European Policy Perspectives on Data-intensive Agriculture & Food

2nd Joint Policy Workshop organised by e-ROSA and Big Data Europe

CLORA headquarters, Brussels, 11 December 2017

Scope and objectives

Following the success of the 1st Policy Workshop jointly organised by e-ROSA (Towards an e-Infrastructure Roadmap for Open Science in Agriculture) and Big Data Europe, the two H2020 projects held a 2nd Policy Workshop in order to bring together a selected group of stakeholders working on policy frameworks and agendas relevant to the open science and digitization discussion in the agri-food sector.

The one-day workshop took place at the CLORA premises in Brussels on 11 December 2017. Key objectives of the workshop were presented by Odile Hologne (INRA) and Nikos Manouselis (Agroknow):

- To bring together representatives from the relevant DGs (DG RTD, DG CONNECT, DG AGRI and DG GROW) in order to discuss recent developments in terms of policy frameworks and funding agendas with the community representatives as well as their peers;
- To facilitate discussions related to the European Open Science Cloud (EOSC) and its implementation within the agri-food community through a dedicated Food Cloud;
- To facilitate discussions related to data sharing and the digitization of the Food Supply Chain as a whole.

The workshop was organised around two main sessions as follows:

Session 1 - Putting the EOSC Vision into Practice for Agriculture & Food. Representatives from DG RTD and DG CONNECT as well as from the scientific community presented their current activities and progress towards implementing the EOSC in the agri-food field.

From the EC's perspective, Wim Haentjens (DG RTD) highlighted the need to focus on researchers' needs in terms of Open Science in order to support the EOSC's establishment within the agri-food community. In addition, Georgia Tzenou (DG CONNECT) presented the progress towards the EOSC's implementation as a whole.

From the scientific community's perspective, Odile Hologne (INRA), e-ROSA's coordinator, and Sander Janssen (WUR) presented current and future activities carried out under e-ROSA in order to facilitate community-building around the shared objective of an e-infrastructure for agri-food research.

Session 2 - Digitizing and Transforming European Agriculture & Food Industry & Services. Representatives from DG AGRI, DG CONNECT and DG GROW as well as from the stakeholder community discussed how their current activities support the digitization of the Food Supply Chain and promote data sharing and use amongst all stakeholders.

From the EC's perspective, Ana Cuadrado Galvan (DG AGRI) presented DG AGRI's activities and funding agenda supporting digital transformation in agriculture and rural areas. Furthermore, Saila Rinne (DG CONNECT) presented the latest developments achieved since the publication of the EC Communication on Building a European Data Economy in order to identify and address related policy needs. Lastly, Blaga Valentinova Popova (DG GROW) presented the latest conclusions of the Expert Group focusing on the digitization of the agri-food sector within the High Level Forum for a Better Functioning Food Supply Chain.

From the stakeholder perspective, Walter Stiers (IBM Belgium) presented the new technologies and digital solutions that IBM has developed or is developing for the agri-food sector. Also, Panagiotis Zervas (Agroknow) presented the objectives of the upcoming H2020 project Big Data Grapes.

Agenda

09:00 - 09:30	**Arrivals & coffee**	
09:30 - 09:45	Welcome and introductions of the participants	**Odile Hologne** (INRA) & **Nikos Manouselis** (Agroknow)
09:45 - 11:05	**Session 1 - Putting the EOSC Vision into Practice for Agriculture & Food**	
09:45 - 10:05	European Open Science Cloud (EOSC) - From Vision to Action	**Wim Haentjens** (DG RTD)
10:05 - 10:25	European Open Science Cloud (EOSC): The Perspective of e-Infrastructures Consolidation	**Georgia Tzenou** (DG CONNECT)
10:25 - 10:45	eROSA Vision Paper - Endorsement of the EOSC Declaration	**Odile Hologne** (INRA) & **Sander Janssen** (WUR)
10:45 - 11:15	**Discussion** Reflections from the DG RTD, DG AGRI, DG CONNECT, DG GROW, DG SANTE to the community What does the community need from the EC DGs?	
11:15 - 11:40	**Coffee Break**	
11:40 - 13:40	**Session 2 - Digitizing and Transforming European Agriculture & Food Industry & Services**	
11:40 - 12:00	DG AGRI Activities and Presentation of the upcoming call topic on Agricultural Digital Integration Platforms	**Ana Cuadrado Galvan** (DG AGRI)
12:00 - 12:25	European Data Economy Initiatives	**Saila Rinne** (DG CONNECT)
12:25 - 12:50	Digitization in the Food Supply Chain	**Blaga Valentinova Popova** (DG GROW)
12:50 - 13:10	Precision Agri-Food Transparency	**Walter Stiers** (IBM Belgium)
13:10 - 13:30	Big Data for Disrupting the Grapevine-powered Industries	**Panagiotis Zervas** (Agroknow)
13:30 - 14:00	**Discussion** Reflections from the DG RTD, DG AGRI, DG CONNECT, DG GROW, DG SANTE to the community What does the community need from the EC DGs?	

