flow will allow a better distribution of value along the production chains especially towards primary and processing sector.

The consumers driven sharing of digital information will foster a positive contamination of the entire value chain which will inevitably tend to digitalisation. The consequent adoption of both ICT and IoT standards will inevitably exploit the need of large storage such as Data Lake or Warehouse

platforms.

This process will make the system more and more devoted to interoperability, with the identification of shared or convertible standards.

The need for interoperability is confirmed by the type of intervention concerning not only a single regional entity (even if a quadruple helix). It is easy to foresee the need of a shared infrastructure between several regions and territories due to the extension of the value chains and contingent best-practices.

The availability of inclusive and rich information environments coming from both the consumer and the food chain will also enable the development of new forms of collaboration between public and private stakeholders who will decide to share their knowledge. The natural consequence will be the development of services addressed to public institutions, business organizations and consumers.

Indeed the will to identify, extrapolate and process the information making it accessible is a need pushing at the end different sectors to find common solutions and innovative tools.

This will make the TB&D environment extremely interactive. The BD system itself, thanks to its iterative nature, will grow over the time also thanks the influence of contextual conditions such as modes, ethics, health, lifestyles

Therefore it is to be expected that each action aimed to increase the level of knowledge and distribution of information corresponds to a reaction (known as curiosity) leading to request for deeper information.

Hence the need to develop an adaptive decision-making support systems and a behavioural management policy able to evolve jointly with the information environment.

This situation obviously leads to the development of new and innovative forms of public/private collaboration to share of information related not only to public and private company, SME and farmers but single specific individuals or social structures as well. An obvious consequence will be the agreed need to protect and regulate their use.

This new perspective requires the availability of new technical and operational skills as well as research and training on new technologies (ICT, IoT etc...), social and behaviour analysis and marketing.

As a matter of fact on one hand it will be possible to contextualize the benchmarking, marketing and foresight operations in a more precise and specific way while on the other it will be possible to test new economic, social and health knowledge models on real-time scenarios.

The availability of this knowledge will push forward the farmers digitalisation both in agriculture and

livestock areas. This step will consequently lead to more complex digital systems integration up-to other evolutionary trends such as precision agriculture, sensors, energy and productions LCA.

At the end we can imagine that through the establishment of fairly open and democratic T&BD systems it will be possible to trigger an interactive development of knowledge and a fair recognition of work value.

This will help not only a smart and sustainable future economic development but also an inclusive and consistent one fulfilling the objectives highlighted by the Commission.

It is therefore considered possible within the WA3 to achieve the following objectives:

Objective	Measurable	Time-frame
More complete and trusted information given to consumers to understand their opinions and points of view.	yes	1-3 years
Smart information systems for companies and the public administration coming from direct interaction with consumers and citizens opinions.	yes	2-4 years
Territorial cooperation (public/private) as basis for the transfer of technology, experiences and research experiments and staff.	yes	1-2 years
Democratic sharing of value/added value coming from T&BD within all stages of the agrifood chain, civil society and the territories	yes	1-10 yrs
Improvement of local agri-food business competitiveness, resilience and sustainability; new businesses creation.	yes	1-10 yrs

Results

The expected results of the WA3 activity are:

Development of a set of alignment parameter between production information and consumer opinion based on hardware or software systems able to identify the set (and subset) of data to be aligned within BIG DATA.

It is important to Identify a set of consumers shared information and align it with each sector of the food value chain; to develop a smart strategy necessary to make the data usable.

It is necessary to identify a set of intervention hypotheses applicable in the various analysed scenario to overcome property, privacy, free competition and intellectual property issues.

In this working area, particular attention will be paid to the management of information obtained directly or indirectly by the consumer. As a matter of fact, the ability to collect such information, analyse, protect and make it useful (even adopting interactive push-pull real time methods) is actually the best result we are aiming to achieve.

It is evident that this result can be achieved only through a series of intermediate steps and interacting with the other working areas of the T&BD project.

In particular,

- set up of a cooperative environment with territorial data silos managers in order to develop filters allowing the streaming of information in a regional ware-house system. This operation will make the information available and usable when aligned with consumers opinions.
- Organizing a local infrastructure to collect selected information able to relate and associate the data with the territory in a real time perspective.
- A set of valid alignment criteria as described above, that can be used directly or indirectly by the consumer to express their opinions on specific product tested in various circumstances (domestic, food service, restaurant, vending...).
- The development of one or more intervention policies capable of ensuring the correct sharing of public and/or private information with the consumer; information release will be done given the above propriety issues (in collaboration with WA4).
- Identify a set of information collection and elaboration methods to be used along the early stages of the value chain, identify adequate storage structures for such information

(raw or processed information/metadata). This result should also be achieved in the other focused segment: logistics and distribution. In the second case attention will be paid to the different operational dynamics (in collaboration with working area 2).

- Specific information sets will also be identified to be made visible to consumers in order to stimulate interaction in providing an opinion. Particular attention will be given to the development of strategies to manage complex information related to trends and lifestyle criteria. We will have to consider the interaction with upcoming priorities such as different ethnicities and religious and health/etc positions. This variegated situation requires different ability to analyse, aggregate and correlate hints from the consumer by linking its profile with the specific product or service characteristics.
- Definition of a set of data analysis methods that are able to make them usable (even aggregating them) to operators on the various value chain segments. All these information might have substantial native differences (technically, economically, commercially and culturally) this will result in the need of specific output sets definition according to different targets of use.
- Development of a set of tools to protect both the push-pull system's operations and the veracity/democratization/usability of output data (collaboration with WA4 collaboration).

Actions

The activities that will need to be done in the WA3 are actually those that will allow us to reach the results subset:

- Mapping, knowledge and standardization of regional Bds, strategies and methodologies to recover data from territorial silos into the DB, generate building blocks with interoperability characteristics. Identification and deployment of methodologies to process and manage identified information to overcome security, privacy, competition and privacy issues.
- Development of strategies and methodologies capable of engaging the consumer in a push-pull iterative process. These methods can be based on either active (APP or FidelityCards) or passive tools (generic or dedicated social platforms analysis). The ultimate goal is to establish a communication channel capable of collecting contextualized opinions and related profile information.

- Development of an appropriate information alignment criteria/tool able to perform in the agriculture and livestock segment , food products/ingredients manufacturing and consumer environment. The criteria should consider social/environmental pervasive factors related to food opinion makers (environment, energy, sustainability, local culture, traditions, changing nutrition habits, health). These criteria, tested in different pilots, might be physical or virtual. They have to be capable of operate in the various food distribution channels (Home, Food Service, vending, Institutional).
- defining transparent criteria for the formation of information "input or package" made visible to consumers in order to stimulate their interaction in providing a judgment/opinion. Particular attention will be given to the development of strategies to manage complex information related to modes, ethical, religious interests as well as lifestyles, ethnicities and different skills of the consumer. In particular the consumer output must be related not only to the specific product or service tested but also to the information made available.
- It is also necessary to elaborate, similarly to the WA2, data analysing methods to enable their pertinent usage to operators on the various segments of the value chain. Indeed the data output has to be correlate to the specific user interests, capability and cultural level. We assume that each value chain component might have a different level or interest (technically, economically, commercially and culturally). Different regions could have different approaches coming from cultural or historical differences. At the same time, a set of tools to guarantee the push-pull system's operations and the veracity, democracy and usability of outputs (similar to WA4) will be taken into consideration.

Expected impacts

The economic development of the agrifood sector will benefit from the growth of knowledge and the sharing of information coming from the Big Data sue; in particular when interactive communication with the consumers is activate.

The food production process will benefit from the capacity to anticipate the consumers needs or trends; at the same time consumers will have advantages finding more and more products aligned with its needs in a multicultural and globalized society perspective.

To this end, the interoperability of both proposed models and developed information sets is a key to the sharing and valorisation of the process even in a European key.

The interoperability of models and information sets is a key issue to allow the sharing and valorisation of the activities performed under the WA3 and in the BD set and use in a European perspective.

Hence the need to operate on substantially standardized regional BIG DATA, connected with local silos/repository structures via external warehouses capable of smart data transfer.

As far as citizens are concerned, they will have accurate and reliable information about the products before purchase, knowing their value in connection to the territory. This process, even if gradual, will forward the added value redistribution along the food chains. It will inevitably lead to the recognition of the product value due to the primary sector (farmers harvesting the raw materials) and to the transformation industry (manufacturing products) better than now were only the distribution segment has a guaranteed mark-up.

The distribution operators, organized or not, can benefit from the BigData as well even even considering what above said. In their case the BD approach will offer them different leverage and cost savings. Easy solutions to product certification processes management and capability to correctly anticipate consumer needs are some non-secondary issues capable of balancing lower mark-ups. BD will enable distributors to better manage stocks, orders, marketing operations, and substantially reducing direct and indirect costs.

Regional public health and fiscal activity will have the opportunity to improve and simplify further their controls. Thanks to the redundancy of available information on production, transformation and consumption, it will be possible to identify, even in real time, product flows and values.

This pilot action is will contribute to the development of digital services all over EU and will re-use and valorise available public data.

Funtioning of the WA/ Responsibility for each task

The work in WA3 began with 2 regions: País Vasco (España), Friuli Venezia Giulia (Italia) involved as co-leaders in the development of this working document.

For different reasons, finally Friuli Venezia Giulia has been the only region, in collaboration with Andalusia, responsible for developing this proposal.

From now on it is necessary to:

- Identify new regions that want to take the lead in the activities of the area.
- Carry out a reassignment of responsibilities in the area to ensure the fulfilment of the tasks foreseen.

- Define among all participants which will be the working procedures to be followed.
- Define how the rest of participating regions will be involved in the development of the work.

Working and communication tools

It is believed that part of the job can be handled with the help of written communication tools: email and repository shared on the network (eg Drive, Dropbox etc.).

Verbal Communication: A Cisco WebEX-based video camcorder quality has been experienced, which, once overcome easily solving technological problems, allows a fair level of interaction for simple issues among few people.

However, periodic meetings between project designers are considered necessary.

From this point of view, it would be very useful to have a continuity of participation of the same regional or delegated people from the regions.

Monitoring

Identify indicators (2 in each of the following categories):

Execution (actions done)

- Number of meetings done and number of stakeholders involved.
- Number of event participations.

Results (results achieved)

- Mapping.
- Number of projects selected in the European calls.

Impacts (measured)

- Quality of interactions between stakeholders of the European regions (through a survey).
- Dissemination of the results: number of communication activities performed..

Additionally, Please see monitoring for each pilot in the Annex IX.

Annex V. Framework WA 4. Open data, interoperability, data governance and information security, cyber security.

This WA4 will allow you to address and solve many issues that will most likely occur as soon as you start working concretely for activating the Big Data that will allow you to collect and use information from a variety of sources:

open data, public administrations, private companies, "social", etc.

Properly handling the data acquisition phase, not just from the point of view of the computer, will be one of the important aspects for the success of the whole project.

Recognizing discrete data, making it readily accessible and available, while respecting existing privacy, privacy, security, commercial value, will be a source of valuable information for the entire community.

The way in which information is acquired is complex and potentially different in every region of Europe. There will be a lot of work to fine-tune administrative and IT procedures to achieve the desired results.

Challenge

According to the Business Innovation Observatory, one of the most important drivers of innovation processes in the EU and other areas of the world, will integrate consumer experience in multiple decision-making and operational centers in a systematic and "real" time ", (http://ec.europa.eu/growth/industry/innovation/business-innovationobservatory_es).

It is a very important aspect for the food chain, although it is necessary to consider the extent of the challenge and in particular the huge amount and variety of data needed, both structured and unstructured, and procedures for generating useful information and identifying models relevant that are not obvious. The use of "great data" and cognitive techniques, even with predictable advances in supercomputers and high performance computing, is a commitment to the future and can be of great help. However, to make the challenge happen, it will require a major change of culture towards the shared digital economy and an important interregional cooperation effort.

1. Organization and reorganization of local and regional data already potentially available.

Organization and reorganization of regional agrifood data to improve its usability in areas other than the original ones: alignment criteria or horizontal (by sectors) and vertical (for value chains).

First data platforms to be made available:

a. Public

Region, State, Entities, Local Authorities Agencies Sectors: agriculture, forestry, hunting and fishing, environment/hydraulics, agrifood, health, food safety, production (CCIAA), promotion and foreign trade (ERSA, ICE), technology transfer and training.

b. Private

Enterprise / Business Associations: primary producers, processors, distributors, logistics, food and catering operators, food retailers, quality and origin certifiers, individual citizens and their associations.

