Executive Summary

A thematic partnership on "Traceability and Big Data" for the EU agrifood value chain: SMARTFOOD
"Executive Summary Scoping Note"

Background

Internet and digital technologies are radically changing the life of European citizens and the European Commission has made the creation of a Digital Single Market a priority. The agri-food 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 agri-food value chain actors (farmers, food manufacturers, transport, retail and of course consumers).

The agri-food value chain has characteristics that differentiate it from value chains in other industries and there is a need for specific types of information and data management systems. The large volume and diverse nature of the data, including both structured and non-structured data, calls for specific integration and management procedures to make the most of the new economic opportunities based on information, data and cognitive technologies.

To this end, the agrifood sector, through the S3 Agrifood platform, will establish the leadership of innovation linked to data and support the transition process to a new form of building networks and synergies between multi-actors by creating a suitable and inclusive ecosystem that will accompany innovation.

The co-creation and interregional cooperation processes that are involved in the Thematic Partnership on "Traceability and Big data" represent a great opportunity for all stakeholders.

Objectives of the Thematic Partnership

The Thematic Partnership aims at encouraging, motivating and facilitating the incorporation of necessary digital technologies and data application in agri-food sector value chains. The specific objectives are:

- Improving the competitiveness, resilience and sustainability of the agri-food sector.
- Achieving a transparent, collaborative and balanced agri-food value chain and promoting an economy of shared value.
- Accelerating adoption of ICT, improved data management and interoperability in the agri-food sector
- Fostering data-driven innovation at all stages of the agri-food value chain
- Developing new business models and market opportunities and quality job creation.
- Establishing creative designs for decision-making based on data management and the creation of decision support systems
- Ensuring the inclusive governance of data and knowledge flows

- Improving the synergies between public institutions, knowledge agents, civil society entities, farmers and companies.
- Sharing best practices and developing standards and benchmarking in relation to agri-food value chain developments 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.

Main Topics

A preliminary analysis has enabled the definition of some key thematic areas and common foundations for a data-driven agri-food chain have been identified (including good practice examples), these include:

- More complete and trusted information available to consumers.
- Smart information systems for companies and the public administration.
- Territorial cooperation as basis for the transfer of technology and research outcomes, experiences, research staff and between companies, in those regions that are interested in this topic.
- The shared value that will generate added value in all stages of the chain that will have an impact on the rest of phases and in society and the territories at large.
- Improvement of business competitiveness, resilience and sustainability and creation of new businesses.

To help clarify the potential commitments of other regions, we suggest some areas that are important in the innovation processes of the food chain and where inter-regional cooperation can be beneficial. Three specific fields of work have been identified to be discussed with other interested regions:

- **Specific topic 1.** Traceability and Big Data in the *"Lifecycles of the value chain"*
- **Specific topic 2.** Traceability and Big Data in the *"Smart monitoring of the value chain (production, agrifood industry, logistics, distribution and consumer) aiming to improve the competitiveness in the agrifood sector")*
- **Specific topic 3.** Traceability and Big Data in order to "Incorporate consumer experience and of the various different operators of the food chain in decision-making processes"

Moreover, there is a need to address issues such as *"Open data, interoperability, data governance and information security, cybersecurity"* as a **cross-cutting topic**.

Based on these topics, it is suggested to structure the thematic partnership as follow.

The Interregional Thematic Partnership would be composed by regional partnerships which should include institutions from public administration/decision makers, research and

technological centres, privates companies and consumers associations. The management structure could be as follows:

Coordinator of the Thematic Partnership: Andalusia
Co- Leader of the Thematic Partnership: (to be appointed)

- Topic 1 Coordinator: Co-lead regions (to be appointed)

- Topic 2 Coordinator: Co-lead regions (to be appointed)

- Topic 3 Coordinator: Co-lead regions (to be appointed)

- Cross-cutting Topic Coordinator: Co-lead regions (to be appointed)

It is suggested to involve at least eight regions in management and coordination activities of the Thematic Partnership. Seventeen EU regions have signed the Expression of Interest to date.