Presentations

Session 1 – Putting the EOSC Vision into Practice for Agriculture & Food

European Open Science Cloud: Sharing and re-using research data in agriculture, food and nutrition (Wim Haentjens, DG RTD)

The EU policy framework Food 2030 seeks to address the need to step up in terms of investment in the agri-food area.

Following the success of the first Food 2030 High Level Event in October 2017, the 2nd Food 2030 High Level Event will take place in June 2018. In addition, the forum FIT4FOOD2030 was launched in November 2017 in order to gather a wide variety of stakeholders (e.g. JPIs, KICs, etc.).

Food 2030 supports the implementation of the EOSC as a "research data commons" in the agri-food area. Following the EOSC Summit in June 2017, a Declaration and an Action List were published in October 2017. The 1st EOSC Stakeholder Forum took place in November 2017 and the EOSC Roadmap is to be published soon.

Thematic clouds (Topic 6 of Call INFRAEOSC WP 2018-2020) need to interlink with each other and to the EOSC. The Food Cloud seeks to do so in the agri-food area by supporting use cases that address researchers' needs and ensure long-term sustainability.

Discussion

- The issue around the definition of "scientific" data was highlighted. Scientific data should be defined from the researcher's perspective, i.e. by the researcher's needs, as researchers can be interested in all kinds of data (i.e. produced in labs as well as by private firms, public organisations, etc.). Food Cloud demonstrators should dig into the complexity of sharing diverse types of data (e.g. licensing issue).
- New digital resources and technologies represent a huge opportunity to achieve a new type of research (e.g. long-spanned studies).
- The scope of the Food Cloud also includes environmental and health issues.

European Open Science Cloud: The perspective of e-infrastructures consolidation (Georgia Tzenou, DG CONNECT)

Existing e-infrastructures – transversal and thematic ones – are the starting point to develop the EOSC and integrate and consolidate these e-infrastructures into a single virtual, trusted environment and access channel for the researcher.

EOSC Hub (74 partners, 12 EU e-infrastructures) in collaboration with OpenAIRE-Advance are H2020 projects that support the implementation of the EOSC by integrating operational services.

In addition, other projects are financed to prototype new services: for instance, the project FREYA supports the development of a PID (Persistent Identifier) commons that can address new needs as a whole. EOSC Hub will identify needs that should be addressed in the upcoming call on innovative services (INFRAEOSC-02-2019).

Discussion

The question on the approach to identify the needs mentioned above was discussed, i.e. top-down vs. bottom-up, knowing that the identification of these *science* needs will be conducted by the *technological* e-infrastructures leading EOSC Hub. In particular, there may be a risk of rejection of use cases by EOSC if some are considered as too "scientific"/bottom-up driven. This is why Thematic Clouds need to focus on the identification of specific needs of their researchers and inform the development of the EOSC.

