

Environmental Audit Committee

Oral evidence: [Climate Change Adaptation, HC 1023](#)

Tuesday 14 March 2017

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Members present: Mary Creagh (Chair); Peter Aldous; Geraint Davies; Caroline Lucas; Kerry McCarthy; John Mc Nally; Dr Matthew Offord.

Questions 1 - 101

Witnesses

I: Baroness Brown of Cambridge DBE FREng, Chair, Adaptation Sub-Committee, Committee on Climate Change, Matthew Bell, Chief Executive, Committee on Climate Change, and Daniel Johns, Head of Adaptation, Committee on Climate Change.

II: Lord Gardiner of Kimble, Parliamentary Under-Secretary of State for Rural Affairs and Biosecurity, Department for Environment, Food and Rural Affairs, Dornford Rugg, Team Leader, Policy and Adaptation in Climate Change, DEFRA, and Molly Anderson, Head of Climate Adaptation Evidence and Analysis, DEFRA.

Examination of Witnesses

Baroness Brown of Cambridge DBE FREng, Matthew Bell and Daniel Johns.

Q1 **Chair:** I am delighted to welcome our witnesses for this session: Matthew Bell, Chief Executive of the Committee on Climate Change, Baroness Brown of Cambridge, Chair of the Adaptation Sub-Committee, and Daniel Johns, Head of Adaptation on the Committee on Climate Change; some old friends and one new face. You are all very welcome.

If we can kick off, your committee has identified five areas where stronger policies and investment is required: flooding, health, risk to the water supply, which is a massively neglected risk, risk to natural capital and risks to food. You identified a new area, which is pests and diseases and invasive non-native species affecting people, plants and animals. We tend to think of non-native species as something like Japanese hogweed and not things like Zika virus. The Government have published their assessment of your evidence this year and I just wondered what your thoughts on the Government's response was.

Baroness Brown of Cambridge: First of all, thank you very much for giving us the opportunity to appear today. We very much appreciate that. The Government published their climate change risk assessment in January and we were pleased that that followed very closely our evidence report that was published in the middle of 2016. They accepted all of the areas that we said were risk areas to focus on, other than they did not rank the risks to domestic and international food production and trade as an area of more action needed. They saw that more as a research priority because they felt that some of the areas anyway were issues that would be addressed by international markets.

We were raising a concern that it could lead to spikes in food prices for particular foods and also a concern about food crime. We might get a recurrence of things like the horse meat scandal, where there were hikes in prices and people were finding other ways to keep them down. So we felt it was a risk that we should be thinking about more action on, but

that was the only area, I think, where Government sort of downplayed slightly the research that we presented to them. We were very pleased at the positive response. Of course their document is an analysis of the risks.

What they will publish next year is the next National Adaptation Programme, which is of course the action plan that follows up on those risks. We are pleased that they have accepted our prioritised risks. I think the second National Adaptation Plan, the second run-through, is really key. The one we are working on at the moment was the very first one. We think the second one is the real opportunity to do something that is a major upgrade on the one we have at the moment.

The National Adaptation Plan we have at the moment was very much a collection of all of the things that were going on. We see this as a real chance to focus and for a real focus not on process, but on delivery and on looking at actions that will reduce risk, because although there is a lot of action going on at the moment, we don't see that it is really doing enough to reduce the risk, particularly in key areas of flooding and health and natural capital. Indeed, with a lot of the actions we have at the moment, it is very difficult to measure the impact they are having on the risk, so all of those considerations need to go into making sure that we get a really mature National Adaptation Plan in our next iteration.

Q2 Chair: So you think the Government should be focusing very much on short-term action rather than on any more research. You think the research is done, the risks are clear, the time for process is over and the time for action is now. Is that right?

Baroness Brown of Cambridge: No, I do not think we are saying there shouldn't be more research. I sit on the Committee on Climate Change and work on mitigation as well. Compared with mitigation, some of these risks are arriving slowly—the adaptation ones. In many areas we need both action and research, and in the one you highlighted, the emerging pests and diseases, I think that is a particularly important one for research. We have time. That is the good thing. Research programmes

tend to take five, 10 years. We do have time to be doing research there, but also we have some other key research areas.

