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Scientific Support
for Food Security and
Global Governance

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Abstract

This report summarises the proceedings of the JRC-organised conference 'Scientific Support for Food Security and Global Governance' thank took place on the 28th of September 2011.

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Scientific Support for Food Security and Global Governance

Introduction

The objective of the conference, organised by the European Commission's Joint Research Centre (JRC), was to examine from a scientific point of view the need to increase the global availability of, and access to food in a sustainable way.

With 21 speakers representing national governments, international organisations, EU institutions, industry, NGOs, universities and research institutes, the day-long conference focused on key questions relating to food security, with specific regard to how science, technology and innovation could contribute to food for all. The conference attracted over 380 participants.

Hosted by JRC Director-General Dominique Rostori, this conference on "Scientific Support for Food Security and Global Governance" aimed to foster a debate on the issues raised by the two earlier meetings and to highlight the ways in which science could best contribute to policy-making at EU and global levels to enhance food security worldwide.

Previous meetings on the same topic:

In March 2011, the JRC and the UK Government Office for Science (Foresight) co-organised a high-level seminar entitled "Future of Global Food and Farming: How can Science Support Food Security?" At this seminar, many speakers emphasised the need for a strategic approach to ensuring food security and global governance of the food system.

Furthermore, a meeting of G20 Ministers of Agriculture was held in Paris on 22 and 23 June, 2011, at which the Ministers agreed on an Action Plan to achieve five goals:

- improving agricultural production and productivity;



The conference on Scientific Support for Food Security and Global Governance attracted 21 speakers and over 380 participants.

- increasing market information and transparency;
- strengthening international policy co-ordination;
- improving and developing risk management tools to help manage the risks associated with food price volatility; and
- improving the functioning of agricultural commodities' derivatives markets.





**Why does an
adequate and
stable food
supply require
global measures?**

Opening session

Why does an adequate and stable food supply require global measures?

Opening the conference, JRC Director-General **Dominique Ristori** defined food security as one of the most important challenges facing humanity.



Dominique Ristori
JRC Director-General

'I am convinced that this meeting today will provide a real opportunity to define where and how science, technology and innovation will contribute to food for all.'

Science, he said, would be key in meeting that challenge, and he issued a call for a new system of global governance as the only way to ensure food security in an increasingly complex world.

Mr Ristori listed the three main issues that needed to be addressed if food security were to be achieved: the world's growing population, climate change and the need for global governance.

- **The world's growing population** was projected to reach 8 billion in 2030 and more than 9 billion by 2050, with much of the increase occurring in developing countries, especially Africa. Although agricultural production had risen at times during the second half of the twentieth century, this had more recently slowed down. On occasions, consumption of cereals such as wheat, rice,

corn and soya beans had outpaced production. In order to meet the food security needs of a growing population, investment in science and technology was indispensable – yet in recent years this had tended to decrease. There was a need to double the efficiency of every agricultural input, based on new technologies in areas such as soil, crops, water, pesticides and energy.

- **Climate change** and the need to adapt to it presented a parallel challenge, alongside that of raising productivity. Soil and water were not renewable resources and the world could not risk damaging these. In some places today, temperatures could rise rapidly during growing seasons and reduce yields by up to 30% – necessitating more efficient varieties and more accurate scientific foresight. The acceleration of urbanisation, changing consumption patterns, deforestation, soil degradation and food loss and wastage were all important factors as well.
- **The need for global governance** was clear. The issues associated with food security were so complex that governance in this field could only be global. There was a general agreement among countries that better international co-ordination and commitment were needed to achieve improved land and water management, better agricultural technologies, and increased investment, especially from the private sector.

With its seven Institutes and its 2,700 staff, the JRC was committed to its role of providing evidence-based science to support policy development, Mr Ristori said.

As the in-house science service of the European Commission, the JRC was the only Commission service in charge of direct research, providing sci-

entific support and solid and independent advice for the conception, development and monitoring of European policies and now in particular on the Europe 2020 priorities.

JRC's priorities included agriculture and food security, environment and climate change, energy, clean transport, health, information and communication technologies, and safety and security in the nuclear field. The Joint Research Centre works closely with other DGs and external partners in their efforts to enhance food security worldwide.

The JRC activities in the areas of food security include:

- Monitoring Agriculture by Remote Sensing (MARS): harvest forecasts and early warnings, support to implementation of the Common Agricultural Policy,
- Forecasting system on Crop monitoring and forecasting of EU crops: AGRI4CAST,
- the Global Disaster Alert and Co-ordination System, created with the UN, to develop models to predict catastrophic events such as cyclones and floods,
- Support to balancing future demand and supply sustainability,
- Natural resources,
- Climate change,
- GMOs and Biotechnology,
- the FOODSEC initiative to monitor food insecure areas worldwide.

'I am convinced,' concluded Mr Ristori, 'that this meeting today will provide a real opportunity to define where and how science, technology and innovation will contribute to food for all.'

The next speaker, **Marion Guillou**, President of the French National Institute for Agricultural Research (INRA), focused on the need to address the scientific challenges, notably in view of the extreme demographic changes projected for the next decades. It was necessary to address the three aspects of food security: quantity, access and quality.



Marion Guillou
President of the
French National
Institute for
Agricultural Research
(INRA)

Would it be possible to extend the world's cultivated surface, given the need for forests and urban development? Could yield be increased? How could price adjustments be managed to avoid excessive volatility, which damages producers and consumers alike? And how could the changing eating patterns worldwide be managed? In the face of this overall challenge, Dr Guillou outlined the main focus areas being pursued by INRA and the measures that she considered necessary in the short and long term.

- **Quantity:** Environmental public goods were under increasing pressure, in the form of water stress, biodiversity loss and the loss of arable land. To establish more productive – yet environmentally sustainable – agriculture, measures had to be taken in the short and long term. In the short-term, it was important to improve existing practices and systems, inter alia by disseminating widely already existing innovations. For the longer term, more research was needed, especially into the genetics of tomorrow, and the results had to be translated into practical innovation.
- **Access:** In the short term, political initiatives were necessary in areas such as poverty reduction and the elimination of excessive price volatility. In the longer term, inter-

national research initiatives would make an important contribution, for example by improving the understanding of the wheat genome.

- **Quality:** When humanity had met its basic quantitative needs, it tended to seek out more calories of animal origin. This had always been true, but the speed of this transition was now unprecedented. The projected increase of the intake of calories, notably those of animal origin, would put great pressure on food production systems. Today, obesity existed side by side with malnutrition. If everybody in the world consumed 3,000 calories per day, with 500 being of animal origin, world food production would already now need to rise by 28%. In the short term, nutritional recommendations, labelling and public policy were necessary. For the long-term, more research was needed in areas such as sociology, economics and anthropology.
- **Climate change:** Climate change could be partly responsible for the wheat yield stagnation that had been observed in recent decades. To mitigate and adapt to climate change, appropriate public policies would need to play a part, alongside longer term research into remote sensing, biodiversity and ecosystems, and methods of creating more resilient agricultural systems.

In Dr. Guillou's opinion, Europe would be an important actor in meeting these global challenges, through its policies in fields like agriculture, the environment, energy and public health, and as a catalyst for international research, enabling partnerships to stimulate innovation, especially public-private partnerships, and linking with international initiatives. She particularly mentioned Joint Programming Initiatives such as the recently established one on Agriculture, Food Security and Climate Change, along with Research Infrastructures like Analysis and Experimentation on Ecosystems (ANAEE). Under the umbrella of the Horizon 2020 initiative, Europe's priorities were at the interdisciplinary crossroads of agriculture, environment, food and public health programmes, said Dr Guillou, helping the world to meet future challenges 'the like of which humanity has never faced before'.

