

Agricultural Data Interest Group (IGAD)

Pre-Meeting Agenda

Research Data Alliance

Version 18th September 2015

21st to 22nd September 2015

INRA, Paris (France)

1st IGAD Pre-Meeting Day INRA building, 147 Rue de l'Université		
Time	Session	Room
08:30 - 09:00	Registration	Main entrance
09:00 - 09:20	Introduction by Odile Hologne (INRA) Presentation about the Pre-Meeting by the IGAD Co-Chairs	115
Institutional issues: how to get policies on openness and good data management adopted and implemented?		
09:20 - 09:40	Data management plans: means and goals? by Hugo Besemer (Wageningen University, The Netherlands) At Wageningen University there has been an ongoing training on data management planning for PhD researchers since 2012. As a result data management plans are mandatory for PhD projects and for research groups since April 1st 2014. There is a sharp contrast between the discussions for the development of these plans, and the discussions in the "data community" even if they are on the same issues (e.g. property rights, retention). This presentation will highlight some of the differences and show a number of potential benefits of data management plans for individual young researchers and research groups.	115
09:40 - 10:00	CODATA, Open Science Policies and Capacity Building by Sidmon Hodson (Committee on Data for Science and Technology, CODATA, France) CODATA is an organisation established by the International Council of Science with the mission of improving the quality, reliability, management and accessibility of data of importance to all fields of science and technology. To achieve this, CODATA promotes Open Data and Open Science through three strategic priorities:	115

	<ul style="list-style-type: none"> • Supporting implementation of data principles, policies and practices • Addressing the frontiers of data science and its adaptation to scientific research. • Capacity building for data science (particularly in low and middle income countries - LMICs) <p>This presentation will focus on CODATA's work on Open Science and data policy issues, including our Data Policy Committee and our collaboration with the Jomo Kenyatta University of Agriculture and Technology near Nairobi. Also covered will be examples of our Capacity Building activities; an appeal for opportunities to collaborate in advancing Open Science for the benefit of agricultural research; and a discussion of how IGAD, CODATA and other organisations might work together on capacity building activities, particularly towards making agriculture data sets available, reusable and interoperable.</p>	
Soil Research Data		
10:00 - 10:20	<p>Agricultural Soils Research Data in Tasmania, Australia; Policies, Collaboration and Sharing by Darren Kidd (Dept Primary Industries, Parks, Water & Environment, Australia)</p> <p>The Tasmanian Department of Primary Industries Parks Water and Environment (DPIPWE, Australia) is a state government agency concerned with managing the natural and economic components of the state's agriculture, including spatial information management for sustainable land use. To maximise contribution to the agricultural sector, the Tasmanian Government has a long-standing resource collaboration with the University of Tasmania as the Tasmanian Institute of Agriculture (TIA), facilitating agricultural research, development and extension into the government's agricultural policy through combined resources and personnel. This research includes aspects of soils, productivity, cropping, livestock and biosecurity. The institutional partnership has served the agricultural sector well, ensuring all aspects of research, policy and management are maximised to benefit the state's agricultural productivity.</p> <p>Another research mechanism that facilitates participation in agriculture between research institutions and industry is the federally-funded Australian Research Council (ARC) Grants system; a linkage project funding scheme. In Tasmania, a recent ARC agreement between DPIPWE and the University of Sydney has facilitated the rapid uptake of Digital Soil Mapping (DSM) technologies into departmental land evaluation to inform land suitability assessment in newly commissioned irrigation schemes, as part of the Government's 'Agrivision 2050' policy to increase agricultural value ten-fold by 2050.</p>	115
10:20 - 10:40	<p>Soil Data Availability in support of Agriculture Development and Environmental Protection by Pandi Zdruli (International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM) Mediterranean Agronomic Institute of Bari, Italy).</p>	115

