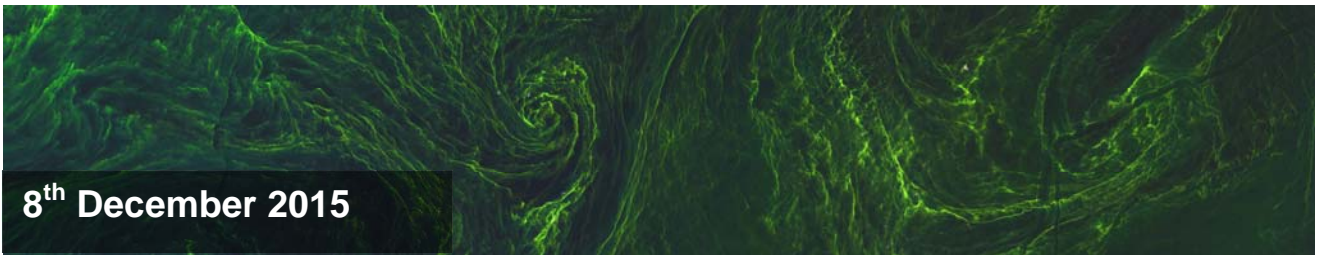


## Catalyzing change



8<sup>th</sup> December 2015

### Research gaps

This forum focused on food security problems in developing contexts and on a global scale. The key issue for all speakers was the importance of improved data sources for modelling scenarios and researching solutions to fundamental questions regarding food supply.

**Thierry Nègre**, from the Institute for the Environment and Sustainability (IES) at JRC, examined various data information challenges with regards to food security policy in the context of African and international development goals. Despite recent advances in technology, there is still a problem regarding scarcity of data. In Africa this stems both from a lack of resources and a lack of desire to fund conventional data collection methods. This has the knock-on effect of reducing the quality of data and, in turn, the ability to create accurate models. Related challenges include the ownership and transparency of data, and Thierry observed that many difficulties arise from institutional, rather than technical, problems. He advocates that technological solutions must be adapted to the needs of the user and that a system approach addressing scientific, technological, legal and institutional challenges is required.

**Professor Jaideep Prabhu**, Jawaharlal Nehru Professor of Indian Business & Enterprise at the Judge Business School, spoke on food waste in developing countries and emerging markets. In this context food waste occurs largely as a result of two major issues in the supply chain: a lack of information for farmers concerning neighbouring market prices and consumer needs and an inefficient cold chain. The latter can result from geographical practicalities and infrastructure issues as well as delays caused by institutional regulations. Jaideep suggests a better understanding of the relationship between informational and infrastructural problems is needed. Gathering more data would allow for an econometric analysis and help limited resources be targeted so as to solve big problems, a principle known as frugal innovation.

**Dr Drew Purves**, a Research Scientist at Google DeepMind, highlighted the importance of considering food as part of a global system, particularly in the light of the looming threat of climate change on the earth's system. There are three major questions which need answering. First, how will food production change globally in the coming decades in business as usual conditions? Secondly, given the known issue of increasing population, how can food production and supply be improved through best practice? Finally, what radical agricultural technologies or behavioural changes could be encouraged to create better solutions for farming? Fundamentally, the investigation and modelling of these questions is hampered by poor quality, inaccessible, scarce or even missing data concerning basic information, such as crop yields. This is usually a result of institutional, rather than technological, limitations.

### Wicked problems and questions generated by the discussion

**What is the role of government and private institutions in data collection? Should governments be doing more?** In many ways national institutions seem to be lagging behind private companies in gathering data. A reliance on the free market for data and, in turn, solutions for food production poses difficulties concerning adequate access, appropriate information gathering, confidentiality issues and short-termism. The potential for international bodies akin to meteorological services may be provide long-term perspectives.

**Who should take ownership of data?** Given how much big data is being gathered, is it appropriate for private or governmental institutions to have ownership of such an important resource? Is more research needed into how data is stored and traded? **How does ownership of data impinge on creating open and transparent data sources?** Sharing data openly may create issues regarding confidentiality, but this must be balanced with the potential benefits from new applications and viewpoints that may not have otherwise been discovered if data was not freely shared.