2. Data storage strategy and data collection systems.

- Data storage strategy, "Data Lake" strategy systems compared to "Big Data" and "Data Hub": analysis of various possible technical solutions and shared identification of the most appropriate ones to be identified in relation to the regional context in activation.
- Evaluations, experiments and verifications on the use of Block Chain technology as a tool to manage part of the public archives that will be generated in traceability projects.
- Evaluations and experiments for the proper management of "Open Data" or public or private archives "not open date"; evaluations and experiments on data storage technologies (Silos, Data Lake, Data Warehouse, etc.); Evaluations and experiments on other data management issues such as: upgrades, reliability (security), intellectual property protection and usability, distribution, access policy.
- Big Data Integration: Interoperability and collaboration between regional Big Data Agrofood managers to improve data exchange and traceability along the food chain value chains. Evaluation, testing and verification of data integration techniques for cleaning data collection and preparation for analysis.
- New data collection systems: industry-specific SCADA sensors and systems, LoRa sensors, POS and loyalty cards, traceability and RFID solutions, language, organization, analysis, access, Internet of Things (IoT) technology, data quality and data processing validating.

3. Data analysis and interoperability.

Data analysis: intelligent collection, extraction, processing, usability, redundancy of information in different contexts, automatic learning techniques.

Interoperability as a key factor: SWOT analysis of "by sectors" or "by geographical areas" in the European food market.

In addition, interoperability will have to address issues relating to technical, semantic, organizational and legal aspects, as indicated in the European Interoperability Framework.

4. Governance and policy criteria in information management and network data security.

Definition of data access rules and protection policies, to be defined to protect both public and private data types, with reference to privacy, confidentiality, intellectual property, competitiveness and any good ethical and legal practice.

5. Secured Information Security.

Storage Methods, Reliability of Storage Strategies and Backup and Configuration of Data Protection Security Policies. Accessibility rules with respect to protection and confidentiality with appropriate personalized access profiles.

Scope

The issues covered in this Work Area: "Open Data, Interoperability, Data Management and Information Security, Computer Security" transversally cover every aspect faced by the entire T & BD platform.

Many of the goals identified and listed in the scoping notes of February 2017 can not ignore the availability of a far more powerful and efficient information management system than is currently available in most regions.

For example, you need to look at product value chains in detail, support decision support systems based on a thorough understanding of all up-to-date information in the industry, you need to be able to highlight and share existing good practices, to foster cooperation between regions on common interests, concrete comparisons and good practices, serves to integrate the agrifood industry into ICT and the digital economy, it is necessary to develop in the Open Data concept to make the information of the sub-sector more and more accessible to citizens.

The list of proposed thematic topics (3.2 of the scoping notes) perfectly reflects the centrality of the issues and the operational scope of the activities of this WA4.

Without creating the right development conditions for the Big Data agrifood operating environment, it will not be possible to create identified topics such as:

- "More complete and reliable information available to consumers"
- "Intelligent information systems for companies and public administration"
- "Territorial cooperation as a basis for the transfer of technological and research results, experiences, research personnel and companies, in those regions concerned with this topic"
- "The shared value that generates added value in all phases of the chain that will have an impact on the rest of the phases and society and the territories in general"

It is necessary that the practical activities that can be found in the specific topics identified can be

carried out on a Big Data operating platform. This platform has already addressed and, at least partially solved, the issues raised in the "structural" cross-topic called to give answers to key issues for system operation (data access and management, interoperability, data management rules, security and reliability of managed information, network security).

In order to be able to experiment and implement effectively all these issues, which are legal, organizational, technical-informatics, telematics and systems, you need to have a real Big Data on which to work. On the basic IT infrastructure you can work and refine by gradually finishing all the aspects listed above.

Each region will have to personalize some aspects of this phase based on its own national and regional regulations, organizational practices and peculiarities of the territory.

An ideal situation, useful in combining skills and experiences, stimulating collaborative work and accelerating the realization of the Big Data could be that of experimentation work conducted with collaboration between some regions for a pilot project that is shared and actually replicated in territorial and administrative different.

With such an initiative, it would be possible to create "Quickly" an early replayable Big Data, with broad guarantees of interoperability, re-use and good practices among participants and across EU regions. It would surely also be an effective tool for cooperation between the regions, in line with the spirit of the platform.

Objectives

The Friuli Venezia Giulia (IT), Extremadura (SP) and Gallizia (SP) regions, working as co-leaders of the T & BD (Traceability and Big Data) sub-platform "Agrifood" Working Area 4, have developed this document the purpose is to define, with a degree of detail greater than the T & BD scoping notes, the activities, objectives, and challenges for Working Area 4 (WA4) entrusted to them by the coordinating regions.

In line with key note scoping, the objective remains to generate a series of funding on mature and related projects in new growth areas across the EU. The thematic platforms aim to promote the creation of related solutions between them through interregional cooperation between public and private, including through the integration of key implementation technologies (KET), by analyzing the complementarities and synergies between the regions by sharing knowledge, improving mutual knowledge and so on.

In short, the platform will help build an ecosystem and promote interregional engagement that

supports digital innovation and entrepreneurship within the chains of the value of European food.

This document defines:

- working plan for WA4;
- the operational arrangements for the joint work of the regions which will have to work together;
- the various communication channels that will be used to achieve this.

The objectives:

Quickly, in some regions, activate management systems for regional food agrifood Big Data on which to begin the verification work for the management of the issues of competence of the WA4 (systems that will now also be able to experiment on the other WAs at any time).

Realize an infrastructure model for managing a regional "mature" agrifood Big Data to be made available to all affected European regions. Through collaborations between regions it will be easy and inexpensive to support the start up by creating a network of dialogues and interoperable regions for information on the agrifood sector.

Find, study, and collect all Open Source data sources that provide industry-specific information to help simplify access to information gathered as useful business support and to be included in the context of the Big Regional Data.

Create Regional Expert Groups working to study and solve specific issues (privacy, data overwriting, information exchange contracts, identification or drafting of behavioral ethics policy rules, rules for computer security management, etc.).

Groups in the various regions could collaborate and hopefully co-ordinate with sharing experiences and good practices (forums, archives, Q & A, etc.).

Results

Once identified and obtained the necessary funding, it is believed that the following results can be quickly reached:

- 1) design, share and implement a first Big Data agri-region management system that is replicated in some regions of the partnership, an essential basis to start many of the other activities needed.
- 2) Bringing the Big Regional Agrifood Region into full operation by making the sub-fund a new and

important tool to use and fill in, providing more and more information and added value to everyone, businesses, researchers, public administration and citizens.

3) Collect and make available all the "Open Data" of interest in the agrifood sector. Generate archives "Open" by entering data contained in the Big Data that can be freely consulted by everyone.

4) Consolidate regional expert groups on the topics of the WA4, coordinated at the interregional level, able to address and solve specific issues related to Big Data related to: privacy, ownership, security, privacy, etc.

Actions

It was not possible to define activities at this time. This can be done after the Pilot's complete and shared definition.

Please see the pilots projects in the Annex X.

Expected impacts

The economic development of the agrifood sector will only benefit from the growth of knowledge and the sharing of information that the Big Data model.

The production process will be favored, but at the same time, consumers' intentions will be met in real time with the ability to anticipate the phenomena that are now essential in a multicultural and globalized society.

The distribution industry, whether organized or not, can benefit from the BigData approach by leveraging process and product certification processes but also at the same time being able to anticipate consumer needs correctly by identifying more precisely both the modes and the consumptions with the possibility of linking them to the territory.

This situation will enable them to better manage stocks, orders, marketing operations, and substantially reduce both direct and indirect costs.

As far as citizens are concerned, they will have accurate and reliable information about the products before purchasing them and knowing their value as absolute and connected to the territory.

This process, though gradual, will favor phenomena of redistribution of the value of productions along the chains and will inevitably lead to the recognition of the primary sector in the first place and to the transformation then a greater added value for their work.

Regional public health and taxation will have the opportunity to improve and simplify further its controls. In fact, thanks to the new information available on production, transformation and consumption, it is possible to identify, even in real time, product flows and value.

To this end, the interoperability of both proposed models and developed information sets is a key to the sharing and valorisation of the process even in a European key.

Hence, the need to operate on substantially standardized and interoperability regional BIG DATA structures.

This pilot action will contribute to the development of digital services covering the whole EU and will reuse public data.

Funtioning of the WA/ Responsibility for each task

At this time, it seems premature to define this level of detail.

It will be necessary to first understand who is really available to participate actively.

With them you will decide together in a joint meeting.

Working and communication tools

It is believed that part of the job can be handled with the help of written communication tools: email and repository shared on the network (eg Drive, Dropbox etc.)

Verbal Communication: A Cisco WebEX-based video camcorder quality has been experienced, which, once overcome easily solving technological problems, allows a fair level of interaction for simple issues among few people.

However, periodic meetings between project designers are considered necessary. From this point of view, it would be very useful to have a continuity of participation of the same regional or delegated people from the regions.

Monitoring

The following indicators have been identified to enable proper monitoring of the development of

WA4 activities:

Indicators of execution:

- Preparation of a review report of projects
- Elaboration of report on the status of application
- Elaboration of a report on financing opportunities
- N° of infodays days organized.

Indicators of results:

- N° attending the training days.
- Number of pilot actions / projects promoted under the WA4.

Indicators of impact:

- Evaluation of the improvement obtained through the development of the pilot actions / projects promoted in the framework of this WA4..

Annex VI. Successful projects.

* Please note that the columns H2020 and PRIMA correspond to the current topics relating with the selected pilots rather than the real topics used to execute the concrete successful projects.

Working Area	Nodo	Stakeholder	Project	Sector	H2020	PRIMA	Pilot
WA1	Andalucía	BIOAZUL SL	RICHWATER: Commercialization and market introduction of an innovative wastewater reuse technology in agriculture. 691402 The project deals with the reuse of urban wastewater and the nutrients for agricultural irrigation. This will reduce the use of conventional water sources (which are more and more scarce) and the reduction of chemical fertilizers consumption. The project includes LCA studies and the certification of the technology by the ETV programme of the European Commission. www.richwater.eu	Todos		S1-T1	Yes
WA1	Andalucía	BIOAZUL SL	Water2Return: Recovery and REcycling of nutrients TURning waste. WATER into added-value products for a circular economy. 730398. H2020-WATER-2014-two-stage WATER-1a-2014 The project deals with the development of a system to treat and upgrade wastewater from slaughterhouses. LCA and CBA studies are foreseen. www.water2return.eu	Carnico		S1-T1	Yes
WA1	Andalucía	BIOAZUL SL	FRESH-DEMO: Innovative humidification/disinfection technology to reduce waste and prolong the shelf-life of fruits and vegetables. 634699. H2020-SFS-2014-2 SFS-17-2014 The project deals with the use of Eco innovative humidification systems to be used along the whole value chain to improve the product self life and quality. LCA and CBA were performed. www.fresh-demo.eu	Hortofruticola	SFS-16	S2-T3.2	Yes
WA1	Andalucía	BIOAZUL SL	The TREAT & USE project aims to test and disseminate the economic and technical feasibility of a safe and efficient method for the treatment of water through the work of six small and medium-sized European companies from the technical and agricultural sectors and a research center. and the direct reuse of water and nutrients resulting from agricultural production with minimal costs of operation and maintenance.	Todos		S1-T1	Yes
WA1	Andalucía	Coexphal	CONTROL CROP: Control of the growth of crops under the greenhouse optimizing criteria of sustainability, economic and energy efficiency. Code: P10-TEP-6174.	Hortofruticola		S1-T2	Yes
WA1	Andalucía	Coexphal	ENERPRO: Control and energy management strategies in production environments with support of renewable energy. Proyectos del Plan Nacional (2015-2017): control and energy management strategies in production environments with support of renewable energy. Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2014-56364-C2-1	Todos		S1-T2	Yes
WA1	Andalucía	Coexphal	POWER: Control and supervision strategies for the integrated management of installations in energy-efficient environments. Código: DPI2010-21589-C05-04.	Todos		S1-T2	Yes
WA1	Andalucía	Coexphal	PROBIOREN: Control and optimization for the biomass production from microalgae as renewable energy source. Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2014-55932-C2-1-R.	Todos			NA
WA1	Andalucía	Coexphal	MACROBIO: Modelling, simulAtion, ContRol and Optimization of photo-BIOrractors. Proyectos del Plan Nacional (2011-2015): Modelling, simulAtion, ContRol and Optimization of photo-BIOrractors (MACROBIO). Proyecto del Plan Nacional. Ministerio de Ciencia e Innovación. DPI2011-27818-C02 (114.000 €).	Todos			NA
WA1	Andalucía	IRSOLAV	HdC Trust Platform tools to help companies in tcarbon footprint management that it allow to calculate and reduce the emissions and complains with international standars.	Todos	DT-ICT-08	S1-T2	Yes
WA1	Andalucía	Universidad de Córdoba	Reducing the hydriological impact of imported strawberries in Huelva (Andalusia/Spain). To test in the hydraulics lab, a set of industry standard irrigation tapes (most common irrigation system in the region) and other commercial emitters under controlled conditions (flow and pressure).	Hortofruticola		S2-T1.3	Yes

