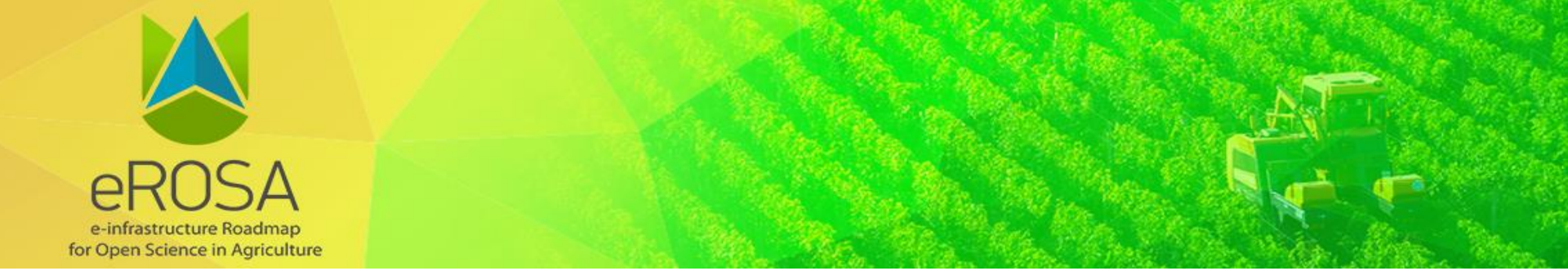

eROSA

Towards an e-infrastructure roadmap for open science in agriculture

Odile Hologne, INRA, Head of the department of scientific information

eROSA coordinator

eROSA
e-infrastructure Roadmap
for Open Science in Agriculture

eROSA has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 730988

eROSA in brief

- Coordination and support action (infrasupp 3 2016)
  - Support small-size foresight roadmaps for research and education communities and operators of e-infrastructure services.
  - Identification of potential collaboration from stakeholders across different geographic areas and scientific domains.
- 18 months
- Started in january 2017
- Consortium : INRA (FR), WUR Alterra (NL), Agroknow (GR)
- « brother » project : Aginfra + AGINFRA : prototype new services

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Objectives

- Community building : researchers in agri-food sciences and ICT specialists ; international ;
- Improve the knowledge of the landscape : infra/e-infra, projects, policies … relevant for an « e-infra for open science in agriculture »
- Roadmap : conception, advocacy

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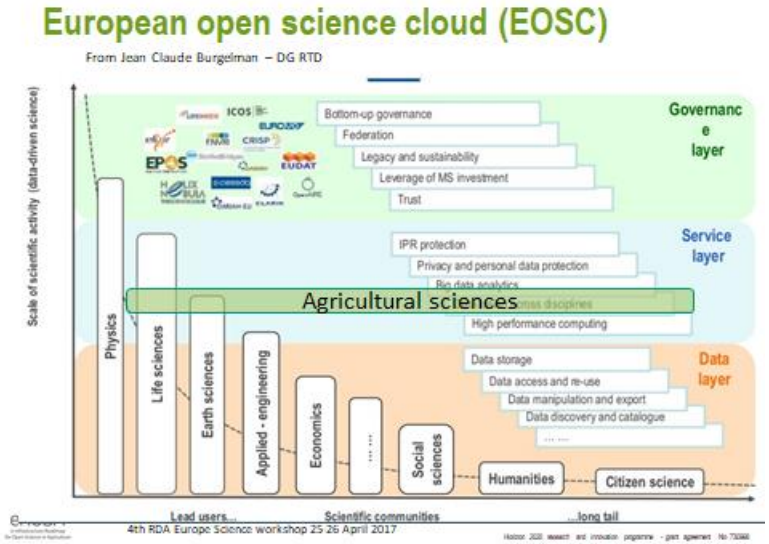
The need for a roadmap

- A puzzle of different component
- Need to build a shared vision
- No real research infrastructure in agri-food (ESFRI in environment, genomics, earth observation …)



