



Report on Wilton Park Conference 927

FEEDING THE WORLD: ARE NEW GLOBAL AGRICULTURAL POLICIES NEEDED?

Monday 24 – Wednesday 26 November 2008

Summary

1. If the world is to have enough food to feed an estimated population of 8-9 billion in 20-30 years time, significant changes will be needed and hard policy choices will have to be made. Productivity needs to be dramatically increased, but climate change and the increased scarcity of resources, including water, land, and phosphates, and the variability of fuel and other input costs will present challenges to the collective ability to produce additional food. This Wilton Park conference assessed the key challenges, looking beyond the recent food price spikes, and identified a number of national and international policy priorities. While the conference did not seek consensus, several common themes emerged.

2. With up to 3 billion more people to feed by 2050, and increased protein in many diets, it is estimated that current global food production must be increased by 80-100%. There are real questions about how this can be accomplished given the long-term impact of climate change which could potentially threaten production in key parts of the world. Whilst the price spikes in the first half of 2008 may be a blip or cyclical, 'business as usual' in terms of production is not the answer. The widespread use of export bans during the 2008 food crisis will have a long-term impact on the willingness of food importing countries to depend on trade, while many countries are likely to increase their efforts to become more 'self-sufficient' or buy in production capacity from other countries, posing significant potential downsides for populations least able to increase production.

3. Production increases will be constrained by the availability of water and land for food, competing now with the increase in growing crops for biofuels and the need to avoid deforestation. To increase productivity there are strong calls for the public and private sectors to work together in both developed and developing countries to undertake more research and development in plant breeding, seed-coating and disease resistance (for instance against wheat rust). Some increase in the use of genetically modified (GM) crops is probably necessary to increase production and productivity. Technical developments such as precision farming and reducing post-harvest loss will also be critical. In addition, in many developing countries improved infrastructure (roads and finance) and access to markets would help farmers to increase production. The importance of agricultural extension work needs to be reinstated enabling farmers in developing countries - Sub-Saharan Africa in particular - to use the many simple but highly effective technologies already available.

4. Water will need to be better utilized for agricultural purposes; rain water harvested, stored, and ultimately priced. Watershed management will also become vital. The feasibility of merging traditional production methods with GM and organic crops could also be explored.

5. Continuing and perhaps even increased volatility of prices for agricultural commodities can be expected, given weather-related variations in yields and the variability of the oil price, to which wheat and corn in particular have become linked. The increased development of second generation biofuels for the transport sector may further intensify competition for land use and thus negatively impact food production. For this reason deforestation for the development of biofuels should be avoided.

6. Agriculture policies of national governments and the international community need to be consistent and long-term and enable robust and dependable markets to develop. Policies need to recognise the reality of farming – that it is private sector driven with small family farms and smallholdings remaining the backbone of global food production. Ongoing political support for agricultural production is critical at the national and international level. A conclusion to the World Trade Organisation Doha

negotiations is needed as it would help reduce agricultural protectionism which distorts markets and undermines investment in developing country agriculture. The issue of strategic reserves remains a matter of some debate: many participants recognised the importance of a strategic reserve for emergencies, but there is also suspicion concerning international reserves, and interest in developing a 'virtual reserve' fund.

Introduction

7. The dramatic spike in food prices in the first half of 2008 dominated newspaper headlines, with riots in a number of countries including Mexico, Egypt and Kenya where the price of food led to civil unrest. In Haiti, the Parliament dismissed the Prime Minister over the food crisis, blaming him for failing to respond adequately. There was global unrest, with murders, protests and 40 million more people pushed into poverty as they were unable to meet their basic needs for food. International organizations such as the United Nations and the World Bank were thrust into the limelight, as people looked to them to provide emergency relief to the countries most in need. This dramatic and sudden change in food prices led to many questions: how did no one predict this crisis, what should be done to fix the problem in the short-term, and how can the international community prevent crises like these in the future?