WA1	Andalucía	Universidad de Sevilla	VAROS Variable Rate Operation for Orchards. To advance the Technology Readiness Level (TRL) of the VRA (Variable Rate Applications) for orchard management, and to enable more optimized use of inputs in fruit production, minimize the use of pesticides and protect the environment. Proyecto ICT-AGRI. http://www.ict-agri.eu/node/35754	Hortofrutícola	DT-ICT-08	S1-T2	Yes
WA1	Andalucía	Wellness Telecom	Implementation of monitoring devices in electrical panels and software development for the energy management.	Todos		S1-T2	Yes
WA1	Andalucía	Evenor-Tech	OPERA Métodos operativos para el incremento de la eficiencia en el uso del agua y la resiliencia en el riego. The project will focus on combatting water shortage at the farm scale and territory level by developing applicable service models for decision support in irrigation. ERANET-Water	Todos		S2-T1.3	Yes
WA1	Andalucía	Zabala Innovation Consulting	EULatin America Mineral Development Network Platform. Generación de una plataforma para las buenas prácticas en minería sostenible, a través de una licitación del banco mundial				NA
WA1	Andalucía	Coexphal	CONTROLCROP. Control del crecimiento de cultivos bajo invernadero optimizando criterios de sostenibilidad, económicos y de eficiencia energética	Hortofrutícola		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020: NoAW Develop innovative eco-design and hybrid assessment tools of circular agro-waste management strategies and address related gap of knowledge and data via extensive exchange through the Knowledge exchange Stakeholders Platform	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 VALUMICS - Understanding food value chains and network dynamics	Todos	DT-ICT-08		Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 AgriMax- Agri and food waste valorisation co-ops based on flexible multi-feedstocks biorefinery processing technologies for new high added value applications	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 PerformFISH- Consumer driven Production: Integrating Innovative Approaches for Competitive and Sustainable Performance across the Mediterranean Aquaculture Value Chain	Pesca	DT-ICT-08		Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 STAR-ProBio - Sustainability Transition Assessment and Research of Bio-based Products	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 TREASURE- Diversity of local pig breeds and production systems for high quality traditional products and sustainable pork chains	Carnico		S1-T2	Yes

WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 REFRESH Resource Efficient Food and dRink for the Entire Supply cHain	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 NoAW -Innovative approaches to turn agricultural waste into ecological and economic assets	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7 SUCCIPACK Development of active, intelligent and sustainable food PACKaging using PolybutyleneSUCCLinate	Todos		S1-T2	Yes
WA1	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	POR-FESR TEPASS - TEcnologie per l'Agroalimentare Sicuro e Sostenibile	Todos		S1-T2	Yes
WA1	Emilia Romagna	ENEA	INTERREG PEFMED "Uptake of the Product Environmental Footprint across the MED agrofood regional productive systems to enhance innovation and market value- A territorial-based approach to agrofood sustainability"	Todos		S1-T2	Yes
WA1	Emilia Romagna	ENEA	ESFRI Roadmap 2018 Project aimed to -promote and create new opportunity of integration and interactivity both at national and European level - provide a unique and simple transnational access to both academic research groups, as well as industrial partners, to solve all questions related to food quality production in respect of continuous evolving European and international regulations.	Todos	RUR-13		Yes
WA1	Galicia	University of Santiago (USC)	ManureEcoMine and LIVE-WASTE (Project numbers: 603744 and LIFE 12 ENV/CY/000544).	Carnico		S1-T1	Yes
WA1	Galicia	University of Santiago (USC)	Recovery and utilization of nutrients 4 low impact fertilizer (RUN4LIFE).	Todos		S1-T1	Yes
WA1	Galicia	University of Santiago (USC)	Ecological footprint and eco-efficiency analysis as a tool to assess sustainability in targeted sectors from a smart concept strategy.	Todos		S1-T2	Yes
WA1	Galicia	University of Santiago (USC)	Innovación y sostenibilidad ambiental de residuos alimentarios urbanos en Smart Cities. BBVA 2015.	Todos		S1-T2	Yes
WA1	Galicia	University of Santiago (USC)	Evaluation of innovative technologies for wastewater treatment (Red_Novedar)	Todos		S1-T1	Yes
WA1	Galicia	University of Santiago (USC)	WoodWisdom-Net Research Programme - European project BIOFOAMBARK - Bark Valorization into insulating Foams and Bioenergy (Project reference: 235066 FP7-ERANET-20008-RT)	Madera		S1-T2	Yes
WA1	Galicia	University of Santiago (USC)	Quantitative tools for sustainable food and energy in the food chain. Cooperation and Innovation for Good Practices (Q-SAFE)	Todos		S1-T2	Yes
WA1	Galicia	University of Santiago (USC)	Finding regional Environmental life cycle assessment Information on packaging waste management through flexible software tools and databases (FENIX).	Todos		S1-T2	Yes

WA1	Galicia	University of Santiago (USC)	Desenvolvemento de solucións intelixentes para unha loxística verde (SIGSOL)	Todos	DT-ICT-08	S1-T2	Yes
WA1	Galicia	University of Santiago (USC)	Increasing of value of modified milk "UNICLA" diminishing carbon footprint, and noticing it in the label for the consumer	Lácteo		S1-T2	Yes
WA1	Pays de la Loire	ESA	Work on the use of the analysis of the life cycle in the wine industry with regional actors. To better understand the relationships between agricultural practices, environmental impact and quality of the products. Willingness to support change of practice in a participatory approach to eco-design.	Vino		S1-T2	Yes
WA1	Pays de la Loire	ESA	Participative research on little territories in order to co-develop agricultural systems more sustainable (quality of water, local food system, animal welfare...)	Todos		S1-T2	Yes
WA1	Ribatejo	Agrocluster	Eu-rice project analyses, compares and tries to find out ways to face climate change effects in the main European rice production areas: Bulgaria, Greece, Portugal, Spain and Italy – coordinator	Arroz		S1-T2	Yes
WA1	Ribatejo	Agrocluster	Data-Driven Emerging Industries: New industrial value chains	Todos	DT-ICT-08		Yes
WA1	Ribatejo	Agrocluster	Inov.Linea - Centre for technology transfer food - this center already in operation, allows the study and support the development of new products through technological innovation. Support for Industry and Innovation takes place in an environment of industrial production (using pilot equipment).	Todos	RUR-13		Yes
WA1	Ribatejo	Agrocluster	The BIO-WARE Project comprises awareness and information actions that contribute to the achievement of Bioeconomics projects that are developed within the strategic ranks of the Region.	Todos	RUR-13		Yes
WA2	Andalucía	BO TRUE ACTIVITIES	Traceability in berries handling plants: Development of a traceability and production control system in a fruit and vegetable handling center using sensors, readers and actuators, combining edge computing with cloud computing.	Hortofrutícola	DT-ICT-08		Yes
WA2	Andalucía	BYNSE (grupo SERMICRO)	Production and quality prediction for logistic and Marketing Operational Planning: Development of a Big Data system with machine learning that integrates information on greenhouse air conditioning systems, along with crop specific sensing, job and task logging (such as pollination), and includes the development of predictive models of production, date of optimum collection and quality, for the efficient decision making in the logistics operative and in marketing campaigns.	Hortofrutícola	DT-ICT-08		Yes
WA2	Andalucía	Coexphal	IoF2020 – Internet of Food and Farm: dedicated to accelerate adoption of IoT for securing sufficient, safe and healthy food and to strengthen competitiveness of farming and food chains in Europe.	Todos	DT-ICT-08		Yes
WA2	Andalucía	Coexphal	European Project (2013-2017). A Traceability and Early warning system for supply chain of Agricultural Product: complementarities between EU and China. Acronym: TEAP. Marie Curie Actions. Call: FP7-PEOPLE-2013-IRSES	Todos	DT-ICT-08		Yes
WA2	Andalucía	Coexphal	FUTUREFARM: Robot Fleets for Highly Effective Agriculture and forestry Management http://www.rhea-project.eu	Hortofrutícola	ICT-09		Yes
WA2	Andalucía	DCOOP	IoF2020 – Internet of Food and Farm: dedicated to accelerate adoption of IoT for securing sufficient, safe and healthy food and to strengthen competitiveness of farming and food chains in Europe.	Todos	DT-ICT-08		Yes

WA2	Andalucía	IRSOLAV	OLEOSIG: GIS for the improvement of production and quality of olive oil. Management tool, consultation and planning based on the cadastral mapping and in the Geographical Information System of Agricultural Plots of the Junta de Andalucía (SIGPAC) to link all the information related to the olive grove: geographical positioning, soil composition, general characteristics of the olive grove, phytosanitary treatments used, productivity, yields, diseases, etc	Olivar	SPACE-02		Yes
WA2	Andalucía	ec2ce	Developmet of tools based on Artificial Intelligence to help the decission making process on greenhouse production, pest management and market forecast	Todos	RUR-04		Yes
WA2	Andalucía	Heimdall Technologies	REDORF Platform - Electronic Register of Denominations of Origin by Radiofrequency). Provide the consumer with real-time digital information through their mobile device for product traceability and intelligent enterprise data	Todos	DT-ICT-08		Yes
WA2	Andalucía	S-DOS	Development of a collaborative platform for management and data governance of forest and forest inspection processes based on the dynamic management of work orders with a multi-channel user interface, environmental inspectors and platform managers.	Todos	DT-ICT-08		Yes
WA2	Andalucía	ANSERLOG	Acquisition of technology of portable data logging devices with built-in data transmission systems and software / hardware development necessary for the exploitation of this technology in the transport of perishable goods in Spain	Todos	DT-ICT-08		Yes
WA2	Emilia Romagna	CRPV	"Morefarming". www.morefarming.it. It's a project related to the development of a Precision Farming system, that requires the implementation of an ICT platform that collects and manages lot amounts of data and information from several public and private database and systems.	Todos	DT-ICT-08		Yes
WA2	Emilia Romagna	CNR IBIMET	Application of climate smart tools, technologies, policies to improve resilience, reduce climate impacts and improve GHG mitigation in field management and monitoring of their efficiency	Todos	DT-ICT-08	S1-T2	Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	JPI HDHL: Empadasi European Nutritional Phenotype Assessment and Data Sharing Initiative (ENPADASI) will deliver the Data Sharing In Nutrition (DASH-IN) infrastructure.	Todos	SFS-14		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	JPI HDHL: Foodball Development of public databases on food metabolites, software tools, and chemical libraries.	Todos	SFS-26		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	Era-Net Core Organic Plus EcoBerries Ensuring quality and safety of organic food along the processing chain	Hortofruticola	DT-ICT-08		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7 FishPopTrace Integrate data from European fish species traceability projects, and to generate a single compatible database and tissue archive.	Pesca	DT-ICT-08		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7: Triticeaegenome New bioinformatic tools to structure, relate and comprehensively analyse the large scale genomics data on Triticeae crops	Todos			NA

WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7: STARTEC Tools based on scientific evidence and predictive and probabilistic models to enable food operators estimate the quality and safety level in their products (ready-to-eat foods) if alternative ingredients, process and storage conditions are applied.	Todos	DT-ICT-08		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7: EATWELL Data on healthy eating interventions in Member States and review existing evaluations of the effectiveness of interventions	Todos	SFS-14		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 MOSES Information platform devoted to water procurement and management agencies to facilitate planning of irrigation water resources	Todos		S2-T1.3	Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 TREASURE Diversity of local pig breeds and production systems for high quality traditional products and sustainable pork chains	Carnico		S1-T2	Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020: AUTHENT-NET Transnational mechanisms and instruments for collating and exchanging information on food authenticity research,	Todos	DT-ICT-08		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 OLEUM Harmonized analytical solutions to detect and fight the most common and emerging frauds and to verify the overall quality of olive oils	Olivar	DT-ICT-08		Yes
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020: LEGVALUE Decision tool for farmers to choose the optimal legume species with their adapted crop management and to assess the economic and environmental benefits of legumes in the cropping and grassland systems.	Legumbres	DT-ICT-08		Yes
WA2	Emilia Romagna	Rete Alta Tecnologia ER	Progetto Aladin http://www.progettoaladin.it Intelligence management tool for water use and irrigation.	Todos	DT-ICT-08	S2-T1.3	Yes
WA2	Emilia Romagna	Imem	X-Drone - http://www.imem.cnr.it/xdrone/	Todos	ICT-09		Yes
WA2	Emilia Romagna	UNIPR Agri-Business Unit	Strength2Food (http://www.strength2food.eu/ , H2020 n. 678024), Strengthening European Food Chain Sustainability by Quality and Procurement Policy.	Todos	DT-ICT-08		Yes
WA2	Emilia Romagna	Id-Solutions	Cold chain monitoring – Tberry	Hortofruticola	DT-ICT-08		Yes
WA2	Emilia Romagna	University of Ferrara	WARBO "LIFE 10 ENV/IT/000394" http://www.warbo-life.eu/	Todos		S2-T1.2	Yes
WA2	Emilia Romagna	University of Ferrara	INTERREG ITA-SLO, standard projects 02/2009. GOTRAWAMA - http://www.gotrawama.eu/	Todos		S2-T1.2	Yes

WA2	Emilia Romagna	University of Ferrara	Rare earth elements distribution in grapevine varieties grown on volcanic soils: an example from Mount Etna (Sicily, Italy). Fondo Giovani MIUR , doi:10.1007/s10661-017-5878-6	Vino	DT-ICT-08		Yes
WA2	Emilia Romagna	University of Ferrara	Geochemical characterization of elements in Vitis vinifera cv. Negroamaro grape berries grown under different soil managements. doi: 10.1007/s10661-016-5203-9	Vino	DT-ICT-08		Yes
WA2	Emilia Romagna	University of Ferrara	Determining the geographic origin of caper in Aeolian Islands through geochemical analysis. Fondo Far 2015 doi: 10.3301/ROL.2016.79.	Hortofruticola	DT-ICT-08		Yes
WA2	Emilia Romagna	University of Ferrara	Minni Project funded by National Ministry of Environment 2008-2012 http://www.enea.it/it/seguici/pubblicazioni/pdf-volumi/V2013ProgettoMinni.pdf	Todos			NA
WA2	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	H2020 MOSES - Managing crOp water Saving with Enterprise Services	Todos		S2-T1.2	Yes
WA2	Extremadura Region		National Research project: RTA2015-00002-C04-00. Funded by INIA. Topic: Traceability in meat sector (Iberian pig), value chain, NIRS technology	Camico	DT-ICT-08		Yes
WA2	Extremadura Region		Regional Sectorial project: EI-14-0005-1. Funded by FEDER and Government of Extremadura (Spain). Topic: , Smart monitoring, big data, real-time decision making.	Todos	DT-ICT-08		Yes
WA2	Extremadura Region		International Innovation project: 0606_MITTIC_4_E. Funded by FEDER- POCTEP. Topic: Modernization and technological innovation in the agri-food sector. New technologies (NIRS, QR-Codex, Active packaging, sensors,...), traceability, quality control,...	Todos	DT-ICT-08		Yes
WA2	Extremadura Region		International Innovation Project: SUDOE INTERREG IV-B: FI4VDI: Federated Infraestructures: Desarrollo de una Red de Infraestructuras Federadas para la Generación de Servicios de Virtualización de Puestos de Trabajo (FI4VDI)	Todos	DT-ICT-08		Yes
WA2	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: S4I: Software Sensor for Smart Infraestructures	Todos	DT-ICT-08		Yes
WA2	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: ConSumar: Application of Big Data techniques to the predictability of energy expenditure	Todos	SFS-26		Yes
WA2	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: Ultrasecuenciación y supercomputación para la unificación del patrimonio genealógico y genético extremeño. Aplicación al estudio de enfermedades hereditarias	Todos			NA
WA2	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: Ecotrafic: Application of Big Data to the predictability of urban traffic in Smart cities	Todos	SFS-26		Yes
WA2	Extremadura Region	CICYTEX	H2020 - FERTINNOWA - Transfer of INNOvative techniques for sustainable WATER use in FERTigated crops	Hortofruticola		S2-T1.2	Yes
WA2	Extremadura Region	CICYTEX	H2020 – TREASURE - Diversity of local pig breeds and production systems for high quality traditional products and sustainable pork chains	Agrifood		S1-T2	Yes
WA2	Extremadura Region	CICYTEX	SUDOE - AGROSMARTcoop: Smart integration, competitiveness and economical growth of agrifood cooperatives in rural spaces	Agrifood	RUR-13		Yes
WA2	Extremadura Region	CICYTEX	POCTEP – 0049_INNOACE_4_E: Implementation of non-destructive technologies in fields and horticultural farms / Application of HPP for improvement of traditional food	Agrifood			No
WA2	Magisz	HAAI	Dissemination of ICT research in agriculture (2010-2011): Journal of Agricultural Informatics and Portal for Information Services have been established, Studies and book publishing, Organising conferences and Support Young Researchers.	Todos	RUR-13		Yes

WA2	Magisz	HAAI	AMI@Netfood. Development of Long-term shared vision on AMI Technologies for a Networked agri-food sector. FP6-015776. (2005-2006)	Todos	DT-ICT-08		Yes
WA2	Magisz	HAAI	Information dissemination project proposals on EU level (in international consortium): INTERREG III: development of regional information system, 2003, FRUITSTONE, 2004, HELICAS, 2004.	Todos	RUR-13		Yes
WA3	Andalucía	RURAPOLIS	Gastrotrends To better understand the profile and preferences of consumers of packaged agri-food products in order to help industrialists make better decisions regarding packaging, format, channel, communication strategy. ISBN-978-84-617-2976-0	Todos	No Topic		Yes
WA3	Andalucía	ec2ce	Development of marketing tools that takes into account in real time the information of the consumer	Todos	No Topic		Yes
WA3	Andalucía	RURAPOLIS	FIMART: Fair of innovation and technology for the rural environment. In an event that includes technical conferences, meetings for R + D + i cooperation, an investor forum, an agrohackaton ... has been positioned as a major event of identifying needs among users of technology and proposing solutions.		RUR-13		Yes
WA3	Andalucía	Cadiz University	Design and construction of a smart sensor advanced bicycle and a Cloud platform of centralization of treatments and data with exploitation and interpretation of these using scientific techniques.	Todos	RUR-04		Yes
WA3	Emilia Romagna	UNIFE/vine grower oil	Vine grower oil. Intelligent label. Monitoring of physical chemical parameters from production to consumption with smart phone applications. Gather consumer perception smart phone applications. Identify the issues of quality in the agrifood products in order to provide a response to the needs of the consumer	Todos	DT-ICT-08		Yes
WA3	Emilia Romagna	CNR IBIMET	SISS Società Italiana Scienze Sensoriali Italian Taste project- a series of studies based on direct interviews, consumers tests in innovative and commercial products. Consumer opinions and preferences collected are utilized to optimize food processing and marketing. Food producers are partnering and partially financing the projects (ex Fondazione Bonduelle, Campari, Adacta Int S.P.A), Chelab-Silliker etc.).	Todos	No Topic		Yes
WA3	Emilia Romagna	CNR IBIMET	Sensory Analysis Network PPP for Incorporation of sensory and consumer data on smart platforms (participated by CNR- IBIMET, Analysis s.r.l., ChemStamp s.r.l., E-sof s.r.l., R & I).	Todos	DT-ICT-08		Yes
WA3	Emilia Romagna	CNR IBIMET	Sustainable Land Use platform – Climate Kic Food focus, including consumer engagement, awareness raising and behaviour change. Consumer engagement, awareness raising and behaviour change to accept and appreciate sustainable and climate smart production and food.	Todos	No Topic		Yes
WA3	Emilia Romagna	CNR IBIMET	URBAN Bo- It Thematic Cluster on Food, Sport and Health Cluster collecting a large public and private partnership (among the others Città Metropolitana Bologna, CSSAB, Ascom, Confagricoltura, UniBo, CNR) on food connection and food quality in the urban landscape. This will be a operational strict connection to incoming FICO Project in Bologna	Todos	No Topic		Yes

WA3	Emilia Romagna	CNR IBIMET	Portale gusto salute e qualità (http://www.gustosalutequalita.it/en) A scientific window on taste, food quality and health operated by CNR-IBIMET – including own sensory lab activities	Todos	No Topic		Yes
WA3	Emilia Romagna	ER Mushroom company	Retailers and consumers (final customers including catering) evaluation. Database on final customers choice is ongoing. Use of the consumer feed-backs on driving the production optimization. New and improved processing choices to change the production. Private project with public grant support. Research contract with CIRI agroalimentare	Todos	No Topic		Yes
WA3	Emilia Romagna	Food crossing district	Consumer acceptance of co-milling of olive and tomato by-product. Evaluation of the possible evolution to have new functional product with healthy properties and good consumer's acceptance. Semi.-industrial scale production. Industrial scale-up and commercial exploitation.	Todos	No Topic		Yes
WA3	Pays de la Loire	ESA	Data creation on experimental devices (non-destructive sensors, laboratory measurements, working sessions with consumers and/or stakeholders). Evaluation of biochemical and sensory quality markers, and of differentiated products quality and environmental impact.	Todos	No Topic		Yes
WA3	Pays de la Loire	ESA	Data collect from private and public partners (open data). Creation of structured and reliable database.	Todos	SFS-26		Yes
WA3	Pays de la Loire	ESA	Eco-quali-conception methodologies that include consumers from early stage in product conception in order to promote a decision-making and innovation processes that match with the market expectations and increase the added-value of the product.	Todos	No Topic		Yes
WA3	Pays de la Loire	ESA	Offer to the stakeholders a support for change management and a help for decision-making. This may be done using for instance inverted modelizations (in particular for the fruits and vegetables sector, the wine industry and the ornamental sector).	Todos	No Topic		Yes
WA3	Pays de la Loire	Regional Agriculture Chamber	Information to share (in french) : https://mbamci.com/startups-et-blockchain-au-service-de-la-tracabilite-alimentaire/	Todos	No Topic		Yes
WA3	Pays de la Loire	ESEO	Recommendations sensitive to a mobile users context (in the framework of smart city application, thesis 2016-2019).	Todos	No Topic		Yes
WA3	South Savo	South Eastern Finland University of Applied Sciences (Xamk)	Innovation Smartmeal provides consumer real-time information of nutritional values of meal gathered on plate. It also provides information of customer food choice to food service provider. Feedback systems can be integrated to it. See more www.xamk.fi/smartmeal	Todos	No Topic		Yes
WA3	South Savo	South Eastern Finland University of Applied Sciences (Xamk)	Project application/evaluation phase: Developing a database for primary and secondary food production (proof of concept phase). Database has information of public procurements related to food in order to help suppliers, farmers, processors to predict their production.	Todos	SFS-26		Yes
WA3	South Savo	South Eastern Finland University of Applied Sciences (Xamk)	Traceability on lake fish catches see more: https://www.xamk.fi/en/research-and-development/electronic-monitoring-brings-transparency-supply-chain-freshwater-fish-2/	Pesca	DT-ICT-08		Yes