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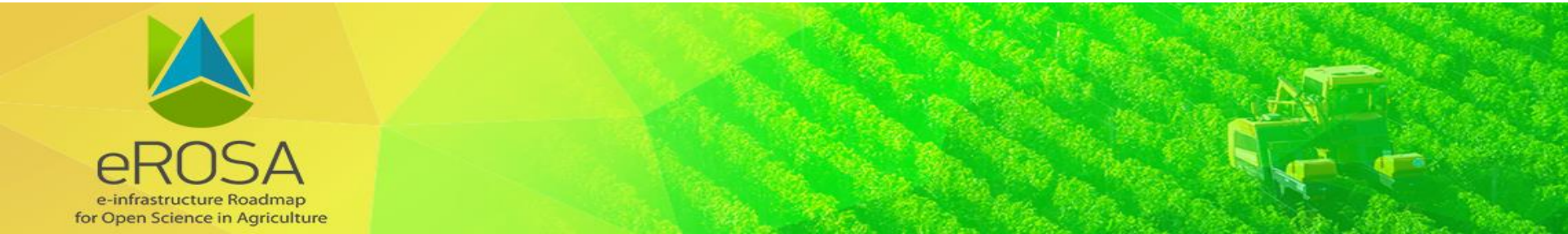
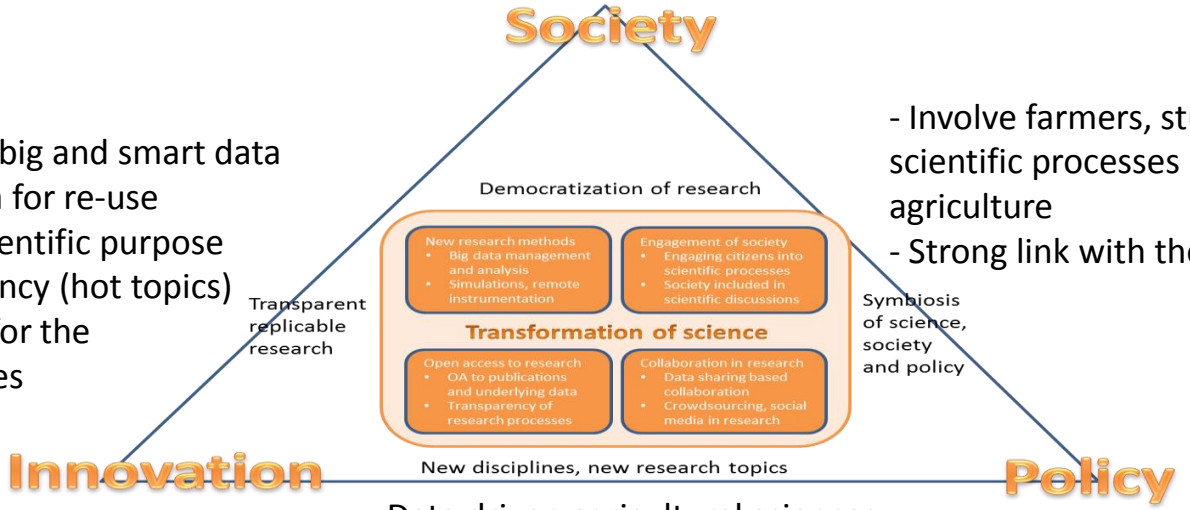
Context

Open science, agri-food, e-infrastructure



Open Science and Agri-food

- From small data to big and smart data
- Open research data for re-use
- Data sharing for scientific purpose
- Research transparency (hot topics)
- Knowledge access for the developping countries



- Involve farmers, students or teachers in scientific processes : citizen science for agriculture
- Strong link with the societal challenges

- Data driven agricultural sciences
- Multidisciplinary and multiscale approaches
- Data science for policy making