The final speaker of the session, **Ann Tutwiler**, Deputy Director-General (Knowledge) at the FAO, focused on the practical role of global measures in the effort to secure an adequate and stable food supply. While recognising that much of the work would be done at national level, Ms Tutwiler highlighted a number of reasons why global action was also necessary.



Ann Tutwiler,
Deputy Director-
General (Knowledge)
at the Food and
Agriculture
Organization of the
United Nations

The first of these was the **global impact** of hunger, and the poverty associated with it. Not only were hunger and poverty issues of concern in themselves; they also had an important impact on other issues of global relevance, such as security, the environment and climate change. Avian influenza had been one example – an issue of global impact arising as a result of the way poultry were being raised in one part of the world.

Laws on natural resources were another area requiring global action, since natural resources such as lakes and water tables were not subject to national boundaries. With 70% of the world's water used for agriculture, the need for global governance was clear. Soil was another resource which had been ignored, and which had consequently suffered from depletion and salinisation. For this reason, the FAO had recently inaugurated a Global Soil Partnership.

Fisheries was a third area – for the simple reason that 'fish move, sometimes outside anyone's boundaries'. The FAO had recently applied for a grant from the Global Environmental Facility to help develop global governance rules for fisheries that lay outside national boundaries.

Climate change was clearly on the list of global issues. Not only did it exacerbate food insecurity, it was also in turn exacerbated by hunger and poverty.

Markets were another key area demanding global measures. Agricultural markets were global and individual national decisions could have effects on global prices, production and supply. In this context, the impact of trade barriers was significant, with recent rice price volatility having been caused by policy measures, not crop shortage.

The same considerations applied when considering how to manage the global reach of **corporate organisations**. While this corporate global reach had many positive effects – stimulating investment in the agricultural sector, helping to reduce post-harvest losses and mobilising new supply and value chains – it also meant there was a clear need for codes of conduct in areas such as the responsible use of pesticides.

The importance of **knowledge, policies and systems** was another area to be highlighted in terms of the need for a global approach. Reliable statistics, for example, were vital in helping to develop appropriate measures to target nutritional deficiencies accurately. Advocacy – using reliable information to help amend national policies which were either over-supportive or insufficiently supportive – was another key tool.

Having outlined several areas where a global approach to food security was vital, Ms Tutwiler concluded on a note of optimism, underlining that, with yields now far below their potential, and with the high levels of wastage of food and water, it was ‘not rocket science’ that was needed to make progress. ‘We know how to address these issues,’ she said.





Agricultural production and sustainability: Will availability and access to resources (land, water) be the key determinants in future patterns of food production?

First session

Agricultural production and sustainability: Will availability and access to resources (land, water) be the key determinants in future patterns of food production?

Professor Joseph Alcamo, Chief Scientist of the United Nations Environment Programme (UNEP), opened the session by stating his view that, from the vantage point of the scientist, the agricultural system was a 'managed ecosystem'.



Professor Joseph Alcamo,
Chief Scientist of the
United Nations
Environment
Programme (UNEP)

From this, it followed that there was an ecological basis to food security, and it was therefore important to consider the threats facing this ecosystem.

Professor Alcamo outlined four key threats:

- **Pressures on marine and inland fisheries:** although these fisheries were the source of some 10% of world human calorie intake, it was estimated that around a quarter of marine fisheries fish stocks were depleted. Some studies had even indicated that as much as 29% may have 'collapsed' – meaning that current catch level is less than one tenth of the historical maximum registered catch. The causes included overfishing, habitat destruction, and wastewater contamination leading to oxygen-depleted 'hypoxic' (dead) zones.
- **Pressures on croplands:** factors such as urban expansion, the competition from

bioenergy crops and land degradation were among the main pressures. Urban expansion was a more serious threat than many people realised. Although urban areas occupied only a tiny percentage of the earth's surface, 15-20% of food production took place on city outskirts.

- **Water scarcity:** this was a major threat, in a context in which irrigated croplands produced a yield two or three times greater than rainfed areas, and accounted for 40% of global food production. Demands on water were increasing, with one study projecting a doubling in India from 80 cubic kilometres in 1995 to 160 cubic kilometres in 2050. Meanwhile, glacial melt was having a major impact on water availability, with the potential to trigger both flooding and drought.
- **Climate change:** with its potential to result in changed rainfall patterns, accelerated glacial melt, and altered zones for pests and pathogens.

Having outlined the threats, Professor Alcamo turned his attention to four steps to help establish a sound ecological basis for food security.

- 1. Make world fisheries sustainable**
Creating marine protected areas (MPAs) and removing 'perverse' subsidies that lead to overfishing were two actions that would help, along with ending the current situation whereby 25% of fish catch was used for fishmeal rather than human consumption.
- 2. Reduce direct pressures on land and encourage 'smart' land use**
Sustainable bioenergy production, reducing competition from bioenergy crops for prime

cropland, would be an important measure. Other measures would include more sustainable land management, a focus on compact urban development in place of suburban spread, and reducing meat consumption. By 2050, Professor Alcamo said, the grain needed to feed livestock could feed 3.5 billion people.

3. 'Climate-proof' agriculture

The keys to this were improved water efficiency and crop resilience, through measure such as improved irrigation efficiency and the development of drought-resistant crops.

4. Reduce food losses and waste

Food losses during harvest and distribution, and the use of edible crops as feedstock, meant that 4,600 kilocalories of edible crop harvest were required to produce 2,000 calories consumed by humans.

Professor Alcamo concluded by saying that the ecological situation he had outlined amounted to a challenge to the scientific community to provide the knowledge, information and strategies to achieve the key steps he had described. We were undermining the ecological basis of our food system and threatening our security, he said. But the options for restoring the ecological base were many, and science could provide the knowledge we need.

The second speaker was **Paulo Gouveia**, the Director of Copa-Cogeca, an organisation representing 57 farmers' organisations and 31 cooperative organisations in Europe. Mr Gouveia discussed the role of the EU farmer in assuring food security, and how this could be achieved in the face of a series of challenges affecting farmers.

These challenges included:

- globalisation and trade liberalisation;
- market turbulence and excessive price volatility;
- increasing production costs, in particular for inputs such as energy;
- an unbalanced food chain;
- the demand for safe and healthy food;
- climate change; and
- limited availability of natural resources.

In parallel with these challenges, the forecast increase in the global population, together with increasing urbanisation (expected to be 70% by 2050, compared with 49% at present), meant that, by FAO estimates, food production would need to increase by 70%. In this context, sustainability and productivity were not a business opportunity for farmers but a necessity.



Paulo Gouveia,
Director of
Copa-Cogeca

However, sustainability consisted of three separate 'pillars', economic, environmental and social.

The central issue was that farmers could not deliver the environmental and social aspects if they were not economically viable. It was crucial to find win-win solutions that allowed farmers to contribute to a better environment, but which also had a positive impact on their productivity and profitability.

For example, agriculture was asked to deliver food, feed, fuel and fibre, while also providing public goods and services. The problem was that the provision of these public goods and services was not remunerated by the market. Similarly, farmers had a key role as managers of the landscape and rural areas, but this required a sufficient number of farmers with particular skills sets. Creating the solutions needed to keep European farmers competitive while also addressing citizens' expectations – in other words, integrating all of the three pillars of sustainability – was the most difficult and critical balance to find.