WA4	Andalucía	Evenor-Tech, SLU	Exploitation of the MicroLEIS Decision Support System. Transfer of technology to the administrative and private sector .	Todos	RUR-04		Yes
WA4	Andalucía	Wellness Telecom	Securization of IoT devices. Securization of devices via implantation of cryptographic chips embedded in the architecture.	Todos	DT-ICT-08		Yes
WA4	Andalucía	Wellness Telecom	Securization of Industrial Communication Environments and Protocols (PLCs, SCADA). Architecture design for the securization of industrial environments and implementation of good practices	Todos	DT-ICT-08		Yes
WA4	Andalucía	Zabala Innovation Consulting	Finodex Project. Generate new values in the European ICT ecosystem, through the promotion and support of initiatives based on new FIWARE platform technology and the use of open data, involving SMEs and entrepreneurs for this	Todos			NA
WA4	Emilia Romagna	Alma Mater Studiorum – Università di Bologna	FP7-FIGARO - Flexible and Precise Irrigation Platform to Improve Farm Scale Water Productivity	Todos		S2-T1.3	Yes
WA4	Emilia Romagna	UniMORE	Search for relevant variable sets in complex systems. Several joint publications and ongoing common project on this topic.	Todos	DT-ICT-08		Yes
WA4	Emilia Romagna	UNIPR Agri-Business Unit	PrimeFish (H2020, n. 635761), Developing Innovative Market Oriented Prediction Toolbox to Strengthen the Economic Sustainability and Competitiveness of European Seafood on Local and Global markets.	Pesca	RUR-04		Yes
WA4	Emilia Romagna	UNIPR Agri-Business Unit	Strength2Food (http://www.strength2food.eu/ , H2020 n. 678024), Strengthening European Food Chain Sustainability by Quality and Procurement Policy.	Todos	DT-ICT-08		Yes
WA4	Emilia Romagna	CIDEA	Aladin- Agroalimentare Idrointelligente - http://www.progettoaladin.it Development of a new multisensory technology platform for the relief of the water stress condition of crops, to be used on drones, for the production of irrigated maps to be used in tailored irrigation.	Todos	ICT-09	S2-T1.3	Yes
WA4	Extremadura Region		Regional Project: AGILA-2 (Acceso Generalizado a Internet desde LinEx-2)	Todos			NA
WA4	Extremadura Region		International Innovation Project:0401_RITECA_IL_4_E Red de Investigación Transfronteriza de Extremadura, Centro y Alentejo (Fase II)	Todos			NA
WA4	Extremadura Region		International Innovation project: 0606_MITTIC_4_E. funded by FEDER- POCTEP. Topic: Modernization and technological innovation in the agri-food sector. New technologies (NIRS, QR-Codex, Active packaging, sensors,...), traceability, quality control,...	Todos	DT-ICT-08		Yes
WA4	Extremadura Region		International Innovation Project: SUDOE INTERREG IV-B: FI4VDI: Federated Infrastructures: Desarrollo de una Red de Infraestructuras Federadas para la Generación de Servicios de Virtualización de Puestos de Trabajo (FI4VDI)	Todos	DT-ICT-08		Yes
WA4	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: S4I: Software Sensor for Smart Infrastructures	Todos	DT-ICT-08		Yes
WA4	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: ConSumar: Application of Big Data techniques to the predictability of energy expenditure	Todos	DT-ICT-08		Yes
WA4	Extremadura Region		Regional Project in progress, funded by FEDER and Government of Extremadura: Ultrasecuenciación y supercomputación para la unificación del patrimonio genealógico y genético extremeño. Aplicación al estudio de enfermedades hereditarias	Todos			NA

WA4	Extremadura Region		Regional Project, funded by FEDER and Government of Extremadura: Ecotrafic: Application of Big Data to the predictability of urban traffic in Smart cities	Todos	DT-ICT-08		Yes
WA4	Extremadura Region		Regional Project in progress, funded by FEDER and Government of Extremadura: CultivData: data farming for agricultural efficiency	Todos	DT-ICT-08		Yes
WA4	Pays de la Loire	ESA	Within the LARESS (laboratory interested in sociological and economic issues related to agriculture and food industry), report the constraints and opportunities related to data sharing within the sectors: analysis of the diversity of the stakeholders' strategies; identification of economic models related to valorization of data; follow-up of the different forms of actors' coordination. Theses researches aim at giving information to the actors on the issues of data sharing and data coordination (in particular in the cattle industry).	Todos	SFS-26		Yes
WA4	Pays de la Loire	ESEO	Wireless networks security (intrusion detection) through a research project that is over.	Todos	DT-ICT-08		Yes

Annex VII. Pilot Actions. WA 1. Lifecycles of the value chain.

PILOT ACTION A: Optimizing water use along the pig production chain

- **Title of the project:** Optimizing the water use along the pig production chain.
- **Specific challenge or need to be solved:**

Pigs are one of the most relevant animal protein providers in Europe. Their production, from farm to table, is very expensive in water use. There is a need to work on applying innovation that contribute to the development of more efficient and sustainable pig production processes, minimizing the consumption of resources such as water.
- **Scope:**

This pilot action aims to work on the improvement of the water use in order to optimize the consumption of this expensive resource.

As monitoring the entire value chain of pork production is a too ambitious a goal, this pilot action puts the focus in two stages of the production chain that are the most demanding in water consumption: the breeding of the pigs in the farms, and their subsequent processing in the slaughterhouse.
- **Objectives/ Actions:**

In the first scenario, the pilot action will analyze the breeding process in at least 100 farms during one year in order to identify best practices during the process, and the possibilities of using the pig slurry not only as fertilizer, but also for irrigation. This will imply the necessity of controlling the water use in the 100 exploitations and the characteristics of the slurry produced.

In a second scenario, the process of the animals in at least 4 slaughterhouses will be analyzed in order to identify best practices and ways for reducing the water consumption. This will imply the necessity of sensor the slaughterhouses and capturing the data during one year.
- **Participants:**

The pilot will need for scenario 1:

 - At least 100 different farms. The desirable consortium should include at least four different countries in order to analyze the process taking into account different

national legislations.

- A coordinator in the data capture process in each country that will manage the analysis of the farms and will guarantee the quality of the information kept. This partner will have the responsibility of making the necessary investment in sensors for controlling the required information of each farm.
- A set of experts in pigs breeding that will analyse the information collected with the help of big data tools, will calculate the environmental impact and will identify best practices during the process, and the possibilities of using the pig slurry not only as fertilizer, but also for irrigation.

The necessary participants for scenario 2:

-At least 4 different slaughterhouses. The desirable consortium should include at least four different countries in order to analyse the process taking into account different national legislations (Spain and 3 other countries with intensive pig production).

- A coordinator in the data capture process in each country that will manage the analysis of the slaughterhouses and will guarantee the quality of the information kept. This partner will have the responsibility of making the necessary investment in the sensor for controlling the required information of each slaughterhouse.

- A pull of experts in pigs processing in slaughterhouses that will analyse the information collected, will calculate the environmental impact in order to identify best practices and ways for reducing the water consume.

- **Budget:**

The budget of this pilot action is related with the number of farms and the slaughterhouses involved. A base approach with the minimum number of partners could be:

1.500.000 € for scenario 1.

1.500.000 € for scenario 2.

- **Time-line:** 18 months

PILOT ACTION B: Open pest Management Alert System.

- **Title of the pilot:** Open Pest Management Alert System
- **Participants:**

The envisioned consortium should integrate:

- At least two different providers of solutions for recording pest management operations. The desirable consortium should include at least two different countries with common border in order to analyze the problems related with the accommodation of data models developed for different national legislations (Spain/France).

- A technology provider with experience in working with data model integrations in the agriculture domain (better in the pest domain). It will be valuable if it could offer knowledge for the engagement of the solutions with international data models provided by ISO, OGC or EU (INSPIRE, WFD, etc).

- A technology provider with experience in big data applied to agriculture. It will be valuable if it could offer its own technology or if it has experience in managing open software technologies for big data in agriculture.

- A set of experts in pest management, their identification and treatment. These experts will help the big data analyzers for developing and/or configuring their tools.

- End users

- **The need to be solved:**

Global food security depends strongly on the capacity of agricultural output to meet the growing demand of food in terms of quantity and quality. Direct losses caused by pathogens, animals and weeds are altogether responsible for losses ranging between 20 and 40% of global agricultural productivity. Plant health and crop protection are questions of great importance for farming economic feasibility, but also for environment protection and human health.

The axis of European Regulations in this context is the Directive 2009/128/EC of 21 October 2009, establishing a framework for Community action to achieve the sustainable use of pesticides. As a consequence, the member states have developed their own national

legislation that, in most cases, forces agricultures to record of the activities related with the use of pesticides in their exploitations. This necessity have generated different software solutions for helping them (<http://www.cuadernoexplotacion.es> and <http://www.visualnacert.com> are only two of them). These software products (in some cases provided by public administrations and in some cases provided by private companies) are keeping a lot of information related with the management of pest problems in many places and in long periods of time.

- **Scope/ objectives/ results:** This pilot action proposes the development of a pilot information system that will integrate several information systems in order to mix (anonymized) the information their have for building analyze modules that will inferred patterns for identifying pest problems and their solution. It will also provide an open access information system under the paradigm of open data. This will also provide a very useful tool for developing new solutions by third parties.
- **Expected impacts:**
 - ✓ Exploit the potential of information analysis to facilitate decision making for integrated pest management.
 - ✓ Rational and sustainable use of pesticides and other chemicals.
 - ✓ Improving the profitability and sustainability of agricultural holdings.
- **Budget:**

The budget of this pilot action depends on the number of providers of solutions for recording pest management operations that it will include. A base approach could be:

500.000 € for the core of the knowledge management system (big data analyzer based on the work of the pull of experts).

100.000 € for each end user application developed (for the pilot action will be need at least one).

100.000 € for each provider included in the system (for making model analysis and software connectors). The pilot action will need at least two providers.
- **Time-line/ Duration of the pilot action:** 12 -18 months

Annex VIII. Pilot Actions. WA 2. Smart monitoring of the value chain to improve the overall competitiveness of the agrifood sector.

PILOT ACTION A: Development of a “DataAgrilab” platform

- **Participants:**

- Pilot region: Region des Pays de la Loire.
- Technology provider: the numeric cluster «Images et Réseaux»
- Potential other regions interested: Emilia Romagna, Andalusia, Extremadura, Aragon, Basque Country, Galicia, Friuli Venezia Giulia, Ribatejo, Latvia, Hajdu Bihar Country, South Ostrobothnia.

- **Challenges and Needs:**

In a more and more connected society, farmers suffer a lack of digital use. The issues and the opportunities of precision agriculture are essential to improve the competitiveness of the farmers. Pluviometry, soil resistivity, humidity... the applications are numerous and strategic. Indeed, thanks to this information provided by the sensors, farmers are able to tailor their agronomic practices to the properties of their environment. Nevertheless, these new technologies are useless if the data collected is not controlled, managed and restored in an adapted way.

- **Scope:**

Create a European platform which provides to farmers necessary tools to collect data (thanks to IoT technologies). This platform would analyze this information (public or confidential, it depends on the farmer's which) and produce applications (dashboards, maps...).

This platform will be key to develop innovations using the collected data via the APIs and controlling devices.

This platform is a 3 steps technology:

- First, the information is collected by sensors (IoT).
- The information is unified, controlled and analyzed by the platform.
- The data is transferred to databases.

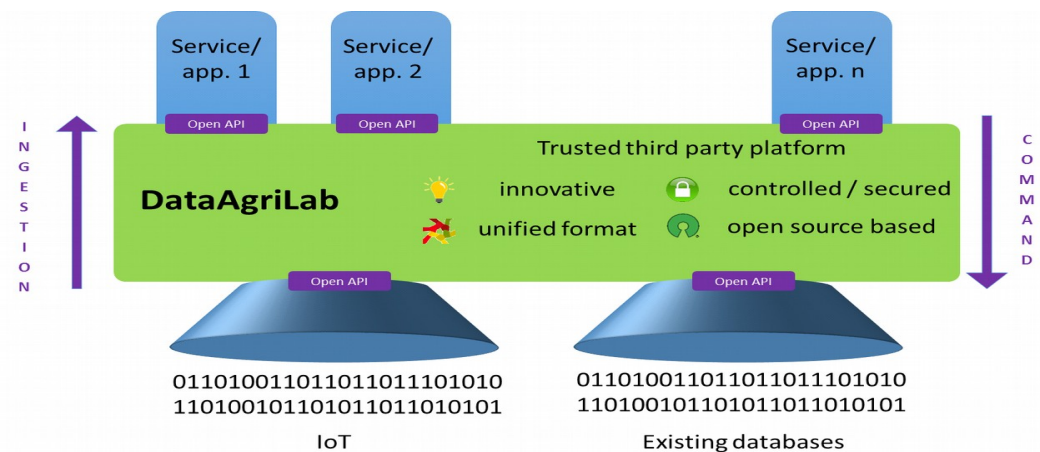
- **Objectives/ Actions:**

This public service would become a decision support tool for the farmers. Thanks to this information, the farmers could take appropriate decisions with all the data needed.

The platform DataAgriLab will give open and commercial services to collect data via the maximum possible IoT services in open (LORA, SIGFOX) and regulated bands (4G, 5G), host them, provide access to these data via APIs and give the opportunity to control devices via IoT technologies. A dedicated attention will be given to cyber security of the solution. The SW technologies used to develop the platform will be as much as possible open source. The FIWARE middleware will be a key element of the development.

DataAgriLab will be able to provide bi-directional interaction allowing not only data intake from IoT equipment and existing databases (open or closed data) but also sending commands back to the IoT equipment. It enables data valorization including: data intake, processing, analytics, governance, storage and portal, visualization (dashboards and maps).

