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From The Future of Food and Farming (2011)

The global food system will experience an unprecedented confluence of pressures over the next 40 years. On the demand side, global population size will increase from nearly seven billion today to eight billion by 2030, and probably to over nine billion by 2050; many people are likely to be wealthier, creating demand for a more varied, high-quality diet requiring additional resources to produce. On the production side, competition for land, water and energy will intensify, while the effects of climate change will become increasingly apparent. The need to reduce greenhouse gas emissions and adapt to a changing climate will become imperative. Over this period globalisation will continue, exposing the food system to novel economic and political pressures.

Any one of these pressures ('drivers of change') would present substantial challenges to food security; together they constitute a major threat that requires a strategic reappraisal of how the world is fed. Overall, the Project (see reference) has identified and analysed five key challenges for the future.

Addressing these in a pragmatic way that promotes resilience to shocks and future uncertainties will be vital if major stresses to the food system are to be anticipated and managed.

The five challenges are:

- A. Balancing future demand and supply sustainably – to ensure that food supplies are affordable.**
- B. Ensuring that there is adequate stability in food supplies – and protecting the most vulnerable from the volatility that does occur.**
- C. Achieving global access to food and ending hunger. This recognises that producing enough food in the world so that everyone can potentially be fed is not the same thing as ensuring food security for all.**
- D. Managing the contribution of the food system to the mitigation of climate change.**
- E. Maintaining biodiversity and ecosystem services while feeding the world.**

These last two challenges recognise that food production already dominates much of the global land surface and water bodies, and has a major impact on all the Earth's environmental systems. In recognising the need for urgent action to address these future challenges, policy-makers should not lose sight of major failings in the food system that exist today. Although there has been marked volatility in food prices over the last two years, the food system continues to provide plentiful and affordable food for the majority of the world's population. Yet it is failing in two major ways which demand decisive action:

Hunger remains widespread.

925 million people experience hunger: they lack access to sufficient of the major macronutrients (carbohydrates, fats and protein). Perhaps another billion are thought to suffer from 'hidden hunger', in which important micronutrients (such as vitamins and minerals) are missing from their diet, with consequent risks of physical and mental impairment. In contrast, a billion people are substantially over-consuming, spawning a new public health epidemic involving chronic conditions such as type 2 diabetes and cardiovascular disease. Much of the responsibility for these three billion people having suboptimal diets lies within the global food system.

Many systems of food production are unsustainable.

Without change, the global food system will continue to degrade the environment and compromise the world's capacity to produce food in the future, as well as contributing to climate change and the destruction of biodiversity. There are widespread problems with soil loss due to erosion, loss of soil

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In view of the current failings in the food system and the considerable challenges ahead, this Report (see reference) argues for decisive action that needs to take place now.

The response of the many different actors involved will affect the quality of life of everyone now living, and will have major repercussions for future generations. Much can be achieved immediately with current technologies and knowledge given sufficient will and investment. But coping with future challenges will require more radical changes to the food system and investment in research to provide new solutions to novel problems

This Report (The future of food and farming, 2011) looks across all of these options to draw out priorities for policy-makers

The analysis of the Project has demonstrated the need for policy-makers to take a much broader perspective than hitherto when making the choices before them – they need to consider the global food system from production to plate.

The food system is not a single designed entity, but rather a partially self-organised collection of interacting parts. For example, the food systems of different countries are now linked at all levels, from trade in raw materials through to processed products. Besides on-farm production, capture fisheries and aquaculture are also important, in terms of both nutrition and providing livelihoods, especially for the poor – about a billion people rely on fish as their main source of animal protein. Many vulnerable communities obtain a significant amount of food from the wild ('wild foods'), which increases resilience to food shocks.

Most of the economic value of food, particularly in high-income countries, is added beyond the farm gate in food processing and in retail, which together constitute a significant fraction of world economic activity. At the end of the food chain, the consumer exerts choices and preferences that have a profound influence on food production and supply, while companies in the food system have great political and societal influence and can shape consumer preferences. All of the above imply the need to give careful consideration to the complex ramifications of possible future developments and policy changes in the global food system. Policy-makers also need to recognise food as a unique class of commodity and adopt a broad view of food that goes far beyond narrow perspectives of nutrition, economics and food security.

Food is essential for survival and for mental and physical development – nutritional deficiencies during pregnancy and in early growth (especially the first two years) can have lifelong effects. For the very poor, obtaining a minimum amount of calories becomes a dominant survival activity. However, issues of culture, status and religion also strongly affect both food production and demand, and hence shape the basic economics of the food system. Also, food production, cooking and sharing are major social and recreational activities for many in middle- and high-income countries.

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Other emerging themes, synergies, dichotomies....

Integration of horizontal networks in value chains – what are the new forms of aggregation? Can systems move towards synergic and holistic approaches? Are we moving from chains and networks towards broader definitions of foodsheds?

As seen above, there are several degradation processes threatening Earth's capacity to replace resources.... Is the agrifood industry slightly recognizing this and moving towards looking at landscape and watershed impacts rather than farm level? What will the implications for local development be in the future?

Is the north/south a real dichotomy when talking about smallholders? What will happen in the next decade to the voice of farmers? Will multiple organizations support the emergence of a less polarized vision of social groups in agriculture?

Where is the value generated? Who establish the prices at each tier of the supply chain? While most commodities' prices are still linked to the BRENT and to the Chicago Mercantile Exchange we will see the emergence of COST+ pilots to link prices to the production cost. Will this help reassign the values along the supply chain?

Recommended resources:

Foresight. The Future of Food and Farming (2011), Final Project Report.

The Government Office for Science, London