Institutions from the domain of knowledge, that is, centres of expertise, technology transfer and research, whose regional authorities have not joined the Thematic Partnership, can accede as Associate Members providing a distinctive added value to the partnership as advisers.

Developing the Thematic Partnership

In line with previous thematic smart specialisation platforms, it is proposed to follow a four step process in designing and developing the thematic platforms for agri-food traceability and big data. The pilot process is summarised below.

Process: Learn – Connect – Demonstrate - Commercialise
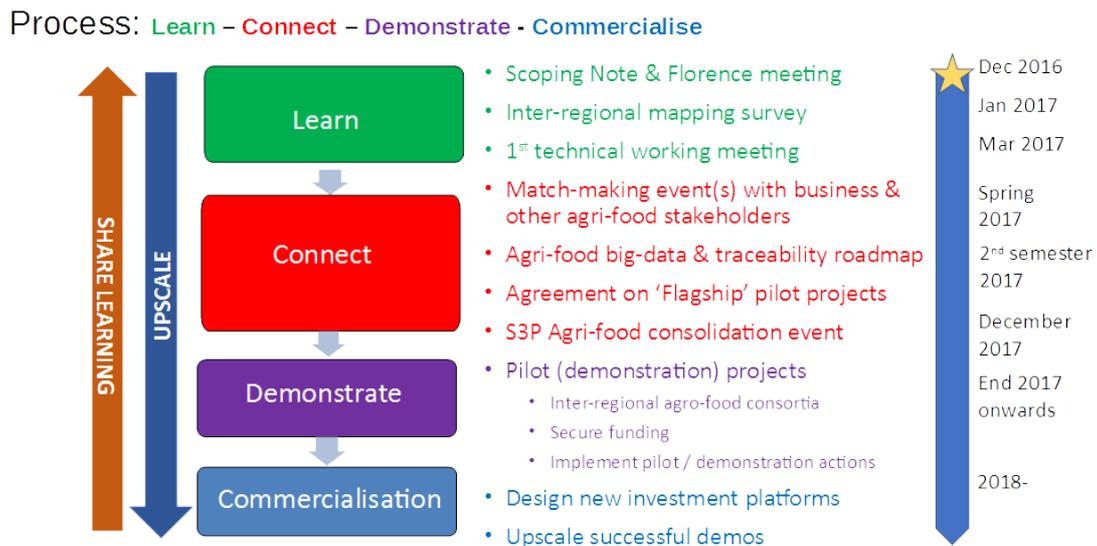
A session on the thematic partnership "Traceability and Big Data in the agri-food chain" was held at the meeting in Florence on 7th December. During the session the four topics and the proposed next steps were debated in a plenary session.

See Annex 5 (Summary of the workshop proceedings 7 December 2016, Florence) of the scoping note to know the conclusions of the workshop. Nevertheless, it is also annexed to this document.

Next steps

- Design of the governance and management framework of the Thematic Partnership.
- Mapping of agro-food related data and traceability know and infrastructures in each regional partnership (private company-public administration-competence/knowledge centres) - a survey has been circulated for the mapping (see annexe 5 of the scoping note to know the content of the survey).
- Matching, in the partner regions, complementary know-how and capacities in technologies or applications relevant for using or generating data to support food traceability and improvements in quality, etc. along food chains.
- Analysis of and development of (inter-)regional pilot and demonstration actions in the field of big data and traceability that can be proposed for co-financing and/or co-investment and that help support regional agri-food value chains to enhance their competitive position.
- Analysis of the financial sources available.
- Technical meeting in Seville on 28th and 29th March.

Regions that have joined and/or confirmed interest in the Thematic Partnership to 28th March

A mapping of regions whose RIS3 priorities included innovation in the agrifood sector has been undertaken. Annex 1 contains those regions, regional clusters, technological centres, business networks and consumers associations which have joined the partnership and/or expressed their interest in this project.