One concrete use of this platform would be to create a specific data base for the SME's agricultural machinery suppliers. The platform would be a tool to enhance their customer services and facilitate the operation and maintenance on their products in the field. Thanks to this new decision making tool, the agricultural machinery suppliers could equip and test solutions, then adapt their solutions to the needs of the specific agricultural environment.



- **Results:**
- **Expected impacts:**
- **Activities:**
- **Products:**
- **Time-line:**
 - 12 months for a beta version.
 - 18 months for a final version.
- **Budget:**

Budget (K€) for the two year project :

SW licenses	60	to network suppliers
Studies and developments, Data Integration, Archi Logiciels	80	to SMEs
Maintenance costs	40	to SMEs
Coordination, technical mgt.	100	I&R
TOTAL	280	
- **Identified funding instrument/programme:**
 - DT-ICT-05-2020: Big Data Innovation Hubs.
 - DT-ICT-08-2019: Agricultural digital integration platforms.
 - RUR-15-2018: Enabling the farm advisor community to prepare farmers for the digital age.
 - ICT-32-2018-2020: Internet of Things.
 - ICT-18-2018-2020: Big Data technologies and extreme-scale analytics.

PILOT ACTION B: Reducing contaminants in food.

- **Participants:**

- Pilot region: Region des Pays de la Loire and its stakeholders.
- Technology provider: Biofortis.
- Research: ESA - USC Grappe - INRA ; ONIRIS - INRA : SECALIM ; LABERCA ; CEA
Tech = technology transfert ; CTCPA = technical center ;
- Enterprises: inovalys ; cryolog.

- Other regions interested: Andalusia.

- **Challenges and Needs:**

- **Scope:**

- **Objectives/ Actions:**

Working on new methods of combating contaminants in the food industry. Historically, stronger and stronger sterilization was used, but it would affect the food product (ex: organoleptic characteristics change). Recent research projects focused on contamination flora origin and traceability, in order to limit treatments, acting at the contamination source, and in a more targeted way. It is a knowledge transfer between the medical community and food industries.

Thanks to the Next Generation Sequencing (NGS), the technology provider developed a scientist method to produce large volumes of sequence data on the spoilage flora's DNA. Thus, using this technology in the food industries represents an opportunity to identify the sources of bacterial infections in the value chain. With a better knowledge of the sources of infection, food industries could develop tailored methods of combating contaminants instead of using traditional sterilization methods that affect the organoleptic qualities of the products.

In view of the huge amount of information generated by this method, Big Data management is a key part of the project.

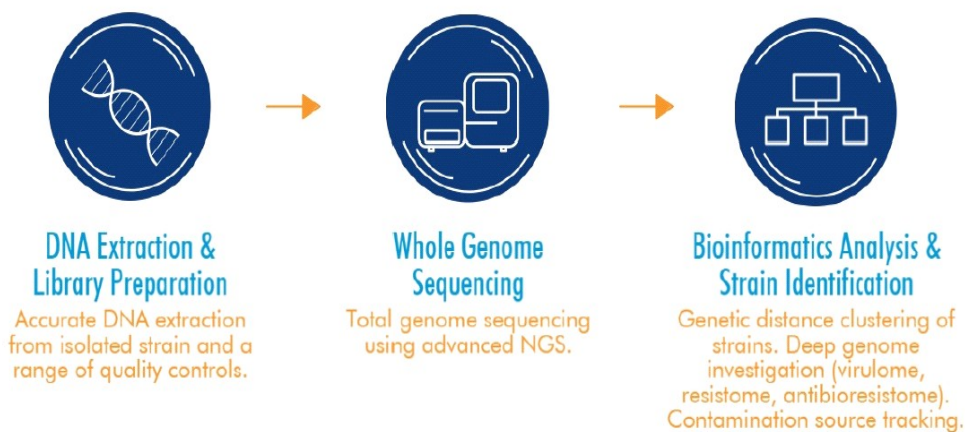
- **Results:**

Thanks to the data generated by these microbiologic analysis, NGS can be used in case of Agrifood crisis management to track the source of a contamination, to find which link of the value chain is responsible.

Analysing the structure of a microbiologic ecosystem allow the Agrifood producers to identify which bacteria alters the products so they can focus on new strategies to improve

organoleptic qualities of the products.

How it works



- **Expected impacts:**

Reducing the use of traditional sterilization thanks to a better knowledge of the production environment and of the microbiological composition of the products.

Develop a new decision making tool based on the exploitation of the data collected by a new microbiologic technology.

- **Activities:**

- **Products:**

- **Time-line:**

- **Budget:**

- **Identified funding instrument/programme:**

DT-ICT-05-2020: Big Data Innovation Hubs.

ICT-18-2018-2020: Big Data technologies and extreme-scale analytics.

PRIMA initiative Topic 3.2: Food safety in local food chains.

Annex IX. Pilot Actions. WA 3. Incorporating consumer experience & different operators in food chain decision making processes.

PILOT ACTION A: Big Wine FVG

- **Participants:**

- Coordinators: Region Friuli Venezia Giulia and Cluster Agrifood FVG
- Regional partnership: Andalusia (ES), Basque Country (ES), Pays de la Loire (FR), Extremadura (ES).
- Stakeholders: AGEA (Agriculture Agenda Agency), Almaviva (computer company), Promoturismo FVG (Regional Agency), ERSAs, Soltec Technologies, CEVIQ srl (Quality Certifier), Consortium DOC FVG (Consortium of DOCs), Territory Viticultural Enterprises (for example La Sclusa and Rodaro, etc.), Regional Agricultural Unions (Coldiretti).

- **Challenges and Needs:**

- a) Availability of up-to-date, complete and certified sectoral information.

Today, it is not possible to easily and promptly control the information of the regional wine sector which would be indeed necessary to effectively support the policies of the various decision-makers.

- b) Dissemination and promotion of regional wine production (through the availability of information that characterize them precisely and specifically).

The distinguishing features of the local wine production, wine quality, their traceability, the quality checks in order to ensure food safety, and protection disciplines are certainly a value added of the products and should be available to consumers.

- c) Safeguard against counterfeiting and activation of wine traceability.

It is necessary to be able to protect oenological products from possible commercial frauds, based on the creation of apparently identical copies but with different products. Today, there

is no effective tool to recognize and protect the minimum product unit, the "bottle". We need to provide the customer the possibility to verify the entire production chain from wine roots to wine itself (traceability "from field to glass").

d) Collection of consumers' experiences and knowledge of product distribution markets:

The wine products of our region are sold worldwide. To know the consumers' experiences wherever they are would surely be very helpful to improve products on each step of the production chain.

With the spread of the telematic "network" and the consequent "globalization", the ways of distributing and marketing wine-growing products in the world have also grown. Consequently, there is a need for knowledge and monitoring tools.

- **Scope:**

The system must be able to collect all sorts of information, in any way, relevant to the world of regional wine.

All involved public entities (eg Ministry, AGEA, Region ...) and individuals (eg Certifying Bodies, Consulates of Conservation, GDO ...), who are active in the sector, must be involved gradually. All will become both provider of the data possessed and recipients of the information they are interested in, contained in the system.

For the complete activation of the traceability of information on individual wines, with the fixation of a searchable device that allows the identification of each individual bottle, producers will be voluntarily involved, among those who sell DOP products or regional PGIs.

The proposed system is thus created taking into account the need for interoperability and reusability of the project in other European regions, with the necessary localization and customization.

It is also important to collaborate with other partner regions to define a standard that in the future will allow full data interoperability between European regions.

- **Objectives:**

The main target of the project is to study and undertake the necessary efforts to promote

regional wine products through the management of all the information that characterize and distinguish them. Therefore, the implementation of a comprehensive system which supports the wine sector, called BigWine FVG, is foreseen.

The following aims have been identified to meet the needs and challenges outlined above; to simplify, these are grouped based on the four main needs above mentioned:

- Availability of complete and certified sectoral information.

The project plans to develop advanced computer tools able to gather all the information about the regional wine sector; such information available at various levels (national, regional, local) must be collected and assembled in a single certified public container. The aim is also to prepare and make available analysis, searchable and processing tools of useful data for policy makers, producers, consortia, consumers, etc.

- Dissemination and promotion of regional wine production (through the availability of information that characterizes them precisely and specifically).

Through a proper information structure, the system offers the possibility to provide the public with technical information that characterizes regional wine products. This is to promote the wine production sector.

- Safeguard against counterfeiting and activation of wine traceability.

Through the affixation of specific tools on the labels, it will be easy to duplicate the bottle identification information, preventing the marketing of any kind of "copy" of these ones. For producers who will choose to join the traceability proposal for their bottled wines, IT applications will be created which, starting from the bottle, will allow them to access the "Big Wine FVG Data" and to all the information available about that specific wine (from plant roots, to the pedo-morphological characteristics of the soil, quantities of grapes produced, the characteristics of the wine, the producer, etc.).

- Collection of consumers' experiences and knowledge of the product distribution markets.

Through dedicated applications and social networks, in addition to the dissemination of product information to customers, it will also be possible to collect a wide numbers of

ratings from them in various ways, such as:

- * Explicit and direct reporting/claims;
- * Compilation of specially prepared modules;
- * Elaboration of access statistics for published information in order to understand the interests and intensity of access to the various information;
- * Provision of appropriate access information spaces on FB, Twitter etc.: visible and useful showcases for collecting feedback and statistics of interest.

- **Results:**

The results to be obtained through this project are:

- Establish a certified public system that will produce analytical reports and syntheses of all the relevant aspects of the subfund (production, transformation, marketing, etc.), with the necessary modalities and frequencies.
- Immediate and complete availability of the information needed for regional product customers, thus promoting the best features from all points of view. Availability of a wide range of products for effective information communication to promote the quality, uniqueness and traceability of our wines.
- Prevention of fraud opportunities through product protection, especially those of highest value; satisfaction of the need for traceability of all regional productions. The placement of products within the territories from which they come will bring important synergies with the touristic and naturalistic sectors for an integrated valorisation of the regional territories.
- Lead, the best possible way, the sector modernization, variety choices, harvest choices, and product features through accurate market dynamics and customers' feedback.

- **Expected impacts:**

- Consolidation and development of the wine sector through optimized and "informed" management;
- Improvement of regional programming and management skills of the sub-sector;
- Fighting the counterfeiting of the wine sector;
- Traceability of productions and consequent increase in recognizability and value;
- Employment growth in the regional wine sector through greater dynamism in plant

management, better integration with the region, other agrifood products and tourism;

- **Activities:**

- Assessment of databases and systems available on all identified sources.
- Designing the Data System of the Big Wine FVG system.
- Designing appropriate tools to support stakeholders such as dashboards, analysis and statistics.
- Design and build App for Smartphone.
- Involving external subjects.
- Training of the staff concerned.
- Prepare and implement product identification devices.
- Promotion and dissemination for the involvement of all stakeholders.
- Information program for all citizens.

- **Products:**

- An integrated system of sector information including the interchange system with all external archives.
- Analysis tools and statistics on custom information for different users,
- Smartphone App.
- Products needed to handle ID devices.
- Formative and informative campaign.

- **Time-line:**

System activation at initial test phase: 6 months after P.A. (Project Approval)

First traceability experiences: 6 months from the first harvest after P.A.

System presentation for first collegial evaluations: 18 months after P.A.

Closing project and switch to ordinary management: 24 months after P.A.

- **Budget:**

The cost of this pilot is big because it takes the task of activating the regional Big DATA infrastructure, which does not exist today, and that once activated it will be usable for many other platform projects. The calculated cost is almost 2.5 million, but 1.5 is dedicated to the share then shared.

Costs of the BIG WINE project (x 1000 euro):

Cost of staff dedicated to partners and external collaborations..... 100

Costs of technical collaboration between regions.....	150
RFID and software verification cost planning.....	60
Cost of planning and activation external archive connection.....	200
Activation costs Data Analysis and “User Dashboards”.....	100
Promotion and dissemination of project.....	90
	TOTAL 700

These costs consider that the BIG DATA regional agrifood platform has already been activated.

If this is not possible you will need to add an activation cost of 1,500,000 €

PILOT ACTION B: Milk&Cheese

A structure shared by all partners for the regional Big Data Agrifood management and for the incorporation of consumers' experience in the regional milk and dairy products sector.

- **Participants:**

Friuli-Venezia-Giulia

Galicja

Andalucia

Emilia-Romagna

Pays de la Loire

South Savoy

South Ostrobothnia

- **Challenges and Needs:**

The possibility of correlating the consumer's viewpoint with specific chains of the agrifood value, such as the MILK AND CHEESE SECTOR, in real time is now a subject of considerable interest for various stakeholders involved in these processes.