	<p>There is a wealth of global soil data available managed by various organizations such as the Food and Agricultural Organization (FAO) of the UN, the International Soil Reference Information Centre World Soil Information (ISRIC), the United States Department of Agriculture Natural Resources Conservation Service (USDA NRC), the European Soil Data Centre (ESDAC) of the Joint Research Centre (JRC) of the European Commission (EC), the International Institute of Applied System Analyses (IIASA) as well as many other national research institutions and universities. One recent project is the GlobalSoilMap.net mostly funded by the Bill & Melinda Gates Foundation, AGRA, and the Australian Government which aims to make a new <i>digital soil map</i> of the world using state-of-the-art and emerging technologies for soil mapping. The Global Soil Partnership (GSP) coordinated by the FAO/EC within the Pillar 4 promotes the collection and handling of soil data as well as their validation and integration with other disciplines. Another source of soil information at global and regional level is the Harmonized World Soil Data Base Viewer version 1.2 developed by the FAO, the Chinese Academy of Science, IIASA, ISRIC and the JRC. ISRIC is developing also a World Soil Profile database as a web-facility that aims to enhance the collation, harmonisation and distribution of soil data for the world.</p> <p>Usually the data available include a set of chemical, physical and rarely biological analyses (including soil microbiology). However, not all the data available are easy accessible and the situation differs between countries, institutions and regions. The USDA NRCS for instance has an open data distribution policy and through the Web Soil Survey everyone interested could download data for the US. Under a similar structure operates also ESDAC in Europe that offers soil data sets collected by various projects completed over the last decade in Europe. Nevertheless, a crucial issue is the implementation of new soil surveys and collections of recent soil data, especially in Africa where a new system called Africa Soil Information System (AfSIS) is being implemented.</p> <p>Historically, soil data were used for agricultural development projects and taxation purposes. Still such uses are on-going especially in the developing countries where rural development remains a priority. In the Western world and world's developed economies, soil information is crucial in environmental impact assessments, monitoring soil ecosystem services, designing land use planning policies as well as management recommendations. Implementation of such policies on-the-ground is something different, but this is not the subject of this conference.</p>	
10:40 - 11:00	<p>Soil Research Data Policies, Data availability and Access, and the Interoperability challenge. A Data Management and Sharing Plan for Soil Open Data by Giovanni L'Abate, Edoardo A. C. Costantini (Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria (CREA)/ Agrobiology and Pedology Research centre)</p> <p>Standards to describe soil properties have been strongly improved in the last years, with several ISO specifications and international</p>	115

	<p>thesauri available for specific applications. The European directive on “Infrastructure for Spatial Information in the European Community (INSPIRE)” has brought together most of the existing standards into a well defined model and other world wide initiatives are aimed to improve the interoperability challenge. Semantic interoperability would facilitate the building of data services that reuse and combine data from different sources. An European specific database right law, the Database Directive (1996), protects the producer of a database, who has invested the necessary effort to constitute the database. That means that Database rights under the EU are created automatically, vested in the employers of creators and do not have to be registered to have effect. According to the strategy of CREA about the dissemination of the research products (November 6, 2013) collections are public shared according to Release license (IODL v2.0) and the principle of Open Data: freely available to all, free of copyright or other forms of control which prevent the reproduction, and other restrictions, except for the obligation to cite the source. Open Data are published on the Web in an open format, suitable for use regardless of the necessary tools for their subsequent treatment.</p> <p>Soil data managed by the Agrobiology and Pedology Research centre of CREA might be classified into four main categories: Soil Maps, Soil Bodies, Soil Profiles, and Soil Samples.</p> <p>In reference to Metadata compliance, an INSPIRE compliant metadata profile for soil geographic data-sets and data-set series was obtained through The INSPIRE portal that offers a Metadata Editor to compile metadata files as XML files.</p> <p>All the soil maps produced by CREA in the last decades have been published online and both metadata and maps can be accessed and searched at soilmaps.it. Besides, The CREA soil database collects over 50,000 soil profiles surveyed in Italy in the last 6 decades. A selection of these soil profiles and soil bodies has been shared as Open Data based on data quality, representativeness, and relevance criteria. The SISI (Soil Information System of Italy) is the application designed to store soil data and related thematic information. Online publication of the SISI application, the relative thesauri and Resource Description Framework (RDF) was possible with the support of the EU FP7 agINFRA e-infrastructure project. The database provides an inventory of Italian soilscapes at two reference scale: Soil regions (1:5,000,000) and Soil systems (1:500,000). Relation between soil entities (typological unit, derived profile, benchmark profile) and soil geography (mapping unit), was also stored. Soil samples have been shared as well as Open Data. Data and Service Sharing and Interoperability conforms to open geospatial consortium and ISO standards WFS, WMS, and WCS.</p>	
11:00 - 11:20	Coffee Break	
11:20 - 11:40	<p>The Soil Research for Development platform for sharing data and information on agronomic trials to develop options for integrated soil fertility management in sub-Saharan Africa by E. Jeroen Huising, Bernard Vanlauwe, Nteranya Sanginga, Kenton Dashiell (<i>International Institute of Tropical Agriculture, Nigeria</i>)</p>	115