Andalusian Regional Partnership to 28th March

Relevant stakeholders for traceability and Big Data in Andalusia have been identified at the level of public administration, universities and technology centres, civil society as well as private companies that develop activities in domains of ICTs or other KETs and agri-food (sensors, robotics and automation, machine vision systems, artificial intelligence, Big Data, Open Data...). Meetings have been held with many of the identified stakeholders and a regional public-private partnership has been created. It will be the Andalusian regional partnership of the Interregional Thematic Partnership. Annex 2 contains the list of members of the Andalusian regional partnership to date.

Annex 1. Entities/regions which have joined and/or expressed their interest in participating in the S3P Agri-food Thematic Partnership on "Traceability and Big Data"

Regional Governments:

Country	Region
Finland	Satakunta
Finland	South Ostrobothnia
Finland	South Savo
France	Brittany
France	Pays de la Loire
Greece	Central Macedonia
Hungary	Hajdú Bihar
Hungary	South Transdanubian
Italy	Friuli Venezia Giulia
Italy	Sardinia
Italy	Emilia Romagna
Netherlands	Limburg
Spain	Basque Country
Spain	Extremadura
Spain	Galicia
Spain	Navarre
Turkey	Middle Black Sea

Clusters:

Country	Region	Entity
Italy	Basilicata	Agri Go Basilicata
Italy	Emilia Romagna	ASTER Consortium for innovation and technology transfer
Italy	Friuli Venezia -Giulia	Sandaniele Agri-food Park
Portugal	Alentejo	AgroCluster Ribatejo
Spain	Basque Country	AZTI Technological Center specialized in sea and food innovation
Spain	Extremadura	FUNDECYT-PCTEX Science and Technology Park of Extremadura
Spain	Navarre	INTIA – Institute of Agri-food Technology and Infrastructure of Navarre
United Kingdom	Northern Ireland	Agri-food and Biosciences Institute (AFBI)

University / Research Centers:

Country	Region	Entity Name
Spain	Aragon	Aula Dei Science and Technology Park
Italy	Piamonte	University of Turin
Hungary	Hajdu Bihar	University of Debrecen
Netherland	Gúeldres	University of Wageningen
United Kingdom	Northern Ireland	Agrifood Quest (Queen's University of Belfast)
Finland	South Savo	South-Eastern Finland University of Applied Sciences
Finland	South Ostrobotnia Region	Seinäjoki University of Applied Sciences
Finland	Satakunta	Tampere University of Technology

Other entities / Research Centres:

Country	Region	Entity Name
Italy	Basilicata	TAB Consulting srl
Greece	Epiro	Logotech

Annex 2. Andalusian Regional Partnership on "Traceability and Big Data"

PUBLIC BODIES. REGIONAL GOVERNMENT OF ANDALUCÍA

- Regional Ministry of Agriculture, Fisheries and Rural Development
- Regional Ministry of Economy and Knowledge
- Regional Ministry of Employment, Enterprise and Trade
- Regional Ministry of Health
- Regional Ministry of Environment and Spatial Planning
- Agency for Andalusian Innovation and Development (IDEA) – Coordinator of Andalusian RIS3
- IFAPA - Institute for Research and Training in Agriculture and Fisheries

UNIVERSITIES / RESEARCH AND TECHNOLOGICAL CENTRES

- ANDANATURA – Andalusian Natural Areas Foundation
- CeiA3 – Campus of International Excellence in the Agri-food sector
- Cei-mar - Campus of International Excellence of the Sea
- CIDAF – Functional Food Research and Development Centre
- CITIC – Centre of Innovation and ICT of Andalusia
- CITOLIVA – Technology Centre of Olive Tree and Olive Oil
- COEXPHAL-UAL Chair (University of Almería)
- COIAA - Agricultural Engineers Association
- CTA – Andalusian Technological Corporation
- CTAQUA – Technological Centre in Aquaculture
- GEOLIT – Science and Technology Park of Jaén
- Institute for Fat Research, High Council of Science Research
- PITA – Science and Technology Park of Almería
- TECNOVA - Technology Park for Ancillary Industry, Postharvest and Fruit and Vegetable Packaging
- University of Almería: Coexphal Chair
- University of Cordoba
- University of Almeria