https://ec.europa.eu/digital-agenda/en/open-science

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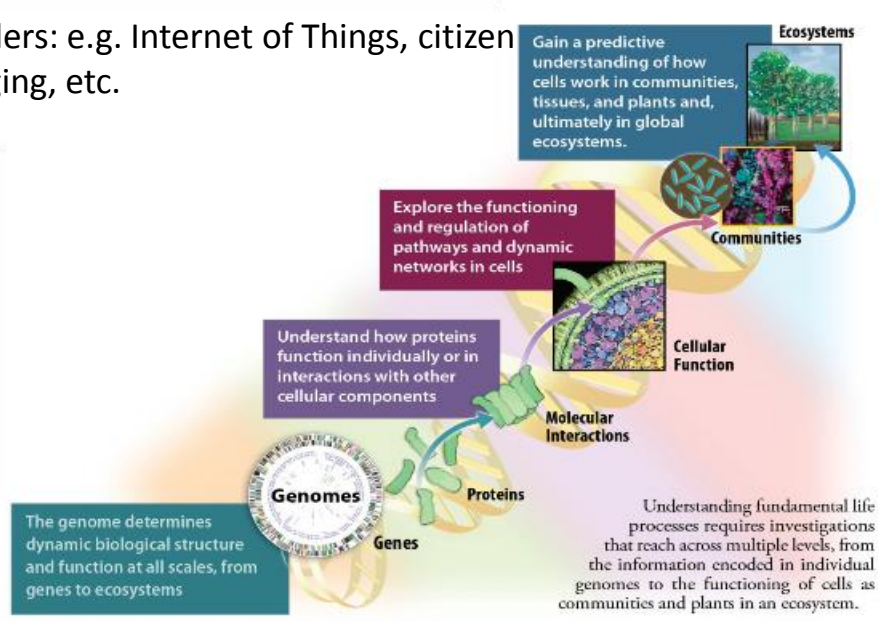
Data flows

The agri-food sector is dealing with an increasing amount and variety of data due to:

- The multidisciplinary nature of agri-food science, which is adopting a more and more systemic approach;
- The automation of data collection thanks to robots, sensors, etc., as well as new engineering tools such as in the omics field;
- The development of new types of data sources and providers: e.g. Internet of Things, citizen science, voice- and image-based applications, micro-blogging, etc.



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Data sharing : beyond the technical issues

- Societal priorities imply the maximum of transparency and access to data;
- Business interests can support differing objectives
- Personal privacy concerns

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E-infrastructure as an opportunity to support agri-food sector and sciences

Community
Ecosystem
Federated
Services
Skills
Distributed
Sustainabilty

Improve & federate existing structures (standards, interoperability, governance, financing) based on user needs
Incentives for data sharing in science & training

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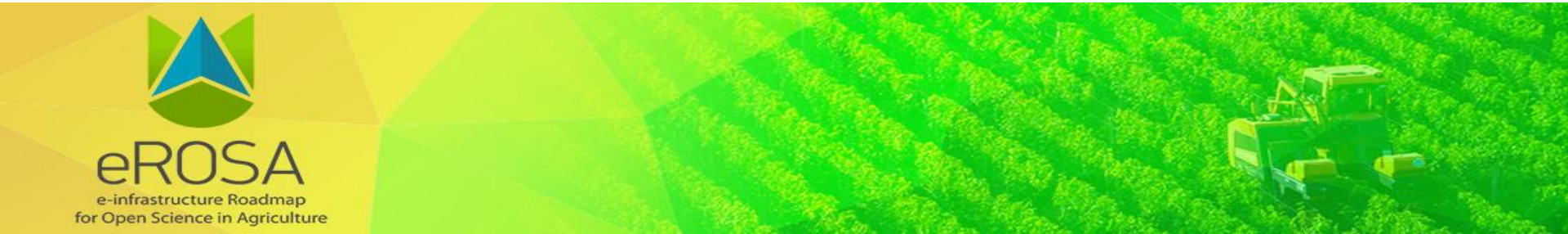
The actual landscape

Work in progress



Ongoing survey

Browse by Agri-food Discipline:

- Agri-food Economics and Policy
- Agriculture - General
- Farming Practices and Systems
- Food safety and Human nutrition
- Forestry
- Natural Resources and Environment
- Agri-food Education and Extension
- Animal Production and Health
- Fisheries and Aquaculture
- Food Security
- Geographical and Regional Information
- Plant Production and Protection
- Agricultural equipment
- Engineering, Technology and Research
- Food distribution
- Food technology
- Government, Administration and Legislation
- Rural and Social Development

Browse by Type:

- Organizations 300
- Initiatives 55
- Data points 63
- Facilities 60

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Data challenges in agri-food sciences