	<p>The platform brings partners in research for development together to improve the sharing of data and information on agronomic trials with the aim to make better use of the data to find solutions for a more sustainable and integrated way to manage soil fertility for restoring and improving productivity on African soil. With agronomic trials we refer to various types of trials like variety trials, nutrient omission trials, nutrient response trials, soil organic matter trials, and other trials that look at the response to soil amendments, soil conservation and tillage operation or other soil management options, whether short term or long term. These individual trials or experiments often investigate one particular aspect of the GxExM (Germplasm x Environment x Management) equation but together they may help to solve these interactions for the different crops and environments. However that will require a clear analytical framework. Much effort is and has been put in the collection of the data and often relatively little effective use of the data is made because data is often not made available beyond the project or institution that has collected the data. In the meantime of lot a valuable data, e.g. from long term trials has been lost because of poor data management practices.</p> <p>The platform will work towards improving the discoverability of data from trials done on African soil; it will work on the proper documentation of the data sets through the adoption of metadata standards and work towards adoption of open access and data policies by the member institutions of the platform; the platform will work on a data infrastructure and data portal to increase access to the data. The platform will maintain the metadata base to provide an overview and link to available data sets. The platform is intended for the international agricultural research centers, national agricultural research organizations, international development organizations and universities that are involved in ISFM related research,. starting with an existing network of organization that are already collaborating in a number of international project in sub-Saharan Africa</p>	
11:40 - 12:00	<p>Challenges on Soil Data Management, sharing or publishing by José Rafael Marques da Silva (Universidade de Evora, Portugal)</p> <p>Within several research projects many types of soil data are generated annually, including soil geoelectric surveys (thousands of hectares) and the respective intelligent soil sampling (hundreds of samples). Normally the objective is to understand the soil variables spatial structure and in this context, one proposes to present some cases study already developed or actually being developed in the Alentejo region, Portugal.</p> <p>Considering the previous (i) much of these soil information can be lost after the research projects ending and (ii) normally is very expensive to obtain it. In face of that one pretends to discuss the possibility, within the framework of a Soil Research Data interoperability working group, in developing a collaborative soil data repository system, based on standard formats (eg. INSPIRE directive), where these type of information can be safeguarded and shared worldwide.</p>	115