The path towards achieving this balance, Mr Gouveia said, required three elements:

1. **Targeted research**, focusing on practical solutions that farmers could implement economically. To help this, fast progress was

needed in setting up the recent EC Innovation Partnership initiative on agricultural productivity and sustainability. A focus on 'sustainable intensification' was required, together with the pooling of research resources to avoid duplication. And priority needed to be given to user- and solution-oriented research.

2. Advisors who could 'translate' the new solutions into farmers' language would also be key. Farm Advice Services (FAS) could play an important role here, Mr Gouveia said.

3. Investment by farmers was also required. The challenge was that farmgate prices often failed even to cover the costs of production, leaving little scope for investment.

Putting these three elements in place – research, advice and investment – would enable the green growth required.

Mr Gouveia concluded by turning to agriculture's requirements from the scientific and research community to help achieve this green growth:

- research on easy-to-apply monitoring and forecasting tools;
- new technology and management practices to improve efficiency in water, nutrient, energy and soil use;
- innovation to optimise the use of GNSS technology;
- solutions across the entire food chain, with farming as an equal partner; and
- solutions to provide more and better use of non-food products, including by-products.

While land and water were indeed key determinants of future food production, Mr Gouveia said, they were not the only ones. From the point of view of the European farmer, facing the varied demands of sustainability, innovation was equally important in the effort to achieve the 'sustainable intensification' that was needed.

The third speaker of the session, **Professor Monty P. Jones**, the Executive Director of the Forum for Agricultural Research in Africa, examined the issue of food security from the African perspective, and asked how the potential of science could be harnessed there.



Professor Monty P. Jones,
Executive Director
of the Forum for
Agricultural Research
in Africa

It was disheartening that 940 million people in the world went to bed every day hungry when there was enough food in the world for everyone to eat three square meals a day. Although in proportional terms this represented progress compared with the 1950's, when 1 in 3 people went to bed hungry, the aim in coming decades had to be for everybody to go to bed well fed.

Science and technology had contributed greatly to the 'green revolution' that had taken place in Asia and Latin America, but this green revolution had not yet come to Africa – as was shown by three key indicators:

- Over the last 45 years, **African food production** had been stagnating or declining. Africa was forced to import some 25% of its food requirement – even though the continent had all that was needed to produce its own food and become a net exporter.
- **Africa's rapid population growth** was adding to the challenge, with 325 million Africans malnourished.
- **Climate change** was another exacerbating factor. 95% of African agriculture was rain-fed, and 65% of the global increase in climate-related hunger was projected to occur in Africa, as a result of increasing phenomena such as drought and flood.

The answer to Africa's food security challenge lay in improving agricultural productivity, especially for smallholders. Science and technology would make an important contribution to this improved productivity, but other factors were crucial as well. It was essential for smallholders to be given access to land, water, knowledge, inputs, energy and markets.

Meeting these requirements depended, in turn, on three additional facilitating factors:

- the right institutions and infrastructure;
- an enabling policy environment; and
- empowerment of farmers – including women in particular, who made up the majority of agricultural workers in Africa.

Focusing on the role of science and technology specifically, Professor Jones noted that, in a recent review of 24 Poverty Reduction Special Programmes in Africa, only 4 had mentioned agricultural research as a priority. Yet science and technology had a key role to play in the African context. Its focus, he said, should be on a number of specific aims:

- closing the yield gap;
- reducing post-harvest losses;
- improving the genetic ceiling;
- strengthening institutions;
- ensuring well-functioning markets; and
- facilitating policy development.

If the potential of science and technology to meet these needs was to be met, high quality investment was needed, based on robust priority-setting and targeting. Stability was a second key factor, with long term investment in programmes favoured over short term project investment.

But even this, on its own, was not enough. Whatever the advances made by science and technology, the benefits would only be fully realised if there was a parallel focus on improving such 'complementary' services as infrastructure, credit facilities, property rights and market and trade incentives.

In conclusion, Professor Jones noted the particular need for collective action in the African context, where 27 of the 48 sub-Saharan countries had populations below 10 million, and where the sheer variety of agro-ecological systems increased the costs of research.



Dr Mikael Karlsson,
President of the
European
Environmental Bureau

Concluding the session, the Moderator, **Dr Mikael Karlsson**, President of the European Environmental Bureau, observed that, in his view, science and technology of course had a great role to play, but coming up with new thinking and innovation was not the biggest obstacle. The real 'bottleneck', he said, was empathy and solidarity – the need for commitment, not just 'awareness'.





**Market
information and
transparency,
food price
volatility in
particular in
the poorest
countries**

Second session

Market information and transparency, food price volatility in particular in the poorest countries

The first speaker of the session, **HE Mohamed Ibn Chambas**, Secretary-General of the African, Caribbean and Pacific Group of States, began by examining the world's historical progress towards achieving its food security aims.



HE Mohamed Ibn Chambas,
Secretary-General of
the African, Caribbean
and Pacific Group of
States

The World Food Summit in 1996 had set the goal of halving the number of people suffering from hunger by 2015. This had been repeated four years later as a Millennium Development Goal, along with a similar commitment to reduce the number of people living on less than one dollar per day. There had been progress – but not at a rate sufficient to achieve the World Food Summit target. The number of hungry people in developing countries had not fallen relative to its 1992 level.

The goal of food security presented the world with tremendous challenges, with the developing countries most affected. These challenges included:

- the impact of climate change;
- pressure on water resources;
- rising sea levels;
- biodiversity issues; and
- the need to reduce emissions of greenhouse gases.

Dr Chambas highlighted two areas that were vital to achieving food security:

1. Achieving **growth in food production** was a major key to enhancing food security and reducing hunger. Productivity-driven increases in food production had been shown to have a strong positive impact on the rural economy, leading to increased food availability and a reduction of food prices on the local market. At the same time, enhanced income for producers had a strong stimulating effect on the broader local economy.
2. Improving **market information and transparency** was vital in ensuring market access and trade. The quality, availability and dissemination of market information were key factors in price setting – where there was frequent potential for speculation and price volatility. Now that food commodities were an established class of financial assets, it was important to examine the role of information and speculation in destabilising the food price system.

In the search for a global solution to the issue of food security, and to address these issues, three requirements urgently needed to be met:

1. a coherent and effective system of governance at both national and international level was imperative;
2. investment in agriculture had to be enhanced and targeted at reducing vulnerability and enhancing resilience; and
3. global food market monitoring had to be strengthened to counter speculation.

These three aims could all be achieved, Dr Chambas

concluded, with sufficient collective political will to save the world from hunger.

The importance of data and increased transparency to help tackle market uncertainty and damaging volatility provided the focus for the next speaker, Marc Sadler, leader of the World Bank's Agricultural Risk Management Team. The fundamental issue facing the world was the need to switch from being reactive to being proactive. Volatility was based on human reaction to things that happened – whereas in fact we knew in advance that many things were going to happen, especially in agriculture. This issue was bigger than any single institution or country could manage, so a global approach was needed.

The existence of volatility in world food markets was clear. It was not uncommon to see food contracts hitting both their upper and lower daily limits within a single day.

The causes of this volatility included

- natural disasters;
- structural changes to the market, such as varying levels of production, consumption and stock drawdown, all of which affected the market's price sensitivity;
- the release of new data, for example new crop projections; and
- one-off events such as changes to buy or sell recommendations by influential bank analysts.