For example, we need to know a lot more about the impact of rising temperatures and rising humidity on air quality, the impacts of particulates and of ground-level ozone. We need to understand better the fact that in the marine environment, we are starting to see that warmer water species of plankton are appearing in the North Sea. We don't know what impact that will have on the marine food chain. Is that something that is serious that we need to be preparing for? We need a combination of research and of action, but we also need to be able to look at and get a better measure of how those actions are addressing and reducing risk for us.

Q3 **Chair:** We have been particularly concerned on this Committee with flooding. I just wondered if you thought Defra has the staff and resources in its adaptation team to ensure that the UK does respond effectively to the risks posed by climate change.

Baroness Brown of Cambridge: Resourcing in Defra is a concern, particularly in the context of Brexit, which I know your Committee has looked at, and the enormous challenge there will be of moving European environmental regulation and legislation into UK law. That is going to be a very large job. I think Defra have talked about there being more than 1,100 pieces of regulation and legislation they need to address. Andrea Leadsom herself has said that more than a third of that probably cannot be simply transferred through the Great Repeal Bill. There is a huge job there. They have a lot on their plates at the moment. They are an unprotected Department and I think resource in Defra is a real concern. There are a lot of good people trying to do a very good job there and I think the work we do needs to help them focus so that they really are looking at the priorities and the things that can make a significant difference, because it is going to be tough.

Q4 **Chair:** How have the staff numbers fallen since 2012 in the adaptation team in Defra?

Baroness Brown of Cambridge: I don't have that information. I do not know, Daniel, whether you have any insight into that.

Daniel Johns: I don't have the figures to hand. I certainly know that there were around 30, 35 people working on the National Adaptation Programme when it was first being developed in 2012 and published in 2013. There certainly isn't 30, 35 people there now. I am sure you could ask the Minister when he appears later.

Q5 **Chair:** Yes, we will. We are going to ask you about Brexit right at the end, if that is okay, and the troublesome third of legislation that Andrea Leadsom revealed. It was at this Committee that she revealed the troublesome third, so we are now notorious for that session.

Baroness Brown of Cambridge: We have been worrying that about on the House of Lords EU Committee as well.

Chair: Yes, I think we need to compare notes on that. I just wondered if the officials had anything to add on those questions.

Matthew Bell: The only thing I would add on the resourcing is that it is important that we don't just focus on Defra and it does not all fall on Defra, especially when we are talking about something like flooding. Obviously the Department for Communities and Local Government plays a big role in thinking about flooding and building standards as well. When we are talking about overheating, the Department of Health also has a role in those areas. Perhaps those are two Departments that are slightly less affected by Brexit in a relative sense. Even on issues like flooding, where it feels like it might be a very narrow focus, in fact there is a cross-Government focus and part of the action that is needed and part of what both the National Adaptation Programme, the next one and others need to do is to reflect that other Departments also need to take these risks seriously in how they fulfil their duties.

Chair: We are going to come on to that now with a question from Geraint.

Q6 **Geraint Davies:** I wanted to also ask about the comprehensive plan for

adapting to climate change and in particular about overheating. Obviously we have talked about flooding and plankton, but I am thinking of things like greater respiratory problems from overheating for the health service. In terms of pollution impacts, I am thinking about impacts on traffic. People will know that there are going to be more sudden and heavy bursts of rain, and will ask whether that is being factored into traffic management. I am thinking about people's behaviour in prisons when there are sudden changes in temperature. I understand that certainly in the health service, very few health authorities have any sort of adaptation plan where they have thought these things through. I am wondering whether you think that in these sort of areas there needs to be more focus and more holistic planning for behavioural changes and other impacts on those areas in particular.

Baroness Brown of Cambridge: I think you are absolutely right. We have good provision for short-term dealing with emergencies of heatwaves. We don't yet have the long-term planning and policy that says, "In building new hospitals and in building new homes, we are taking the issues of overheating as well as the issues of insulation and being warm enough into account" and we don't have plans for adapting the buildings we have at the moment.

Also, as we have flagged up, I think there are a number of key areas of research that we need to progress. In many of these areas, we need to be bringing research communities together to look at research that is about the technical but also about the behavioural side. I hope that will be one of the big benefits we will see from the bringing together of the research councils to form UK Research and Innovation and that we will be able to get a lot more interdisciplinary research response to our needs. Indeed, one of Lord Krebs's last acts was to write to the research councils with an overview of what we saw as the research requirements going forward. Indeed, I have written to Sir Mark Walport, the new chief executive of UK Research and Innovation, and asked Mark for a meeting so that we can discuss this.

