

House of Lords EUC Report: Agriculture

Innovation in EU agriculture

Motion to Take Note

Moved by Lord Carter of Coles

That the Grand Committee do take note of the report of the European Union Committee on *Innovation in EU Agriculture* (19th Report, HL Paper 171).

Lord Carter of Coles: My Lords, I declare an interest as a farmer in receipt of payments under the common agricultural policy.

"Sometimes we talk about agriculture as something very old and traditional; it is not competitive and we can forget it. We really don't understand how strategic agriculture will be in the future ... We have left the era of surplus and come to the era of scarcity. We need to refocus what an Innovation Union is ... agriculture is at the centre of an Innovation Union and the new global challenge".

Those of your Lordships who have our *Innovation in EU Agriculture* report to hand will know that these are not my words but those of Mr Paolo de Castro MEP, the chair of the European Parliament's Agriculture Committee, who gave evidence to our inquiry. We quoted Mr de Castro's words at the start of our report because they encapsulated the key concerns of the committee, which I am sure are widely shared in the House.

The committee sees a future characterised by risk and uncertainty. The first risk is that of climate change, which threatens more extreme weather events; the second is that of demographic change, which means more mouths to feed and more complex diets to satisfy; third are the multiple uncertainties which surround the economic health of states in Europe and elsewhere. It is imperative that policy-makers in all areas have their eyes open to these risks. Our inquiry left us in no doubt that agricultural policy is no exception; indeed, we suggest that it is of central importance in meeting the challenges ahead.

Since our report was published, the European Commission has presented its proposals for the common agricultural policy from 2014. I shall say more about that and our assessment of it later on. For us, the key test is how they measure up against the need to orientate the CAP towards the thoroughgoing support of innovation in agriculture, because, if we do not increase productivity, we face some very serious challenges.

It is almost exactly a year since the Government Office for Science published the Foresight report on global food and farming futures. I was pleased to chair a seminar here in the Palace last February at which Sir John Beddington, the Government Chief Scientific Adviser, presented his findings to us. Against the background of projections that foresee an increase to 9 billion in the world's population by 2050, the Foresight report highlighted six important drivers of change. The first, obviously, is the global population increase; the second is the size and nature of per capita demand; the third is the governance of the food system; the fourth is climate change; the fifth is competition for key resources, as we can see in Africa now; and, the sixth, changes in consumers' behaviour.

The committee was able to take evidence from Professor Charles Godfray, one of the lead experts for the Foresight report, about the need to bring about what we call the "sustainable intensification" of agriculture. Your Lordships will no doubt recall that the Royal Society has supported this aim and explained it as the process of increasing agricultural yields without adverse environmental impact and without the cultivation of more land. We also supported it when we reported on adapting EU agriculture to climate change in March 2010. In his evidence to us, Professor Godfray said that, given the certainty of increasing demand for agricultural output, sustainable intensification was,

"almost a deduction rather than an argument",

and he described innovation as critical to sustainability.

As your Lordships know, CAP represents more than 40 per cent of the EU's budget expenditure. For the period 2007 to 2013, the agricultural policy budget is around €400 billion, which is split roughly 80:20 between direct payments under Pillar 1 and rural development measures under Pillar 2. There are, of course, powerful arguments that this level of EU expenditure is too high, but we must face the political reality that while the overall level may be reduced, the EU will continue to offer major financial support to European farmers over the next budgetary period from 2014.

Our report maps out ways in which future CAP expenditure should be directed towards promoting innovative agriculture, and, in particular, we call for money to be switched out of the CAP and into increased funding for agriculture and the EU's research programme. We argue that when payments are made under Pillar 1 of the CAP, this should be in return for the delivery of environmental benefits by the recipients. We also call for a higher share of CAP funding to be reallocated towards innovation under the rural development fund in Pillar 2. I should like to talk about each of these changes in turn.

First, regarding agricultural research, we were struck by information making global comparisons in agriculture. The OECD and the FAO co-operate in analysing agricultural markets over a 10-year horizon. In our report, we quote the OECD-FAO *Agricultural Outlook 2010-2019* and highlight projections for increased agricultural production over the next decade in different parts of the world. We found the numbers particularly compelling. In Brazil, the forecast increase is more than 40 per cent; in the United States, growth of between 15 and 20 per cent is forecast; yet the projected increase in Europe is a mere 4 per cent-hardly adequate to deal with the challenges that the continent faces.

A mix of factors underlies these comparisons and the starting points for farming in these different areas vary widely. However, anyone looking at these comparisons must surely share our view that the options for the future of EU agriculture would not include a steady-as-she-goes approach. It is just not good enough to carry on as we are. Again, I use a quotation from one of our witnesses-a most impressive witness- Mr Georg Häusler, Head of Cabinet of the Agriculture Commissioner. He spelt out the need for the European Union to look beyond its boundaries and respond to the fast-changing world we are in. He said:

"We in Europe are sitting here saying, 'Agriculture is the old economy', in what I call an innovation-hostile environment".

We have heard this before. He continued:

"A lot of political groups are telling us to farm as we did in the 19th century, selling our tractors and doing it in the old way because it will be good for the environment".

Yet, he continued:

"This is the strategic debate. Does Europe say that it can provide food for 500 million rich Europeans and import what we do not have, or does it play a role in feeding 9 billion people, including 1 billion people in China and India who are starting to eat meat?"

As a committee, we are in no doubt that Europe has the intellectual resources to kick-start EU agriculture into the 21st century. Witnesses described the UK and the EU as a powerhouse of creating knowledge. In this country, the Biotechnology and Biological Sciences Research Council, the BSRIC, spends around £470 million a year on research in biotechnology and biological sciences. In France, the National Institute for Agricultural Research, INRA, has an annual budget of just over €800 million-that is, about £670 million. In the EU's current framework agreement for the years 2007 to 2013, funding of some €2 billion is earmarked for food, agriculture and biotechnology. These are very large sums, but our report makes it clear that it is not enough.

As far as this country is concerned, we received compelling evidence that while the quality of basic research in biotechnology is high, much of the potential for its practical impact is being wasted because gaps occur in the research pipeline. We are clear that the Government urgently need to support efforts to translate scientific findings into agricultural practice much more consistently.

As regards the EU, we said in our July 2011 report that we found it unacceptable that the research budget allocated just under €2 billion to agricultural research over seven years while the agricultural policy budget was around €400 billion. The ratio is just not appropriate.

Your Lordships may know that, in the proposal which the European Commission has more recently published for the EU's financial framework from 2014, funding of €4.5 billion has been proposed for research and innovation on food security, the bioeconomy and sustainable agriculture. That is a step in the right direction, but we remain of the view that there needs to be a much more radical shift in funding away from simple farm support payments towards the promotion of agricultural innovation.

I turn to the Commission's proposal on what is called the European innovation partnership on productive and sustainable agriculture. Your Lordships will know that in 2010, the Commission presented its commitment to making the EU an innovation Union. European innovation partnerships are to be established under this commitment in a range of policy areas. They are intended to strengthen co-operation in innovative research, bringing together all the key stakeholders across the EU, from those conducting basic and applied research all the way through to the final users, such as farmers and businesses, and every step in between.

There will be those who understandably question the need for yet another pan-European initiative; we have a lot of those. Our inquiry shows, however, that there is still a considerable lack of co-ordination across Europe among those many excellent researchers whose efforts are key to the future success of our agricultural sector. We have seen the issue of unnecessary duplication. The problem-and the potential solution to it-was clearly described to us in evidence we received from the InCrops enterprise hub at the University of East

Anglia. We support the idea of a European innovation partnership which is characterised by effective action-based co-operation. It should not be an aspiration: we need to see the action attached to it and we urge the Government to play their part in bringing this about.

I turn to the CAP itself. Here, I think it makes sense if I link what we said in our July 2011 report with the views that we have now expressed on the reform proposals published by the European Commission in October last year. In their totality, the proposals seem to us to fall short of the commitment to radical change which we think is needed. We consider that the Commission has missed the opportunity to introduce the new approaches to EU agriculture policy which current-and, above all, future-circumstances call for. As I have said, we favour both a reduction in the overall budget and, within a smaller budget, a redistribution of funding away from direct payments towards environmental protection and sustainable innovation.

As for the Commission's proposals for the greening of Pillar 1 payments, we sympathise with its underlying objective, which is close to our report's recommendations that payments under Pillar 1 of the CAP should be made in return for delivery of public goods, responding to issues such as climate change, protecting biodiversity, and encouraging agricultural innovation. However, as we see it, it is problematic that the Commission's greening proposal is a one-size-fits-all approach because it lacks flexibility. Our view is that it would be far better if greening measures for direct payment were identified at the national or regional level and if they build on the cross-compliance requirements while recognising the substantial efforts already made by farmers.

There is understandable concern in the farming community that stepping up the environmental considerations attached to Pillar 1 could result in greater bureaucratic complexity; that is a great concern across Europe. Our answer to that rests on our conclusions about what are called agricultural knowledge transfer systems.

In drawing my remarks to an end, I want to mention those conclusions, particularly on knowledge transfer. Across the EU, there are many channels through which advice flows to farmers, and those include public sector agencies and commercial providers. Our report acknowledges the diversity of methods used to transfer knowledge-this most important thing-and recognises that no one single solution is applicable everywhere; knowledge transfers must be fine-tuned, as I have said, to national and regional practice.

Under the CAP, member states are required to operate a system for advising farmers on land and farm management-the so-called farm advisory system-for which some financing is available under Pillar 2. The FAS was set up at the time of the last CAP reform in order to offer advice, which must relate to cross-compliance but may go beyond that. However, we understand that in practice, in most member states, the FAS's role has not developed beyond providing just minimal levels of advice. The FAS cannot become the sole source of advice to farmers, but we are clear that the time has come to extend its role beyond cross-compliance. Given the importance of effective knowledge transfer, we consider that, under the CAP, member states should be required to ensure that comprehensive farm advice is available throughout their territories, geared towards meeting the new challenges of food security, climate change and the need for sustainable intensification.

We are pleased that the Commission's proposals from last October echo this call and foresee that the FAS should extend beyond cross-compliance, and we look to the Government to

work with the grain of this proposal. However, our report was particularly critical of the position in this country. We are concerned that the provision of farm advice in England has become fragmented and overly complex. We see the urgent need for the levy boards to play a central role in broadening and deepening the range of advice currently offered in England. In this context, we very much welcome the Government's recent announcement that, from January of this year, the new farming advice service in England will provide advice on competitiveness, nutrient management and climate change adaptation and mitigation, in addition to continuing to offer advice on cross-compliance. We also look forward to hearing in due course about the outcome of the integrated advice pilot project that the Government launched last year, which we regard as very important. The pilot shows that the Government are listening to us. We think that that is good and, if it shows that they are listening to the farmers, frankly, that is even better.