Behind all of this, the perception of what lay in the future was fundamental. In essence, the problem was simply expressed: the world did not know how much food it had. It used models, projections and estimates, but had no verified system to ascertain real, physical stocks. This uncertainty generated volatility whenever problems were perceived. Volatility was driven by lack of knowledge and by fear – as had been shown by the rice price spike of 2007-08, where production levels had not been a problem at all.

In order to combat volatility, it was clear that the world needed two things:

1. Accurate knowledge of the food stocks it really had – a requirement which should be easier to achieve given that 50% of world cereal stocks were in two G20 countries, China and India.

2. A forum in which policy makers could engage in a common level of discussion, based on agreed information.

Turning, finally, to ways in which these goals might be achieved, Mr Sadler highlighted the recent G20 AMIS initiative (Agricultural Market Information System). The expected outcomes of AMIS included improved short term global outlooks for major grains; more accurate and harmonised stock information; harmonised national and international food balance methodologies; early warning of global price spikes, and early discussion on crisis prevention among policy makers.

Other tools to help reduce volatility by improving forward visibility included the use of indices measuring variables, such as weather, to forecast crop production. One such was the WRSI (Water Requirement Satisfaction Index), a measure of the amount of water available to a crop at crucial periods of its growth. The use of weather risk mapping, employing historical data to enable better planning and monitoring, was another important technique, along with the creation of 'synthetic weather' to solve problems caused by insufficient data in existing weather records.

In all these responses, designed to eliminate excessive volatility by making the world less reactive and more proactive, technology had a vital role to play, Mr Sadler concluded.

The next speaker, **Professor Joachim von Braun** of the Centre for Development Research at the University of Bonn, examined the causes of food insecurity and price volatility, their impacts, and the policy actions required to deal with them. In Professor von Braun's view, these policy actions needed to include the setting up of a new multilateral organisation to help prevent food price volatility.

To begin with, it was important to distinguish between three different types of price behaviour, namely increasing trends in food prices, price volatility and drastic price spikes.

In itself, a rising trend was not a problem if it was smooth. The problem was volatility. Among the drivers of food prices, 'old' fundamentals continued to be important – supply, demand and stocks. But these had been joined by a set of 'new' fundamen-

tals which included energy market linkages, financial market linkages, speculation and trade policy.



Professor Joachim von Braun,
Centre for
Development
Research at the
University of Bonn

This 'financialisation' of world food markets had been visible since 1990. From that date, there had been clear correlation between banking crashes and the behaviour of the world wheat price, in a way which had not been seen pre-1990. In fact, the transmission from financial and energy markets to food prices had become so strong that it was impossible to understand today's food price volatility in terms of production alone. 'Financialisation' clearly ranked alongside supply or demand shocks as was one of the major factors causing food price volatility.

Looking in more detail, there was no doubt that food price volatility was boosted by speculation in the futures markets. But this did not always happen. There was a difference between 'normal' days and 'nervous' days. More research was needed to understand this variability.

What was clear was that volatility hurt the poor the most. The precise impact of price shocks on the poor depended on four factors:

- the prevalence of poverty and inequality in the area affected;
- consumption patterns and the structures of price change;
- the spatial pattern of the price change (e.g. urban vs. rural); and
- the income sources of the poor (including farming).

The costs of volatility were many. They included increased hunger and disease, the reduction of investment incentives, distorted asset markets, fiscal and

macro-economic effects, and political insecurity. A strategic agenda was therefore necessary, with a focus on promoting pro-poor agriculture through technology and institutional innovations. As part of this, Europe needed to strengthen its mechanisms to share its science. Measures to expand social protection and improve child nutrition should also form part of the agenda, as should action to reduce market volatility.

In this context, Professor von Braun outlined a five-point action plan to combat volatility:

1. keeping trade open at times of global and regional food shortage;
2. regulation of food commodity markets;
3. developing financial stabilisation instruments such as import facilities and hedging capacity;
4. establishing a grain reserves policy – both physical and virtual; and
5. establishing more flexibility in biofuels policy to allow greater stability in food markets.

Professor von Braun ended with a call to establish a new multilateral organisation to monitor, guide policy and engage in curbing food price volatility. This body should take the form of an 'international grain reserves bank'. Since food was, in effect, the 'currency of the poor' (50% of their income is spent on food), this organisation should function like any other central bank, with the purpose of protecting this important currency.

Continuing the theme of analysing agricultural commodity price volatility, the final speaker of the session, **Jacques Delincé**, Head of Unit for Agriculture and Life Sciences in the Economy (AGRILIFE) within the JRC, set out to examine a number of key questions.

1. Is the current price peak exceptional?
2. Is current price volatility exceptional?
3. What are the drivers of these trends? In particular, what are the roles of energy prices, ethanol production and speculation?
4. What are the impacts if I am rich or poor?

1. Is the current price peak exceptional?

FAO monthly food price indices from 1997 to the present showed that sugar prices were indeed at record highs. Although other prices had risen since

2009, however, they remained comparable with levels reached in the previous price peak of 2007-08. In the US, agricultural prices had also risen in the recent boom, but were below levels reached during the oil shocks of the 1970s, and had risen less in the present boom than energy and metals prices. Taking inflation into account, present agricultural prices were not exceptional.



Jacques Delincé,
Head of Unit,
Agriculture and
Life Sciences in the
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Joint Research Centre

2. Is the current price volatility exceptional?

According to World Bank data, food price volatility had indeed risen in the period from 2008, although it had recently declined again. But the level of volatility was below that shown in other markets such as fertiliser, energy and metals. Volatility had been greater in Africa than in Europe in the first decade of the 21st century, but compared with the decade from 1991 to 2000, there had been no significant increase in volatility.

3. What are the drivers of these trends? In particular, what are the roles of energy prices, ethanol production and speculation?

Among the drivers of agricultural price volatility (using the wheat price as an example), it was possible to identify exchange rate volatility, oil price volatility and the business cycle as the factors increasing volatility. Stock levels and speculation were factors which tended to reduce volatility. Although this view of speculation might be counterintuitive, speculation tended to occur when there was an imbalance between sellers and buyers and could sometimes smooth out these imbalances.

Using estimates based on World Bank data, the link between energy prices and food prices had strengthened markedly between 2005 and 2010. Since 2008, however, there had been no correlation at all between ethanol production levels and maize

prices. Indices of speculation, meanwhile, showed no correlation with wheat prices.

4. What are the impacts if I am rich or poor?

Looking at his final question – the impact of volatility on rich and poor – Dr Delincé noted that EU agricultural income per annual work unit had increased by 12.6% in 2010 compared with 2009. Looking at poor farmers, the evidence showed that high input and output prices did impact farm productivity, revenue and profits. And in new member states of the EU, smallholders had not benefited as much as large farms, with small and medium farm revenues declining by between 5% and 32% relative to large farms.

As a result, Dr Delincé said, it was possible to draw the following conclusions:

1. We are currently experiencing a third peak for agricultural prices.
2. The current volatility of prices is higher for agricultural products than in other sectors.
3. Food price volatility is greater in Africa than elsewhere but has not increased post-2000.
4. The main wheat price volatility drivers are low stocks, energy volatility and dollar exchange rate volatility.
5. Reasonable levels of speculation can even limit volatility.
6. The best farms profit from current prices, but the smaller/poorer ones lose competitiveness.





**Global
governance:
Is better
governance of
food supply
and demand the
most efficient
path to food
security?**

Third session

Global governance: Is better governance of food supply and demand the most efficient path to food security?

Opening the third session, the Moderator, **Sir Brian Heap**, President of the European Academies Science Advisory Council and former Foreign Secretary, The Royal Society, remarked that, in the area of governance, it was vital to distinguish between evidence-based and politically-based measures. The role of independent scientific advice was therefore especially important.