One of my priorities as the new chair is to get around a range of other Government Departments, because at the moment all of this is very much centred on the activity in Defra. I think, as Matthew has highlighted, it is important that DCLG are involved, it is important that the Department of Health are involved, the Department for Transport and Local Government, because we do need a cross-Government response to these issues going forward. I don't know, Daniel, if you want to expand on that.

Daniel Johns: Yes, just to say that it is one of those areas. You mentioned overheating, where, as I say, there are reactive emergency response arrangements, yet there is no requirement within building regulations to build homes today and tomorrow that avoid overheating. There are minimum standards that allow ventilation to avoid poor indoor air quality, but nothing to prevent them overheating. It is one of those areas where in our first statutory report to Parliament on the National Adaptation Programme, we flagged the risk of overheating in new homes as red. Having published the climate change risk assessment evidence report last summer, we are now preparing our next statutory report to Parliament, which will be published at the end of June this year. We are reviewing the evidence again to see whether or not in the last two years, since we last reported, there has been progress. But certainly there is no standard that prevents new homes overheating that are being built today.

Q7 **Geraint Davies:** Did you want to add anything? I guess that there are two factors here. One is that average temperatures will be higher and I suppose we can look towards southern Mediterranean countries for building standards for prisons and schools et cetera, but also, there will be more sudden bursts of changeable weather that will have impacts, whether respiratory, traffic or whatever. It seems to me that, at a time of a cut in overall resources, there is a tendency for frontline management to focus on short-term problems rather than long-term planning and structural changes. Is extra effort being put in to ensure a sort of mandatory focus on this—more holistic, long-term planning on these

things, and overheating in particular? Is that now occurring in Government or is it being overlooked due to the pressures of the short term?

Daniel Johns: If I can add that there was a debate within the House of Lords during the passage of the Housing and Planning Bill last year, where Lord Krebs supported a number of amendments proposed that would, first of all, make sure sustainable urban drainage systems are present in new developments—I don't know if you want to go there, but it is still a problem, clearly—and also at the same time promoted the need for new homes to have some kind of standard that prevented them overheating.

When we made recommendations to the Government back in 2015, in both those cases they said that what they wished to avoid at this point was additional burdens on the housebuilders in a period where obviously the priority is about building 1 million new homes over the course of this Parliament. What they are not prioritising is measures that might help ensure those houses are cost-effective to heat going forward, so they obviously remove the requirement for them to be zero-carbon homes, the requirement for them to avoid overheating in hot summers. I have been in new homes recently that do readily overheat in relatively mild temperatures in summer. Also on preventing those homes from flooding, we can expect 200,000 new homes this Parliament to be built in areas of flood risk.

Baroness Brown of Cambridge: Of course we are a country where our housing stock lasts a particularly long time, so these houses are going to be with us for a long time and we do need to build them for the future, not just for now.

Q8 **Geraint Davies:** Obviously in the case of flooding, you put some initial money in and you could save a lot of money with a small risk, but similarly, with prisons, if it is the case that there is a behavioural problem triggered by an extra couple of degrees in a claustrophobic environment with fewer prison officers and more prisoners, the downside cost is much

bigger than the investment upfront to ensure you have cooler, more calm prisons, I guess. Is there an adaptation of existing prisons, for example, or is it just about new prisons?

Daniel Johns: At the moment, we don't have the basic data about internal temperatures within hospitals, care homes, prisons and schools to know to what extent this is a problem. We certainly hear anecdotal examples of new, very significant housing developments reaching 50 degrees by the time you get to the top. They have lots of glass, very little ventilation. This one particular example we saw had a stairwell coated in glass, south-facing, and in the summer the temperatures at the top of that glass stairwell were reaching 50 degrees. There just is not the attention being paid, even within housing, and I would also say there is no evidence that has been considered when you think about new care homes and new prisons. So we don't have the evidence about internal temperatures and we do not have the policies in place that would avoid these kinds of new homes and other types of building overheating.

Q9 **Geraint Davies:** Finally, how easy would it be to get data to show the size of the problem but also the size of the adaptation, not just for new houses and new build but for existing stock to stop these sort of problems or is that just impossible?