<u>The e-ROSA project: Towards an e-infrastructure roadmap for open science in agriculture (Odile Hologne, INRA – Sander Janssen, WUR)</u>

e-ROSA is an 18-month project that seeks to support community-building and the development of a roadmap around the objective of a common e-infrastructure of agri-food research. So far, several activities have been carried out, in particular:

- The e-ROSA partners have endorsed the EOSC Declaration through a commitment letter;
- A first assessment of the implementation status of the EOSC in the agri-food field has been carried out (in particular during e-ROSA's Stakeholder Workshops): generic e-infrastructures are key for the provision of technological services, however services related to semantics are a missing component in EOSC; in addition, for such services there is also a need on the content and not only on the technology development aspect;
- A vision paper has been elaborated in order to foster shared empowerment of all stakeholders around a common vision.

In addition, e-ROSA's 2nd Stakeholder Workshop took place in November 2017 with representatives from all across the food system at national, European and international levels. The objectives of the workshop were to: i) identify *societal impacts & research challenges* that benefit from an open science e-infrastructure in agri-food; ii) identify common challenges in ICT & data that could be tackled with an *e-infrastructure approach*; and iii) engage a broad community of scientists with a diverse background to ensemble *transformative use cases*.

The workshop facilitated discussions in three break out groups: 1) Smart farming, food security & the environment, 2) Gene-based approaches from omics to landscape, and 3) Food Safety, Nutrition & Health. For each of them, societal and scientific challenges were identified, as well as obstacles and expectations. Overarching conclusions concern the need for research to better target individual stakeholders of the food system (i.e. farmers, consumers, etc.) as well as the need for sharing, connecting and collaborating.

Discussion

- The issue of competition between the different sectors (e.g. farming sector and food sector) to be the first one to get the data– and thus the challenge to achieve a cultural mind shift towards openness of data – was raised. In response to this issue, the e-ROSA community can be considered as an organic community of Open Data "pioneers" that will grow (e.g. need to include the SHS community).
- e-ROSA and the ERA-NET ICT-Agri will collaborate in the near future:
    - ICT-Agri's database on projects supported via the ERA-NET will be linked to e-ROSA's mapping activity;
    - The ERA-NET instrument is valuable in terms of sustainability and strategic alignment as it gathers Member-States around the table.

Session 2 – Digitizing and Transforming European Agriculture & Food Industry & Services

Horizon 2020 Work Programme 2018-2020: Funding opportunities for digital transformation in agriculture and rural areas (Ana Cuadrado Galván, DG AGRI)

DG AGRI has been carrying out several activities, also related to the Digitising European Industry Strategy (DEI).

Regarding the upcoming calls supported by DG AGRI (RUR Topics WP 2018-2020 – Digital Transformation in agriculture and rural areas), calls have been designed in order to implement three levels of action: 1) Uptake of new technologies, 2) Technology Development, and 3) Impact of new technologies. In particular, the call on Agricultural digital integration platforms supports the development of platforms with mixed funding from DG AGRI and DG CONNECT.

Discussion

Farmers associations are very aware of the data opportunity, but there is a need to better define property rights in order to enable data sharing in a trusted way for farmers.

European Data Economy Initiatives (Saila Rinne, DG CONNECT)

New developments have been achieved since the publication of the EC Communication "Building a European Data Economy" (January 2017). In particular, an online consultation was conducted until April 2017. The following conclusions of this consultation have led to the implementation of additional activities by DG CONNECT:

- A legislative instrument is required to address the data localisation issue: a regulation proposal on the Free Flow of non-personal data was submitted in September 2017.
- Regarding the issue of B2B data sharing, contracts are preferred to hard policies: guidance material is in the process of being developed to support the elaboration of such contracts. Furthermore, having more data available to economic actors would foster innovation: an upcoming initiative will be funded from April 2018 on in order to support such a goal. However, one major issue is the question of where the limit is between private and publically funded data.

In addition, the cross-cutting calls H2020 ICT 11-12-13 managed by DG CONNECT can support domain-specific projects such as projects in the agri-food sector.

Digitization in the Food Supply Chain (Blaga Valentinova Popova, DG GROW)

DG GROW has been facilitating a multi-stakeholder dialogue that focuses on the food supply chain as a whole (initially only on the industry) via the High Level Forum for a Better Functioning Food Supply Chain. The latter involves all EU Member-States (mainly agriculture ministries) and various DGs. This dialogue was initiated following the statement that the EU is lagging behind in the agri-food sector in terms of innovation and added value, and that the digital era can play a significant role in addressing these issues. It relies on the food supply chain approach vs. the food system approach as the former reflects more the competitiveness aspect.