Sir Brian Heap,
President of the
European Academies
Science Advisory
Council and former
Foreign Secretary,
The Royal Society

The first speaker of the session was **Hervé Lejeune**, Inspector-General of the Ministry of Agriculture of France, which currently holds the G20 presidency. Mr Lejeune placed the focus firmly on the potential fragility of the world's food system and the pressing need for united action to provide strengthened global governance. In dealing with food crises today, what was at stake went beyond agriculture alone, he said. Given world population trends, world food security and global stability were in jeopardy.

That was why French President Nicolas Sarkozy had in 2008 proposed a new global partnership and a panel of high level experts to address the problems, and why the G8 in 2009 had announced a fund of \$22 billion for new food security programmes.

But in spite of all international efforts, food security

risks had persisted and had become even more serious than before.

The need to improve global governance relating to food security had thus been a priority for France when it assumed the G20 presidency. With 15% of the world population malnourished, and agricultural production rising by only 1.5% a year compared with almost 3% ten years ago, the world was in a precarious position. It would only take a small event, such as a drought in Russia or a tornado in the US, to make it impossible for the world to feed all of its people.

United action was therefore crucial. For this reason, G20 agriculture ministers had reached a number of concrete decisions, contained in the Action Plan on agriculture and food price volatility of June 23, 2011.



Hervé Lejeune,
Inspector-General
of the Ministry of
Agriculture of France

There were five pillars to this action plan.

- 1. Increased food production**, since shortages were a key driver of volatility. This required both public and private investment, together with research, new technology and international co-operation in research projects. One initiative was a new international study aimed at improving wheat production, with

similar studies planned for rice, millet and sorghum.

- 2. Improved co-operation between G20 member states** to help create reliable systems of information and analysis and to aid rapid reaction when required. The recent setting up of the AMIS (Agricultural Market Information System) initiative was one concrete example of this.
- 3. Transparency.** Excessive price volatility occurred because markets were not well-informed. Here too, AMIS would help, by providing greater transparency.
- 4. The protection of vulnerable countries against excessive food price volatility** by means such as better risk management techniques, better contractual agreements between producers and buyers, and a proposal to set up a system of emergency humanitarian food reserves.
- 5. Financial regulation of world food markets** to overcome the inadequacy of existing regulation which had led to excessive food price volatility.

Having summarised the response of the G20 to the challenge of world food security, Mr Lejeune concluded by stressing the high level of political determination which had characterised this response – as evidenced by the very short delay in starting to implement the proposals. This, he said, was ‘something rare enough to merit emphasising’.

The next speaker, **Sir Gordon Conway**, Professor of International Development at Imperial College, London, was in no doubt about the vital role of good governance in enabling food supply. It was no coincidence that those African countries which were most successful in food supply were those with good national governance.

In this context, it was instructive to analyse the ‘Green Revolution’ which had produced an extra 117 million tons of rice in Asia between 1965 and 1980. Of this increase, 27 million tons had been attributable to new varieties, 29 million to increased fertiliser use, and 34 million to irrigation water. The remainder – another 27 million tons – had been due to what might be termed ‘residual factors’. These ‘residual factors’ were extremely important. Their exact importance could be measured in terms of total factor productivity – the ratio of total output



Sir Gordon Conway,
Professor of
International
Development at
Imperial College,
London

growth to total input growth. What they amounted to, in effect, was the ‘enabling environment’.

The enabling environment had a number of components, all of which were heavily dependent on an approach based on good governance:

- macroeconomic policies that favoured markets and trade;
- the process of provision of inputs (not the inputs themselves);
- physical infrastructure (roads, irrigation etc.);
- social infrastructure (education, research, etc.); and
- accompanying institutions and regulations.

Together, this package of factors determined whether agriculture would develop and whether the products would reach those who needed them.

The ideal model of an enabling environment, said Professor Conway, citing an example he had visited in SW Zambia, had the farm household at its core, with local seed and fertiliser companies providing inputs, as well as banks providing microcredit, all routed through a local agro-dealer. The farm was linked to local traders who provided access to national and regional trade outlets. Crucial to all of this was connectivity – both ‘hard’ connectivity in the form of roads, but also ‘soft’ connectivity via mobile phones and the internet.

The governance requirements for establishing enabling environments included:

- appropriate macroeconomic policies;
- significant investment in infrastructure, research, extension and education;
- security of land tenure (not necessarily ownership);

- minimal corruption;
- efficient and fair markets; and
- a supportive environment for SMEs.

Leaders of countries needed to understand these requirements and to appreciate that smallholder farmers were in the private sector and needed the appropriate support.

To underline the significance of the enabling environment, Professor Conway ended with a quote from Lydia Myantekyiwaah, a farmer in Ghana's Ashanti region:

'I did not realise how much I was being cheated until I took part in this sale where every single bag weighs exactly 50kg ... It's good to know I can get more money for my maize.'

Sometimes, Professor Conway concluded, the most important piece of technology in developing countries was to have a weighing machine in the market.

The next speaker, Oxfam Director of Campaigns and Policy **Phil Bloomer**, had a very clear message for the conference. Global governance was currently at a low point, while global challenges had never been greater.



Phil Bloomer,
Oxfam Director of
Campaigns and Policy

These challenges included:

- climate change, with global temperature on course to rise by 3.5°C – an average which masked the fact that in sub-Saharan Africa the rises could be in the region of 7 to 8°C;
- an unprecedented shift in land ownership since 2001, with approximately a quarter of a million hectares of land having been sold,

leased or licensed, largely in Africa and mostly to international investors;

- pressures on water;
- pressures on arable land; and
- competition from energy, where government subsidies for biofuels totalled \$20 billion in 2009.

The next ten years would be crucial for the world to meet these governance challenges. Recent research by the Stockholm Resilience Centre showed that of nine 'planetary boundaries', the world had already exceeded three – on biodiversity loss, climate change and the nitrogen cycle. A further three were approaching their safe boundaries – ocean acidification, global freshwater use and land system change.

However, the good news was that we were still 'masters of our destiny' if we could manage to work within these boundaries. The challenge was to move from a situation in 2010 where ecological impacts were starting to exceed planetary boundaries with a population of 7 billion, to a situation in 2050 in which the world would have moved back within those boundaries with a population of 9 billion. At the same time, it was important to increase the resource share of the worst-off 20% of people.

Countries like Brazil and Vietnam, which had both succeeded in halving hunger levels, showed there was hope, as did multilateral initiatives such as agreements on CFC emissions, reforms to the CAP, G20 coordination, and emissions trading schemes. One important focus was to direct growth to where poor people were. In developing countries, a 1% increase in agricultural GDP resulted in a 6% increase in the incomes of the poorest 10%.

Mr Bloomer concluded by suggesting some proposals particularly pertinent to the EU and its role in making global governance more effective:

1. Taking 'low-hanging fruit' early would help to build momentum, while it was also important to have 'transformative' proposals ready on the shelf for the longer term.
2. Initiatives to reduce the number of shocks were required. These might include stronger ambitions to combat climate change, for example reducing emissions by 30% by 2020 within the EU instead of the current target

of 20%. Removing the 'perverse subsidies' on biofuels would be key, as well as initiatives to reduce speculation, and to resist export bans and land and water grabs.

3. Strengthening resilience to shocks would also be necessary. This could be done by increasing investment in smallholder productivity, the use of financial regulation such as the proposed Financial Transactions Tax, by technology transfer, and through the vehicle of EU policy.