Daniel Johns: No, it is not impossible. Certainly we have seen studies on hospitals, for example, which look at the type of construction. Older hospitals, kind of Nightingale-type hospitals, very solid, lots of thermal mass involved, don't overheat so badly. It is the 1950s, 1960s and 1970s lightweight buildings with lots of glass, southerly aspect, very little ventilation, that do. You can't even open the windows in many cases because of health and safety issues about windows being open high up within hospital buildings. It is clear that there has certainly been a lot of building in the past that has added to the problem, but I guess what we do not know really is the data on those types of buildings, prisons, hospitals, care homes that are being built today.

Baroness Brown of Cambridge: The Government's climate change risk assessment does comment that, but of course until we get the new National Adaptation Plan, we don't know what the actions are going to be to address that, so there is a recognition of a need to address this.

Q10 **Chair:** Thank you. In our 2015 report on the National Adaptation Plan, we recommended timeframes, targets, monitoring and evaluation. Can I just ask, Daniel, did that actually happen? Do we have timeframes and targets and evaluations? Have the Government done that?

Daniel Johns: Certainly they accepted our recommendations. In 2015, when we said there should be a clearer sense of purpose in the next National Adaptation Programme, there should be a sense of which risks are the most important and what actions they are going to take that are going to have the most impact, that recommendation the Government did accept. Therefore we would expect the next National Adaptation Programme next summer to have a much clearer and possibly a much shorter set of key actions that are going to make the difference. We would much rather a short, specific, focused NAP than the NAP we had last time with 370 actions, over 30-odd objectives. It was very difficult to see how the actions in total were going to make the difference we need to see.

Chair: Thank you. That is helpful. We are going to explore some of this in detail with Matthew.

Q11 **Dr Matthew Offord:** In the climate change risk assessment from 2017, the Government have made known the amount of research that they are undertaking. Perhaps if you could just elucidate for us about the current state of research, particularly in regard to the risks of climate change.

Baroness Brown of Cambridge: Daniel, I think you are probably better-placed.

Daniel Johns: Certainly. What we wanted to do with the climate change risk assessment brought last summer was first of all to make it absolutely clear to the Government where they should put their limited resources in

the next National Adaptation Programme, but also highlight the research gaps. We wanted to take forward those gaps now so that by the time the next climate change risk assessment comes out in the early 2020s, the gaps—hopefully as many as possible of them—will have been filled. We hosted a conference, a one-day research conference, at the Royal Society with Sir Mark Walport and Professor Ian Boyd to try to get the research community to work together to address some of these gaps. We are confident there is movement. We have had a response back from the research councils and we will continue to meet with them to urge them to invest in these kinds of multidisciplinary, interdisciplinary issues that need to be addressed by the research councils working together.

We also need to see the next set of UK climate projections that are due out from the Met Office and Defra next spring also helping to take forward the level of evidence that we have about how the natural variability in the weather will combine with the underlying climate signal to create the weather conditions that the country will have to deal with in future decades. I think in the past, climate projections have kind of given you, “What is a typical summer going to look like? What is the average temperature going to be in winter in the mid-century?” but the next climate projection should hopefully paint a much clearer picture about the full range of weather conditions we might expect at any point in time during the course of this century.

Q12 Dr Matthew Offord: That is quite interesting in itself, but what about short-term research and long-term research, because that is going to be quite important in predictions in future? You have already mentioned the previous summer’s temperature, but how are you going to focus? At the minute, you seem to be implying that short-term research has been undertaken, particularly as you look to the CCRA in 2022. What about longer-term research? How is that being addressed?

Daniel Johns: Individual research councils will have programmes of research that are relevant to climate change adaptation. Very little research is probably triggered only because of climate change, but

certainly there is a lot of investment going through the Natural Environment Research Council into infrastructure resilience, to take one particular area. They are looking very much at individual sectors—how resilient are the rail and road, energy and water sectors to climate change—but also how these systems work together as a system of systems to spot problems relating to bridges or the fact that everything runs on electricity and ICT these days so what potential there is for more systemic cascading failures as a result of point assets failing.

Q13 **Dr Matthew Offord:** Could you explain to us or give us an update on progress for the CCRA for 2022? How is that going?