An Expert Group on how to digitize the food supply chain was created. So far, several challenges have been identified, including the skills gap, which is not only digital, but also managerial, organisational, etc. (e.g. need to develop open mindness to new technologies and business models). There is a need to share best practices. However, this is challenging in terms of instruments to use to promote the uptake of best practices (e.g. codes of conduct are not necessarily efficient in all countries depending on the culture).

Discussion

- There is significant resistance to data sharing due to fear of not being competitive (99% of the private stakeholders in the food sector are SMEs). In addition, this sector is very fragmented and political awareness and will from agriculture ministries to support digitization is low.
- The e-ROSA Roadmap can be presented to the Expert Group in order to raise awareness about the benefits for the private sector to share data with academia and about specific actions were collaboration can be achieved.

<u>Precision Agri-Food transparency (Walter Stiers, IBM Belgium)</u>

The Internet of Things is being more and more used in the agri-food sector as it provides very precise, real-time, context-specific data. IBM has developed several technologies and tools to support the interpretation and use of these data through a first pilot:

- The Weather Company Data Package provides forecasts adapted to the needs of the agricultural sector (e.g. evapotranspiration, soil characteristics).
- PAIRS is an information platform that enables the development of specific tools on top of it: it for instance supports the alignment of semantic resources (e.g. semantics differ at the field level and at the level of the production line);
- IBM has developed adapted user-interfaces as agriculture is people-observation-based and requires a solid user-experience;
- Blockchain has been used for food traceability as this technology ensures trust and a proof of quality: improving food traceability can trigger a huge gain in time;
- Artificial Intelligence can support the entire supply chain as a whole (e.g. through machine-learning, notifications and alert systems when a problem is detected, shared ledgers for full transparency, etc.).

Discussion

- IBM seeks to set up a second pilot in the EU. Up to now, there is no fixed commercial model for the pilots. In order to scale up the solutions described above, all stakeholders (especially SMEs) need to be represented.
- These activities rely on the principle that the initial owner of the data remains the owner.

<u>Big Data for Disrupting the Grapevine-powered Industries (Panagiotis Zervas, Agroknow)</u>

The H2020 Big Data Grapes is a 3-year project that seeks to connect data from all stages of the value chain in the grapevine industry.

There is a need to support more efficient decision-making throughout the supply chain. This can be achieved thanks to data-driven knowledge bases. However, the challenge of the heterogeneity and multiplicity of data, data sources and data flows needs to be addressed in order to support effective data management, processing, analytics, visualisation and exploration.

Pilot cases are developed under Big Data Grapes in order to improve the efficiency of Farm Management Systems, support the production of higher quality products, and support the description of products through “data storytelling”.

Overall conclusions

Thanks to the success of e-ROSA and Big Data Europe's previous workshop in generating strong interest of participants and related DGs and communities, this second Policy Workshop succeeded in achieving its objectives by bringing again together diverse, targeted stakeholders that could fuel the strategic dialogue on Open Science and digitization in agriculture and food.

Workshop outcomes clearly demonstrate elements of convergence and a common vision between the different stakeholders representing the agri-food community. In brief, main outcomes of each workshop session can be summarised as follows:

1) Session 1 – Putting the EOSC Vision into Practice for Agriculture & Food

The EOSC seeks to provide researchers with a single access channel to e-infrastructure services. It aims at supporting the use of operational services through the consolidation and integration of existing e-infrastructures (especially generic ones) as well as developing new services. The implementation of the EOSC needs to rely on the combination of both transversal and thematic approaches.

Regarding the latter, a thematic approach (e.g. via Thematic Clouds) plays an essential role in identifying the researchers' needs within a specific scientific community and informing the EOSC for the latter's development as a whole. This is why the H2020 project e-ROSA is seeking to bring together and facilitate the organisation of the agri-food community around a shared vision of a future global e-infrastructure for this scientific field, and to make the link with the EOSC in order to express specific community needs and facilitate the development of related services.