The challenge and opportunity for Europe, said Mr Bloomer, was to take a leadership role and drive forward to achieve the food security that was so necessary. The fundamental question was: 'Can the EU build that coherent Development and Climate Policy necessary to achieve food security within those planetary boundaries?'

The fourth speaker of the session, the founder and Secretary-General of the Global Foundation, **Steve Howard**, agreed with previous speakers: global governance at present was too weak to achieve what needed to be done. In Mr Howard's view, it was important to examine where leadership came from and how it could be broadened and strengthened.



Steve Howard,
Founder and
Secretary-General
of the Global
Foundation

The world needed to make use of leadership resources which existed beyond the sphere of governments alone. The collaborative efforts, outside government, of business, scientists and civil society could make a major difference at a global level. The issues of food, water, energy, sustainability and climate change were all bound up together, and transcended national boundaries. There was a need for strategic leadership which included science, busi-

ness and government all working together. But the leadership should not come just from government.

The G20 should be the key vehicle to drive progress on matters of long term sustainability, but it was crucial that the G20 should be well advised by all the talents in the community, not just by 'experts'. The community had 'had enough' of elites telling them what to do. Citizens were no longer listening to elites and a new model was needed – inclusive, broadly-based, and free of vested interests.

To meet this need, Mr Howard called for the establishment of a Global Eminent Persons Group to act as a standing body to provide ongoing advice to the G20. While this group should include scientists and experts in food and agriculture, it should also include artists, business leaders and community leaders.

The idea of a Global Eminent Persons Group had already been floated at a global think tank summit in Beijing in June, said Mr Howard. In contrast to the 'train wreck' of the Copenhagen Climate Summit, at which some countries had been unwilling to come to the table to negotiate, the world had to find a new negotiating style – serious and inclusive – in order to get to the future.

The proposal had received the support of the Australian Prime Minister, Julia Gillard, EC Commission President José Manuel Barroso, and former World Bank President James Wolfensohn, among others. It had also gained support from senior Chinese leaders – a critical element since, with 350 million people on track to be urbanised in the next 15-20 years, China would be crucial to global efforts to achieve food security. An exploratory meeting on the formation of such a group was due to be held in Bordeaux in late November.

The key question, concluded Mr Howard, was what it would take to achieve the unified approach that was necessary to meet the strategic challenges of food, water, energy, climate change and sustainability. The roles of both science and the European Union would be crucial in this. With the help of both it would be possible to make the idea of a Global Eminent Persons Group work, and consequently to make the G20 an even greater success.

The final speaker of the session was **Jean-Louis Chomel**, Head of the EuropAid unit in the Development and Cooperation Directorate-General of the European Commission. Mr Chomel outlined the main challenges and the key priorities from the perspective of the Development and Cooperation DG in the areas of agriculture and food security.



Jean-Louis Chomel,
Head of the EuropAid
Unit in the
Development and
Cooperation
Directorate-General of
the European
Commission

The main challenges were:

- increasing agricultural production to feed a growing world population;
- greater efficiency, to cope with the pressures on natural resources and with post-harvest losses;
- price volatility; and
- climate change.

Faced with these challenges, two priority issues lay at the heart of the fight to achieve food security: governance and investment in a sustainable future

1. Governance

Hunger was a global concern, which therefore required a global response. That was why governance was so important. The EU was a major contributor to global food security governance, in particular through its backing for the reform of the Committee on World Food Security and for the implementation of the food security agenda in the G8 and G20 contexts. The Commission was also deeply involved in governance in international research, and supported the mandate of the Global Forum on Agricultural Research.

2. Investment

On the investment side, the EU was serious about investing in sustainable agriculture and food security as a way of speeding progress towards the Mil-

lennium Development Goals. That was why, as the world's leading grant donor, the EU was leading by example. In its help to small scale farmers, who formed the majority of developing world agriculture, the Commission always looked to the bigger picture, focusing on the efficient and sustainable use of natural resources, enhanced incomes, and improved resilience. And it recognised the role of science in achieving sustainable improvements in agricultural systems. Between 2007 and 2010, the EU had invested 225 million euros in global and regional initiatives for agricultural research for development. These included programmes to breed crop varieties with greater tolerance of stress, and innovative platforms to help link African farmers to markets.

Food security was about more than agriculture, however. It also assisted other Millennium Development Goals, including those on child mortality, maternal health and basic education. On top of its direct investment in food and agriculture, it was also relevant to note that the EU had launched a 1 billion euro Millennium Development Goals Initiative.

In addition, it was important to make mention of the 1 billion euro EU Food Facility launched at the end of 2008 as a rapid response to the global food security crisis. Through these and other measures, said Mr Chomel, the EU had made clear that agriculture and food security were among its top priorities. These were priorities which would not change, he concluded.

In drawing the session to a close, the Moderator, Sir Brian Heap sounded a note of caution. While communities in Africa wanted to hear about new science and technology, and it was important for Europe to share this, it was important to remember that these communities wanted to 'do it for themselves'. Europe needed to tread very carefully, Sir Brian said, in not appearing to impose solutions from the outside in a potentially patronising way. For this reason he said, partnerships would be critical.



**The need for innovation:
Where and how will science and technology, including bioeconomy, contribute to food for all?**

Fourth session

The need for innovation: Where and how will science and technology, including bioeconomy, contribute to food for all?

Opening the session, the Moderator, **John Bensted-Smith**, Director of the JRC's Institute for Prospective Technological Studies, described his work in 2008-09 as co-chairman of a Task Force examining the question of the food chain and what triggered price rises. From this work, one conclusion had been clear: in order to help agriculture maintain and improve its productive effort in the face of new challenges, the world needed to redouble its efforts in research, development and innovation.



John Bensted-Smith,
Director of the
Institute for
Prospective
Technological Studies,
Joint Research Centre

The first speaker, **Pierrick Givone**, Scientific Director of Cemagref, the French Research Institute in Science and Technologies for Environment and Agriculture, concentrated on the role of global agricultural monitoring as a way of achieving food security and market transparency.

In this context he focused specifically on the recently developed GEO-GLAM initiative, a project focused on Global Agricultural Monitoring, carried out under the auspices of the Group on Earth Observation (GEO).

Developed within the G20, under the French presidency, GEO-GLAM's goals were to reinforce international co-operation and to disseminate data

and products to provide better information and forecasting. This would be based on the use of satellite earth observation data, in situ observation, and meteorological and climate data. The objective was to create a network, at first regional but then worldwide, to help provide improved agricultural production forecasts.

An action plan had already been established for GEO-GLAM, focusing on three actions:

1. strengthening national capacities for agricultural monitoring;
2. harmonising, connecting and strengthening existing global and regional agricultural monitoring systems; and
3. developing an operational global agricultural monitoring system of systems.



Pierrick Givone,
Scientific Director of
Cemagref, the French
Research Institute in
Science and Technolo-
gies for Environment
and Agriculture

The deliverables from GEO-GLAM would comprise six main benefits:

1. cultivated areas, crop-type distribution and crop yield forecasts, including early estimates, regular updates and quality assessments;
2. meteorological data and forecasts;
3. the dissemination of data to all stakeholders;

4. strengthened national agricultural monitoring capabilities;
5. a global earth observation system for agricultural monitoring; and
6. improved monitoring methods.

The driving idea behind the project was that everyone should have access to homogeneous information in order to contribute, if not to market stability in itself, at least to a better knowledge of the parameters of the market. The concern at present was that nobody really knew what stocks existed, particularly when taking into account the need to know both publicly-held and privately-held stocks. Everyone, Mr Givone continued, had only a limited piece of knowledge, and this contributed to the development of price volatility.