I offer your Lordships one final thought on this topic. Our report highlights that agriculture innovation is a complex business. It is complex and difficult because it requires interaction among scientists, the farming community, food processors, retailers, government and consumers. That requires systems to be put in place that promote communication among all those actors. When the EU level group on agricultural knowledge and innovation systems reports, it will be very important that member states give that group's conclusions the highest priority.

In conclusion, having spoken today on behalf of my committee, I pay particular tribute to the committee's members, whose engagement with the subject gave our inquiry both great energy and great effect. I also thank the committee's specialist advisers on the inquiry- Dr Julian Clark, of the University of Birmingham; and Dr Jonathan Wentworth, of the Parliamentary Office of Science and Technology-whose support was invaluable. In the months that have passed since the report was published, we have seen encouraging reflections of a number of our recommendations in proposals from the European Commission and in announcements made by the Government. However, we remain concerned that the changes now envisaged to the CAP and to the support given to agricultural innovation, in the lab and on the farm, fail to rise to the challenges that we see in the future. Of course, we support the steps being taken towards innovation in EU agriculture, but, frankly, those modest steps need to turn into determined strides if we are to reach the right destination. I beg to move.

The Earl of Caithness: My Lords, it is a pleasure to follow our chairman. In doing so, I declare my interests as a member of the EU Committee on agriculture that produced this report and as a trustee of a trust that owns agricultural land and receives payments from the EU in relation to its agricultural activities.

I also thank our chairman for the very comprehensive way in which he introduced this report. It is, as he said, a hugely complex subject, and I do not think that he could have produced such a good report without the help of our clerk and specialist adviser, whom I should like to thank, as well as those who gave us evidence. It was a fascinating subject on which to take part and a fascinating report to put together in a comprehensive framework.

I always think it is rather sad that Europe is increasingly becoming the granny of the world. We realise that as we get a little older we become a bit more granny-like and the rest of the world passes us by. The chairman, the noble Lord, Lord Carter of Coles, explained exactly what was happening in other countries with the growth of agricultural production. I believe

that what is happening in Europe is utterly unacceptable. If we do not have radical change, we will get left behind even more and that will lead to disastrous consequences.

Farming is increasingly in the spotlight, as your Lordships know. It is facing pressure from all sides and from many different interests. Besides the Foresight report, which concentrates not just on producing more food but on producing food sustainably, there are the other interests of biodiversity, habitats, energy and indeed water, which is the subject of our current report and is vital to all of us. Therefore, farmers are in the pressure pot yet again with the world looking on.

That highlights that any future help and support for the farming industry and in a wider sense must be much more co-ordinated than it has been to date. You cannot look at farming separately from the impact of forestry, biodiversity or habitat, because that solution has failed. There has to be a much more comprehensive approach to see the implications of carrying out reform in one sector and how that might affect our needs. The situation is therefore much more complicated, and the EU bureaucratic structure is ideally placed to stymie anything going down that line.

The EU has to change. The noble Lord, Lord Carter of Coles, was absolutely right to say that CAP reform was a fundamental factor in all this. All of us in the committee were disappointed at the lack of imagination in the CAP reform. It is all very well to perpetuate the current system—to an extent, it has worked tolerably well, given the position from which we started—but in moving from an era of surpluses to an era of scarcity one has to adapt and be much more bold in one's thoughts, particularly if there are to be the added pressures of coping with water shortages and different temperatures.

Where does this leave the farmer? It leaves him with one key ingredient: he needs good scientific advice and he needs his hand to be held at the right time—not to restrict him but to help him to adapt and produce the food that we all need in a sustainable way, as well as keeping the environment healthy.

It was interesting to see how the research for this science varied within the UK. It was evident that, in Scotland, liaison with universities and with the Scottish Agricultural College is much better and takes place on a much higher plain than is the case in England. However, we are hugely spoilt in the UK. If one looks at Appendix 1 on page 88 of the report, one will read some devastating comments about work that has been carried out on the constraints on agricultural innovation cross Europe. I refer to the two extracts from a report by the European Standing Committee known as SCAR in 2008. Our report comments on this:

"The lack of co-ordination between national agricultural knowledge systems is a significant weakness for Europe and means that the potential of its investment in World class research is not being optimised".

That is a condemnation of the current system but it is very hard for the Minister to reply positively to it because it is a charge against the EU. It is the Commission that must adapt.

Albeit that the research budget has been doubled, that is not enough. There is not enough within the CAP reforms to make certain that the right research is being linked and can be produced on the farm. There is not just one way. A huge amount of research is being

undertaken on farms that needs to be transferred back to the universities to be enlarged and developed. It is very much a two-way process.

My noble friend the chairman-if I may call him my noble friend-mentioned the CAP reform and the emphasis that we would like to see on Pillar 2, with more greening of it and more environmental benefits coming that way. I totally support that but I have a worry at the moment. With much of Europe bankrupt, one must remember that under Pillar 2 50 per cent of the cost must be paid by the member state. Although we are right in principle to say that there should be more in Pillar 2, I cannot quite see how Greece and other countries will be able to give it the right amount of attention. It is laudable in its aims but I fear that we will not get quite the advance that we wanted there.

I turn to something that the noble Lord, Lord Carter of Coles, did not specifically mention in detail-GMOs. Immediately, memories come to one's mind of headlines in some of our worst tabloids. That is one end of the spectrum. The other is that this could help us. I do not by any means say that GM is the complete answer but it is a possible way forward and would help us to some extent. It is very depressing that the EU has taken the line that it has so far. I was interested in the Government's response to our recommendation on this-Recommendation 33. I thoroughly support what the Minister said in his response, which was, "By allowing decisions", to be made against producing GM crops "on non-safety grounds", the EU,

"would undermine the current science and evidence-based assessment process".

This takes me back to where I started. It is utterly key that we move forward in a scientifically proven and acceptable way. If the EU is going to put further spanners in the works, we will certainly not make any of the progress that we should. This is far too important a subject for us not to focus our minds. I hope that today's debate will be read in Europe and that it will help the Minister in his negotiations there. It is in Europe, rather than in Westminster or Holyrood and the other devolved areas, that decisions have to be made.

Baroness Parminter: My Lords, I declare an interest as a member of the sub-committee. As our chairman, Lord Carter of Coles, said, our starting point was the issue of feeding the rising global population-as he said, rising to 9 billion by 2050. We should not forget that in the UK the population by 2030 will have risen to more than 71 million. In response to that challenge and the challenges of climate change, it is clear that we will have to use fewer of our planet's finite resources to feed our nation. However, the challenge is also an opportunity in the UK. One opportunity is to grow our food and drink industry, which buys two-thirds of all that our UK farmers produce, has a turnover of more than £76 billion and a growing export market, and is the largest manufacturer in all sectors in the UK. Innovation in agriculture will be key to meeting that challenge, and our committee's report is, I believe-as I suppose one would say with slight self-interest-a timely response to that debate. I look forward to hearing the Minister's closing remarks and hope that he will address the four issues that I shall highlight.

The first is how in this difficult economic situation, as my noble friend Lord Caithness mentioned, we will find the necessary extra funding for innovation. Science is key and the Government should be congratulated on protecting the science budget in the 2010 spending review. That was a welcome sign of the Government's commitment, but none of us are under any illusion that that will be sufficient funding. The sub-committee was pleased by the Commission's proposals for the reform of CAP that were published subsequent to our report, which double the funding for innovation in agricultural research under the Horizon 2020

budget, and by the cap on the level of single farm payments. The cap is important because of the signal it sends to the public on how their money supports small and medium-sized farmers delivering public goods competing in a global market. It could deliver extra funds into innovation. With what appears to be growing support across member states in Europe for the idea of capping single farm payments, can the Minister outline the Government's views on any capped funding payments being hypothecated towards innovation-related measures under Pillar 2?

Secondly, does the Minister agree with our report's reference to the innovation-hostile environment of Brussels? I think it is fair to say that there was some debate in our committee about the language that we might choose with which to term that issue. Does the Minister believe that the precautionary approach to developing new technology still holds good? If so, how does he feel that the legitimate views of public citizens can be effectively heard in debates about innovation which will impact on their lives every day through the food they eat? Is it the role of the British media to articulate strongly held views about the impact of innovation in agriculture, or should a more sophisticated debate be held with European citizens at an earlier stage of developing new technologies? To that end, what are the UK Government doing now to make clear to the public their support for growing GM crops in the UK, given the current debate in the EU on the national decision-making proposal that could in future allow member states to grow crops in their countries, unlike the present EU-wide ban?

Thirdly, in order to deliver food security, does the Minister agree that innovation in tackling waste in the food chain should be an equal priority to innovation in increasing food production? Estimates show that 30 per cent of all food grown worldwide may be lost or wasted before or after it reaches consumers-30 per cent. As Europe considers introducing biowaste targets, the Government are urging the adoption of a voluntary approach to reducing food waste. In doing so, results here are being closely watched by interested parties around the globe, including the UN, which is looking at the global potential of our Courtauld agreement. But could more be done? Recently announced phase 2 results of the Courtauld agreement show glacial progress by the supply chain in delivering waste reduction. Despite the commitment and hard work of WRAP and the progress of individuals, it is in the agriculture and food supply chain where there has to be further progress. Large manufacturing companies, often with European and global reach, must be used to put pressure to ensure that supply chains deliver progress from top to bottom. Without that, the case for European targets to reduce food waste will be strong as a means to deliver food security, alongside a focus on greater agriculture innovation.

Finally, and perhaps with a rather more UK-centric view than this debate might allow, I beg leave to mention the issue of whether the Government can do more to support further innovation in UK agriculture, which, in addition to contributing to our food security, supports public health goals. We know that, with the rising tide of obesity and health problems, we want more people to eat fruit. To that end, it is welcome that the Government are investing in a strong "five a day" campaign to promote it. We know that people want to buy British fruit and support local producers. Indeed, Sainsbury's is now looking to source 50 per cent of its fruit from the UK by 2020; the figure is presently only 10 per cent. We know that rising temperatures in the UK, as identified in the UK 2012 climate change risk assessment, could mean an opportunity in future to grow blueberries, apricots, grapes and peaches. We know that people want more convenient food, such as bagged and easy-peeling fruit.