On one hand, this production sector increasingly needs to adapt its primary and transformed production goods to a changing market situation.

As a matter of fact, the changing nutritional needs, the emergence of fashion and trends are very timely phenomena whose monitoring is now strategic.

Moreover, it is a fact that today consumers' perceptions of food products are increasingly circumspect. In fact, the widespread knowledge of the food world, understood as cooking, food and nutrition, is an element that enables all consumers to be able to analyze a product on the basis of the collateral information which are available (origin, formulation, nutritional values, history, tradition).

Likewise, a constant verification of the value of their own production both in terms of consumer satisfaction and compliance with commercial, health or certification constraints is a requirement that companies must face.

Therefore, the possibility of engaging a possibly profiled and informed consumer to a value chain is an exercise today considered not only necessary but strategic. Having a universe of representative and real consumers, capable of expressing an objective and correlative judgment, with which it is possible to operate interactively, is now a strategic asset for any operator in the industry.

Each pilot trying to develop this process has to face three main issues:

1. Developing an experimental Big Data infrastructure able to gather information across the value chain as widely as possible by making such data as neutral as possible. In other words, the platform must be powered by the data archives available in the various chain rings after a process of aggregation or transformation of the same, which then are made available to the users. This step is essential both for the productive part (which needs to respond to the requirements of compliance to intellectual property and free knowledge) and for the consumer part (whose privacy must be preserved).

2. It is therefore evident the need to introduce an alignment criterion that allows the collection and analysis of the various information in the structure to be correlated to a particular product, process or consumer. This correlation must be implemented both in real time and in iterative fashion. Each point of the chain must be able to interact with the consumer by increasing or decreasing the flow of the available collateral information.

3. Data thus appropriately correlated can then be analyzed by using conventional or innovative data mining, and analytics and statistics tools. This process can be developed by testing the consumer not only in real time but also interactively or by modulating the flow of collateral information he/she has been provided with.

The practical sum of the alignment criterion with the analysis system applied to a standardized territorial infrastructure is in fact a pilot system.

Therefore, it is believed that if the basic infrastructure is sufficiently structured and standardized also through the use of appropriate input information systems to overcome the cultural, regulatory and territorial differences present in the various regions, the different pilots (Criterion + Data mining & analytics) can be profitably developed and shared across the different regions.

The predisposition of basic infrastructures (BigData) which can be aligned, resulting from a collaboration in defining the interoperability of input filtering systems, can then also enable:

- At the same time, the same analytical pilot system on a larger regional BigData aggregating all results obtained
- A more advanced pilot able to operate at a higher level on a BigData obtained by aggregating regional structures thanks to their standardization.

- **Scope:**

The purpose of the pilot activity in FVG region is to develop a Big Data experimental infrastructure to make operational and test a series of extraction and analyses pilot based on virtual (within the information themselves) or physical (RFID, IQRCode, imaging ...) alignment criteria that allow the value mapping of different dairy chains by enabling the process of collecting the consumer's judgement.

For the development of the upstream infrastructure, a set-up systems will be necessary for the identification, extraction and filtering of the information available on the different silos.

On this part of the project, it is intended to make use of what has been developed by the FVG region as base for the WA4 or other pilots on the WA3.

In order to incorporate the consumer's experience, a wide set of information will be necessary to allow the highest degree of iteration with the consumer on one hand and, on the other, their profiling in accordance with the privacy laws.

Judgement collection and consumer profiling will be performed through a virtual system based on a structured APP which, through an informative system, will link consumers to producers by offering these two classes promotional and discount advantages based on their territorial, nutritional and cultural profiling.

The development of the pilot that has to be activated (Criterion + Data mining & analytics) will the following goals:

- show its value at the local level
- establish collaborations and acquire and share knowledge and expertise with other rural areas where milk dairy production is important
- support, from an operational point of view, the FVG milk & cheese sector in the reordering process of production facilities, and create value for the primary sector

- **Objectives:**

The main aim is to obtain some regional Big Data systems capable of collecting, processing and redistributing available information on the agrifood sector, and in particular on the milk (and its derivatives) sector.

The tested systems will reach full maturity in only a few years to become good practices available to all European regions interested in this.

Precious outbound information will be "profiled" for all stakeholders including but not limited to local business and breeders, regional administrations, other entities involved such as universities, clusters and innovation centres, the Ho.re.ca. sector, and individual consumers.

Other potentially collected information on this channel will be important in supporting a bioeconomy and circular economy logic, favoring the search for local products and thus with a low

environmental impact (carbon foot print, water consumption, LCA ...) which can be possibly involved within circular economy processes .

- **Results:**

The construction of a regional and certified Big Data in the milk and its derivatives sector will provide many benefits to the entire regional community. The existing but unavailable information will be made available to everyone. Of course, the data will have to be filtered and distributed in full compliance with privacy and confidentiality rules and regulations. An increasing amount of information will be available to regional and local decision-makers, businesses, agencies, clusters, associations and citizens.

It is quite clear that the use of this information will enable the activation of new services that improve business productivity, collaborations between the production sectors in view of a clean and sustainable growth of the agricultural world and its transformation.

The mapping and knowledge of value chains will allow for a substantial redistribution of incomes along the chains, supporting in this sense the permanence of businesses operating in rural areas such as farmers dedicated to milk production.

- **Expected Impacts:**

This pilot action will contribute to the development of digital services covering the whole EU and will reuse public data.

The economic development of the sector will only benefit from this growth of knowledge on an important and delicate compartment such as milk. The production process will be favored, but at the same time we will know consumers' buying intentions in real time. Citizens will have accurate and reliable information about the products before purchasing them, and will their absolute value and as connected to the territory.

The regional public health will be able to further improve food safety controls thanks to new information available on both production, and transformation and consumption levels.

- **Activities:**

- Definitive design of the Big Data base infrastructure and sharing of technology choices with the technical partners of the various regions also on the basis of the activities developed by the regional WA4.

- Design of the "user interface" and organizational access data structure (for external and replicated data respectively) and basic architectural organizational rules, with regard to the need for interoperability and reusability in the various regional realities.

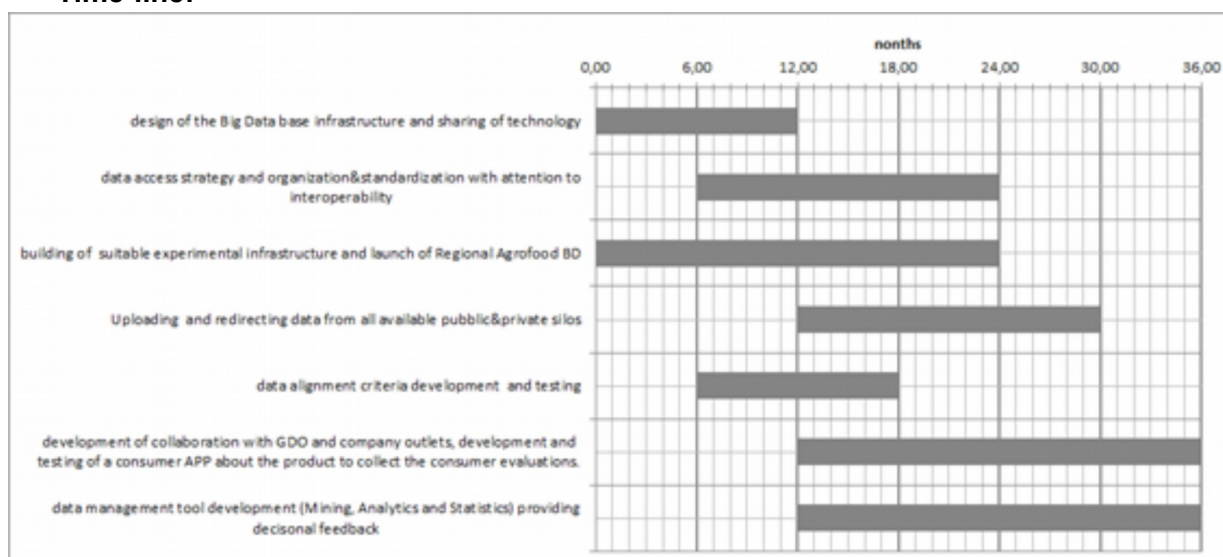
- Acquisition of appropriate and scalable infrastructural operating spaces, launch of the agrifood Regional Big Data.
- Uploading / re-addressing data:
 - from all available public archives (also made available by the parallel activity carried out in the WA4) of the agricultural, agrifood, statistics, veterinary, sanitary, environmental, agri-development, environmental, Chambers of Commerce, Crafts, Professional Organizations
 - from all available private entities: agricultural companies, transformer companies, professional technicians, food industry operators, large retailers, traders, distributors, transporters and logistics, associations for the re-use of expired products, citizen associations aimed at food issues and health
- For each product / chain of value identified:
 - Identification of all the available information for controlling and monitoring the entire supply chain from different points of view: energy cost, economical cost, carbon footprint, food security, waste production, unsold and expired production, etc.
 - Development of input information and consultation infrastructure and development on companies side and of consumers' side.
 - Study and cataloguing of information sources already available, and designing of new ways or tools to generate additional information needed to promote, know and monitor the whole chain.
 - Upload, management, analysis and processing of "profiled" output data.
 - Study and realization of tools for analysis and information processing.
 - Study and implement personalized data access tools according the different user categories.

- **Products:**

Area of intervention: Milk and Dairy Regional Value Chains

- 1) A public Big Data structure available and capable of interacting with companies and consumers in the regional territory;
- 2) An interface to collect information on consumer trends, needs and points of view;
- 3) An interface to promote and support regional products in the local market according to consumer trends.

- **Time-line:**



- **Budget:**

man/year	2	1	1
average manpower costs/year	50.000,00 €	40.000,00 €	35.000,00 €
year of activity	1	2	3
Regional BD access or regional data collection*	100.000,00 €	60.000,00 €	35.000,00 €
development of BD infrastructure	50.000,00 €	10.000,00 €	5.000,00 €
infrastructure	10.000,00 €	5.000,00 €	5.000,00 €
staff	100.000,00 €	40.000,00 €	35.000,00 €
territorial marketing	25.000,00 €	25.000,00 €	20.000,00 €
expenses (20%)	37.000,00 €	16.000,00 €	13.000,00 €
annual costs	322.000,00 €	156.000,00 €	113.000,00 €
total costs	591.000,00 €		

* the cost is depending from activation of Regional Big Data and it's availability. Alternatively it is possible to set up an experimental self standing system starting to collect publicly available data.

Annex X. Pilots Actions. WA4. Open data, interoperability, data governance and information security, cyber security.

PILOT ACTION A: Identification and Big Data analytics of open data sources in the agrifood sector.

- **Participants:**

Friuli-Venezia-Giuli

Extremadura

¿Galicia?

Andalucia

Emilia-Romagna

Pays de la Loire

¿South Savo?

¿South Ostrobothnia?

- **Challenges and Needs:**

Decision-making is a very important step in the development of a farm. Choosing the crops to be planted and where to do it, choosing the livestock and how to feed it are some examples of decisions, which must be addressed in the process.

In this sense, extracting valuable knowledge from information about terrain, weather conditions or historical agrifood product prices, for example, will allow farmers to make better-informed decisions and probably improve the performance of their farms.

- **Scope:**

Each of the participant regions will identify the available open data information sources in their regions that could be relevant for agrifood sector (terrain orography, climatology, watersheds, etc.) and then, will analyze such sources for unifying access to them. Once the sources have been identified and selected, algorithms and data models will be designed and implemented to extract knowledge from available data through big data techniques. This project will offer agrifood sector stakeholders, mainly farmers, valuable knowledge to make more accurate agricultural decisions. This project will be carried out for two years.

- **Objectives:**

- Identification of open data information sources (eight at least) that are relevant to agrifood sector in each involved regions.
- Unifying access to such information sources by understanding them and establishing their formats.
- Extraction of knowledge to help farmers' decision-making using big data analytics.

- **Results:**

- Open data sources inventory related to agrifood sector of each region involved in the project.
- Unified access to identified open data sources.
- Big Data algorithms and models related to agrifood sector information.

- **Expected Impacts:**

This pilot action will contribute to the development of digital services that cover the whole EU and reusing public data. This open data sources inventory will improve the performance of public institutions and private companies by providing agrifood sector stakeholders with relevant information to facilitate the decision-making.

It also can contribute to current issues as circular economy and bioeconomy by supporting public and private initiatives with valuable information to design strategies for the development of more sustainable production systems.