ICT COMPANIES AND ORGANISATIONS

- Bioazul
- BO TRUE ACTIVITIES SL
- BYNSE (SERMICRO Group)
- CO2 Consulting
- ec2ce
- Eman Ingeniería
- ETICOM
- Evenor-Tech, SLU
- FAICO – Andalusian Foundation of Image, Colour and Optics
- GIESA – Cabinet of European Initiatives
- Global InDevices
- GMV Innovating Solutions

- HISPATEC
- HP Enterprise
- IBM España
- INNOVASUR
- Internet of Things
- IT Anserlog
- ITSOFT (innovatelecom)
- MGS SOFT
- MUEVO
- Pri Ops Ciencia de Datos SL
- RSC Talent 2016 S.L.
- Secmotic
- Sigrow
- TIER 1
- UTW
- Verdtech - Verde Smart Corporation S.L
- Vodafone España
- Wellness Telecom.
- WENDU WEARABLE SL

COMPANIES AND ORGANISATION IN THE AGRI-FOOD SECTOR

- AEMETIC (Smart Agro Working Group) – Electronic, ICT and Digital Content Business Association
- APROA – Association of Andalusian Producers Organisations
- AGROCOLOR
- coag – Coordinator of Farming Associations
- COEXPHAL - Association of Organisations in the Fruit and Vegetables sector of Almería
- COVAP – Livestock Cooperative of Valle de Los Pedroches
- DCOOP
- FIAB – Spanish Food and Drink Industries Federation
- FRESHUELVA
- Global Gap
- Global Olive
- Indecco: Research on Ecological Grasslands
- Inventia Agrarica SL
- Javier Pérez Caro
- Regulatory Council for Aloreña de Málaga olive oil PDO
- Regulatory Council for Condado de Huelva and Condado de Huelva Vinegar PDO
- RURAPOLIS
- Subafresh
- Valle del Gudalhorce Local Action Group

CIVIL SOCIETY

- UCA-UCE Consumers Association of Andalusia

Annex 3. Summary of the workshop proceedings of the Thematic Partnership on "Traceability and Big Data", Florence

Smart Specialisation Thematic Platform on Agri-Food
Thematic Partnership on Traceability and Big Data
Lead Region: Andalucía (Spain)

Summary of the workshop proceedings, 7 December 2016, Florence (Italy)

Introduction

As part the European Commission's S3 Platform's Kick-off event for the thematic platform on Agri-Food[1], the Regional Government of Andalucía hosted a parallel session to discuss a scoping paper on the topic of traceability and big-data in the agri-food chain.

The scoping paper reviewed the state of the art and rational for the platform and proposed four topics on which the platform's future activities could be based. The scoping paper underlined that:

- Agri-food is a key sector for employment and future growth in many regions
- Boosting quality and productivity (value) along the whole food chain is a smart specialisaiton priority for regions across the EU:
- Agri-food innovation should help resolve societal challenges: health and ageing, resource efficiency and climate change mitigation;
- Enhancing food traceability is an identified challenge and 'opportunity' that can be supported applying ICT based systems in food production, safety, processing, decision-making, automation and distribution.
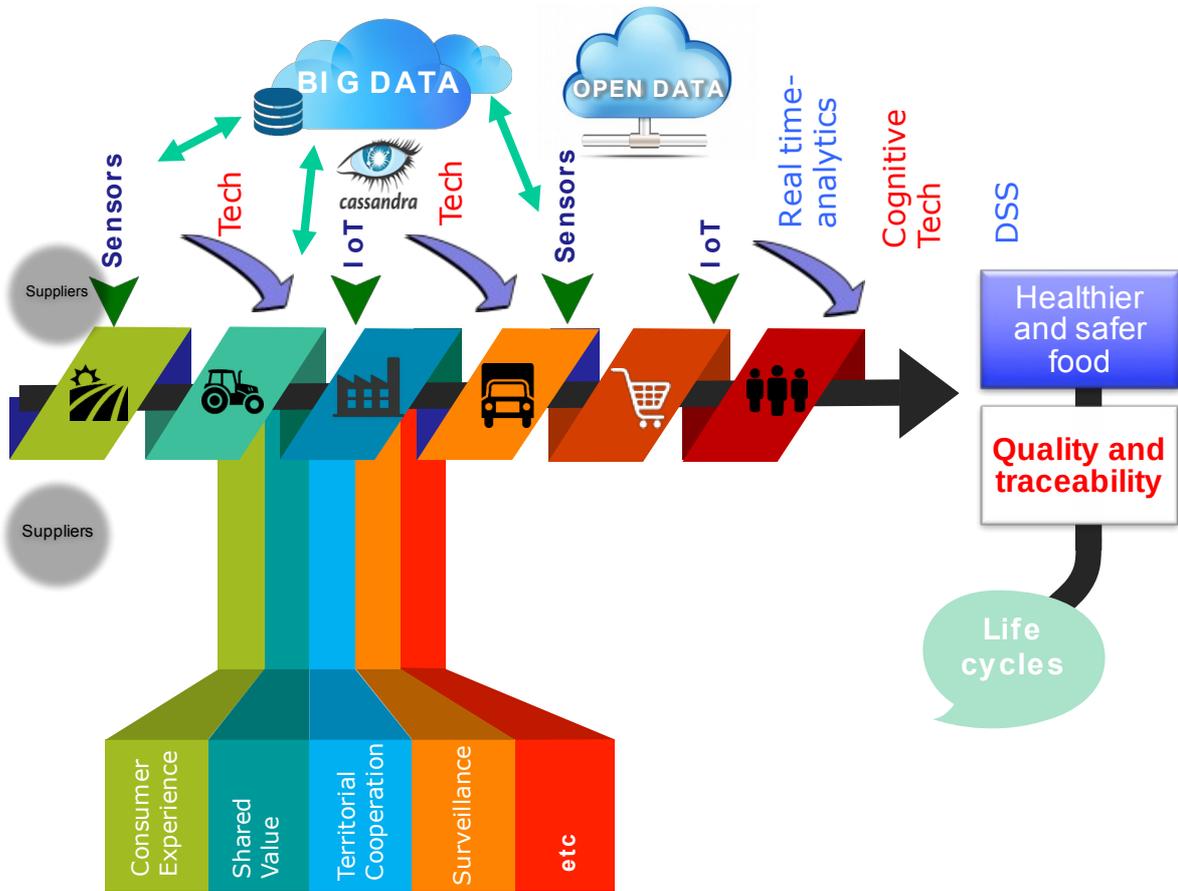
The initial mapping of initiatives in the field of traceability and big data in the agri-food chain underlines that there is a good basis for inter-regional co-operation:

- There are about 50 food related clusters in Europe with a number working specifically in agri-food ICT and data fields. There is therefore, significant scope to link up know-how and expertise in traceability, digital technologies and data-driven business models
- At European level, there are various complementary initiatives working 'upstream' on research and prototyping on key technologies for agri-sector, etc.. These include ERA-NET ICT AGRI 2, European Innovation Partnership (EIP-AGRI), IOT Food, etc.
- The newly approved EIT-KIC on Food will develop a business-research-education platform at European level and is driven by major industry players. A number of the regions interested in joining the platform are involved in the KIC Food and this will help foster synergies.

Compared to these existing initiates, the <u>S3 thematic partnership's value proposition or 'unique selling point' (USP)</u> will be: **to develop inter-regional co-operation on the application of data-driven business models to boost the competitiveness of regional agri-food chains.** The intervention logic of the thematic partnership is illustrated in the diagram below

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[1]http://s3platform.jrc.ec.europa.eu/-/kick-off-event-of-the-smart-specialisation-platform-on-agri-food?inheritRedirect=true

Building on the analysis in the scoping note and the thematic partnership model, the four topics proposed for the thematic partnership are:

- TOPIC 1. Traceability and Big Data in the lifecycles of the value chain.
- TOPIC 2. Traceability and big Data in the "Smart monitoring of the value chain (production, agri-food industry, logistics, distribution and consumers) aiming to improve the competitiveness in the agri-food sector"
- TOPIC 3. Traceability and Big Data to incorporate the experience of consumers and of different operators in the value chain in decision-making processes
- Cross-cutting Topic: Open data, interoperability, data governance and information security, cyber security.