Knowing all this, surely we should be investing in further research into innovation in fruit growing here in the UK. However, one of our principal research centres for fruit and vegetables, East Malling, now employs 40 staff, as opposed to 400 staff 30 years ago. It is true elsewhere, such as in Warwick, where we once had a much greater staffing capacity than we have now. Clearly, we cannot turn the tap on just like that. However, I would ask the Minister what the Government can do to co-ordinate the work of all partners, in both the public and private sectors, to identify gaps in research in areas that not only will increase the production of food with fewer resources and increase the tax to the Exchequer from a highly successful food and drink manufacturing sector, but will meet public health goals. If funding choices in innovation have to be made, both here and in the EU, it is those areas of agriculture that should be prioritised.

Lord Curry of Kirkharle: My Lords, I am very pleased that this report is being debated today and grateful to the committee for its publication. It is not only timely but on an extremely important subject, as we have heard, and is worthy of debate. May I say what a great honour it is to be a Member of this House and to find myself in the company of so many eminent and highly respected noble Lords? May I also add how grateful I am to the many friends I have on all sides of the House for the very warm welcome I have received? I am particularly grateful to my friends, the noble Lord, Lord Plumb, and the noble Baroness, Lady Byford, my supporting Peers, for their wise counsel and enthusiastic support. The noble Baroness is, I am thankful to say, still rescuing me when I get lost or step out of line.

I should like, with noble Lords' permission, to say a little about myself. I gather that it is not uncommon to do so on the occasion of a maiden speech. I come from a farming family background in Northumberland. In 1971 my wife and I secured the tenancy of a farm situated in mid-Northumberland in the hamlet of Kirkharle, hence my title. I assume that many noble Lords will know that Kirkharle is the birthplace of Lancelot Brown, who became known as Capability Brown, the great landscape architect—a notable heritage indeed. However, what may not be as well known is that I am not the first Baron of Kirkharle. A family named Loraine owned the lands of Kirkharle for centuries and was granted the barony. William Loraine gave Capability Brown his first job in 1728, clearly recognising his emerging talent. There is a stone in the middle of a field to mark the death of one of his predecessors, a Robert Loraine, who was,

"barbarously murdered ... by the Scots in 1483 ... returning home from the church where he had been at his ... devotions".

Family records state that he was chopped into pieces, put in his saddle bags and the horse sent home.

Kirkharle was, and still is, in border country. I remind those who, as a contribution to the current debate on Scottish independence, suggest rebuilding Hadrian's Wall, that most of Northumberland, including Kirkharle, lies north of Hadrian's Wall and we wish to remain part of the United Kingdom. Sheep stealing was the cross-border currency then, and my early business experience at Kirkharle was in farming sheep and beef cattle—not stealing them, I hasten to add. My wife ran a very successful farmhouse bed and breakfast business during that time. We were there for 12 very formative and enjoyable years, and it was then that my interest in agricultural, food and rural policy was determined—which brings me to the debate before us today.

I compliment the sub-committee for this valuable report and the recommendations contained in it. This topic is of critical importance and needs to be taken very seriously indeed by the House. As has been mentioned, it follows a number of recent reports: the follow-on from the foresight study led by Professor Sir John Beddington, the EU Commission's Horizon 2020 document, the Royal Society report, and others, including one for which I was responsible 10 years ago, which drew our attention to the huge global pressures we face and the need to find sustainable solutions.

Innovation is certainly going to be required and the recommendations in the report are important. The well documented rise in the global population has been referred to already; it is now 7 billion and is forecast to rise to 9 billion by 2050. In addition, there is the impact of climate change, leading to increased desertification and weather volatility. There is a direct link between global weather patterns and commodity price volatility. Even here in Britain with our temperate climate, the Environment Agency is deeply concerned about water table levels in the south and east of England in the depth of winter. River flows are exceptionally low and rainfall has been between 30 per cent and 40 per cent lower than normal, which has led to restrictions on extraction that will have serious consequences for this year's growing season, unless the position changes.

These issues have rightly heightened our concerns about food security. As Professor Bob Watson reminded us, the challenge is not one of feeding the world today. There is enough food, although the margin between supply and demand is finely balanced. Sadly, there are still more than 1 billion undernourished people in the world and about 1 billion who are obese. We waste more than 30 per cent of our food here in Britain, and I suspect that the figures are similar throughout the western world. The challenge today is one of governance, logistics and distribution, and of finding ways of providing today's technology to sub-Saharan Africa.

We have been incredibly successful in our ability to increase food production in parallel with the increase in the global population, and I am fairly confident that we will continue to do so, provided that we increase our investment in science and technology, as suggested in the report. The subject of research-how we determine our priorities, and how we mend the pipeline to ensure that scientific knowledge is translated into practical solutions-is of course a high priority in the report, and rightly so. I know that it is a high priority for the Minister, who conducted his own study. For that, we should be very grateful. As he knows, I am keenly interested in this subject and will be doing what I can to further the cause. The impact of these global challenges and the role of science will need to be front of mind as the imminent CAP reform negotiations begin in earnest. The eventual outcome will be critical in shaping how we respond to these issues. As the noble Lord, Lord Roper, and other noble Lords know, I chair the Better Regulation Executive, and one of my deep concerns is that out of the CAP reform process we may find ourselves lumbered with significant additional bureaucracy. That, under the current proposals, is a serious risk that will itself stifle innovation-the very subject that we are trying to encourage.

No, in my view the challenge is not just whether we can grow enough to feed the world but whether we can reduce our environmental impact at the same time. Our ecosystems are fragile; our greenhouse gas emissions, including carbon emissions, are too high; and we are too reliant on expensive inputs to support current production levels. We need to find new tools and innovative solutions to help us produce more from less. To address this challenge, we need to continue to invest not only in science but in people. Investing in one and not the

other will not achieve the outcomes that we are looking for. We need to invest in schoolchildren so that they have an understanding of these issues, and we need to invest in career development opportunities so that we attract young people who can help deliver the sustainable systems necessary-whether they be scientists, teachers or technicians who want to work in agriculture because it is such a fascinating challenge, and an exciting opportunity at such a pivotal point in history.

Baroness Byford: My Lords, it is a huge joy, if I may use that expression, to follow a friend of mine of many years' standing, the noble Lord, Lord Curry of Kirkharle. I first met him many years ago when he was chairman of the Meat and Livestock Commission. Noble Lords who have had a chance to look at his CV will have seen that his slightly casual introduction of himself very much understates his record over many years.

The noble Lord said that he came from a farming family, but he has held many important positions for us within the wider context. He was first appointed a commissioner of the Meat and Livestock Commission in 1986. He then went on-he did not mention this-to become a board member of the NFU Mutual insurance company. He became its chairman, a post from which he has only recently stood down. He also chaired, as he did mention, the commission on the Future of Farming and Food, reporting to the Government in January 2002. It was very important and the first one of its kind at that stage. He chaired other things as well, including the Leckford Estate Management Committee and the Better Regulation Executive, to which he referred. His work within his own particular interest and, even more, within the community has been recognised on two other occasions. He was awarded the CBE for his services to agriculture in the 1997 New Year's Honours List and a knighthood in the Birthday Honours List of 2001. He was appointed a Cross-Bench Peer in the House of Lords in October 2011. I am sure that the noble Lord, Lord Curry, is in no doubt that he is warmly welcomed to this House and we look forward to hearing from him on many future occasions.

I should go back to the beginning and declare my family's farming interest and the fact that we receive money from the CAP allocation.

It was a great pleasure to be part of this group and, although I was missing for some months because I was unwell, I congratulate the chairman, my noble friend Lord Carter of Coles, and all our advisers who supported us. I particularly congratulate those who gave us evidence. Some did so via an inter-country link, which was quite an interesting way of doing it rather than fetching people over. One of the challenges faced by EU committees is how to take evidence when looking at an EU problem without being able to get people from those countries to give direct evidence. I think it is something that the committee needs to reflect on a bit more overall. I am well aware of the cost and time involved, but certainly the telelinks help, and we were grateful for that opportunity.

I should like to put this report into the context of where we are on producing food and, in particular, on food security. Last May, the NFU briefing stated that agriculture provides £7.169 billion of gross added value and supports some 500,000 jobs in this country. In addition, the food chain contributes over £88 billion per year-7 per cent of GDP-and is responsible for over 3.7 million jobs. Sadly, agriculture and farming are often talked of in a silo but they certainly should not be. The facts and figures speak volumes and they really should get better recognition than is currently the case. It is a huge challenge for all of us throughout the EU and the world to produce enough food in a sustainable manner in the long term.

The Government's response to the report, however, is not quite as clear on some aspects as it might be, so I have some questions for the Minister. In their response, they say that £400 million will be allocated for research and development, but I am not clear how it will be spent, which people are responsible for it and who will oversee the efficacy of it. The Minister may not have the precise figures with him today but it would be enormously helpful to all of us if a timetable could be brought forward. The response talks very much in terms of "this is going to happen" and "that is going to happen", but from reading it-and I read it quite carefully-I could not quite tie it up as I would like to have done.

As other noble Lords have said, in the UK we face falling or static yields in crops and in milk and protein production. Water shortage is with us in large parts of the country; water excess in others. The effects of Europe-all the other regulations, the NVZs, the pesticide rules, animal recording systems and so on-place increasing costs on farmers and on the Government.

Sixty years ago today, when the Queen acceded to the throne, agriculture was a genuinely labour-intensive employment area. Automation has drastically reduced the numbers involved. The sectors providing inputs, such as seed suppliers and fertiliser and machinery manufacturers, and those handling outputs-food processors and retailers-employ a high proportion of graduates, and research is an important part of their activities.

The number of specialist agricultural colleges has declined over the years and the proportion of places available for agricultural, as opposed to small animal or pet-related, studies has fallen. I wonder how often schools' career advisers recommend agriculture as something for students to follow. The noble Lord, Lord Curry, referred to that. FACE, whose strategy group he chairs, tries to put information into schools to help teachers, let alone their pupils, understand how food is grown. It is an enormous challenge not just for our Agriculture Minister but also for those involved in education to encourage young people to come into the industry, which offers a tremendously wide variety of opportunities in the long term. More people should be enthused to come into it and given information as to how to go about it.

The world is facing starvation. During the past two or three years, high-level investigations have resulted in several reports, already mentioned, and they all agree. The Lords' committee stressed three areas of great concern: the need to increase spending on scientific research in agriculture; the communication of its findings to those working in agriculture; and the alteration of the attitudes of Brussels bureaucrats-I hope that I am allowed to say that.