8. Unfortunately there are no simple answers to these questions. The food crisis was described by many as the "perfect storm". While acknowledging the long-term slowing of growth in agricultural yields and the increasing populations and changing diets in certain large developing countries, the more proximate causes of supply and demand imbalances included droughts and floods that led to crop failures and the use of food and feed crops for biofuels production. Protectionist policy responses such as export bans further exacerbated the crisis, and poor countries with weak transportation infrastructure and fragile market systems were particularly vulnerable to market volatility.

9. The World Bank estimates that the world population will grow to more than 8 billion people in 2030, meaning that the world will require about 50% more food than is currently being produced. This not only suggests the need for a greater output,

but also for a more diversified production. China is now consuming 55kg of meat per person per year, which is half to one third of what the EU and the US are consuming. By 2080, this is projected to rise to 80kg. Given the larger amount of land and inputs necessary to produce 1kg of meat versus 1kg of rice, this may seem unfeasible. However, it is important to also note that changing diets in China and India are not just about eating more meat; China's rise in food demand is mainly for vegetable oils, and India expects an increased poultry demand for religious reasons. Brazil already consumes 100kg of meat per person per year and this is expected to decrease. Perhaps surprisingly some of the biggest increases in food demand are likely to come from newly populated regions like Northern Africa.

10. However, population increase is only one factor of consumption. Price fluctuations also have social effects. If input prices rise, subsistence farmers can often no longer afford to produce, forcing them off the land and into the city to compete for other means of employment. These poor subsistence farmers - as well as the urban poor - are obviously most impacted by price fluctuations. Guaranteed access to food is essential for these vulnerable populations and it is up to policymakers to ensure their demands are met.

Overcoming constraints to food production

11. **Climate:** Climate change is already affecting agricultural production systems and will continue to do so. The effects will not be distributed evenly as some areas may gain by the changes and some are likely to lose significantly. Shifts in weather patterns mean that wet areas are likely to be continually wetter and dry areas continually drier. These patterns will lead to an increased frequency of floods and droughts of the kind that have devastated crop yields over the past several years. In Australia, for example, which is among the world's largest exporter of wheat, climate change has led to more bush fires, decreased availability of water, and significant droughts, all which severely impact crop yields. Droughts experienced by Australia over the past year have been recognised as one of the major contributors to the 2008 food price spike because of the ripple effect it created in global agriculture markets. The situation is only expected to get worse; in a report by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) it was predicted that extreme weather events, which used to occur in Australia every twenty

years, will begin to occur every other year by 2040. CSIRO estimates that droughts will occur twice as often and double the area they currently cover.

12. Poor populations will be among the most effected by climate change, as their economies are the most vulnerable and are unable to quickly respond to drastic changes or emergency situations. The International Institute for Sustainable Development (IISD) reports that yields from rain-fed agriculture could decrease by 50% by 2020, and in Bangladesh an increase of 4°C in temperature could reduce rice production by 30% and wheat production by 50%. The Intergovernmental Panel on Climate Change (IPCC) estimates that Sub-Saharan Africa drought affected areas could expand by 60-90 million hectares, and that the effects of climate change could lead to an additional 170 million undernourished people by 2080. These numbers paint a very bleak picture if action is not taken now.

13. Agriculture also accounts for 30% of all greenhouse gas emissions, and pollutants from fertilizer run-offs threaten the integrity of oceans and rivers. If policies to reduce greenhouse gas emissions are going to be effective, the question of emissions from agriculture will have to be addressed and for this reason, it is generally agreed that the revised Kyoto framework will probably have to include agriculture in any agreement. Climate change and policies for mitigation and adaptation will each have direct effects on the structural distribution of food production and the availability and affordability of food.