The first technical meeting to establish the GEO-GLAM initiative had taken place just the previous week in Geneva, attended by 13 of the G20 nations, plus key international organisations including GEO, FAO, the World Meteorological Organisation and the Committee on Earth Observation Satellites.

The world had a need for pooled, homogeneous information, Mr Givone concluded. If this information could be provided, and be technologically and scientifically validated, it would be an important factor in helping to limit food price volatility.

Thanking Mr Givone for his contribution, John Bensted-Smith remarked that there was no doubt that the provision of improved and timely information, both physical and financial, was a central pillar in improving resource allocation, which in turn contributed to food security.

The next speaker, **Maive Rute**, Director for Biotechnologies, Agriculture and Food at DG Research and Innovation within the European Commission, focused on the 'how?' part of the session title. *How* could science and technology contribute to food security in a way which was economically sound, socially acceptable and environmentally sustainable?

At the recent G20 meeting in Montpellier, there had been strong agreement that agricultural research and innovation could already add a lot to the goal of food security for all. A great deal of knowledge was already available. But there had also been agree-

ment that 'business as usual' was not an option.

From the perspective of DG Research and Innovation, said Ms Rute, there were three areas to highlight when it came to answering the 'how?' question:



Maive Rute,
Director for
Biotechnologies,
Agriculture and Food
at DG Research and
Innovation,
European
Commission

- **The promoting and dissemination of innovation.** The problem was that much knowledge existed, but it was not managed as well as it might be and made accessible to those who needed it. There was therefore a clear push within DG Research and Innovation to link research and innovation better. More innovation-driven projects were being funded in the annual call for proposals, and there were more projects involving small or medium size businesses, as SME involvement helped facilitate the take-up of research results. The new 'Innovation Partnerships', currently being piloted, were a potential vehicle to help pool resources and ensure that farmers' voices were heard on the research side. Ways were also being explored to improve links with the FAO, to help make the research carried out by European institutes more available than in the past.
- **The encouragement of improved co-ordination in research.** One key tool here was the use of ERA (European Research Area)-NETS, which enabled researchers from European member states to come together, exchange information and pool resources. The Commission was also helping to set up Joint Programming Initiatives – another effective way of helping to co-ordinate research, as Marion Guillou of INRA had

already described. In addition, a global-scale initiative was being tested, along the lines of the ERA-NETs in Europe, bringing together worldwide research agencies.

- **Funding collaborative research and taking a policy lead.** In this regard, the EC's proposal for the next Framework Programme included a doubling, to 4.5 billion euros, of the funding for research into food security, sustainable agriculture and bio-economy. This was a major increase which sent out an important signal for other funding bodies and underlined the fact that food security was at the top of Europe's agenda. The Commission also funded projects working towards achieving the Millennium Development Goals, and in this context had recently approved an 8 million euro project on global food security and nutrition.

In the area of policy initiatives, it could not be overlooked that the world's growing population had other needs as well as food – all of which had to be met within the planetary boundaries described earlier by Phil Bloomer of Oxfam. The Commission was therefore focusing on a bioeconomy strategy, looking at the competing needs for food, fuel, fibre and feed and how to reconcile these needs. This new strategy was due to be published in a few months time.

The final speaker of the session, **David Wilkinson**, the JRC's Director of Scientific Policy and Stakeholder Relations, said science had two key roles in helping to achieve food security:

1. Tackling the underlying causes of food insecurity.
2. Providing immediate assistance to solve crises as they occurred.

Focusing his presentation on the second of these roles, Dr Wilkinson said that in order to provide the most effective assistance to help solve crises, it was vital to have reliable crop predictions that were accepted by all stakeholders.

The JRC had extensive experience in this, having first become involved in crop prediction some 20 years ago, at the request of DG Agriculture. As one of the primary cereals producers and a major player both as exporter and importer, the EU needed time-

ly yield forecasts to co-ordinate Member States' actions and to make appropriate decisions.



David Wilkinson,
Director of Scientific
Policy and
Stakeholder Relations,
Joint Research Centre

This need for independent, reliable forecast data was now becoming more important than ever, as reduced stocks and climate change appeared to be making markets more nervous and unstable than before. This nervousness was especially high a few months before the main harvests.

In the drive to meet this need for accurate forecast data, Dr Wilkinson highlighted four ongoing initiatives in which the JRC was closely involved.

- **MARS** – At the heart of the JRC's and Europe's activities in this area was the MARS (Monitoring Agriculture by Remote Sensing) system. Making use of satellite observation data, meteorological data, crop models and statistical modelling, MARS enabled accurate yield forecasting and a close to real-time early warning system. This data provided much more detailed information than the general trends produced by econometric models, enabling 'hot spots' of potential or actual crisis to be identified in a way not possible otherwise. While the JRC had been supplying this data to DG Agriculture for many years, the initiative was now being extended to cover key areas outside the EU as well. Recent examples included the Horn of Africa, Niger, and North Korea.
- **Global Agricultural Geo-Monitoring Initiative** – The JRC was also a key contributor to this initiative, being set up as part of the G20 Action Plan agreed in June 2011. As the meeting had just heard from Pierrick Givone, this was an important step forward,

to which the JRC was contributing by sharing information and co-chairing a network of 15 global and national crop monitoring systems.

- **GLOBCAST** – A new project being established by the JRC, GLOBCAST was a feasibility study to extend the MARS concept globally, monitoring the impact of weather in the main grain producing areas, producing short-term forecasts and feeding into the GEO-GLAM initiative.
- **IPC (Integrated Food Security Phase Classification) system** – Even the best information had no value if it was not appropriately linked to decision-making, said Dr Wilkinson. There was a need for information that was recognised as unbiased and reliable, and which was accepted by a wide range of operators. In cases of crisis, multiple information sources and contradictory messages generated invalid decisions and/or delays. In this regard, the IPC system offered an effective model. Developed in Somalia in 2004, it was implemented by a broad partnership including key global organisations such as the FAO and the WFP, donor countries and NGOs such as CARE and Oxfam. The IPC provided a common language and severity scale to classify and map food insecurity situations, and information to support decision-making.

It was obvious, concluded Dr Wilkinson, that the EU had a key role and responsibility in addressing the issue of global food security. Supported by the JRC, the Commission was ready to contribute to this challenge.

Bringing the session to a close, John Bensted-Smith reiterated that timely and accurate information made a major difference to policy-makers in helping them address the challenge of food security. The clear conclusion was that reinforcing global efforts in research, development and innovation was indispensable to any sensible strategy on food security.





Concluding session

Concluding session

The first speaker of the concluding session was **José Manuel Silva Rodriguez**, Director-General for Agriculture and Rural Development in the European Commission.



José Manuel Silva Rodriguez,
Director-General for
Agriculture and Rural
Development,
European
Commission

Mr Silva said the EU's Common Agricultural Policy would need to adjust in order to face up to the food security challenges the conference had been discussing. Before discussing the role of the EU and the CAP, however, he wanted to make a few observations about present issues facing global agriculture.