Reforms coming to the CAP give us an opportunity to think again. I pay tribute to the EU Select Committee, which has just issued a fairly strongly worded press release supporting our thoughts on the opportunities for innovation that lie in looking at the way in which the CAP is delegated. The government response acknowledges the problems, but I should be grateful if the Minister could go further and tell us about what is proposed and how it will be implemented.

The quality of evidence given to the committee, the depth of the analysis of the problems, the revelation of the range of work that is going on and the levels of achievement are enlightening and heartening. One finds in any journal related to food production articles on pest-resistant crops, water-saving cultivation methods and the use of inedible plants for the production of energy. There is no shortage of innovative ideas. However, as the report states, bringing them to fruition is fraught with difficulties, not least of which are duplication in

development and fragmentation in application. One obvious route is to encourage larger-scale farming, where most of these innovations will take place, but that produces the problem of what happens to smaller farmers. They, too, are a vital part of producing food, particularly in eastern European countries.

I am well aware of the difficulties being experienced in establishing such concerns even within the EU regarding large versus small, and I wonder whether there is a role here for government. I particularly refer the Minister to the whole question of large-scale animal husbandry, which is one way in which we could produce more food. However, there is huge resistance and education will have to play an important role as a result. That is within our own country but I suspect that it is replicated across the whole of Europe.

My noble friend Lord Caithness raised the question of the GM debate. GM crops have many advantages to offer, but I would be glad to hear whether European co-operation has resulted in the start of an investigation that will add greater balance to how GM may develop in the longer term. It has been suggested that member states can make those decisions for themselves, but that is not the basis of the argument; rather, it should be about whether the science is right, whether it will produce the right food and how we should go about it. I should be glad if the Minister could reflect on that a little from the UK perspective and also from his experience of it across Europe.

I am proud to be president of LEAF-Linking Environment and Farming-and I am convinced that UK agriculture has demonstrated that it has the right tools to increase yields, improve animal welfare, preserve biodiversity and conserve natural resources, all with the enthusiastic backing of consumers. However, progress needs to be faster. One way that we can make this happen-to go back to the point that my noble friend raised-is to think about how to attract more people into this industry. I also raise the question of how we give them continuous professional development in the same way that people in other trades and professions expect. I should like to see a recognised route from school through GCSEs to apprenticeships to a diploma and, if wished, to graduate status to match the opportunities being offered by other industries such as the Armed Forces, retail and manufacturing.

If I may digress, I have the great honour of being a liveryman of the Worshipful Company of Farmers. I should also reflect to the Committee that here is a practical example of the way in which the livery tries to encourage and support young people coming through. We give awards each year to students at agricultural colleges. We also run two leadership courses. One has just been completed and the other is still going on. They are for the more mature student, if I may reflect it in that manner. This point is crucial, and although we did not touch on it quite so much in the report, I hope that my colleagues recognise that somehow we have to make agriculture and food production a much more lively and desirable vocation to follow. It is crucial because all the other industries depend on us producing worldwide enough food for future populations.

I would like to see an increase in the movement of people between the various sections of food and production, particularly between research and practical farming. I have no doubt that it can and will be done, but we need to move from the old image of farming in the early 1920s with long hours in the dirt and the cold to reflecting the industry as it is-one that responds to innovation, that uses technology and relies on science. We have a wonderful opportunity, and I thank the committee for giving us a chance to look at this important report on innovation in agriculture.

Baroness Sharp of Guildford: My Lords, I, too, declare an interest as a member of the sub-committee that produced the report. As the noble Baroness, Lady Byford, has just said, it is an extremely interesting report to participate in. In many senses it was a logical development from some of the other reports that we have been working on in the sub-committee. This is my fourth session on the sub-committee so I shall roll off. During this time we have looked at, among other things, the development of forestry and the impact of climate change on agriculture. Central to our deliberations has been the common agricultural policy and the reform of that policy. Innovation fitted in extremely well with all those reports and now we are looking at water, which is yet another aspect of the problems that we currently face and fits in with the whole question of innovation in agriculture. Above all, this report picks up on the challenge of climate change to agriculture. Our previous report on climate change and agriculture led us to be aware of the need to renew the research effort, not only in this country but in Europe as a whole, and to develop new processes and new technologies for agriculture.

We have been very much aware of the challenges facing the global environment. As the sub-committee chairman the noble Lord, Lord Carter, mentioned, we began by looking at the Foresight report on global food and farming futures, on which one of our witnesses, Professor Charles Godfray, had been the leading researcher. Of course, that report picks up what the Chief Scientific Adviser, Sir John Beddington, has described as the "perfect storm" now confronting the global environment through the combination of four elements: global population growth, which we have already mentioned and which is expected by 2050 to increase to 9 billion from the current 7 billion; the fact that climate change will shift the potential of different areas around the world to produce food; the exhaustion of fossil fuel energy sources; and the increasing competition for water resources. As all four of those issues coincide and come together in the course of the next 30 to 50 years, that will create a real urgency about how we are to feed all these people.

Therefore, the whole question of food security will become not only an issue but a very urgent issue. It is interesting that when we came to look at our report summary, we strengthened some of the conclusions. In relation to this challenge, we said:

"The response to this challenge has to start now. Decisions have to be taken, and actions implemented, with urgency".

The issue of food security is an urgent issue that needs to be addressed and we have not time to dilly-dally for too long in responding to it.

It is interesting to reflect that, in the course of the 20th century we faced a similar population increase and, during that century, we fed that population really very amply. We used fossil fuel energy and made extensive use of fertilisers, but we also brought into play large amounts of land—on the one hand, through the destruction of rainforests and, on the other, through the expansion into wilderness areas. In much the same vein, we have used water to irrigate agricultural areas where water is scarce. For example, one need only look at how important irrigation is to Spanish agriculture and the Spanish fruit and food industry to recognise the difficulties that people will face as a result of climate change, given the problems that arise even with current water resources. However, we can no longer resort to the solutions that we had in the 20th century, as we now need our forests and our wilderness areas to absorb the CO₂ emissions that we are creating, and we are running out of fossil fuel energy. In any case, the pollution caused by the excessive use of fossil fuels creates its own problems and, in terms of CO₂, our water resources are increasingly scarce and costly to clean up.

Nevertheless, as has already been reflected in our discussion, those who have studied this issue are relatively optimistic that we can feed the increased population. As my noble friend Lady Parminter mentioned, one-third of the food we produce is wasted. If only we made use of what is wasted, we would have little difficulty feeding the mouths where hunger currently pervades. There is an enormous amount to be done. As the noble Lord, Lord Carter, mentioned, what is termed sustainable intensification of agriculture is required. Essentially, we can produce more from the same resources. The definition given of sustainable intensification is increasing agricultural yields without adverse impact on the environment and without bringing more land into cultivation. As Professor Godfray told us, it makes innovation critical to sustainability. If only we make use of the technologies and the processes out there, the combination of saving what we currently waste and making use of new technology gives us the answer to how we can feed the increasing population. If we can harness the potential of those new technologies and developments in agriculture, we are quite capable of feeding the growing global population.

The noble Lord, Lord Carter, mentioned projections of agricultural productivity: in Brazil, an increase of 40 per cent, in the USA, of between 15 and 20 per cent, but in Europe, 4 per cent. We asked ourselves: why is the potential productivity increase in Europe so low? Why, as Mr Häusler mentioned, is Europe such a hostile environment for innovation? The answer we came to is that it is a complex issue, a mix of very different things.

Traditionally, the CAP aimed to increase production more or less regardless of cost in order to make Europe as self-sufficient as possible—indeed, at one point, Europe was well more than self-sufficient—hence the heavy direct subsidy to the production regime. That was not broken until the early 1990s, 15 or 20 years ago, since when, if anything, the swing has been in the other direction towards limiting production and increasing the emphasis on public goods of agriculture: carbon sequestration, landscape and biodiversity. The new support mechanisms in that direction—Pillar 2, as we call them—were nevertheless still dominated by the old support mechanism, Pillar 1, which paid farmers directly in relation to their production. That gives farmers a degree of security—one issue that we have been debating in our committee in relation to CAP reform—but does it also breed complacency, and is that complacency in itself a barrier to innovation?

Another barrier to innovation is that Europe has a large number of small farms in relation to North America, South America and Australasia—but not in relation to Asia, which has many very small holdings—so despite subsidies, there are low incomes. Farmers cannot afford to innovate and experiment with new ideas; they are innately conservative. The European Commission is well aware of this challenge and currently consulting on reform of the CAP. Our report has been grist to that mill. It sees it as a timely input into the debate.

The report came up with five main solutions, which have already been mentioned. The first was to boost research, mention has been made of the fact that of the €400 billion spent on the CAP in the current financial framework, only €2 billion is spent on agricultural research. As we have also heard, in the next framework, which will be called Horizon 2020 instead of "Framework Programme 8", it is projected that that will more than double to €4.5 billion and will be characterised not only by joint programmes but by the development of the European innovation programmes and various joint programme initiatives that are to take place.

That will still be just over 1 per cent of the total spend on agriculture. As a whole, the EU has a target of spending 3 per cent of GDP on research and development. If we were to spend 3

per cent of what is spent on agricultural support by the CAP, it would be something like €12 billion. If we were looking to spend 3 per cent as a whole, the total within the EU would rise considerably.

Much research is financed at member state level rather than funded by the Commission. As others have mentioned, the BBSRC, spending somewhere in the region of just less than £500 million a year, is one of the big spenders. France and Germany spend more. In the UK, much of the money from the BBSRC is for what I call the top end of the research—a great deal of genetics and genomics research—and not very much is for applied research. We highlighted the fact that it would be a good idea if more were spent on microbiology and research into soil.

Much money is spent at member state level but there is not nearly enough co-ordination. This was something that we were very much aware of, particularly the concept of the European innovation programme and the joint programme initiatives. As I understand it, the joint programme initiatives are bilateral whereas the European innovation programmes are promoted by the Commission and are essentially to bring member states together and allow them to co-ordinate and collaborate. We were aware of how very fragmented the effort was at the moment, and for that reason we very much welcomed the input of Incrops and the model that it suggested for how the European innovation programmes might be put to work and how they might work themselves out.

Is collaboration itself enough? We noted the example of the Netherlands, which has targeted excellence in the agrifood sector as a national objective and developed a very clear strategy nationally to achieve this. Do we want something stronger from the Commission, a European strategy for the agrifood sector that puts agricultural innovation within the broader context?