- Massive data production in labs (sensors, robots, models ….) but also in farms and by the citizens (of huge interest for science)
  - ✓ Big data : more variety than volume
- Disruption in the knowledge ecosystem (see next slide)
- Data silos, poorly documented, not easy to find, nor to access (same for semantic resources)
- Different level of maturity of the practices about data (management, sharing, analysis)
- Not only about data : code, workflow …

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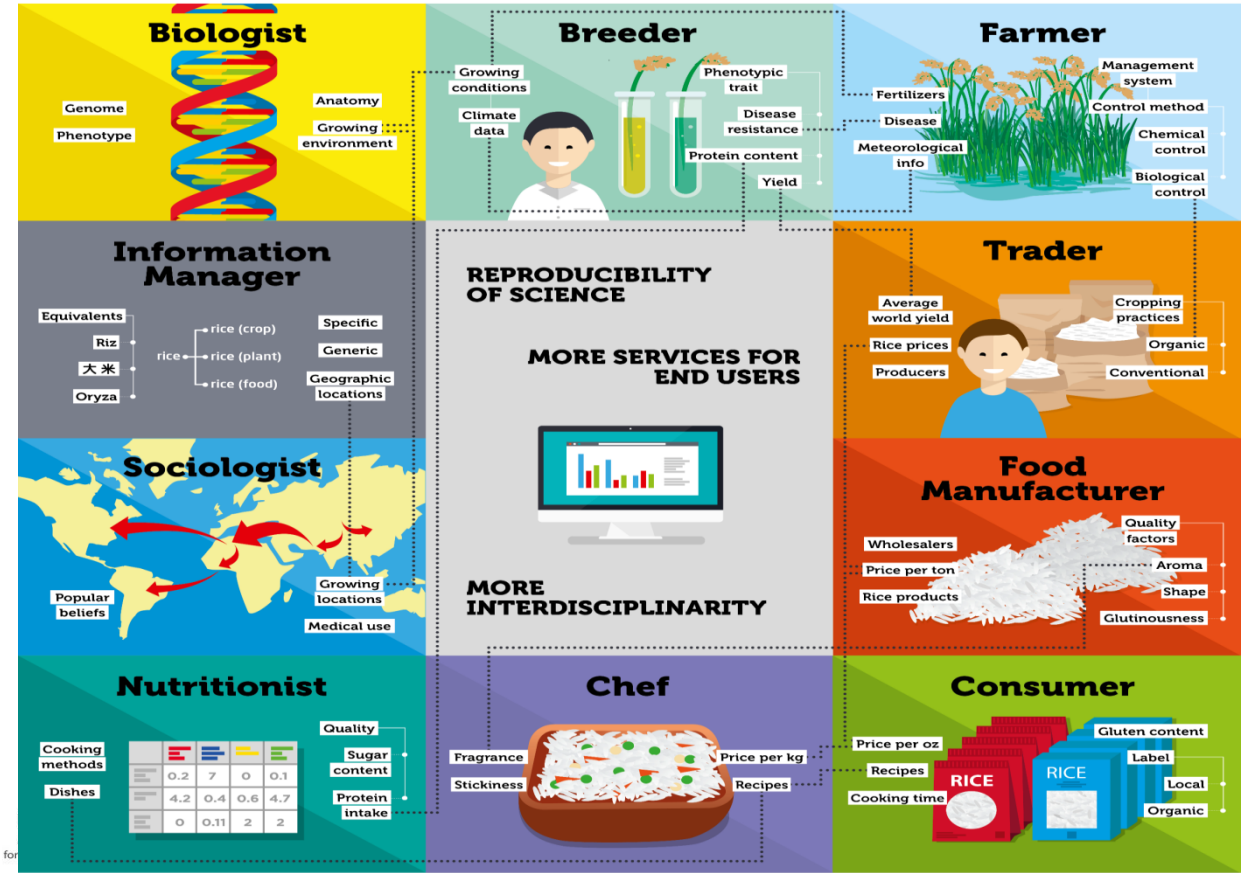
SEMANTICS - THE WAY TO RECONCILE POINTS OF VIEW AND DATA

THE EXAMPLE OF "RICE"



ISSUES

Diversity of focus
Conflicting view points
Scale / granularity
Language
Synonymy & ambiguity
Silos