14. **Water:** Water is critical to agricultural production. However, 97.5% of the Earth's water is saltwater. Of the 2.5% available as freshwater, almost 70% is locked in glaciers and the rest is groundwater, lakes and rivers. Thus only a small percentage of the Earth's water is readily available for human consumption and agricultural production. Distributed among the world's population, there is approximately 1,400 cubic meters of water available per person per year, however currently the average westerner consumes around 2,500 cubic meters per year. As populations continue to grow and living standards increase, there is not going to be enough fresh water to sustain demand over the long term. India and China will both play significant roles, as they have emerging economies with exploding populations. India's rivers are already beginning to run dry, forcing people to procure water from

underground sources, a method that cannot expect to be sustainable over the long term. In China, availability of water for agriculture production is the major constraint on achieving domestic food security. This problem is not only limited to developing countries; in the US drier desert regions struggle for rights and access to water.

15. One important step that could be taken is to allocate water more carefully. It was agreed that the only way to manage water sensibly is by imposing market disciplines. Water, however, is a highly contentious issue politically because it can be argued that proper access to water is a basic human right. Some believe that regionally managed water systems could be a solution, especially in areas like the Nile Basin, and could be managed by countries with the best storage facilities with the least evaporation potential. However, this solution could become problematic if conflicts arise within the region. Water could become a strategic foreign policy tool that one country could use to exert its power against another. Analysing the virtual trade in water – defined as measuring the volume of water used to produce a traded agricultural commodity – might be one method for working towards more efficient and equitable allocations of this scarce resource.

16. **Energy:** The relationship between energy and agriculture has long been intertwined; agricultural production has become a heavy user of fossil fuels through the use of fertilizers, and as tractor fuel and heating. The other side of the equation is agricultural production of energy. The emergence of a significant biofuels sector in recent years has impacted this relationship, as food and feed production are now direct competitors with biofuels for the use of land. Although the estimates of how large a role biofuels played in the recent rise in food prices varies significantly - with estimates ranging anywhere from 3% to 80% - it is undeniable that biofuels consumption mandates and government subsidies encouraged the diversion of land previously used for food production into the production of biofuels. The rationale for biofuels production is twofold. It is claimed to be better for the environment (less carbon emissions), and it is a substitute for imported fossil fuels which plays a direct role in making a country more energy independent. However, the environmental benefits of first generation biofuels have come into serious question. Recent scientific reports have shown that calculations which take into account the indirect land use changes associated with biofuels cultivation show that there is very often a

negative effect on carbon emissions. When rainforests are cut down in order to plant more corn, sugarcane or palm in areas that would have otherwise remained fallow or if permanent grasslands (which hold a lot of carbon) are suddenly taken back into production, the emissions cuts are negated by the carbon that is being released at the onset of the planting process. The climate change rationale for biofuels is thus thrown into question and consequently so too are the government subsidies and consumption mandates that have been adopted in the US and EU.

17. Food miles is a more recent energy issue being discussed. It is important to note that the food miles concept only accounts for the transport side of an agricultural product, not the production side. The question is how harmful is it to ship agricultural commodities around the world? The answer: it depends. It is counterintuitive to ship agricultural commodities produced with a low carbon footprint when the shipping emissions outweigh the carbon reductions. It must be realized that buying local products does not necessarily mean savings on carbon emissions. Products grown in dry areas that require excessive water and fertilizers are more harmful for the environment than imported products grown in an indigenous environment. The argument for buying local is often made without fully taking these broader issues into consideration, and it must be more carefully examined by its defenders.

18. **Environment:** In addition to the environmental issues relating to water, climate change, and the effects of biofuels on land use, biodiversity and sustainability are also important aspects of agricultural production.

19. The relationship between food security and biodiversity is frequently raised in discussions about new land being converted into production or intensification of existing agricultural land. The question around this issue often revolves around how exactly farmers are treating land and the species that live on it, and how they can combine increased production with environmental sustainability. In the EU and the US, where industrial agriculture is the dominant method of production, the integrity of soils and water quality has been compromised by intensive farming and heavy fertilizer use. In order to avoid continued degradation to the land, the EU and the US have developed new technologies and best practices that can benefit animals, such

as birds and insects, and do not significantly diminish yields. However, these best practices have not always been adopted into laws or regulations. Moreover, because they often require substantial financial investments, or at least it is perceived that they will require significant investments and controls, it becomes difficult to regulate them and/or have farmers adopt them. This risk makes it even more difficult to implement these technologies in less developed countries. In this regard, the use of pesticides is an extremely sensitive issue. Their effects on the environment in terms of biodiversity and water are often varied and not always easy to measure or control.