Increase data access and availability		
12:00 - 12:20	<p>Land Portal Pioneers Linked Open Data for Land Governance by Neil Soresen (LandPortal, Italy)</p> <p>Although there is an enormous amount of information and data online about land governance, much of this content is tough to find, and a lot of it is subject to copyrights, which restricts its dissemination and reuse. Grassroots knowledge, from key stakeholder groups, can be particularly difficult to find or may not be available at all, and often time the data and information that is available is presented in ways that are inaccessible to local communities, the media and NGOs.</p> <p>The Land Portal and its partners are actively working to bring information together, eliminating the gaps in available information, and providing a multiple ways for information to be accessed and shared. In this way the Portal aims at dramatically increase the opportunity to use available information, and in the process it is also making the information much more useful.</p> <p>The Land Portal is a pioneering hub for 'linked open data' on land uses semantic tools to share and connect data, information and knowledge. This enables the Land Portal to publish structured data in machine readable, standardised formats under open licenses that can be reused by anyone.</p> <p>This is helping to increase a more effective use of data, better monitor of land issues and holds great promise for adopting and scaling up best practices and promising innovations.</p> <p>The ultimate goal of the Land Portal is to improve land governance.</p>	115
12:20 - 12:40	<p>Implementation of a service for research data management and sharing in Inra by Esther Dzalé Yeumo Kaboré (INRA, France)</p> <p>By adopting a data management and sharing policy containing in 2013, Inra clearly made a stand for good data management and data sharing. My presentation will give an overview of the tools and services which are in development to support the efforts of the researchers to manage, store, and share their data.</p>	115
Interoperability (policies, tools, taxonomies, standards)		
12:40 - 13:00	<p>OGC standard for the Interoperability of agriculture models: data and processes at the same level by Didier Leibovici and Suchith Anand (University of Nottingham, United Kingdom)</p> <p>In order to facilitate research and sharing of modelling approach in the Agriculture domain for food security, possible interoperability settings for data and processes will be presented. This is more a best practice than something new as the standards already exist. Furthermore, analysing models and sub-models from their representations within a workflow encoding standard (graphical and</p>	115

	<p>XML: BPMN2.0) allow communities to share and combine their models into more complex modelling. These two aspect put data and processes at the same level within dedicated infrastructures. We will present the general GRASP-WRE principle (Geospatial Resources for Agriculture Species and Pests - Workflow Research Environment) and its genesis at the University of Nottingham.</p>	
13:00 - 14:00	Lunch Break	
14:00 - 14:20	<p>How to describe a dataset? Interoperability issues by Valeria Pesce (GFAR, Italy)</p> <p>This presentation will focus on some interoperability issues in the machine-readable description of datasets. Starting from vocabularies to describe datasets like DCAT, VOID, DataCube and SDMX, it will highlight issues around: a) describing the coverage of the dataset (type of data, thematic coverage, geographic coverage); b) describing the technical specifications to retrieve and parse the dataset (format, protocol etc.); c) describing the “dimensions” of a dataset (e.g. temperature, time, salinity, gene, coordinates); d) understanding the semantics of the dimensions (units of measure, time granularity, syntax, reference taxonomies).</p>	115
14:20 - 14:40	<p>From GACS to Agrisemantics - steps forward towards interoperability of data for agricultural and nutrition by Caterina Caracciolo (FAO of the UN, Italy)</p> <p>For the past 18 months, CABI, NAL and FAO have been working to align their thesauri into a global agricultural concept scheme (GACS), which will create a one stop access to all three vocabularies and the possibility of exploiting their strengths at once.</p> <p>On July 2nd and 3rd of this year, a number of data producers, as well as owners and users of Knowledge Organizations Systems (KOS) in the area of agriculture and nutrition met in a workshop in Rome, funded by the Bill and Melinda Gates Foundation. Participants discussed the further steps needed to integrate GACS with other KOSs and to create tools and a governance mechanism for the community.</p> <p>A project proposal is in preparation that will look for sponsorship.</p>	115
14:40 - 15:00	<p>An approach for identifying the issues and metrics that define and measure sustainable development in agricultural supply chains by Ruthie Musker (UC Davis, US)</p> <p>Stakeholders within the global food system are concerned with many different sustainability issues and have a plethora of different metrics for measuring these issues depending on the scale and scope of their perspective. This study presents a process for enabling stakeholders involved in agricultural raw material sourcing for a particular region and commodity to make a comprehensive sustainability claim about the impacts and the vulnerabilities in their supply chain. By identifying</p>	115