In order to effectively achieve Open Science, the diversity of "scientific" data that can be used by researchers – which doesn't necessarily come from the lab but also from farms, experimental fields, the supply chain, public organisations, etc. – needs to be taken into account. Indeed, it triggers high complexity at several levels in order to share these data. For instance, farmers that agree to share their data need to be able to rely on effective property rights. Also, the type of data that researchers should be allowed to have access to is not clearly defined since the distinction between private and public data is not easily made in the case of publically-funded research. This complexity should be tackled within the Food Cloud in order to take advantage of the potential for a new, disruptive type of research thanks to data sharing and integration. In addition, stakeholders of the Food Cloud need to better link with economic actors to raise awareness about the benefits for the private sector to share data with academia and hence to increase sharing and use of data that doesn't come from the lab in order to support innovative and relevant research.

Furthermore, the issue of sustainability of Open Science/e-infrastructure services for agri-food research was highlighted. In particular, individual Member-States need to be strongly involved as most of R&I funding is provided at national level.

2) Session 2 – Digitizing and Transforming European Agriculture & Food Industry & Services

Digitizing the European agri-food sector relies on the consideration of the food supply chain/food system as a whole through a multi-stakeholder approach. More specifically regarding the data sharing issue, data from all stages of the value chain need to be connected in order to support efficient data-driven decision-making throughout the value chain and to achieve "data story-telling", e.g. provide detailed and transparent information about a product. In order to do so, the challenge of heterogeneity and multiplicity of data and data flows needs to be addressed.

In particular, making public data (including data produced by research) more available to economic actors and citizens to foster innovation is becoming a pressing issue. However, as mentioned above, the definition of “public” data is not always clear. Also, the establishment of a new EU regulation is ongoing in order to support free flow of non-personal data. Regarding B2B data sharing, guidance material is also being elaborated by the European Commission in order to support the elaboration of appropriate contracts. Maintaining the ownership of one’s data seems to be key in order to share and use data in a trusted and protected way. Nevertheless, at a cultural level, there is significant resistance to data sharing due to fear of a lack of competitiveness, high fragmentation of the agri-food sector and low political awareness and support of digitization of the food supply chain.

Furthermore, there is an ongoing development of new technologies and digital solutions for the agri-food sector (e.g. information platforms, Blockchain, Artificial Intelligence). However, many issues remain challenging in order to scale up these solutions:

- There are no fixed commercial models for the sharing and use of data and other digital resources;
- Major stakeholders of the agri-food sector are underrepresented, especially SMEs;
- The skills gap needs to be addressed, not only in terms of digital skills, but also managerial, organisational, etc.
- Best practices regarding data usage need to be widely and effectively shared and promoted.

--

All workshop presentations are available at: https://www.slideshare.net/H2020_erosa

Report by Madeleine Huber (INRA)

List of participants

	Name	Affiliation
1	Saila Rinne	DG CONNECT. G1 - Data Policy and Innovation
2	Ana Cuadrado Galvan	DG AGRI.B2 - Research and innovation
3	Wim Haentjens	DG RTD.F3 - Research and Innovation
4	Hans-Joerg Lutzeyer	DG RTD.F3 Research and Innovation
5	Nikos Manouselis	Agroknow, Coordinator of AGINFRA+ Project
6	Odile Hologne	INRA, Coordinator of eROSA Project
7	Sander Janssen	Wageningen UR
8	Panagiotis Zervas	Agroknow, Coordinator of AGINFRA+ Project
9	Madeleine Huber	INRA, Coordinator of eROSA Project
10	Georgia Tzenou	DG CONNECT.C1 - eInfrastructure & Open Science Cloud
11	Niels Gøtke	ICT-AGRI Coordinator, ICT-AGRI Secretariat
12	Blaga Valentinova Popova	DG GROW.D.3 - Biotechnology and Food Supply Chain (International)
13	Sjaak Wolfert	Wageningen UR, Scientific Coordinator of the IoF2020 Project
14	Walter Stiers	IBM Belgium
15	Sergiu Didicescu	EIP-AGRI

The project e-ROSA (Towards an e-infrastructure Roadmap for Open Science in Agriculture) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730988.