20. If the global food production system is to become more sustainable environmental considerations will increasingly need to be taken into account in long term policy decisions about agriculture. Sustainable agriculture will be a challenge to achieve not only for products grown and consumed domestically, but also for exports. The US and EU both implement significant controls and standards, for example through animal welfare or labelling, which reverberate throughout the food production chain with both positive (benefitting the environment and sustainable production) and negative (benefitting unsustainable production and trade distorting) consequences. The notion that domestic producers are subject to greater controls than the producers in far off countries who export to those countries, is creating pressure for border regulation on the basis of production methods of other countries.

21. **Food Safety:** Food safety and food security are greatly intertwined. Often the amount of food produced is not the problem, but whether or not it is 'safe' to eat, depending on a broad range of standards. This becomes apparent when large shipments of food are withheld because they are assessed to be 'unsafe'; or food which is not safe for one country is shipped to another country with less stringent regulations. The right for food and the right for healthy and 'safe' food can therefore be controversial arguments. In a world of global trade, standards are necessary in order to ensure a safe food chain, but there is a difficult balance to be found between varying country standards. Typically the countries or group of countries with the largest market have the advantage in setting these standards.

22. Many have cited that over time, standards have become stricter with more rigorous processes, and increasingly complex compliance procedures. This does not necessarily benefit poorer countries, or smaller companies, which cannot afford to meet these costly compliance measures. In the area of food safety and standards, many are calling for science to be brought back into the debates about food production and not just let politically powerful countries set the standards for the rest of the world.

23. **Infrastructure:** Significant proportions of crops can be lost between production and point of sale in developing countries through poor storage and other infrastructure problems. Protecting against crop loss is demonstrably one of the more significant obstacles in ensuring food security for these countries. Having good market information systems, appropriate storage facilities, transportation systems, irrigation and fertilisation are critically important factors for poor and small-scale farmers. Rural investments are necessary, and micro-credit can be one of the solutions which could help subsistence farmers grow out of poverty. Such basic forms of development and investment, for example in some African countries, can have a dramatic impact on ensuring that food produced is not wasted but can get to market.

24. **Research and Development:** Investments in scientific research for increasing yields or adapting seeds to face changing climatic circumstances has been reducing but should be a high priority. There are currently significant differences in approaches to such scientific investments. China is investing more in scientific research and agriculture, specifically in rural development, whilst the EU and the US are decreasing government investments and anticipating that the private sector will fill this gap.

Policy Responses at the National and International Level

25. **Trade:** It is unrealistic for every country to be a self-sufficient food producer. There will always be countries that need to rely on imports to provide enough food for their population. Agricultural trade can provide resilience for countries against volatile food markets and fluctuations in agricultural production. However, agricultural trade will only play a positive role in ensuring food security when

countries abide by globally-set trade policies and build resilient agricultural markets. The experience of the 2008 food price spike demonstrated that imposing certain trade restrictions (such as export bans) during a shortage only exacerbates market volatility by further decreasing global supplies. This was evidenced when large commodity exporting countries such as Russia and Ukraine imposed export bans on wheat in order to ensure an adequate supply of crops domestically. This predominately impacted poor countries, especially poor net food importing countries in sub-Saharan Africa, who are unable to quickly respond to extreme market fluctuations.

26. There are currently no rules on export restrictions included in the current Doha Round of trade negotiations, and their inclusion would be unwarranted at this stage. However, restrictions on export tariffs and bans should be addressed in future multilateral negotiations. Once such disciplines are agreed within the framework of the World Trade Organisation (WTO) negotiations, they could be employed to exert legitimate political and legal pressure on countries who threaten to shut off supply during crisis times. In this way, the WTO would gain an additional tool to ensure supply stability and predictability in times of commodity price turbulence and to counter protectionist reflexes of leaders who are eager to satisfy their domestic constituents by means of short sighted export restrictions. The challenge for global leaders is to find the proper balance between satisfying domestic and international interests in order to achieve collective benefits for all.