	<p>semantically-consistent issues alongside a manageable set of indicators to represent them, this process can contribute to a global definition of sustainability comprised of these scientifically-validated, stakeholder-driven issues and indicators.</p>	
15:00 - 15:20	<p>Challenges in Normalizing and Disambiguating Organization Names by John A. Ferreira (Cornell University, US)</p> <p>While a fair amount of work has been done in the attempt to disambiguate Person names as authors of publications, there is also a challenge in disambiguating Organization names to provide a relationship between People and their affiliation.</p> <p>When a person self-declares the name of the organization for which they are affiliated they don't always use an official authoritative name. The use of acronyms is common as are abbreviations. The challenge is that when harvesting data about a group of people, the relationship between multiple people that actually work for the same organization may not be accurate if different people use different "names" for the name of the organization.</p> <p>This talk will address some of those issues, the challenges in normalizing different names for the same organization, and will describe a process that may help improve organization name disambiguation.</p>	115
15:20 - 15:40	Coffee Break	
15:40 - 16:00	<p>Facilitating data discovery & sharing among agricultural scientific networks: presentation of case studies by Nikos Manouselis (Agro-Know, Greece)</p> <p>This talk will introduce an online service that builds on top of existing open research data sources and catalogues, to support and promote enhanced data sharing among scientific networks and researchers' communities. It will explain how the service provides local, regional and international scientific networks that wish to create a common online presentation of their members' research activities and outcomes, an easy-to-use and highly customisable mechanism so that they set up their network's web portal. A number of case studies (such as the G20 Wheat Initiative and the World Bank's Global Food Safety Partnership) will also be presented.</p>	115
16:00 - 16:20	<p>Development of interoperable platform for agricultural data exchange and applications in Japan by Seishi Ninomiya (Institute of Sustainable Agro-ecosystem Services, University of Tokyo, Japan)</p> <p>The Cabinet Secretariat, Government of Japan has been promoting a policy to develop the interoperable platform as the basis of the next generation IT society which is expected to innovate our wealthy future life. Agriculture is one of its important targets and, along with the policy, the committees for agricultural data standardization and exchange were organized in 2014 under the collaboration between the</p>	115

	<p>Ministry of Agriculture, Forestry and Fishery (MAFF) and the Ministry of Internal Affairs and Communications (MIC) to discuss about the scope and the process to practically implement the platforms as systems. In addition, MAFF launched two big scale research projects for ICT innovation in agriculture in 2014 where practical design and implementation of such platforms are being conducted as the core parts of the projects. In this paper, the current status of such discussions and research projects will be presented.</p>	
Semantics for interoperability in agricultural research		
<p>16:20 - 16:40</p>	<p>Ontology-based services and knowledge management in the Agronomic Domain by Pierre Larmande (Institute of Research for Development, France)</p> <p>The drastic growth in data in the recent years, within the Agronomic sciences has brought the concept of knowledge management to the forefront. Some of the factors that contribute to this change include a) conducting high-throughput experiments have become affordable, the time spent in generating data through these experiments are minuscule when compared to its integration and analysis; b) publishing data over the web is fairly trivial and c) multiple databases exist for each type of data (i.e. 'omics' data) with a possible overlap or slight variation in its coverage. In most cases these sources remain autonomous and disconnected. Hence, efficiently managed data and the underlying knowledge in principle will make data analysis straightforward aiding in more efficient decision making. At the Institute of Computational Biology (IBC), we are involved in developing methods to aid data integration and knowledge management within the domain of Agronomic sciences to improve information accessibility and interoperability. To this end, we address the challenge by pursuing several complementary research directions towards: distributed, heterogeneous data integration.</p> <p>This talk will focus mainly on, ongoing projects at IBC:</p> <p>a) The AgroPortal project aims at developing a reference ontology repository for the agronomic domain. By reusing the NCBO BioPortal technology, we will offer an ontology portal which features ontology hosting, search, versioning, visualization, comment, but we will also offer services for semantically annotating data with the ontologies, as well as storing and exploiting ontology alignments and data annotations.</p> <p>b) Agronomic Linked Data (AgroLD): is a Semantic Web knowledge base designed to integrate data from various publically available plant centric data sources. These include Gramene, Oryzabase, TAIR and resources from the South Green platform among many others. The aim of AgroLD project is to provide a portal for bioinformaticians and domain experts to exploit the homogenized data towards enabling to bridge the knowledge.</p>	
<p>16:40 - 17:00</p>	<p>Crop Ontology: harmonizing semantics for agricultural field data by Elizabeth Arnaud, Leo Valette, Marie-Angelique Laporte (Bioversity, France) (Integrated Breeding Platform, Mexico) Julian</p>	