Daniel Johns: It is still early days. Obviously, the Government have only just presented the Climate Change Risk Assessment report to Parliament. The new CCRA does not need to be published until 2022, as you say, and, therefore, we are talking to Defra at the moment about what their plans are and what their resources and budget will be for the third Climate Change Risk Assessment. From our perspective, it probably took about three years from the point of being commissioned by Defra to produce the evidence report through to publishing it in July 2016. I guess there is probably a year or so at least of work that we can do to start to scope out different options and then agree with Defra which is the best way forward.

Q14 **Dr Matthew Offord:** Do you think that is enough time, then, between the period of that scoping inquiry and the next round? Does that give the Government enough time to look at what is happening and to see if their measures are being effective and then take a further informed decision in 2022?

Daniel Johns: Certainly, there is plenty of research going on about the core climate science, not just within the UK but, of course, around the world as part of the next IPCC set of reports that will come out in a year or two's time. I guess what we would call for is much more research about what works; going back to monitoring and evaluation, to put in place the means to measure and judge whether or not current policies

are effective at reducing long-term vulnerability. In our last report to Parliament in 2015, we highlighted a number of areas where despite all the very good action that is taking place, it still appeared, based on long-term trends, that vulnerabilities were increasing. I guess if there is a priority in the short term, it is about putting in place much better ways to monitor and evaluate the effectiveness of current policy.

Q15 Dr Matthew Offord: One of the criticisms that this Committee has had in the past is about incomplete data gathering and that the requirement for mandatory reporting was dropped in favour of a voluntary code. What is your view on that, the use of voluntary rather than mandatory?

Daniel Johns: I guess you are referring to the adaptation reporting power. Within the Climate Change Act, there is a power for the Secretary of State to ask infrastructure operators and other statutory undertakers to produce an adaptation report to identify the risks they face and the actions they are taking in response. The first round of ARP, as it is called, was a mandatory process and led to over 100 different organisations reporting. The second round, which we are just at the end of, was voluntary and what we saw was more people were invited to take part but less actually did, and perhaps we can talk about that. Defra has asked the adaptation sub-committee to review the value and the evidence coming forward as part of that second round, and we are due to submit our report to Defra in the next couple of weeks.

Q16 Dr Matthew Offord: My follow-up to that would be: do you believe there is a lack of engagement among some organisations and some departments in regards to climate change?

Daniel Johns: I certainly think there are some organisations that probably think they are already doing a good job in terms of managing climate risks among the range of risks that they as an organisation will face on a day to day basis as well in the longer term and, therefore, might not see the value of an additional reporting burden as part of the Climate Change Act. That is probably the reason why 20 or so organisations declined to take part in the second round.

Certainly, on our own role, if the adaptation sub-committee is to report to Parliament on the action being taken, we are quite heavily reliant on these reports to tell us what actions are being taken, what benefits people are finding and what evidence there is that they are making a difference.

- Q17 **Dr Matthew Offord:** Can I, through the Chair, ask if it is possible to have a list of those 20 organisations? I am sure you are not going to be able to reel them off right now, so perhaps they could be sent to us at a later date.

Daniel Johns: Of course, yes.

- Q18 **Dr Matthew Offord:** That is great, thank you. We had some information only yesterday that the Maritime and Coastguard Agency decided not to have a new plan, they just refreshed their plan. They are one of the organisations that I think are probably going to fall into that list of 20.

Daniel Johns: Certainly, the guidance from Defra to organisations in the second round was to allow a light touch update. Given that we are into the second round, Defra is mindful of the burden on reporting authorities of the need to produce this information. In many cases, we did find that I guess we might say there was only a very light touch, almost a cursory update by some organisations. If that is the outcome of this second round reporting, and if that were to continue and to become the norm, then there is a question about how valuable the process is. What we see is real value when it is done properly, and unfortunately when it is done properly it does take some effort.

- Q19 **Caroline Lucas:** Would you, therefore, say that it should be mandatory?

Daniel Johns: In the 2015 report we did recommend the third round should be mandatory.

- Q20 **Chair:** We are in total agreement on that, then, because in our flooding report we said that all infrastructure companies should have mandatory flood resilience reporting. Just on the reporting, is it public authorities? Who are these 100 bodies?

Daniel Johns: It is ports and airports as well as road and rail operators as well as the regulators.