SOLUTIONS

Ontologies & skos resources
Network of ontologies
Documentation
Standards (RDF... W3C)
Persistent identifiers
Shared infrastructures

Aubin S, RDA Agrisemantics Working Group and RDA Rice Data Interoperability Working Group. Semantics – The way to reconcile points of view and data [version 1; not peer reviewed]. F1000Research 2017, 6:1871 (poster) (doi: 10.7490/f1000research.1114998.1)

Some of the gems

- Data repositories +/- open
- Data catalog : http://ring.ciard.net/
- Resources catalog: semantics, metadata

CIARDRING

AgroPortal LIRMM

http://vest.agrisemantics.org
http://agroportal.lirmm.fr/
http://agrisemantics.org/

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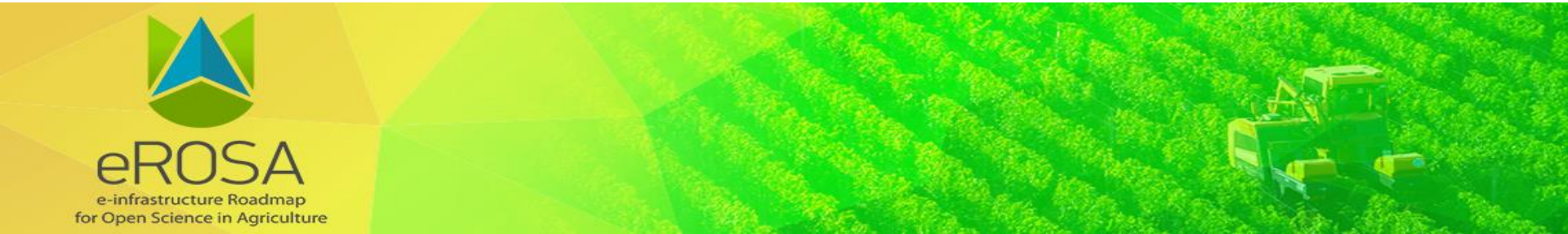
The vision

Work in progress



E-infra to support the ecosystem of innovation, research and education

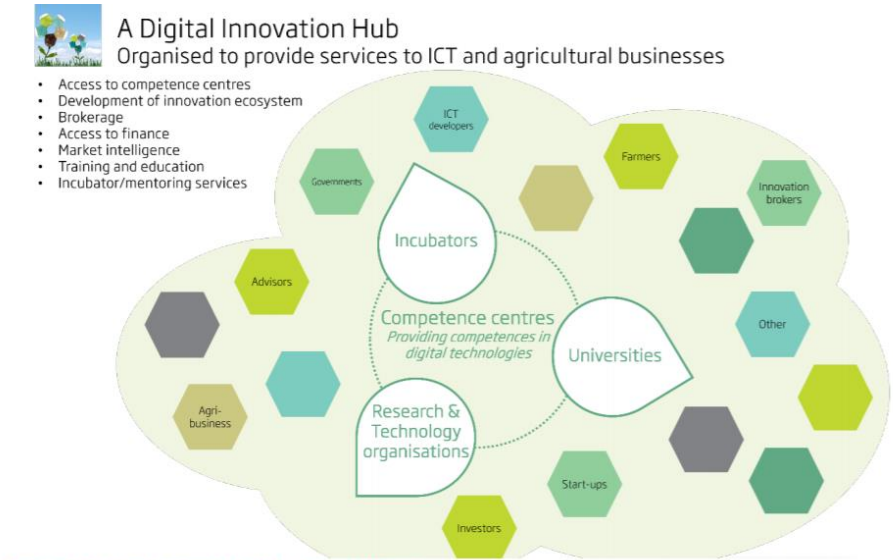
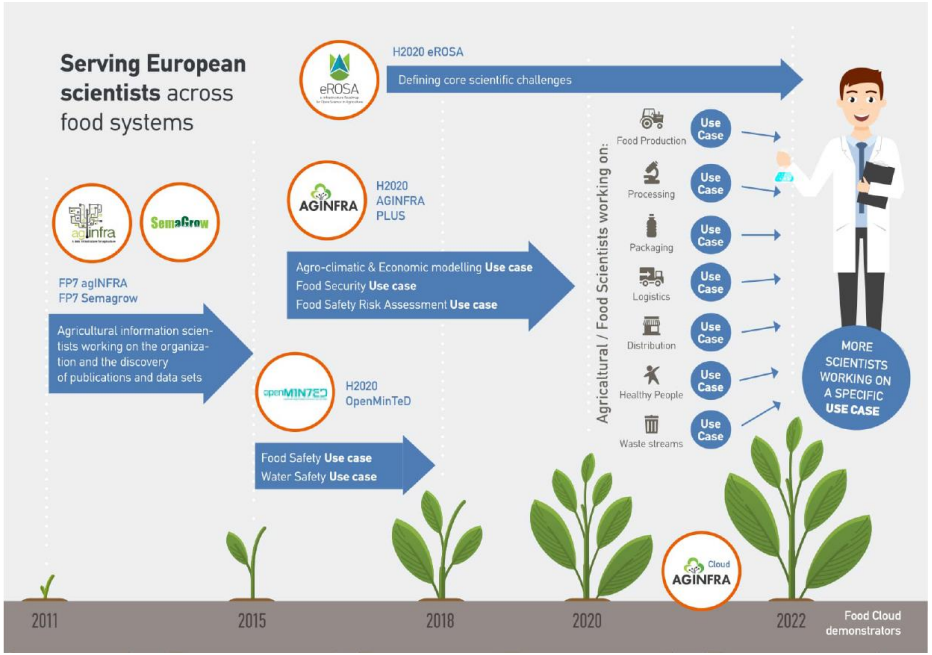