	<p>Pietragalla, Medha Devare (CGIAR Consortium office, France)</p> <p>The Crop Ontology is developed for the Integrated Breeding Platform <http://www.integratedbreeding.net/>, in collaboration with the CGIAR and partners and under the leadership of Bioversity international. It provides semantics in the Plant Breeding domain and will be soon extended to the Agronomy domain. The Crop Ontology <http://www.croponology.org/> provides validated breeders' trait names, measurement methods, and scales for currently 18 crops aside terms describing environmental and experimental conditions of the field trials. This year, standard variable names are being added for each trait name to precisely annotate the measurements stored in the crop phenotyping databases and also for creating standards electronic fieldbooks. Using similar methodology, an Agronomy Ontology is being developed to support combining results of field management practices with crop traits which is important to fully understand the dynamic of varying factors within any cropping system. The Crop ontology is developed with scientists using Excel templates, is maintained online in SKOS and can be downloaded in OBO format. The RDF version is accessible through the Application Programme Interface (API).</p>	
17:00 - 17:20	<p>Collaborative Open Plant Omics by F. Shaw, A. Etuk, A. Gonzalez-Beltran, P. Rocca-Serra, M. V. Schneider, S. Sansone, R. Bastow, R. P. Davey</p> <p>The aim of open science is to make scientific research accessible, facilitating experimental reproducibility and transparency. Mechanisms exist for preserving and publishing research objects in plant science within the "omics" fields. However, researchers are often hindered by: (i) complicated and time-consuming procedures for repository deposition; (ii) a lack of interoperability between disparate information sources and mechanisms; (iii) sub-optimal search and retrieval facilities across data repositories; (iv) a lack of public awareness of existing services. To address these issues, we are developing COPO (Collaborative Open Plant Omics), a brokering service which enables aggregation and publishing of research outputs by plant scientists, and provides access to services across disparate sources of information via web interfaces, and Application Programming Interfaces (APIs) for bioinformaticians. Information deposited and referenced through COPO will be accompanied by rich metadata implemented in linked data formats, in order to create a web of searchable, meaningful semantic knowledge. Through our collaboration with public repository maintainers at the EMBL-EBI, community interactions and user requirements studies with the University of Warwick, and the development and implementation of well-defined standards with the University of Oxford, we will enable a new era of finding, reusing and publishing data in the plant sciences.</p>	115
17:20 - 17:40	<p>Wrap up and Closure of the day Details about the 2nd Pre-Meeting Day</p>	115

2nd IGAD Pre-Meeting Day INRA, 11 Rue Jean Nicot		
Time	Session	Room
08:30 - 08:45	Introducing the 2nd Pre-Meeting Day	110 - 209
08:45 - 11:00	<p>Discussion Groups:</p> <p>Group 1.- Assess and find ways to increase participation from universities, government and research organizations in the Agricultural sector worldwide, chaired by Imma Subirats (FAO of the UN, Italy)</p> <p>Group 2.- Institutional issues: how to get policies on openness and good data management adopted and implemented?, chaired by Hugo Besemer (Wageningen University, The Netherlands)</p> <p>Group 3.- Increase data access and availability (formats, users), chaired by Cyril Pommier (INRA, France) and Pierre Larmande (Institute of Research for Development, France)</p> <p>Group 4.- Interoperability (policies, tools, taxonomies, standards), chaired by Valeria Pesce (GFAR, Italy)</p> <p>Group 5.- Soil Data Working Group, chaired by Pandi Zdruli (Mediterranean Agronomic Institute of Bari, Italy) and Devika Madalli (ISI, India)</p>	110 - 209
11:00 - 11:20	Coffee Break	
11:20 - 12:00	<p>Discussion Groups (continuing):</p> <p>Group 1.- Assess and find ways to increase participation from universities, government and research organizations in the Agricultural sector worldwide, chaired by Imma Subirats (FAO of the UN, Italy)</p> <p>Group 2.- Institutional issues: how to get policies on openness and good data management adopted and implemented?, chaired by Hugo Besemer (Wageningen University, The Netherlands)</p> <p>Group 3.- Increase data access and availability (formats, users), chaired by Cyril Pommier (INRA, France) and Pierre Larmande (Institute of Research for Development, France)</p> <p>Group 4.- Interoperability (policies, tools, taxonomies, standards), chaired by Valeria Pesce (GFAR, Italy)</p> <p>Group 5.- Soil Data Working Group, chaired by Pandi Zdruli (Mediterranean Agronomic Institute of Bari, Italy) and Devika Madalli (ISI, India)</p>	110 - 209