**What levels of data are required?** Amalgamating big data and local level information is crucial to building up a layered analysis. Ignoring certain levels of a system can risk overlooking key elements. Sometimes working at a community level, for example, makes a problem easier to solve.

**Is there too much data?** Drew Purves observed that in some cases a kilobyte of data may be more valuable than a petabyte of another kind of data. Even for experts huge amounts of data can be difficult to utilise and this problem is magnified for end-users such as businesses. There is a skill shortage in this area and more data scientists are needed. Additionally, sometimes data is considered valuable for its own sake, and if this data is not shared it may impede innovation.

**Is a commercial strategy appropriate to data collection?** By persuading people of the commercial benefits of surveys and data collection, they will be more inclined to provide accurate information. More work needs to be done to demonstrate the impact of such data on practical outcomes for end-users (such as farmers), so that people can understand its importance. Public trust concerning confidential data is a big issue.

**How can information be passed onto its end-users?** Farmers (or anyone affecting the supply chain) need specific information concerning how to improve their practice. Large-scale conclusions based on global data may not provide practical information for a farmer to act on.

**What is the relationship between data analysis and resulting policy?** There is little evidence regarding a linear connection between someone's ability to access information and changes to their subsequent behaviour and decision-making processes. Understanding the impact of information on decision makers is extremely important. Sometimes politicians are hamstrung by external influences that will not be mitigated by improved knowledge and this suggests some element of the policy advice system needs changing, whether it is the system itself or the method of communication between scientists and policy makers.

## Biographies

### Thierry Nègre

Head of the Food Security Assessment Team in the Monitoring Agricultural Resources Unit (MARS), Institute for the Environment and Sustainability (IES), Joint Research Centre (JRC) of the European Commission

Thierry Nègre is Head of the Food Security Group in the Monitoring Agricultural Resources Unit of the European Commission Joint Research Centre (JRC). A French national, Thierry was born in Limoges in 1963. After graduating from the Institut National Agronomique Paris-Grignon in 1987, he worked for the Food and Agriculture Organization of the United Nations on the development of national food security information systems in Africa and Asia. He joined the European Commission in 1997 and was the initiator of food security information activities in JRC in 2001. Subsequently, Thierry served as scientific counsellor in the European Union Delegation to the Holy See, the Order and Malta and the United Nations Organisations in Rome, such as the Food and Agriculture Organization (FAO).



### Professor Jaideep Prabhu

Jawaharlal Nehru Professor of Indian Business & Enterprise and Director of the Centre for India & Global Business (CIGB) in the Judge Business School, University of Cambridge

Jaideep Parbhu is Jawaharlal Nehru Professor of Indian Business & Enterprise and Director of the Centre for India & Global Business (CIGB). His research focuses on international business, marketing, strategy and innovation. Specific interests include: cross-national issues concerning the antecedents and consequences of radical innovation in high-technology contexts such as banking, pharmaceuticals and biotechnology; the role of firm culture in driving innovation in firms across nations; how multinational firms organise their innovation activities worldwide; the forces that drive R&D location decisions and the factors that influence the performance implications of these decisions; the internationalisation of firms from emerging markets; and innovation in emerging markets.



### Dr Drew Purves

Research Scientist at Google DeepMind, based in London

Drew has 16 years' experience in ecological and environmental modelling, data analysis and data visualization and he has just started working for Google DeepMind. Between 2007 and October this year, he was the head of the Computational Ecology and Environmental Science group (CEES), a unique group of ecologists sitting within Microsoft Research in Cambridge. Under his leadership, CEES adopted a mission to develop new predictive models of different aspects of the Earth System, and create new algorithms, methods and prototype software tools to enable this kind of modelling. The group carried out a wide variety of original ecological research, focussing on predictive modelling of global-scale environmental phenomena (e.g. the carbon cycle, biodiversity, agriculture); and packaged these results into software tools which they shared, freely.