Figure 1. Digital Innovation Hub in agriculture



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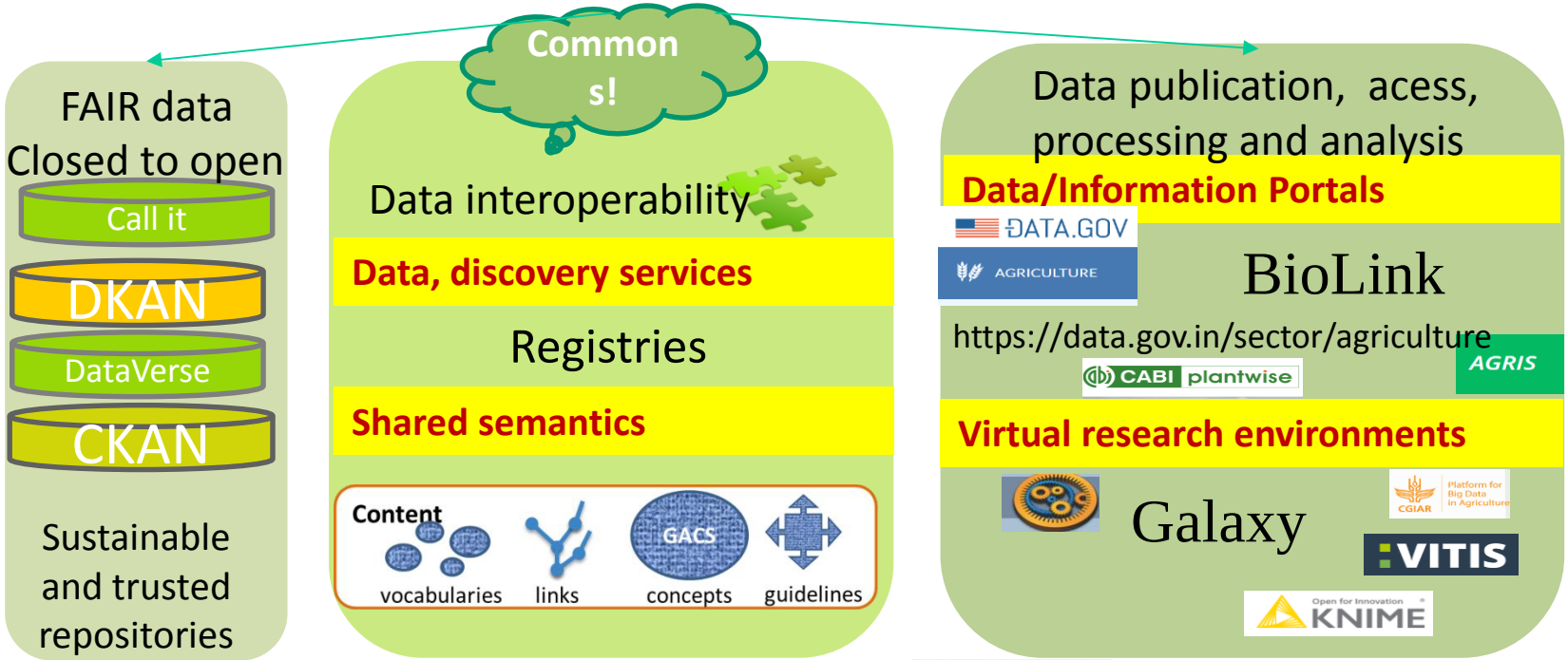
Resources and services : 1st approach