- Q21 **Chair:** The 2013 floods flooded Gatwick Airport and the Port of Immingham after they had reported presumably into you about their level of flood resilience. From memory, Gatwick is now protected to a one in 50-year flood standard, which is not that high, and Immingham I think might be lower. We had a roundtable on flooding in this Committee about a year ago. There is some quite rich stuff around, but we have had the last year's floods where the entire Airwave system went down in Leeds, so the police were unable to radio. This is where the mandatory reporting ends up. It ends up with police in Leeds not able to work out where they need to be sending out their resources.

Baroness Brown of Cambridge: That is one of the key areas that I don't think yet works well enough, which is the visibility of interdependencies. I am sure it does for things like the police in general, but I am referring to the interdependencies between the organisations—their reporting does not necessarily address that—the increasing interdependencies between communications, finance, electricity and water, the ability to know what risk you are suffering from your supply chain or the people you rely on, what the quality of their analysis of those risks is and your ability to assess the level of that risk to your organisation.

Certainly, the interdependencies issue is one that we think does need more focus. Indeed, in talking to some of the organisations, I think the message we got from them was that, with some areas of concern about interdependencies, they were not entirely sure they were totally confident about that. It emphasises that you cannot look at this in stovepipes. Increasingly, you have to take this systems-based approach.

- Q22 **Chair:** And look at cumulative risk as well. Before we move on from the research question, can I ask what the budget is that you have allocated to the research programme?

Daniel Johns: Within the adaptation sub-committee?

Chair: Yes.

Matthew Bell: Defra is the main holder of the budget for the research programme.

Q23 **Chair:** They hold the budget. Do you know the numbers or should we ask the Minister?

Matthew Bell: I don't know. It would be best to check with them.

Chair: Okay, we will bring that forward to the Minister.

Baroness Brown of Cambridge: I also think it is an opportunity—again, I think the formation of UK Research and Innovation will help us with this—to bring together research funding from other Government Departments. There is always going to be pressure on research funding. The more we can work with the combined research councils but bring in the Department of Health and Department for Transport and pull in their collaboration into funding, the better. We have had a very good response from the research community historically on that, and we will be working hard to continue that integration as one of our priorities.

Chair: Great, thank you. We are going to move on now to flooding with questions from John.

Q24 **John Mc Nally:** I would like to move you on to co-ordination across Governments. You will no doubt be aware that this Committee has previously criticised the Government for its lack of a long-term, proactive strategy for flooding. Your assessment states that current levels of adaptation are projected to be insufficient. Are you confident in the light of your upcoming progress report that the Government will be able to develop an effective, long-term plan for flood risk management as part of the National Adaptation Programme?

Baroness Brown of Cambridge: It is certainly one of the issues that we highlight that we think is absolutely critical as well. In the short to medium term, not the last Budget but the one before allocated £700 million towards it, of which three-quarters has been allocated. In the

short to medium term the funding is there, but we still feel that the long-term strategy is missing.

I think also, importantly, that there has been much more focus on coastal and river flooding and the big issue, of course, for cities is surface water and overflowing sewers. That needs much more focus. We would also like to see—and the Government's recently published plan says they will do this—much more focus on combining engineering solutions with some natural capital-type solutions of tree planting and other forms of flood management. The work of the Natural Capital Committee is absolutely key here in enabling policymakers to “value”—I put that in inverted commas because it will not entirely be in money—the relative contributions of both simple engineering solutions and solutions involving catchment areas and tree planting. Those things need to be moving forward side by side. Daniel, I know you have a much more detailed knowledge of this area.

Daniel Johns: As one example, the National Flood Resilience Review came out last September, obviously initiated after Storm Desmond the previous winter. One of the first things it did was ignore surface water. It said, “We will only focus on river and coastal flood risk—surface water we will postpone and look at at some point in the future.”

It also identified about 520 assets, from memory—we are talking about water company assets, electricity, gas, power stations, ITT—within the extreme flood outline and vulnerable to flood impacts. It highlighted that number but then went no further. There has been no published account of what these assets are, where they are, how important they are, how many customers would be impacted should there be a flood in that part of the country and, importantly, what action is going to be taken over time to reduce the vulnerability of those assets to falling over.

That is not a problem just of the National Flood Resilience Review. There has been no published account over the last 10 years by the Cabinet Office, Defra or anybody else about the impact of all the activity that we know has been taking place in the background to harden infrastructure

assets, to improve these risks of interdependency failures, so that we know now, 10 years on from the 2007 floods, how much better we are prepared and how much more resilient we as a country are in terms of our infrastructure and our communities to the flood events that we are seeing more and more of.