Is research itself enough? If it is going to be useful, it must be used—hence the emphasis that we put on knowledge transfer and, above all, knowledge exchange. Those using the developments in science and technology must be able to understand and, for that matter, influence the research so that it is user-friendly. That is why we put so much emphasis on the development of the Farm Advisory Service. Here, it is a mixed picture across the European Union and within the UK itself. Some countries, such as Denmark, France and the Netherlands, have very strong advisory services that help farmers adapt and develop new products and processes. In the UK we found much disappointment at the dismantling of the old ADAS service and its replacement with the mixed-consultant industry-based services, and much hope that the new levy-based AHDB and the new integrated advice pilot would work themselves out.

Generally, the government response seems to have been positive, backing up our recommendations. As the noble Lord, Lord Carter, has emphasised, the key issue is that of carrying through the recommendations into the reform of the CAP. I am particularly glad that the Government have responded so positively to our suggestion that we need to look at research within the broader strategic framework and the reorganisation of farm advisory services.

There is danger in assuming that the market will deliver when necessary. Sadly, the market has chosen the way often only after crises have overtaken events. To go back to where we started, innovation is the key to developing a sustainable agriculture sector, which in turn is the key to future food security.

The Deputy Chairman of Committees (Lord Colwyn): My Lords, there is a Division, but I have a feeling that the noble Baroness is coming to the end of her remarks. Would she like to finish in 30 seconds?

Baroness Sharp of Guildford: Yes. If we wait too long, we may have lost the opportunity to prevent that crisis.

Sitting suspended for a Division in the House.

Lord Cameron of Dillington: My Lords, I am delighted to be speaking in the debate in which the noble Lord, Lord Curry, has made his maiden speech. As we have already heard, his CV in the agricultural and rural world is both comprehensive and stellar in quality. It has long been known that there are few to compare with him in terms of knowledge and experience of all parts of our agricultural and food industry, but equally important, to me, is the way in which he understands how all these parts fit together and how important they are to the economic, social, cultural and environmental fabric of life in both our rural and urban communities. I feel sure that we will all benefit from his words of wisdom on many future occasions, as we have done today.

I must first declare an interest as a farmer in receipt of a single farm payment and as a Lawes trustee at Rothamsted Research Station. I also chair the Strategy Advisory Board of the Government's Global Food Security programme. However, today I want to explain that the problems facing the agricultural industry are global and that the solutions lie not only in pan-European and trans-world partnerships but in a variety of cross-discipline research projects that must cover the whole length of the food chain. Innovation is not just about growing two blades of grass where there was once only one.

Other noble Lords have mentioned the problems facing the world and, if the Committee will forgive a bit of repetition, I should like to put a bit more flesh on the bones of some of them. The first is the growth in the world's population from 7 billion to 9 billion-plus. The more serious problem here is the fact that the population of sub-Saharan Africa is going to rise from 1 billion to 2 billion over the next 30 years. This is serious because there are very grave agricultural shortcomings there.

Secondly, world GDP is going to rise by 400 per cent between now and 2040. It sounds good but it means that most people will be changing to a more meat-eating diet, with more consumption of resources—much more than with a vegetarian diet. China is a prime example. Over the past 40 years, its arable area has almost halved and its meat-producing area has more than doubled. In spite of that, its balance of payments now suffers from major imports of both milk and beef, not to mention soya to feed its beef herd. In fact, the current annual trade of soya from Brazil to China is the biggest movement of a single food product from one country to another in the history of the world.

Climate change is another threat which has been mentioned by other speakers. The equatorial belt may become too hot to farm and, if sea levels rise, some of our most productive deltas will disappear. With only a 15 centimetre rise, in India alone some 150,000 farmers will be displaced.

Another problem area is world water supplies. Even with today's population, the reality is that a child dies as a result of poor sanitation every 20 seconds. Total world water demand is

projected to rise by over 30 per cent by 2030 and there are problems even now. Many river systems already run dry due to excess irrigation. Indian farmers, for example, are now taking 100 cubic kilometres per annum more from their aquifers than are being recharged by rains. The most important aquifer under China's grain belt is falling at the rate of 3 metres per annum. In Africa, already people die in skirmishes between tribes over water. The trouble is that water and rivers do not recognise political boundaries. There are between 250 and 300 rivers and lakes in the world that transcend national boundaries. The dangers are enormous.

There is now a realisation that political unrest might be caused by water and food shortages in the future and that these possible conflicts or anarchy represent a greater danger to the world than the actual shortages themselves. The Government's new co-ordinating research programme is well named as the Global Food Security programme because, while food shortages in the EU probably feel remote to most people, its citizens' security could well be threatened by nutritional problems in the wider world.

The point of my very brief coverage of some of the future concerns is not only to show how serious they are but to show how multifaceted and global are the issues. These are worldwide problems. We have to ensure that we are all pulling together. We need scientific partnerships and co-ordination not only between research establishments in the UK-and I am very pleased to say that that is happening with this Global Food Security programme-but across the world. We need trans-European co-ordination and information exchange. We need partnerships in the wider world such as with the US, Brazil and China, where some of highest spending takes place.

I like to think that we in the UK can still contribute in scientific excellence, even if our budgets have been slashed over the years. Judging by the international partnerships that already exist, it would seem that others on the world stage share my confidence.

We also need north/south partnerships, so we can all focus on some of the developing world's problems and at the same time hopefully enhance the credibility and importance of its scientists, particularly in the eyes of its politicians, so that they, too, pick up on the agenda.

As I said at the beginning, the food chain touches on a wide range of disciplines. Clearly, we need soil scientists, plant pathologists and others involved in the actual growing of the crop; we need hydrological engineers to provide us with water; we need mechanical engineers to provide us with efficient machinery; we need veterinary scientists to maximise livestock production while minimising livestock inputs and greenhouse gas outputs; we need a range of biologists and chemists to cut down on waste both before and after harvest; and we need social scientists to cut down on waste at the consumer end of the food chain, mentioned by several other noble Lords. I came across some research recently indicating that every year in the USA, which also wastes 30 per cent of its food at the consumer end, 300 million barrels of oil and 25 per cent of all man-used water go to produce food that is then thrown away. That is a pretty horrifying statistic.

We also need nutritionists to help achieve the right food intake at the right price to prevent millions of youngsters in the developing world remaining physically stunted or cognitively damaged for the rest of their lives. In this respect, many people think the GM debate is all about producing more food for less cost, but to me the most exciting aspect of these potential scientific advances is where the food is being improved for better health. Of the 10 million-plus kids who die each year in this world, 2 million die from shortages of iron, proteins and

vitamins in their diet, while, for instance, only 1 million die from malaria. There is much potential for improvement here, and innovation could be at the heart of it.

We need land-use and planning research to ensure that we optimise our production of food and energy from land while not endangering other species and their habitats. Incidentally, that includes the responsible use of our marine environment, a whole area of research that is probably related more to the art of the politically possible than cutting-edge science. We have to get all these scientific disciplines working together if we are to address the perfect storm outlined by our chief scientist. We have to co-ordinate and ensure that there are no gaps in the chain. That is one of the roles of the global food security programme and the strategy advisory board that I chair.

Talking of gaps in the chain brings me finally to one of the conclusions of our sub-committee report which has been mentioned by several noble Lords already. As the Minister is only too aware-and we thank him warmly for his previous interest in this subject-there is no point in doing any science unless the information gets out to the practitioners, nor will the science be of much use unless the scientists have learnt what is needed from the practitioners. I chair the All-Party Parliamentary Group on Agriculture and Food for Development, which has recently produced a report on African agriculture called *Growing out of Poverty*-for all those interested, it can be found in the Printed Paper Office. During the evidence-taking sessions, we were again and again reminded that the greatest poverty in Africa is a poverty of information, yet agricultural extension services remain absurdly underprovided for in almost all African and other developing countries. Furthermore, as Sub-Committee D discovered, this underprovision is not limited to Africa but is only too apparent across much of the UK and EU. As others have said in this debate, this situation needs to be urgently rectified if the recently revived interest in agricultural and land-use science is, if you will excuse the pun, to bear fruit.

Lord Plumb: My Lords, first I share the joy and pleasure on this occasion in having the noble Lord, Lord Curry, with us. He is an old friend of mine; we worked together and shared many platforms over many years. We have not always agreed, but we have been mighty near agreeing most times. It is great to see him here and I know, as do all who know him well, that he will make a great contribution to this House, not just on agriculture but on many other issues as well. We are delighted to have him here on this day.

I declare my interest as a farmer, one who has witnessed working in the dirt and the cold many years ago, and I have seen all the changes in policy, structure, technology, science and production methods since the 1947 Act and under the CAP since 1973. I was often told that it was my fault that we had all those surpluses of food not so many years ago; no one can claim the credit for bringing that into some sort of balance, so that we now talk about not surpluses but security. That is a big change-not just a change in attitude, but a change in the general situation.

I did not have the privilege of sharing in the preparation of this report, but I congratulate the chairman, the members of the committee, the clerks and their adviser on producing what I believe is an excellent document-a wide, proactive report on the importance of science, technology and innovation in the practice of farming and horticultural systems. The team of witnesses, as one reads the document, is very impressive. The contribution they made and the way they have been reported has been absolutely first class, and it makes this one of the best documents I have read on agricultural development for some considerable time.

As has been said already in this debate, the European Union has to be competitive in the global marketplace, not forgetting its social and environmental responsibilities. It cannot be assumed that innovation will happen incidentally, due to the nature of farming, different sizes of farms and different techniques and methods. When one assumes that they are all in one lot, I always say that the only sensible definition of a "small farmer" is a chap about five feet tall.

Farming as we know it is often risk averse and isolated, facing difficulties in investment and producing unbranded commodities. I often regard fellow farmers as frustrated research workers, instinctive experimenters and innovators who are prepared to use new products and practices to be more efficient and productive, following of course-as they do-scientific approval.

One impressive side of farming that is not just related to this country is our agricultural colleges and universities. They are providing excellent training and skills for a new generation of farmers, many of whom are keen to become leaders in the industry, with conviction and passion. Nothing gives me more pleasure than to visit those colleges, to talk to young people-and to wish that I was 40 years younger. Both the noble Lord, Lord Curry, and my noble friend Lady Byford have said it was important that we do not just relate this to product. It is investment in people, particularly young people-Care was mentioned as an organisation that is doing a great job in that respect.

My son has near his farm 44 schools, which have adopted, if not him, the farm. They visit it on a regular basis, which I know gives him a lot of pleasure. He has two people carriers, which take the children around the farm while he talks to them. The same schools come back time and again. He even gets them planting potatoes, other vegetables and all sorts of things. They put their names on the plants so that they can come back and see the growth of the product, which they are keen to do.