- **Price volatility:** This was major issue. Research carried out by DG Agriculture showed a number of factors. Among these, the level of agricultural prices was higher than their historical trend, and this could be expected to continue. Prices in September were fairly stable, although they were 231 percentage points above the same time last year. And volatility was at its highest level for three decades. Volatility and high prices in themselves were not a problem. The problem came with excessive volatility, which made it impossible to plan for the future.
- **Productivity:** Against the backdrop of

macroeconomic slowdown, it was important to look after agriculture. But the priority needed to be not just wheat and rice, but also other products where demand was likely to outstrip supply. At the same time, all aspects of productivity needed to be considered. It was not just a question of boosting yields. The key was to produce more with less in a sustainable fashion.

Technology and innovation sprang to mind as solutions, Mr Silva said, and investment was needed in research and development. The solutions would require more than just better international co-ordination. In this light, the French G20 Presidency deserved praise for putting price volatility high on the agenda. The Action Plan recently agreed set out a clear strategy and sent very important signals. Europe was fully committed to the Plan's implementation and follow-up.

Turning specifically to the role of Europe, Mr Silva said the EU was strongly aware of its responsibilities in the effort to improve agricultural production by 2050. With this aim in mind, it was intending to overhaul the CAP in order to favour sustainable food production, rationalise risk and crisis management and introduce sustainable agriculture measures. These changes would be announced in coming weeks.

In addition, the EU was active in a number of other ways:

- **Agricultural research and development** – The EU was heavily involved in this, with funds for agricultural research more than doubled to 4.5 billion euros in the proposal for the next multi-annual period (2014 – 2020).
- The EU recognised the enormous produc-

tion potential of developing countries. Investment needed to be focused on diverse areas of the world not traditionally covered by investment, and the EU supported developing countries' efforts to help their producers strengthen their position in the food chain.

- In addition, the EU would be making proposals to improve the efficacy and transparency of **financial markets**. It was also important to move further in steps to eradicate export restrictions. Some progress had been made here, but not yet enough.

Finally, the aim of reducing volatility did not mean that producers should have fixed revenues. A certain amount of adjustment via the market was natural. The need was to reduce the level of volatility, and this meant that certain levels of support were needed to enable sustainable agriculture. Looking to the future, Mr Silva sounded an optimistic note. Taken together, the proposals from the European Commission and the G20 agreement provided a very good framework for research and agriculture to progress together, he said.



Sir John Beddington,
Chief Scientific
Adviser to the
UK Government

There was hope for the world, was the strong opening message from **Sir John Beddington**, Chief Scientific Adviser to the UK Government. For the first time in human history, the world was not looking at exponential population growth. Population growth would level off around the middle of this century, giving us the opportunity to live within our planetary boundaries.

This was not to say there were no problems facing

the world – problems that were a ‘disgrace’ to humanity, such as the approximately 1 billion people living in hunger and the similar number without access to clean water. Africa was facing a doubling of its population, and a map created by the World Food Programme and the UK Meteorological Office showed food insecurity, exacerbated by the impact of climate change, affecting large numbers of people, in particular in Asia and Africa.

As he had noted on a previous occasion, Sir John said, the world faced a ‘perfect storm’, in which the issues of food, water, energy and climate change all interacted. As had been set out in a recent report by the UK Government Office for Science, this presented the world with five main challenges:

1. balancing future demand and supply sustainably;
2. addressing the threat of future volatility in the food system;
3. ending hunger;
4. meeting the challenges of a low emissions world; and
5. maintaining biodiversity and ecosystem services while feeding the world.

While time did not permit a discussion of all five points, one thing was clear: ‘Our food system is failing.’ To combat this, Sir John highlighted the need for action in three areas:

1. Production and sustainability. At present, agriculture consumed 70% of total global water withdrawals. Around a quarter of vegetated land on earth had suffered human-induced soil degradation, and the way agriculture was practised contributed directly to 10-12% of greenhouse gas emissions. With another 2 billion people to be fed by 2050, and no more land available, the world had to focus on ‘sustainable intensification’.

2. Market information and transparency. The issue of market information, transparency and volatility needed to be addressed. Prices were going to keep rising, with climate change exacerbating the problem. While increasing prices might benefit some farmers, they also affected the poorest people and put more people into poverty. Strong global governance was also indispensable.

3. Climate change. Above all, the area where the world had to seize its chance – and where the next

few months would be critical – was climate change. Copenhagen and Cancun had been successes in some ways, but emissions were still rising and there was still no legally binding agreement on keeping the increase in global temperatures below 2°C. Meanwhile, the world faced two problems. First, major changes to the climate would put agriculture under serious pressure. Second, the demand from an increasing population would cause increased greenhouse gas emissions from agriculture. Without innovation to generate ‘smart solutions’, there would be massive increases in GHG emissions from agriculture.

Examples of possible ‘smart solutions’ included the recent use of Fertiliser Deep Placement (FDP) super-granules in Bangladesh, ‘climate smart’ nitrogen fixation by symbiotic bacteria, or the development of plants with roots capable of carbon sequestration.

‘Climate smart’ agriculture, where agriculture was seen not as the problem but as part of the solution, was a ‘must’. The forthcoming COP-17 conference in Durban was a unique opportunity to put agriculture firmly on the global climate change agenda. The outcomes needed to include international support for sustainable agriculture programmes which adapt to and mitigate climate change, and the adoption of targets for agriculture in national climate change action plans.

The world had the opportunity to live sustainably, Sir John concluded, but only if it recognised the intimate relationship between food, water, energy and climate change.

In his concluding remarks, JRC Director-General Dominique Rostori highlighted three key points that had emerged from the day’s discussions:

- 1. The urgent necessity to invest in science and innovation.** The conference had been presented with strong evidence of this necessity. No single country or organisation was able to solve the issues alone. Infrastructures needed to be shared and networks of laboratories and databases needed to be developed. The role of the EU and the EC was not just to propose and implement policies, but to be a catalyst for the science that was needed. Not only was more scientific knowledge required, but also the capability to turn

science into new products and new markets. It was important to make sure the quality of the environment was fit to meet the needs of future generations, and the world needed to look more closely at ways of forecasting and preventing disaster.

- 2. The indispensable need for a more strategic and inter-disciplinary approach.** This meant more partnerships linking the fields of agriculture, environment, development, energy and science. Farmers would have a role and a responsibility. The world needed to achieve more with less, and the path towards sustainable intensification would involve placing the farmer inside the innovation chain, with the capacity to invest and to reduce direct pressure on the land and the seas. It would also be essential to provide smallholders in developing countries with access to land, water, energy and markets.
- 3. The world’s requirement for a new global governance for food security.** Stronger governance was needed in order to improve the links between producers, traders, governments and all other stakeholders. The initiatives of the G20 were good, but they were only a start. Stronger co-operation between the FAO and the World Bank would be an important element, together with the development of public-private partnerships. Global measures to prevent market volatility were needed as well. The conference had heard a proposal to create a new multilateral organisation, such as an international grain reserve bank, and in some developing regions there was a need for radical and fast intervention. In this context, Mr Rostori said, the Commission was working on an Action Plan which could be presented by the Development Commissioner, Andris Piebalgs, at a meeting due to be held in Addis Ababa in mid-2012.

The conference, concluded Mr Rostori, had been one step on a long journey towards ensuring food for all. He assured participants that the activities of the JRC and the EC would be focused on closely reflecting the conclusions of the debate and on identifying as carefully as possible the critical areas where Europe could make its most significant contribution to food security in the future.

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Abstract

This report summarises the proceedings of the JRC-organised conference ‘Scientific Support for Food Security and Global Governance’ that took place on the 28th of September 2011.



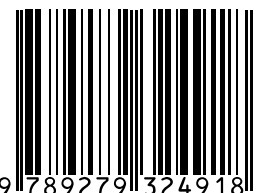
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