- **Activities:**

- Identification and analysis of open data sources.
 - ✓ Identification of open data sources.
 - ✓ Analysis of identified sources (quantity, quality, formats, metadata, etc.) and selection of useful ones.
- Creation of a web platform to unify access to selected sources.
 - ✓ Analysis and planning of the platform.
 - ✓ Design of the platform.
 - ✓ Implementation of the platform.
 - ✓ Test over the platform.

- ✓ Deployment and maintenance of the platform.

- Application of Big Data analytics to the agrifood sector.

- ✓ Business understanding.
- ✓ Data understanding.
- ✓ Modelling.
- ✓ Evaluation.
- ✓ Integration and deployment.

- Communication, dissemination and exploitation.

- ✓ Communication.
- ✓ Dissemination.
- ✓ Service exploitation.

• **Products:**

Service that allows users to access to different open data sources related to agrifood sector from a single place. In addition, this service will offer valuable knowledge extracted from data available to support farmers' decision-making.

• **Time-line:**

Activities / Tasks		M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Activity 1	Identification and analysis of open data sources																								
Task 1.1	Identification of open data sources																								
Task 1.2	Analysis of identified sources and selection of useful ones																								
Activity 2	Creation of a web platform to unify access to selected sources																								
Task 2.1	Analysis and planning of the platform																								
Task 2.2	Design of the platform																								
Task 2.3	Implementation of the platform																								
Task 2.4	Test over the platform																								
Task 2.5	Deployment and maintenance of the platform																								
Activity 3	Application of Big Data analytics to the agri-food sector																								
Task 3.1	Business understanding																								
Task 3.2	Data understanding																								
Task 3.3	Data preparation																								
Task 3.4	Modeling																								
Task 3.5	Evaluation																								
Task 3.6	Integration and deployment																								
Activity 4	Communication, dissemination and exploitation																								
Task 4.1	Communication																								
Task 4.2	Dissemination																								
Task 4.3	Service exploitation																								

• **Budget:**

Personnel costs

6 person/month technical staff for each region.

16 person/month of programmer analyst (two people for 8 months) to develop the web platform.

10 person/month of system administrator to maintain the systems.

20 person/month of data scientist (two people for 10 months).

- **Identified funding instrument/programme:**

- DT-RUR-12-2018: ICT Innovation for agriculture – Digital Innovation Hubs for Agriculture.
- RUR-14-2018: Digital solutions and e-tools to modernise the CAP.
- ICT-24-2018-2019: Next Generation Internet - An Open Internet Initiative (for a more ambitious proposal).

PILOT ACTION B: EuroRegio AgroBigData.

- **Participants:**

Coordinators: Region Friuli Venezia Giulia and Cluster Agrifood FVG

Regional partnership: Andalusia (ES), Extremadura (ES).....work in progress

Stakeholders:Insiel, UniUd, UniTS, Eurotech,

- **Challenges and Needs:**

Starting a Big Data project in the agrifood sector of a region is a complex and delicate task.

Each Region has its own organizational and operational modes. The subject matter is regulated by regional and national laws, different from each other. Morphological and climatic characteristics make each region unique and different from the others. On the other hand, however, it is true that in the process of primary agricultural production, primary product transformation, distribution and logistics, administration and sale, food security, large operational and managerial similarities can be highlighted.

In the light of the above, it is necessary to propose a sharing of experiences among some regions for the activation of a Big Data agrifood project that has the ability to adapt to the peculiar needs of each identified European region.

Obviously, it is obvious that due consideration will be given to the need for the establishment of replicable structures capable of ensuring full interoperability of data between them.

- **Scope:**

The operational plan provides for the initiation of an infrastructure capable of collecting in a single certified public container all relevant information available in the agrifood sector by one of the partner regions, along with the active contribution of the other ones and by other experts in this field (EIP-AGRI for example).

As soon as this new "Regional agrifood Big Data" computer platform reaches an acceptable level of activity (which is estimated to require more than one year from the beginning of the project), it will be possible to replicate it to other regions concerned, giving birth to the adaptation and customization processes related to the inclusion of the miscellaneous typical local aspects.

Starting from this first platform prototype, it will be possible to proceed to the refinement phase, in order to guarantee the possibility of managing the various information related to specific sub-sectors and production chains. This task could be organized and developed on a matrix that

correlates each product data (wine, cereals, vegetables, cheeses, salami, etc.) and the metrics of the specific value chain (cost, energy, carbon footprint, by-products -breaks, markets, exports, etc.). These activities, possibly different, could be completed by the various partner regions in order to speed up the implementation process of the Big Data project in parallel methodology among the different sectors selected.

This approach would have the advantage of addressing the different phases necessary for the production segments: data search, accessibility verification, comparison of accessible options, data updating, data security, solutions to ensure their own ownership, organization of data for analysis purposes, data reorganization to meet the needs of the different "consuming customers" of the databases thus created, and finally packaging the access profiles to the miscellaneous data according to the different needs of different companies, public administrations, professionals and consultants, citizens and regional government.

These activities would make Regions act as project partners, collaborate and compare different experiences, thus gaining the goal of gradually building their own systems on the basis of free choices concerning their priorities, their organizational and project capabilities, in full compatibility and consistency with their own resources. This way, the interoperability criteria, which the project is aiming at, could be easily pursued by looking specifically at creating relationships between the regional technicians involved in the different activities assigned to the different regions involved.

- **Objectives:**

Realization of an integrated regional Big Data system capable of collecting, processing and redistributing both the available information and those coming from the agrifood subgroups involved. The ultimate goal is to build an integrated information system capable of reaching its full maturity in a few years and to be looked at as a good practice for the benefit of all the European regions concerned.

The information that the system intends to make available will be of great value in relation to its inner value and also in relation to the profiling characteristics that will be defined and produced in dependence of the various recipient parties concerned, such as: regional administrations, private companies belonging to the agrifood chains involved, universities, clusters and innovation centers, catering and Ho.re.ca companies, private citizens intended as consumer. The information, appropriately selected and made available, will be a valuable tool for defining appropriate policies and behaviors within the logic of bioeconomics and circular economics, in order to facilitate the identification and retrieval of waste products to be reused. Finally, policies and optimization methodologies based on quantitative metrics (km zero, ecological impact, carbon footprint, logistic optimization, protection of specifics) will be potentially determinable and realizable, and secondly, once access to healthcare data is available, it will be possible to define correlation evidences

(based on epidemiological basis) of the impact of certain eating habits or consumption characteristics that may corroborate the definition of health guidelines for the protection of public health.

- **Results:**

Realizing a certified regional public Big Data will offer many benefits to the entire regional community and, in perspective, to the national and European ones. The Information of great potential interest, now existing but not available, will be made accessible and potentially accessible to everyone. Of course, the data will have to be processed and distributed in full compliance with rules and regulations on privacy, confidentiality, competition and any good ethical and legal practice. By doing so, an increasing amount of information will be available to support regional and local decision-makers, businesses, agencies, clusters, associations, and citizens.

It is quite clear that the accessibility to these information will enable the activation of new services that will improve the productivity of businesses and the establishment of collaborations between the various production sectors, in view of a fair, ecological and sustainable growth of the agricultural world and transformation processes.

- **Expected Impacts:**

This pilot action will contribute to the development of digital services for the benefit of the entire European Community that will benefit from the re-use of these public data. The economic growth of the agrifood sector will only benefit from this impetus given to knowledge in an important and delicate sector such as the agrifood industry. Certainly, the biggest beneficiary of this action will be the productive sector, but at the same time it the community as a whole will benefit from it, as it will be possible to know real-time process metrics and waste reusable production. Citizens themselves as consumers, who are the ultimate subjects of production and processing processes, will have accurate and reliable information on the agrifood products they are interested in. Thanks to new information made available, regional public health, then national and European, will have the opportunity to improve far beyond current standards of food safety controls.

- **Activities:**

- Big Data Execution of the Big Data System infrastructure sharing technological choices with technical partners from the various regions involved.
- Design of the data access structure (for those outside the regional information network); organization (for replicated ones) and basic architectural and organizational modalities, with an eye to the need for interoperability and reusability in the different regional realities.

- Acquisition of infrastructural operating spaces, suitably dimensioned and scalable; the launch of the Big Regional Data Agrifood.

- Loading / re-addressing of data from public sources:

all available public archives from agricultural, and agrifood sectors, from statistics, veterinary, health, environment, Agricultural Development Agency, Environment Agency, Chambers of Commerce and Industry, Professional Organizations sectors and others from all available private individuals: agricultural companies, transformer companies, professional technicians, agrifood business operators, large retailers, traders, distributors, transporters and logistics, associations for the re-use of expired products, citizen associations for food and health issues and others.

- For each product / chain of the value identified:

identifying all the information needed to control and monitor the entire supply chain from various points of view: energy cost, economic cost, carbon footprint, food safety, waste production, unsold production, etc.

Study and catalog existing sources of information and design new ways or tools to generate additional information needed to know and monitor the whole chain.

Upload, manage, analyze, process, output "profile" of all information.

- Study and realization of tools for analysis and processing of information (Correlation for the emergence of various types of trends (consumption, optimization, sustainability, health, ecological) between heterogeneous data.

- Study and realization of personalized data access tools for user types.

- **Products:**

The project will have to represent the realization of a first computer platform that can be the first "Big Data Regional dedicated to the agrifood sector".

The platform will collect all the public information of the sub-fund to enable it to be accessible to all involved public and private actors.

You will be able to experience information management technologies from companies, management systems, and food chains in the agrifood industry.

You will be able to experience the issues of security management, confidentiality, data privacy. Collectively managed and published "Open Data" archives can be collected.

Secure communication channels will be activated to automatically update all existing database data in real-time.

Industry-wide access information systems will be activated for citizens, and proper profiling will ensure user-friendliness or confidentiality with the most innovative methodologies.

The deployment platforms will be deployed on specific specific issues by providing expert working groups able to respond to the needs of system managers in a very short time.

- **Time-line:**

Big Data Execution of the Big Data System infrastructure 9 months after P.A. (Project Approval)
 System presentation for first collegial evaluations12 months after P.A.
 Closing project and switch to ordinary management 24 months after P.A.

- **Budget:**

Costs of the project EuroRegioAgroBigData (x 1000 euro):

Forecast in Friuli Venezia Giulia activation case.

Technical Project Management.....	163
Certification, tracing and history association.....	15
Creating a Platform with Big Data Capacity, Analytics.....	250
Backend Application for Blockchain Integration.....	150
Regional BD access connection and integration.....	60
SIAN convention for DB synchronization.....	250
Data Management and Database Content Big Data,	175
Application management.....	270
Data storage (24 months).....	48
Infrared technical staff travel expenses.....	80
TOTAL.....	1.498

Forecast in Friuli Venezia Giulia activation case.

1	Business Understanding Analysis and detailed definition of objectives and requirements from the different perspective of each of the agrifood subgroups and of each of the recipient parties Consultation with domain experts (public sources data managers, product / chain of value experts) Design of a preliminary plan	75
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2	Data Understanding <ul style="list-style-type: none"> • Inventory of existing data sources • Design of new data sources (consumers data collection) • Exploratory analysis of the data properties • Collection of initial data • Definitions of data subsets and data partitioning • Interoperability and reusability for the different regional realities 	105
3	Data Preparation (part of the continuous improvement cycle) <ul style="list-style-type: none"> • Platform selection • Preparation of data flows, data access control, security settings. • Definition and implementation of synchronization procedures. • Pilot Applications development for consumers data collection • Performances monitoring 	215
4	Modeling (part of the continuous improvement cycle) <ul style="list-style-type: none"> • Platform selection • Definition and implementation of data analysis models, predictive or classification models using various features (e.g. client age, region, cost, energy, etc.) 	295
5	Evaluation/Assessment: (part of the continuous improvement cycle) For the various data consumer profiles, different food subsectors and different regions	90
6	Deployment (part of the continuous improvement cycle)	30
7	Project development management	163
8	Agreements for Database synchronization SIAN	125
9	Cloud Platform – 24 months period subscriptions <ul style="list-style-type: none"> • Data storage and Big Data Services • Multiple Data Model Database • Machine learning • Cognitive services • Analysis Services • Application Services 	140
10	Operations management – 24 months period Support, Platform management, Connectivity expenses	160
11	Travel expenses	100
	Total	1.498

It is necessary to define the general approach and share it according to the available funding.

If you share the facility and start implementing a regional infrastructure, it will absorb economic and human resources once in every region. Future developments, with other pilots, will benefit from the existing structure with substantial time and cost reductions.