12:00 - 13:00	<p>Plenary session Reports by the Discussion Group Chairs</p>	110 - 209
13:00 - 14:00	<p>Lunch Break</p>	
14:00 - 14:30	<p>Workshop on “Big data for food, agriculture and forestry: opportunities and challenges”. Welcome & Introduction</p> <p>Facilitated by: Nikos Manouselis (Agro-Know), Valeria Pesce (FAO/GFAR) Timea Turdean (Semantic Web Company), Martin Kaltenböck (Semantic Web Company)</p> <p>The big data session of the IGAD meeting is expected to investigate the characteristics of data sources & repositories that our community has, in order to identify cases that offer a high degree of variety, velocity and volume and therefore good candidates for the application of big data technologies. In addition, an introduction to such technologies is going to be given and a discussion on their relevance and applicability for the wider range of topics related to food security, sustainable agriculture and forestry. The session will be interactive, involving all participants and getting their views and perspectives.</p> <p>The expected outcomes are a first mapping of stakeholders, initiatives, and services engaging big data sources, repositories and applications; and a call to action for both technology providers (for customised solutions and support) and funding agencies/donors (for allocating enough resources).</p> <p>The session is embraced and supported by the Big Data Europe (http://www.big-data-europe.eu) H2020 Coordination & Support Action (CSA).</p>	Analyses Etudes Formation Conseil (AEF), 137 rue de l'université
14:00 - 14:30	<p>Welcome & Introduction</p> <ul style="list-style-type: none"> ● Introduction to the workshop ● Quick Tour de table (who are you and why are you here) ● Welcome speech: Pascal Neveu (INRA) "Introduction to INRA's big data perspective and implementation challenges" 	137 rue de l'université
14:30 - 15:00	<p>Data Session - Lightning Talks</p> <ul style="list-style-type: none"> ● Tim Verhaart (Wageningen UR, LEI) "Big data opportunities for marketing of horticultural products" ● Elizabeth Arnaud (Bioversity, France) "Big data analytics in the CGIAR research portfolio and the Bioversity perspective" 	137 rue de l'université
15.00-16.00	<p>Data Session - Interactive Session</p> <ul style="list-style-type: none"> ● Breakout in Groups, discussion on relevant data sources and 	137 rue de l'université

	<p>types, compliance to the 3- (or 4-) Vs of big data definition, current challenges and problems</p> <ul style="list-style-type: none"> • Group reports to plenary 	
16:00 - 16:30	<p>Tech Session - Lightning Talks</p> <ul style="list-style-type: none"> • Valeria Pesce (UN FAO & GFAR) "A global linked and open data infrastructure for agricultural development" • Rob Lokers (Wageningen UR Alterra) "big data challenges and solutions in agricultural and environmental research" • Sören Auer (Fraunhofer-Gesellschaft) "Intro to current state-of-art in big data technologies" 	137 rue de l'université
16:00 - 17:30	<p>Tech Session - Interactive Session</p> <ul style="list-style-type: none"> • Breakout in Groups, discussion on technologies currently used for massive data processing, transformation, aggregation, analysis, visualisation etc., plans for future uptake, challenges and problems • Groups report to plenary 	137 rue de l'université
17:30 - 18:00	<p>Wrap Up</p> <ul style="list-style-type: none"> • Stefano Bertolo (European Commission) Position statement on the big data research agenda and portfolio of the EC • Q&A session, discussion on overall opportunities & challenges • Establishing a mechanism to facilitate discussion, collaboration & adoption of big data technologies in agriculture, food and forestry: what can the Big Data Europe do to help • Summary and next steps 	137 rue de l'université