We see those changes. Today we talk about the use of precision farming with satellite-guided machinery, yield mapping, conservation tillage, which is increasing, on-farm bioenergy equipment, heat and power units, anaerobic digestives-all the sort of things that were unheard of a few years ago but are now becoming commonplace on many farms. In future we will see new crop varieties developed through the process of further improved management and possible use of genetic modification and so on.

We know that, to be innovative, farming must be profitable so that it can invest in the future. Farmers have to be confident that they can remain in business. As I read this document-and I have read it more than once-one thing struck me in particular. It is worth quoting from box 2, above paragraph 40, which cites three theories of innovation as applied to agriculture. I thought that they said it all and they are:

"Innovation as a top-down dissemination of new technologies ... Innovation as a bottom-up process",

in which,

"local context and farm-level networks shape innovation outcomes",

and, thirdly,

"Innovation as a socio-technical process",

in which farm businesses mix with all the other bodies and organisations that are involved in the business. That is the big change as I have seen it over recent years. It is a welcome development because different producers can better see the part that each of them plays in the production of food.

Therefore, I hope that in replying to this debate the Minister will agree that there is cautious optimism for the future. It will depend a lot on the simplification of policy under the CAP. We want less red tape and fewer regulations. Above all, in the reform of the CAP- I agree entirely that it must be radically changed this time, rather than tinkered with, as it has been over the year-it is imperative to keep a sensible balance between the support of Pillars 1 and 2, which allow farmers a margin to compete in the global marketplace.

Lord Bilimoria: My Lords, there are some out there who would raise their eyebrows at the idea of a report about innovation in agriculture. Far too many people, in both business and politics, consider agriculture to be an antiquated, backward industry with no place in the 21st century economy, to which the noble Lord, Lord Carter of Coles, alluded in his opening speech. This view is, of course, completely wrong. I am delighted that the EU Committee has tackled the subject of innovation in agriculture and produced a report that makes the case for a reinvigorated, stronger British farming industry.

My business is of course beer. I am sure that many noble Lords know that the most important ingredient in any beer is barley. I can proudly say that 100 per cent of the barley used in Cobra beer comes from Britain. The second most important ingredient is water. Needless to say, the water for the beer that we produce in Britain is 100 per cent British, too-there is no Evian in our beer. As the noble Baroness, Lady Parminter, told us, the food and drink industry consumes two-thirds of what our farmers grow in the UK.

In a recent debate on the creative industries, I mentioned that I was brought up throughout my childhood being told that I was not creative because I was useless at art. I have realised that being creative and innovative are two crucial skills for business. That applies whatever industry you speak of, including agriculture. Over the past three decades, Britain has evolved into one of the most open economies in the world. That has been wonderful and one of our great competitive advantages. However, one of the downsides of that evolution is that we have an economy based far too heavily on services, where manufacturing makes up barely 13 per cent of our GDP, and agriculture barely 1 per cent.

We constantly complain about too much power being exerted on us by Europe and Brussels. The extreme example, the industry that is most crushingly regulated by Brussels is agriculture; and the single area of expenditure in the EU budget that is bigger than all others and makes up well over 40 per cent of the budget is agriculture. As has been pointed out so many times in this debate, of that, the budget for research is a mere €2 billion for five years. It is good news that it will be doubled, but surely we all agree that that is a drop in the ocean. Do the Government agree that more should be invested by the EU and the UK in R&D in agriculture and, if so, what are the Government going to do about it?

There is no question that we have to innovate to cope not only with the increasing global population, as has been pointed out, but the rise of India and China, whose consumption of food, especially meat and dairy products, will rise exponentially as they grow wealthier. We

know that Malthusian theories have been proved wrong. In the so-called green revolution of the 1960s in India, a country which for centuries had catastrophic food shortages, innovative farming methods were used to increase crop yields and almost completely eliminated famines forever. One of the key catalysts of the green revolution was widespread adoption of genetically modified crops.

Fast forward to today, and we see that some of our European partners are seemingly blind to those innovations and insist on sticking to a backward precautionary approach. Rather than promoting innovation in GM, the current practice of the EU forces GM to prove that it is 100 per cent safe beyond any reasonable doubt before it can be used. I fully agree that caution must be a priority, but one must look at the scientific evidence and weigh up the risks and benefits. In a court of law, you are innocent until proven guilty. In the case of GM in Europe, the perception is that it is guilty until proven innocent. Are the Government for promoting research and use of GM crops?

Global food security is a serious issue, and I have personally seen the havoc created by food inflation, which unfortunately has existed regularly in India over the past few years. The European Union has been fantastic in promoting trade and peace between our member nations, but there is no doubt that one of its worst manifestations has been the CAP, which has been unbalanced and unfair within the EU, with countries such as France benefiting disproportionately compared to countries such as Britain.

Furthermore, although the EU has been one of the best manifestations of globalisation, the CAP has made us in the European Union hypocrites. We preach free trade to the world and yet, through the CAP, we practice protectionism. We subsidise our cows in the European Union by \$2 a day, when we know that there are 1 billion people globally living on less than \$1 a day. The European Union is the second-largest overall agricultural producer in the world after China, but our output would increase so much more if we could be more productive. That means investing in innovation and research and encouraging our youth to enter agriculture

On that note, I congratulate my noble friend Lord Curry of Kirkharle on his excellent and authoritative maiden speech. He informed us that Kirkharle is where Capability Brown hails from. Some of us may have noticed that there has been a resurgence and renaissance in Capability Brown gardens in Britain today. I hope that there will also be a renaissance in agriculture in Britain today.

Of the 7,000 plant species that have been used for food in the world, just 150 have been commercialised on a large scale and only three-wheat, maize and rice-supply half of the world's daily food. There is so much potential here. The noble Lord, Lord Plumb, spoke of young people. Just look at how the world has changed. Now, young people aspire to be techies and geeks, thanks to the internet revolution. In the same way, it is great to see the new policy encouraging the youth in Europe to go into farming. However, they have a lot of competition. Last month, I was speaking at an annual conference in India-the Pravasi Bharatiya Divas, the Indian Government's conference for the 30 million-strong global Indian diaspora-to an audience of 700 members of India's youth, including university students, senior schoolchildren and medical college students, and I was utterly inspired by their enthusiasm, brightness and aspirational attitude. This is India's future. This is the future with which we in Britain and Europe will have to compete.

When people say that British manufacturing is dead, I and others like me in the manufacturing sector defiantly say that it is definitely not dead, and that we have world-class, cutting-edge, high-end advanced engineering, be it in aerospace, automobiles or pharmaceuticals. This enables us to partner on an added-value basis with the growing economies of the East. We must ramp up investment and innovation drastically if we are to do the same with agricultural innovation. In fact, just yesterday the Chinese Premier, Wen Jiabao, said:

"Now that Europe is facing a [sovereign] debt crisis, we must consider our relations with Europe strategically ... On the one hand, our largest export market is Europe. On the other hand, Europe is our biggest source for importing technology. From this perspective, helping to stabilise the European market is actually also helping ourselves. We must let all parts of the society understand this".

The noble Earl, Lord Caithness, pointed to a lack of co-ordination, and the noble Baroness, Lady Sharp, also spoke of this. Britain and Europe should be at the cutting edge of innovation and research, exchanging ideas between our 27 nations, making Europe the most fertile hotbed of agriculture creativity. We have the diversity of all our nations, and in Britain we have the best higher education institutions in the world, along with the United States. In spite of higher education funding having been cut-and I am sorry to say I hugely disagree with this; I think it was very short-sighted of the Government-and in spite of our R&D expenditure being a fraction of that of a country such as the United States, we continue to punch above our weight. As the noble Baroness, Lady Parminter, said, protecting the science budget is not sufficient. Do the Government, on reflection, agree with this?

Last year, I was privileged to write the foreword for *Big Ideas for the Future*, a book by Research Councils UK and Universities UK illustrating about 200 world-beating, world-changing innovations in several sectors from universities throughout the UK, including in the area of food security. In fact, I quoted from this book earlier, referring to the 7,000 varieties of food-bearing plants, of which just a fraction have been commercialised; and the book points out some examples. *Reaping the Benefits* by the Royal Society in 2009 predicted that, as we have heard, the global demand for food will double by 2050. A great deal of innovation is necessary to tackle this challenge. The report refers to a "virtual root" which has been developed by a group of researchers at the University of Nottingham, supported by the BBSRC, as a predictive model to simulate root growth accurately. Results from the model are already being translated for crops such as barley, which of course is of great interest to me. This could result in improved varieties being available to farmers in 10 years' time. Another example is that at the University of Birmingham researchers, also supported by the BBSRC, have been identifying key genes that control meiotic recombination, a process that allows genetic modification to occur. Once identified, this information will be an important tool for plant breeders, enabling them to breed improved plant varieties in a shorter period of time. Just imagine the effect of that.

This sort of research is going on all over the country and, indeed, across the European Union. However, in order to face the future we need to invest in it multifold. The developing world, led by India and China, needs innovation in order to feed its growing populations.

The question is whether Britain and other EU members will be leading partners in this process or whether we will let over-regulation, politics and underinvestment keep us on the sidelines.

In conclusion, I should again like to quote, because it is so important, the excellent report of which we are taking note. The introduction to Chapter 6 cites Georg Häusler, Head of Cabinet, DG Agriculture at the European Commission, who asks this question:

"Does Europe say that it can provide food for 500 million rich Europeans and import what we do not have, or does it play a role in feeding 9 billion people, including 1 billion people in China and India",

many of whom,

"are starting to eat meat?".

It is indeed a pressing question, and one that only the EU itself can answer. I am hopeful that we will choose the latter path but I am worried that the EU may be wandering the wrong way.

I shall end where the report begins:

"Regulation should help, not hinder. Politicians ... must not be afraid of new properly tested technologies ... Benefits and risks must be clearly articulated, recognising that too precautionary an approach may pose risks to global food security".

Lord Knight of Weymouth: My Lords, I start by warmly thanking the European Union Committee for what was an extremely interesting and, as I found out over the weekend, highly readable report-that is not always the case. In particular, I thank my noble friend Lord Carter of Coles for leading on this piece of work and for leading the debate so ably earlier this afternoon. I certainly join in the joy in welcoming the noble Lord, Lord Curry of Kirkharle, and in complimenting him on his excellent maiden speech. As the noble Lord, Lord Bilimoria, has just reminded us, Capability Brown was also from Kirkharle, so it would appear that capability is in the water there, and we look forward to many more capable speeches and contributions from the noble Lord, Lord Curry. I also take the opportunity to pay tribute to the work that the noble Lord, Lord Taylor of Holbeach, has personally done in the area of science and agriculture, and I very much look forward to hearing his wisdom when he winds up.