27. **Technology:** Agriculture needs to simultaneously increase production while facing intensifying constraints including: water scarcity issues; competing demands for food, fuel and feed; pests; climate change effects such as droughts and floods that devastate crop yields; and decreased labour forces due to rural to urban migration. Some believe that during these turbulent times for agriculture, technology can play a significant role in overcoming these challenges. Governments and the private sector have been investing in seeds that are resistant to drought, require less fertilizer and water, and are immune to crop diseases. One of the successes in technological innovation has been rice. By adding nutritional value such as vitamins or beta keratin to the seeds, many South East Asian countries have been able to benefit from developments in seed technology. Furthermore, China introduced

Genetically-modified (GM) cotton only four years ago, and the new seeds already account for 66% of Chinese cotton production. However, the reason GM crops have worked so well in countries like China is because it was followed by complementary domestic policies and increased investments for research and development. Technology needs to be applied in a wider policy framework ensuring that farmers can operate in a free market for acquiring the technology, making sure technology is adapted to cultural and economical specifics of the region or country.

28. One critical problem with the use of GM technology is the significant Transatlantic rift on the issue. The US has been using GM crops for decades, whilst the EU bans the use and import of GM crops. This US/EU divide has had spill-over effects to other countries, specifically those with preferential trade agreements or close trade relations with either the US or the EU. Although these technologies could be helpful for poor countries to increase production African and Caribbean countries, for example, that have a trade agreement with the EU have not developed GM technology as they do not see the point of investing in a product that the EU would not accept.

29. Technology developments in GM however, should not be seen as a panacea for guaranteeing food security: hunger is first and foremost the result of poverty, and technology cannot prevent government corruption, unbalanced trade regimes, or poor infrastructure. Significant amounts of money are being invested in research development of seed varieties that are tolerant to drought, pests and other environmental stresses in anticipation of climate change. Even if such developments succeed there is no assurance that large amounts of small farmers in poor countries will be able to afford or adopt the technology and use it to produce the necessary levels of needed food.

30. **Investment:** Investment in agriculture has been decreasing drastically over the past few decades which has had a negative impact on global production levels. There is a widening gap that exists between the need for investment and commitments that have been made. The developing world receives 95% of its financing for research and development from the public sector, but it is projected that an additional \$1.9 billion is still needed. Investment is not just a priority for

developing countries, it is also vital for developed countries. Unfortunately, it has fallen off the agenda in the Western World. In 1970 there were twenty research centres in the UK; today only three remain. China can be used as a model when it comes to realising the importance of investing in domestic agriculture production, as they plan to allocate \$21 billion for research and development spending over the next twenty years. Because of the investments already made, they have drastically improved their post harvest technologies leading to fewer crop losses - which can contribute to as much as 10-15% in these yield losses. Investment in research and development will ensure that countries are adequately prepared to respond to future volatility in agricultural markets. However, there is an estimated 20 year time lag between investing in projects and their realisation. Political will and government commitment to agricultural investment is critical; it cannot be left solely to the private sector. In Africa, committed funding from foundations, Western governments and multilateral institutions is likely to be necessary to support increased and improved agricultural production.

31. **Capacity Building:** Capacity building in developing countries is a critical step that must be taken into account in order to ensure food security. It is essential for countries to integrate capacity building into the priorities of their domestic agriculture policies (such as building roads to connect farmers to the market), and providing for education - especially for women as they make up 10-12% of developing country farmers. Agricultural extension work should be strengthened and supported in developing countries. Education for the future generation of agriculture scientists is critical for developing countries in order to continue generating new technologies and ideas. The majority of agriculture scientists in developing countries are either about to retire or have done so already. In Indonesia there are currently no rice breeders under the age of 50 years old, and Myanmar only has two PhD certified soil researchers.