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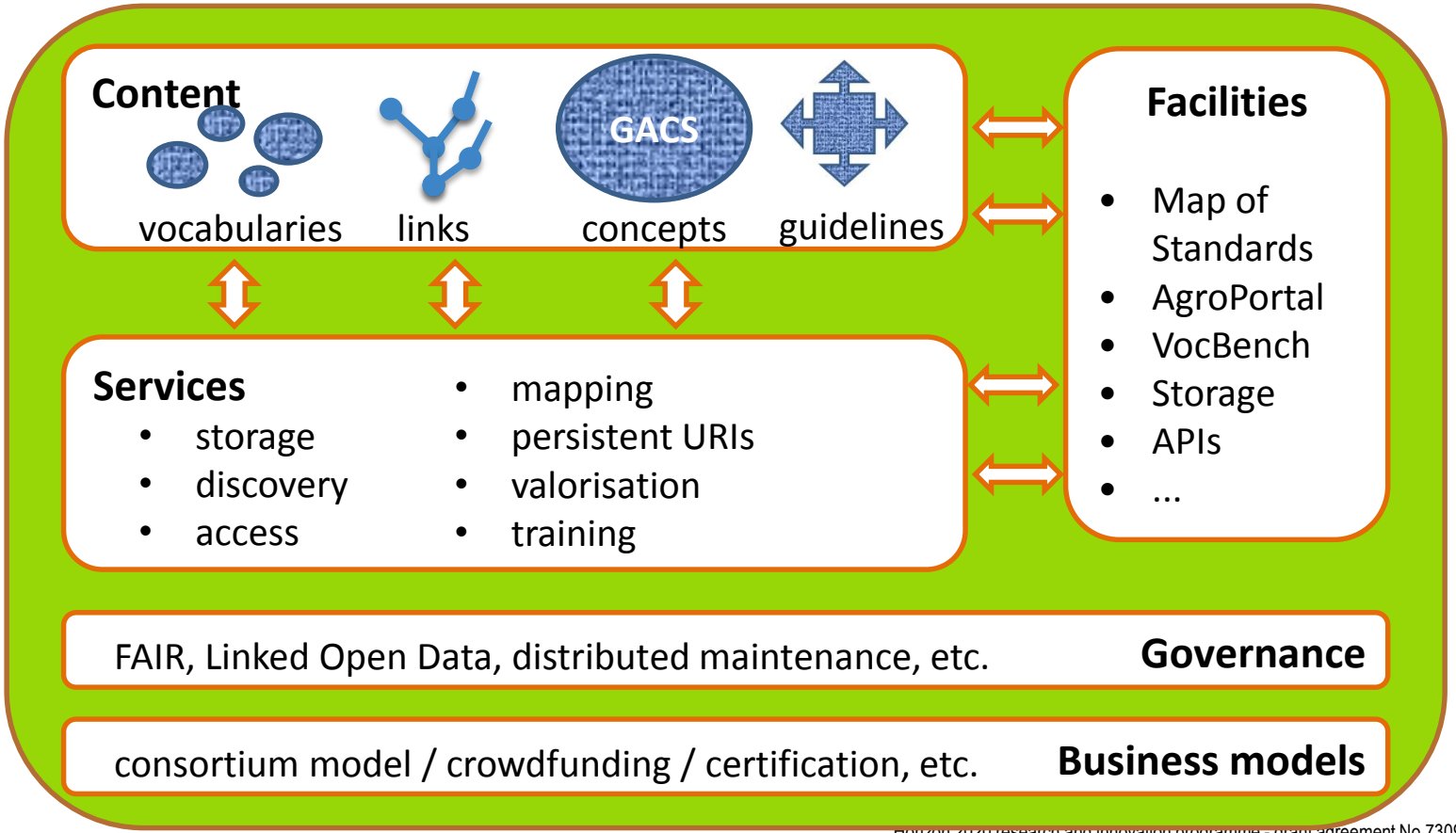
An idea of an Agrisemantics infrastructure

