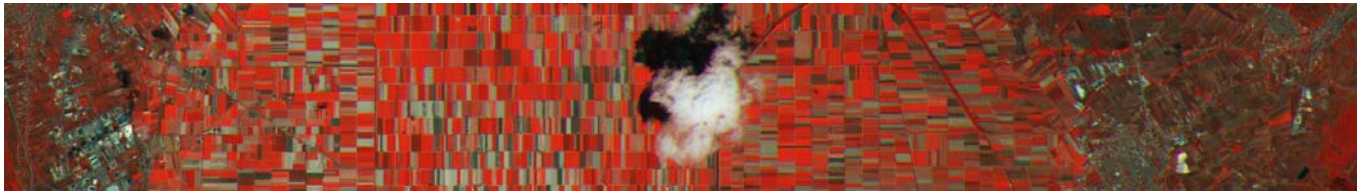


19<sup>th</sup> November 2015: Building up a picture



### Aims

This was the second in a series of three meetings, and the aim of it was to use examples provided by the witnesses to explore ways in which overlaying big data sets and remote sensing can assess and communicate risk and resilience in food supplies and changes in biodiversity.

### Witnesses

**Dr Francois Kayitakire**, a senior scientist at the Joint Research Center (JRC) in the Institute of Environment and Sustainability (IES) from Ispra, Italy flew over to join **Dr Matthew Smith**, an ecologist working in the Computational Science Lab at Microsoft Research and **Craig Mills**, the CEO of Vizzuality.

### Research gaps

Francois outlined the food security programme at JRC and argued that resilience thinking calls for multi-disciplinary approach, not only in the qualitative analyses, but also in quantitative models. Food security is an area that needs absolutely such an approach. An emerging focus of development for both them and the EC is **to think about food security in terms of resilience by building safety nets, putting in place response mechanisms and managing risk**. He argued that putting food security in a broader context of the conflicts surrounding resources and the vulnerability of resources is essential for policy and decision makers.

Matthew's group in Microsoft Research was originally founded to apply their expertise in predictive modelling to real world problems such as water security and food security and climate change. He is now concentrating on agriculture and 'agricultural intelligence' where he is working with companies to create geotemporal models that are being used to predict food supplies, represent demand and match the two together to minimise waste in supply chains. He argued that **some of the data challenges we face are fairly basic, simple and mundane** rather than being highly intellectual. Finding ways to better train the next generation to be able to bridge disciplines will be essential. Are there opportunities for better engagement between, for example, biologists and mathematicians, if the goal was problem based rather than discipline based?

Craig introduced Vizzuality and their aim of visualising complex datasets in a way that people can understand and interact with. Recently, they have been working with the World Resources Institute (WRI) to create [Global Forest Watch](#), based on Matt Hansen's Global Forest Change datasets. Typically, **their challenge is to take data out and to strip the information back in order to be able to communicate clear messages**. For example, the aim of a [new project with the Zietz Foundation](#) is to take live data feeds from satellites and send information to poor farmers in Kenya via their mobile phones to help them to improve their crop productivity. Most of them text only, so key questions centre on ways to present big data on a small screen: How does satellite data relate to what is happening on the ground? How can that information be communicated in a way that helps people to make practical decisions?

### Wicked problems and questions generated by the discussion included:

- **How do we build resilient food systems in both developing and developed countries?**
- **The politics of data are very complex and can be politically changed and politically sensitive** which will influence both how the data are collected and how it is used.
- **Bringing remote sensing data down to a human scale:** There is a disconnect between environmental information and people's understanding and use of that information. There are many new opportunities for open data and services, such as Copernicus, but as yet, there has been relatively little investment in how to communicate the information in a way that people can use to make decisions in the real world.
- **Remotely sensed data does not replace the need for on the ground sensors and information**, but instead compliments it. Finding ways to be able to support long term, ground and air based datasets will be an essential part of answering the questions we need to ask about food security in the future.
- Decisions are taken at multiple scales from local to international. **What place does satellite data have in decision-making at all of these scales** and is it feasible to use it to make local scale decisions?
- **Is there scope for a growing role for citizen science in this 'new world' of open, big data?**
- Although boring, **data collection and storage standards are going to become increasingly important** if we are going to be able to be able to cross-analyse and layer different datasets. Could lessons to be learnt from the experience of genetic open data be applied to environmental datasets?