I do not want to provide a commentary on all the many and interesting areas covered by this report- I am sure that we have other things that we want to do this evening-so I will pick out just a few themes. First, this is clearly a report about not just the future of agriculture but the future of food, where it comes from and how we consume it. The report is about more than just guarding against the future; it is about how we shape the future of agriculture. That is the basis on which I have been trying to think about this-the Foresight report was also certainly very welcome in helping us to think about these issues.

We face an uncertain future: world population growing, as we have heard, from 7 billion to 9 billion; increasing food prices; changing diets; more pressure on land and water; and climate change-I take this opportunity to thank the Minister for the briefing that we had a week or two ago on the department's assessment of the implications of climate change. Agriculture needs to contribute by less input and more output, and it needs to make a contribution to sustainable energy production and consumption. In addition, there is the uncertainty over future CAP reform, which has been discussed and debated this afternoon. All this was

excellently set out by, in particular, the noble Baroness, Lady Sharp, who reinforced the sense of urgency on these issues.

To shape this future and to harness the potential for growth and jobs in the agriculture and food manufacturing sectors, I think that we need: a pro-science climate in which to discuss these issues; international co-operation; and active, strategic government. Those are the three things that I want to touch on in my comments. Paragraph 183 of the report states:

"We welcome the fact that greater prominence is being given to agriculture in the deliberations of the European Commission, and we urge that it should be given a similar priority in political debate in the UK".

I would be interested to hear both whether the Minister agrees and, beyond the high profile given by a debate in the Moses Room on a Monday in February, how we should do that. If we are to move forward and discuss issues such as GM and biotech, do we not need to try to fashion a more pro-science environment in the media in particular? I do not underestimate the challenge in doing so, but any comments on how we might do that-given the Government's excellent ability to spin for the media-would be most welcome.

At paragraph 130, the report states:

"Many of our UK witnesses considered that the UK Government should take the lead in communicating scientific innovations as regards food. Professor Moloney was clear that the only way to offer clarity to consumers 'is through national leadership' and Dr Bushell suggested that politicians have 'an amazing opportunity to shed light on the real risks associated with food and not the imaginary ones'".

The report goes on to say that the Minister in the other place, Jim Paice,

"took a contrary view, suggesting that Government are the worst source to offer such advice".

I have some sympathy with the view that perhaps trust in politicians is at its lowest possible ebb, but there is certainly a role for government in trying to stimulate that debate and ensure that we give a platform to scientists-government scientists-in trying to extend and inform the debate.

The report also wanted more done in schools. Of course, as well as spending a year as a Defra Minister, I had three years as Schools Minister. Paragraph 177 of the report talked very much about the importance-as did the noble Lord, Lord Plumb-of engaging with young people and attracting them into the industry. Does the Minister think that the narrowing of the curriculum in the English baccalaureate predicates against that engagement and makes it even tougher for schools? What are the Government doing, probably in combination with Lantra, and perhaps with the Minister's noble friend, the noble Lord, Lord Baker, to develop university colleges for agriculture? They are an interesting development in 14 to 19 education, but I have not yet heard whether more is being done with the land-based industries in trying to go upstream and attract younger people into the industry than we are doing through the FE sector and its land colleges.

The report states in paragraph 61:

"When we put this concern to Mr Paice, he agreed that there was a need to make the food and farming industry an attractive industry, but saw the Government's role as to ensure that the industry could 'deliver a satisfactory income and terms and conditions'".

I agree with the committee when it states:

"We see this as necessary, but not sufficient".

We need to go further than what the Minister said in his oral evidence. Like the noble Baroness, Lady Byford, I very much support the work of FACE led by the noble Lord, Lord Curry. I should like more of this in our education system.

I move on to international co-operation. The EU's framework programme for research is the world's largest research programme, with funding of €1.9 billion earmarked for the area of food, agriculture and biotechnology. There is differential development in this sector across Europe, given its different geographies, and it is certainly the case that no one size fits all. However, different development needs a more sophisticated differential approach by the EU. The UK has an advanced and relatively mature sector, and we have heard about the interesting work that the Netherlands is doing. However, such work in parts of eastern and southern Europe is far less developed, and we have heard about the very small farm units in some of those areas. Like others, I feel frustration at the projections of only a 4 per cent growth in productivity across Europe. The continent as a whole needs to meet future challenges, grasp opportunities and work together to ensure that the single market area achieves sufficiency.

How much is the Minister concerned about UK food security in isolation? If that is the aim, how will he shift consumer demand to seasonal UK food, especially given that what is seasonal and local changes with the climate? How can the UK use what residual influence it has left on the margins of the European Union to encourage co-operation and convergence of the agricultural economies across Europe? Surely, it is only then that we can do more for less, as is essential, and achieve food security within the single market. As the climate changes and the geography of food production migrates north, how can we develop co-operation between producers across borders so that we can learn from each other's innovative practice? That sort of co-operation is essential.

Finally on international co-operation, what are the Government doing to encourage higher education co-operation, perhaps through the Bologna process, in these areas? I understand the scepticism articulated by the noble Earl, Lord Caithness, and others, but we need to redouble our efforts on co-operation rather than on isolation so that we can address these challenges.

I turn to the question of active, strategic Governments. There was a difference between the evidence given by the Minister of State, Jim Paice, and the Government's official response to the report, which read very well. One was the voice of the Minister and the other, from my experience, was the voice of officials signed off by the Minister. The Government's response to the report is helpful but I would rather look at the Minister's choice of words.

Like the noble Baroness, Lady Parminter, and the noble Lord, Lord Bilimoria, I was concerned about continued government spend on research. I note that the response to a

Parliamentary Question in the other place on 20 January at col. 925W of *Hansard* was that core DEFRA research and development spend for the last five years is contained within the evidence budgets, and that while the proportion of R&D and the evidence budgets is to remain the same as a proportion of the total programme, that will reduce by 29 per cent in real terms. The figures show a reduction from £210 million in 2010-11 to £167 million in 2014-15. The department's evidence investment strategy also shows reductions in spend in this area, and that has to be a concern when we are thinking about these issues.

I also have a concern about whether there is a difference in philosophical approach. Paragraph 27 of the report says that the Minister-not the noble Lord here but Jim Paice-said that,

"the present Government had no plans to publish any new document, and that he did not believe in 'some Government-determined plan'; and he saw no conflict between the Government's emphasis on localism and the need to respond to the challenges outlined in the Foresight report".

I disagree with that. It suggests a hands-off Government who believe in getting out of the way rather than enabling, but we need a more strategic approach than is reflected in the Minister of State's words. I acknowledge the dominance and the vital importance of the private sector in this industry, but surely there is a role for Government in this area, as I detect being strongly argued in this committee's reports.

The committee says that most farmers are understandably risk-averse. The committee quotes in paragraph 109 Philip Richardson, who said:

"the great deal of uncertainties (weather, disease and price volatility) inherent in farming ... make farmers more risk-averse than other business people".

We all understand that, hence the committee's view that innovations need a sound business case for farmers to take them on, but innovation needs a higher appetite for risk to make necessary investment than farmers are going to be willing to make in that sort of environment. Hence the importance of the supply chain-and I noted the interesting evidence given by Morrisons. We need either direct top-down investment or investment via the common agricultural policy. We also need other activity from government. I would be interested to know whether there is any progress on the grocery adjudicator to help give us some leverage over that supply chain and address some of the waste reduction issues that the noble Baroness, Lady Parminter, rightly raised.

I will not take any more of your Lordships' time. This is an interesting area that needs action from the EU and from the UK Government. It needs the urgency that the noble Baroness, Lady Sharp, talked about. I very much commend the report and look forward to the Minister's response.

The Parliamentary Under-Secretary of State, Department for Environment, Food and Rural Affairs (Lord Taylor of Holbeach): My Lords, it is my personal pleasure as well as my governmental responsibility to reply to the debate. I join others in congratulating the noble Lord, Lord Carter of Coles, and the committee, as well as those advising it, on the thoroughness of their inquiry and the subsequent report on innovation in EU agriculture. It really is a first-class report which has informed this debate, as I hope it will the wider public.

I was pleased to be able to attend part of the seminar in November. As I indicated then, and as noble Lords have generously pointed out, this subject is very much up my street. It is an important one, too, and I hope that the response from Defra, which is full and detailed, does credit to the quality of the report. The report will also be useful in reinforcing the Government's position vis-à-vis their European colleagues, as my noble friend Lord Caithness hopes.

I had intended to start my speech by quoting from the opening paragraph of the introduction to the report. The noble Lord, Lord Carter of Coles, used those words to open his speech today. Mr Paolo de Castro encapsulated the essentials of our current position, and the report is unafraid to present the challenge that faces all policy-makers and innovators in science and on the farm. This debate, too, has risen to the challenge, not least because it has served as an opportunity for us to hear the maiden speech of the noble Lord, Lord Curry of Kirkharle, who brings to this Grand Committee, as he will to the House in general, knowledge, expertise and an ability to inform. This will be of great value to the House on this and, I hope, many subjects. The noble Lord is welcome as a Member of this House. He reminded us, as did my noble friend Lady Byford, that we must not in our enthusiasm for innovation forget the people and the skills that we need in addressing this topic-I hope to come to that shortly.

Many noble Lords pointed out that but a short while ago we saw ourselves as being in a land of plenty, but Sir John Beddington's Chatham House speech changed all that, showing us the threat that mankind faces from a perfect storm of resource pressures, climate change and population increase. This was followed by the Royal Society's *Reaping the Benefits*, which showed how science could provide solutions if we were prepared to take the opportunities that it offered and, ultimately, by the Foresight report, which placed the challenge in a global context. Many noble Lords talked of this, none more graphically the noble Lord, Lord Cameron of Dillington. My own Taylor review was designed to look at the need to provide on-farm solutions here in the UK. The sub-committee not only recognises that but also points to the pan-European dimension of its solution.

At the seminar in November, I was given the opportunity to put forward to the European Commission the Government/Defra position on agricultural R&D and to ask for more information from it, particularly on European innovation partnerships and operational groups. Innovation in agriculture is very important to the UK Government. The Government Office for Science's Foresight report on the future of farming clearly laid out the global challenges for the agriculture sector. Investment in research and innovation at both national and EU level will play an important role in

supporting sustainable intensification and climate-smart food systems that will improve food security for Europe and globally.