AgriSemantics Workbench

DOMAIN APPLICATIONS & E-INFRAS



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Conclusion, Challenges

- Technical : Fairificatioin of digital objects (data, code, workflow)
- Sustainability, business model …
- Policy, rules
- Human : users, competence centres

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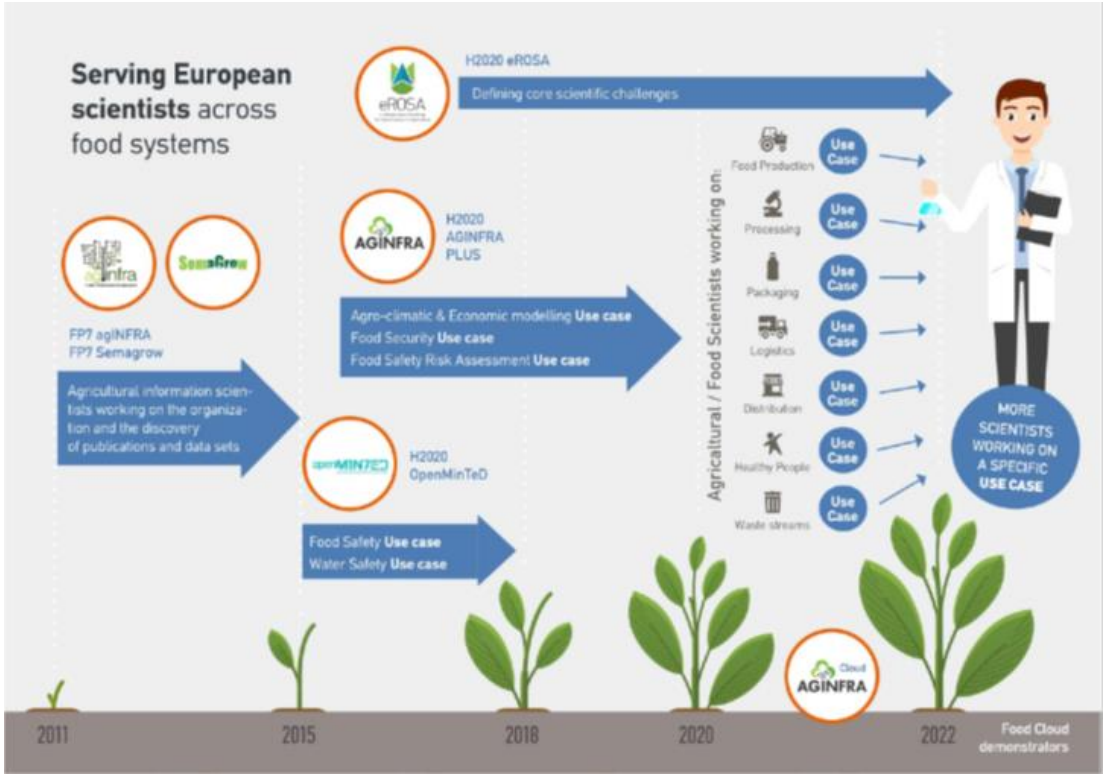
Next steps

- Next workshop (nov 17)
- Vision paper (dec 17)
- Roadmap (ap 18)
- Implementation



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Thank you for your attention!
And many thanks to the eROSA team

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@Holo_08

CONSORTIUM

INRA SCIENCE & IMPACT

ALTERRA WAGENINGEN UR

Agroknow