List of participants

1. Patrice Ajai-Ajagbe, The Association of Commonwealth Universities (UK)
2. Michael Alaux, INRA (France)
3. Erick Antezana, Bayer CropScience NV (Belgium)
4. Elizabeth Arnaud, Bioversity International (France)
5. Sophie Aubin, INRA (France)
6. Pascal Aventurier, INRA (France)
7. Ruth Bastow, Global Plant Council (United Kingdom)
8. Stefano Bertolo, European Commission (Belgium)
9. Hugo Besemer, Wageningen University (The Netherlands)
10. Caterina Caracciolo, FAO of the United Nations (Italy)
11. Peter Dalhhaus, OGC Soil Interoperability Experiment, Federation University Australia (Australia)
12. Esther Dzale Yeumo, INRA (France)
13. John Ferreira, Cornell University (United States)
14. Nicolas Gengler (University of Liège (Belgium)
15. Marc Goovaerts, Hasselt University Library (Belgium)
16. Simon Hodson, CODATA (France)
17. Odile Hologne, INRA (France)
18. Martin Kaltenböck, Semantic Web Company (Austria)
19. Pawel Krajewsky, Institute of Plant Genetics, Polish Academy of Sciences (Poland)
20. Dimitrios Zisis, Institute of Plant Genetics, Polish Academy of Sciences (Poland)
21. Giovanni L'Abate, CRA (Italy)
22. Marie Angélique Laporte, Bioversity (France)
23. Pierre Larmande, IRD (France)
24. Didier Leibovici, University of Nottingham (United Kingdom)
25. Amed Leiva Mederos, Universidad Central "Marta Abreu" de Las Villas (Cuba)
26. Devika Madalli, ISI (India)
27. Nikos Manouselis, Agro-Know (Greece)
28. Jose Rafael Marques da Silva Universidade de Évora (Portugal)
29. Shaheed Martin, Western Cape Dept Agriculture (South Africa)
30. Daniel Martini, KTBL (Germany)
31. Harris Moysiadis, Future Intelligence and QUHOMA project, (Greece)
32. Ruthie Musker, UC Davis (United States)
33. Anahita Nafissi, Forschungszentrum Juelich (Germany)
34. Pascal Neveu, INRA (France)
35. Seishi Ninomiya, University of Tokyo (Japan)*
36. Riaan Nowers, Western Cape Dept Agriculture (South Africa)
37. Valeria Pesce, GFAR (Italy)
38. Cyril Pommier, INRA (France)
39. Rosemary Shrestha, CIMMYT (Mexico)
40. Nicolas Saby, INRA (France)
41. Neil Sorensen, Land portal (Italy)
42. Imma Subirats, FAO of the United Nations (Italy)
43. Paola Tarocco, Servizio Geologico, Sismico e dei Suoli (Italy)
44. Nicolas Tremblay, Agriculture and Agri-Food Canada (Canada)

45. Timea Turdean, Semantic Web Company (Austria)
46. Marc Van Liederkerke, Institute for Environment and Sustainability (Italy)
47. Tim Verwaart, Wageningen UR, LEI institute (The Netherlands)
48. Mike Wallace, Western Cape Dept Agriculture (South Africa)
49. Karna Wegner, FAO of the United Nations (Italy)
50. Pandi Zdruli, Mediterranean Agronomic Institute of Bari (Italy)
51. Robert Davey, The Genom Analysis Centre (United Kingdom)

Workshop on “Big data for food, agriculture and forestry: opportunities and challenges” Only

1. Sören Auer
2. Benoit Dequenne
3. Martin Kaltenböck
4. Rob Lokers
5. Simon Scerri
6. Christian Vasques
7. Kalin Maldzhanski
8. Dana Tomic

Presenting remotely

1. Jeroen Huising, International Institute of Tropical Agriculture (IITA) (Nigeria)
2. Darren Kidd, Tasmania soil maps (Department of Primary Industries, Parks, Water and Environment Tasmania) (Australia)