32. **Access to Credit:** Lack of access to credit for farmers in developing countries significantly impedes farmers from being able to afford inputs or cover operating costs. In Kenya, 50% of farmers earn less than a \$1 per day, and 80% of farmers cannot access credit. Both the private and public sectors in many countries have been providing micro and short-term loans, but the availability of these loans

need to be increased. This is going to be especially difficult given the financial crisis and the increasingly bleak global economic outlook.

33. **Standards and Regulations:** Compliance with food safety standards can be an insurmountable challenge for poor small-scale farmers to overcome. Although their commodities may meet regulations, attaining certification and adhering to the complex rules and regulations can be prohibitive for farmers to be able to sell their products on the global marketplace. Three-fourths of poor people in developing countries live in rural areas, so organising farmers in co-operatives and promoting collective action has been cited as an important step in strengthening these economies. Another option would be negotiating special trade agreements for developing countries so that market access to developed countries would be facilitated; the US's African Growth and Opportunity Act (AGOA) provides a good example of how these special agreements can be beneficial.

34. **Emergency Response:** Many countries still run large grain reserves which play a significant role in market intervention in emergency situations. However, global grain reserves overall have been decreasing and have reached their lowest levels in three decades due to international pressures to eliminate the costly maintenance of reserves. Furthermore, it was believed that increased integration of the global agricultural commodity market would decrease food price volatility and that agricultural technology would bring more predictability to harvests. This has not proven true as evidenced by the most recent price volatilities. In addition, climate change has exacerbated price volatility and will continue to do so. This raises the question of the necessity of maintaining national grain reserves. Organisations such as the International Food Policy Research Institute (IFPRI) and the World Bank have proposed the idea of a global grain reserve that would be comprised of both virtual and physical elements. However, some argue that the 'virtual grain' reserve funds would do nothing to deal with the volatility of the market and long term responses to food shocks. There are also hesitations about developing a physical global grain reserve, due to questions of governance and distribution mechanisms. Some believe it would be best to manage grain reserves at the regional level, but these could be problematic in regions of Africa that are vulnerable to conflict, or have poor infrastructure, or corrupt governments which would threaten the viability of

distributing food in an emergency. It is therefore necessary to evaluate the cost effectiveness of food stocks examining the operational costs versus the benefits they can actually provide.

Conclusions

35. The ideas for how to ensure food security are not new, they include: investments in roads, irrigation, communication, marketing infrastructure and basic services, risk management, coupled with progressive policies and rural development strategies, education and income diversification. It is not the ideas that are missing; rather the political will at global level and recognition that these issues must be addressed. In many countries development does not have to be small incremental steps either, as was the case in the rapid increase in cell phone usage in Africa which provided producers with access to market prices. Many poor countries must surpass additional stages of development in order to meet their most pressing needs. It is essential that agriculture moves up in the list of priorities for both domestic and international policymaking.

36. These arguments all demonstrate that the challenge is not maximising food production, but producing food under sustainable, equitable, environmental, and development-friendly conditions. Many agree that we have the answers of how to feed nine billion people, but the question still remains whether there is the political will to do so.

37. As proven by the 2008 food crisis, markets are unpredictable. The need for a robust food production system is important not only to ensure food security, but also for predictability for farmers, and to address environmental concerns. In order to achieve a robust food production system, a reliable trading regime is also necessary to reduce market volatility, ensure adequate investments in transportation infrastructure and combine them with rural development and technological advances. Policies must also be created that encourage developing countries to improve integration into the global marketplace. Although food prices have stabilised since the initial spike experienced in 2008, it does not mean food security is no longer a concern. We can be certain that oil and energy prices will rise again, and droughts and floods will continue to occur, so food security will once again be a top priority.

The global community cannot afford to avoid the important steps that must be taken now, in order to ensure an adequate supply of food in the future.

Courtney Phillips-Youman
Trees Robijns
February 2009

Wilton Park Reports are brief summaries of the main points and conclusions of a conference. The reports reflect rapporteurs' personal interpretations of the proceedings – as such they do not constitute any institutional policy of Wilton Park nor do they necessarily represent the views of rapporteurs.