The objectives of the parallel session were

- To assess the suitability of the proposed topics and/or propose alternative topics, where appropriate.
- To deepen understanding of each thematic area and define concrete work themes to be developed in the thematic partnership.
- Identification of and / or proposals for pilot and demonstration actions.
- Detect regional / sectoral barriers to thematic partnership development
- Detect regional / sectoral opportunities for thematic partnership development
- Next steps to be taken and agreement on proposed work schedule

The session was structured in two parts. The morning session focused on reaching agreement on the thematic topics and was opened by a short presentation by Alasdair Reid (expert appointed by the European Commission) who also moderated the session. The discussion was structured around three key questions and participants were invited to contribute their ideas both during the discussion and by noting their ideas on post-its. The three key questions were:

- What are the key challenges for the adoption of data-driven business models in agri-food value chains?
- In which agri-food sector and/or value chain segment is there the most need or opportunity for inter-regional co-operation on traceability and big data?
- How can inter-regional co-operation build on and complement regional (RIS3) priorities related to agri-food and data-driven innovation ?

During the morning, the participants raised a number of points for consideration in the design and development of the thematic partnership, these included:

- The thematic partnership's activities should extend across the various food chains including not only agriculturally based foods but also seafoods.
- The relevant technologies supporting traceability extend beyond ICT applications and include 'molecular' traceability (genetics, etc.) and the platform should examine the relevance of data from multiple sources and how this can be used to enhance traceability and add value in the food chain.
- One objective should be to simplify and harmonise data collection processes for all food chain actors but especially producers (farmers, etc.) and small and medium sized food processing firms. Currently these actors are obliged to provide a lot of data to multiple 'registers' and one challenge is to combine existing proprietary and open data to reduce the burden of data provision (e.g. to food safety or environmental agencies, etc.).
- A related point raised was the need to distinguish between mandatory versus voluntary data collection to avoid the cost of collecting data with 'less value'. Data for data's sake should not be an aim and this implies a pre-identification of the types of existing data that can be used and how it adds value to traceability, quality and safety, etc. in the food chain.
- Enhancing consumer confidence in food traceability and food safety (e.g. temperature control during transport of foodstuffs) was raised as a critical element in securing the future competitive position of regional food chains on European and international markets.

The importance of the cross-cutting topic was underlined by many of the points raised during the morning discussion which related to data ownership and a balanced 'playing field' for all actors in the food chain (e.g. the risk that multinational companies like 'John Deere' end up controlling data relating to agricultural production or that supermarkets monopolise data on consumer preferences and trends to increase their 'influence' over the chain).

The afternoon session began with a summary, by Alasdair Reid, of the results of the 'post-its' session. The responses to the first question on the key challenges were largely in line with the morning session discussions and included:

- Improving understanding and developing a framework for data ownership / protection / security as a foundation for new applications;
- Ensuring that all actors in the value chain have access to data and avoid that 'downstream' players accumulate even more power over data.

- Help to overcome cultural and capability barriers to the adoption of data driven models in the agri-food sector, such as traditional thinking, language, consumer psychology, etc.
- Developing data standardisation and inter-operability to encourage and facilitate the exchange and analysis of data along the value chain
- Creating incentives and business models that foster data-sharing.

On the issue of whether the thematic partnership should focus on specific food chains or segments of the 'generic' food chain, the participants underlined the need to cover the entire food chain but an emphasis on the two ends of the food chain:

- Farmers to enhance use of data in decision making related to markets, resource use, etc.. Suggestions made included enhancing traceability back to individual farms and ensuring protection of designated origin
- Consumers: incorporating consumer experience data as key part of food chain traceability, improving information on packaging for consumers to respond to consumers' needs and improve awareness on food origin, etc.

It was also suggested to focus on traceability in transport/logistic chains and to help develop synergies between IT companies and food clusters.