If I may talk about one of these systems, my noble friend Lady Byford asked about animal welfare standards as a factor in good farm management, independent of the size of the unit. Animal welfare standards and business efficiency can be mutually supportive. We recognise the concerns about such standards creating a competitive disadvantage; we have had discussions in the House about the egg-laying directive, and I have pointed out that the department is concerned to ensure that the sow stall directive is properly enforced. These initiatives and high standards are something that we in this country are not prepared to jeopardise, but they do not necessarily conflict with the strategy for larger-scale production units.

The Government invest £400 million a year on agrifood research, including collaborative work with industry. As noble Lords have pointed out, that is mainly through BBSRC. Defra itself spends £65 million per annum on agricultural R&D, including animal health and welfare. I will not deny that I wish that as a department we had more, but deficit reduction must be addressed. Meanwhile, I assure the noble Lord, Lord Knight, that we are actively leveraging our limited funding.

This investment is coordinated by the UK cross-government food research and innovation strategy published by the Government Office for Science. The cross-government and research council programme on global food security will be a key vehicle for driving this agenda forward.

Perhaps I may comment on my noble friend Lady Parminter's view, which she expressed very cogently, about the precautionary principle and how it fits with a policy of innovation. The Government agree with the committee that the precautionary principle remains relevant to decisions on food and environmental safety, but it must be applied sensibly and not as an unjustified barrier to new technologies. The noble Lord, Lord Bilimoria, reminded us eloquently about our global responsibility to use technologies to address food supply throughout the world.

I would like to think that we can build on the shared respect for science that has been evident in this debate to move forward in the court of public opinion. I thank the noble Lord, Lord Knight, for his willingness to develop cross-party consensus on these issues.

Through the Technology Strategy Board, Defra and BBSRC, the Government invest in the Sustainable Agriculture and Food Innovation Platform, worth £90 million over five years, which matches funding by industry. It is worth noting that the TSB's contribution of £50 million to this pot is new investment in innovation. The Government are also reviewing R&D tax credit support for innovation as part of the Dyson review recommendation to boost innovation in Britain.

It might be useful at this point to talk about agricultural skills. Several noble Lords mentioned this, and I shall build on the question that my noble friend Lady Byford asked. The national curriculum review is currently looking at essential knowledge that should be studied pre-16. Studying agriculture should be seen as a front-line activity of central importance to ensure that its relevance to the challenges of food security and sustainable intensification can be supported by a skill base. Lantra, the skills council for the environmental and land-based industries, offers information and careers across the agri sector and determines standards to ensure that qualifications meet both employer and learner needs. I know how important this is. Motivation and enthusing people to enter our industry will be vital if a new generation is to take this agenda of change forward. I should like to point out that in Holbeach itself there is a secondary school, which has now developed academy status, working alongside Lincoln University and the National Food Research Centre—an educational institute—to try to develop this in the heart of perhaps one of the most productive areas of UK agriculture. Therefore, I have first-hand knowledge of what is being done and what can be done on a much broader scale.

However, to tackle the challenges of creating a more innovative, profitable and competitive EU farming industry that can better withstand shocks and recover from them quickly, we also need to work in partnership with other countries in Europe and further afield. This is a factor

that runs through the report and was reinforced by contributions throughout this debate. We therefore welcome European Union mechanisms that support this approach, including the European Research Area Networks-ERA-Nets-as well as supporting the Commission in its provision of the joint programming initiatives, or JPIs, of the member states.

My noble friend Lady Sharp mentioned the importance of awareness in the Commission of the need to remove complacency and to invest in innovation. At a wider international level, the UK's proactive engagement with the Global Research Alliance on Agricultural Greenhouse Gases is an example of where a partnership approach can be used to address common global challenges and add value to our own £12.6 million greenhouse gas R&D platform to identify greenhouse gas mitigation options and monitor them more effectively.

The noble Lord, Lord Cameron, talked about global research partnerships. The Global Research Alliance on Greenhouse Gases includes the USA and Brazil, as well as many EU member states. UK researchers, including those from Rothamsted, which the noble Lord will know well, are actively collaborating with their counterparts in New Zealand and Australia as well as the US. This is all co-ordinated by Defra, which is also collaborating under the sustainable agricultural innovation partnership through the action plan for UK-China co-operation on food security. The noble Lord, Lord Bilimoria, reinforced the importance of this global approach to research projects if we are to meet the global challenge of feeding the world.

As we enter the final years of the EU's seventh research and development framework programme, we welcome the Commission's recent proposals for Horizon 2020, a research and innovation programme for Europe between 2014 and 2020. Horizon 2020 should play an important role in addressing the key societal challenges that we face today. We are pleased that food security and sustainable agriculture are among the grand challenges to be addressed by the programme. Indeed, my right honourable friend the Secretary of State, Caroline Spelman, is due to sign it off today.

EU-funded research must deliver value over and above that of our national programmes, and the impact of Horizon 2020 will depend on the active translation of research outputs as part of effective knowledge-exchange mechanisms. We therefore welcome the aim for Horizon 2020 to cover the knowledge spectrum from fundamental research through to demonstration activities.

Importantly, ambitious CAP reform would provide opportunities for agriculture to become competitive with less reliance on subsidies, releasing funds to encourage the cost-effective delivery of public goods and stimulate innovation in the agricultural sector as it grapples with global challenges to provide sufficient food to feed a growing population in a way that impacts less on the environment. I believe that the current package of proposals will fall short of this aim. I assure my noble friend Lady Parminter that we recognise the need for the identification of funding within the CAP for research and innovation.

We therefore broadly welcome the Commission's proposal to establish a European innovation partnership, or EIP, for agricultural productivity and sustainability that will bring together relevant actors across the research and innovation chain. We also support the establishment of operational groups-OGs, as they are called-to test out emerging findings and to drive forward the adoption of new ideas and technologies. However, we await further clarification from the Commission on how the EIP networks and OGs will operate in practice and how they are to

be funded, and we look forward to working closely with the Commission and others as these proposals are developed.

A number of noble Lords challenged our position on GM. I include my noble friends Lord Caithness and Lady Byford, but it was mentioned in a number of noble Lords' speeches. The EU controls are the strictest in the world and robust enough to ensure that any approved GM products will be as safe for people and the environment as their conventional counterparts. Although ensuring that safety is paramount, we also need to be open to the potential benefits of GM technology. That is important, given the challenges ahead on food security and sustainability. My noble friend Lady Byford is right in her appraisal of the current proposals. A sustainable resolution of this issue must be based on science and be established across all 27 countries of the European Union.

In its inquiry, the committee has also examined the provision of farm advisory services to support agricultural innovation and competitiveness. I am delighted by this as it featured in my own report to the Government, then in opposition, to encourage greater collaboration between the public and private sectors in funding research and ensuring that a more effective knowledge transfer takes place.

A number of noble Lords mentioned the climate change risk assessment. I see this as an opportunity. Published last week, it presents the very real challenges posed by climate change. The scenario as painted for British agriculture is that there are opportunities within this agenda, but the assessment points particularly to the resource challenges of water. This will continue to be an increasing challenge not only in this country but across the world if we are to increase the capacity of our existing arable soils to produce crops and our grasslands to sustain livestock.

I am pleased to report that, as from 1 January—as noble Lords have mentioned—the new farming advice service will provide advice on competitiveness, nutrient management, climate change adaptation and mitigation and cross-compliance. The provision of the new service, secured by open competition, will be delivered by AEA Technology in active partnership with industry-related bodies such as the NFU, the CLA, the AHDB, LEAF, the West Country River Trust and ADAS. Farmers wanting professional advice will no longer have to ring round dozens of organisations before getting through to the right source. After all, good advice is essential to the running of any business, and this new advice service will make sure that farmers can get the most out of their farms.

I therefore wish to encourage any future industry-led initiatives that will stimulate co-operation between industry bodies, innovation, applied research and the effective translation of science and technology into practice. I understand that the noble Lord, Lord Curry, will be chairing a meeting shortly to encourage the levy bodies, colleges and other stakeholders to work together to deliver innovation. That mission has my blessing.

I have not gone into a lot of detail about something that was mentioned by my noble friend Lady Parminter and the noble Lord, Lord Knight: the reduction of waste in the food chain. I see that as a very important aspect of any strategy to increase the efficiency of the food chain and reduce the needless waste of important foodstuffs. As noble Lords will know, this is also a part of my portfolio. I am working very much towards this end and have the considerable resource of WRAP, an excellent body that has provided advice throughout all of this. My noble friend Lady Parminter also mentioned nutritional and health values in foodstuffs. We

should also not ignore the quality of food and its effectiveness in nutritional terms when talking about the capacity of industry to produce food.

It was good to listen to my noble friend Lord Plumb and to have the debate that we are conducting today put into a historical perspective. My noble friend is rightly credited with presiding over this industry in its golden age. I would not describe the future in quite such terms but the noble Lord, Lord Bilimoria, talked of a renaissance in this industry. I share with him and the committee a sense that we have an opportunity-a renewed opportunity-to address the challenges of the future to build a sustainable and more productive agriculture by the use of science, technology and innovation. The committee, along with our farmers and growers, looks to the Government to provide a lead both here and in Europe to do just that. I thank the noble Lords for their participation in this report; it has served as a very useful catalyst for us to be able to reiterate that objective.

Lord Carter of Coles: My Lords, I conclude by thanking all noble Lords for their contributions. We have been debating a very important issue this evening and all the contributions have served to underline that fact.

I noticed a number of themes emerging from noble Lords' remarks. The first is the issue of people: the fact that the population of the world is going to rise and requires feeding imposes a moral, political and economic responsibility on everybody who can help in this. That is one of the noblest things we could focus on. The noble Lord, Lord Curry, and the noble Baronesses, Lady Parminter and Lady Byford, mentioned how we can get people to engage in agriculture, how we can motivate them, educate them and up-skill them. These are very important factors; those things together drive that along.

The second theme is the issue of science: the point made by the noble Baroness, Lady Sharp, about the renewal of science, and the fact that renewal of interest in agriculture generally is a wave to ride, something to pick up on and to drive forward. On the subject of science, the noble Earl, Lord Caithness-in his usual to-the-point way-drew our attention to GMOs. This is not to be ducked; it is an issue to be debated and it is an issue the European Union needs to get clear on. We need to address the issue of GMOs if we are to close that gap between productivity in our continent and in other parts of the world.

The noble Lord, Lord Cameron, drew our attention to the challenges we face on a global scale, as did the noble Lord, Lord Bilimoria: the challenges of moral responsibility, of feeding Africa and involving Europe beyond its boundaries by actually going out and serving and helping solve the problems of the world. The noble Lord, Lord Plumb, with his great experience, raised the most pressing question of all: how is it going to be made to happen? How will it happen? How will we influence the CAP and how will it go forward?