The participants identified a number of specific food chains which could be of interest when developing pilot applications, these included: livestock (meat and dairy), fruit and vegetables (perishable products) olive oil and seafoods. The majority view was that the platform should not pre-select specific food chains at this stage and that the applications or pilot projects developed should seek to address the use of data for traceability relevant for all food chains.
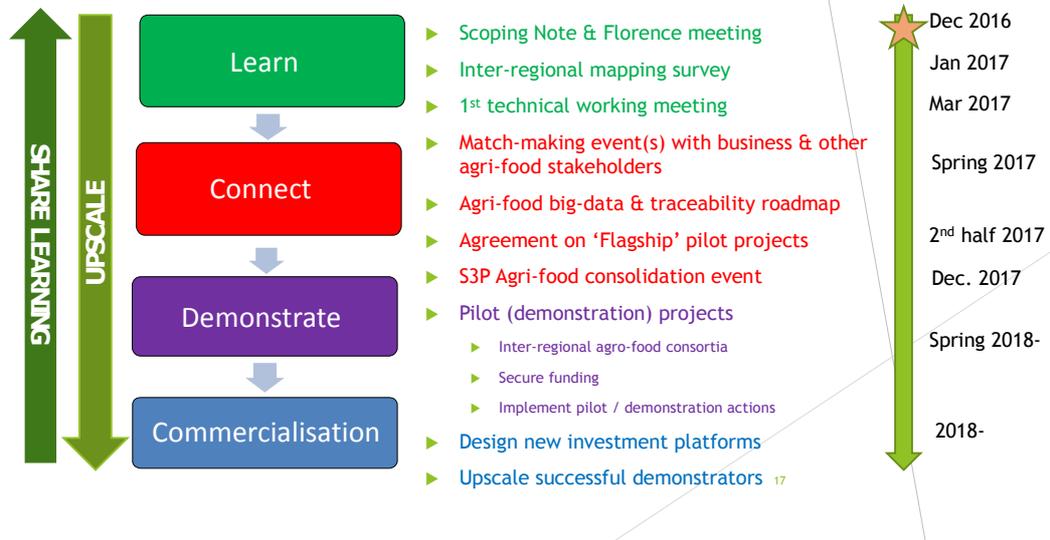
On the four proposed topics, broadly speaking these were viewed as providing a good framework for the development of the platform. The feedback from the participants stressed the importance of:

- Creating common standards for sharing data and systems
- Joint testing of new data applications and creating 'demonstration hubs' (e.g. via Internet of things applications).
- Enhancing the quality of information provided to consumers based on improved food traceability.

A representative from a company of the Andalusian node then presented a business view of how data-driven business models can be applied to the agri-food chain. This sparked a lively discussion on how to further refine the agreed four topics of the thematic partnership and develop pilot projects at inter-regional level.

In closing, the discussion turned to the next steps to take with a presentation of the proposed timeline of activities for 2017 as well as identification of regions that could be invited to join the thematic partnership as illustrated in the diagram below.

Process: Learn – Connect – Demonstrate - Commercialise

	Process	Activities	Timeline
	Learn	Scoping Note & Florence meeting	Dec 2016
		Inter-regional mapping survey	Jan 2017
		1st technical working meeting	Mar 2017
	Connect	Match-making event(s) with business & other agri-food stakeholders	Spring 2017
		Agri-food big-data & traceability roadmap	
		Agreement on 'Flagship' pilot projects	2nd half 2017
		S3P Agri-food consolidation event	Dec. 2017
	Demonstrate	Pilot (demonstration) projects	Spring 2018-
		Inter-regional agro-food consortia	
		Secure funding	
		Implement pilot / demonstration actions	
	Commercialisation	Design new investment platforms	2018-
		Upscale successful demonstrators 17	

The participants agreed to the proposed timetable of activities and asked for an early confirmation of the data of the next meeting scheduled for March 2017 which will be hosted by the Regional Government of Andalucía. Based on requests from the participants, it was agreed that a guidance note for the mapping survey will be provided including hints on how to organise a consultation with relevant 'food cluster' actors in each region.