Baroness Brown of Cambridge: Of course, that gives us a problem in terms of our advice to Government because there is all this information we just do not know about. I have written to Ben Gummer in the Cabinet Office asking if we can have access to this information.

Q25 **John Mc Nally:** That is very interesting because sometimes you think that the Government do not know what they know. You just seem to have exemplified that. You have all this information, and I can talk a wee bit as chair of the APPG on flood prevention about some of the places we have been to visit. That seems to be the case quite along the way—nobody seems to be co-ordinating it and to have taken the appropriate action on who the lead authority is, et cetera.

You mentioned tree planting. I was unaware of the size of fields that have had their shrubbery or hedges removed and, as you mentioned, the flow down through grey areas where nobody has responsibility for clearing the culverts and the conduits and it just floods and floods and floods. That was extremely concerning. That was highlighted. It will probably emerge in evidence that we will produce later on to our own APPG.

Baroness Brown of Cambridge: It does give us an opportunity in terms of what replaces the CAP to be able to reward farmers for starting to address some of this land management that could be helpful. There are things we need to make sure go into that.

Q26 **John Mc Nally:** It came as quite a shock that quite a lot of them were not in place, to be honest. I would like to move you on to fluctuations in spending on flood resilience measures; you mentioned earlier Mark Worsfold's review, Sir Michael Pitt's reviews and the EAC inquiry. That has also been highly counterproductive, decreasing the percentage of flood defences that were already in good condition, for example. Is that

something you want to see addressed strategically?

Daniel Johns: That is interesting.

John Mc Nally: It does seem strange to me that we are not looking after what we already have.

Chair: It is not our report. It is the Worsfold review, which we got from Government as part of our flooding inquiry, which said that the revenue constraints meant that the condition of flood assets that are already there was not good. It fell from 99% in good condition to 92% and, of course, arguably that is why the Foss Barrier failed because it did not have the electrics, it did not have any failsafe mechanism. I think that is what John meant.

John Mc Nally: It is. You say it more eloquently.

Daniel Johns: What we saw was certainly a clear reduction in maintenance activity after the 2010 spending review. We were at about £170 million per year in revenue maintenance expenditure by the Environment Agency in about 2010. That fell to about £140 million within a couple of years. Obviously, since the storms I think particularly of 2013-14, that came back up to £170 million and around about the time that the Worsfold review was commissioned the Government were saying £170 million is as much as we can spend that delivers benefit; there is no case to go further. The £700 million that was announced in the Budget last year included about £200 million, about £40 million extra per year, for maintenance, so we are now up to about £210 million.

Q27 **Chair:** What was it in 2010? Did you say it was £370 million?

Daniel Johns: £170 million. That is just the revenue maintenance budget that the Environment Agency holds. Certainly, in terms of the financial picture now, we are in a much better position than we were a couple of years ago and certainly better than we were probably five or six years ago. Obviously, something must have changed between 2014 and 2016 to tell the Government that there was clearly additional benefit from putting more money into maintenance.

Chair: Desmond, Eva and Frank is what changed, I think.

Q28 **John Mc Nally:** Again, can I go back a wee bit to the evidence from the Committee on Climate Change to an EFRA inquiry? They noted a significant number of local lead authorities that had not completed their local flood risk strategies. Should the Government be providing more support to local authorities to assist with these plans? Again, I heard that being reiterated time and again in the various places we have visited so far.

Daniel Johns: Certainly, we recognise that seven years on from the Flood and Water Management Act we are still in a situation where many lead local flood authorities are not fulfilling the basic statutory duties that the Act contains. The first step in the process is for lead local flood authorities to produce and publish a local flood risk management strategy, and in March 2016 I think only 114 out of the 152 had published a strategy.

John Mc Nally: Thirty-eight had not.

Daniel Johns: There was also a very distinct lack of asset registers. Again, asset registers, which affect local flood risk, are a requirement of the Act. The lead local flood authority has to produce an asset register so that it understands the causes and potential solutions to local flood risk problems. Those asset registers just are not in place. When Defra commissioned an independent review of the quality of local strategies, again they found deficiencies. The strategies, even though they were published, were not fulfilling the requirements of the Act in terms of looking at the costs and benefits of different approaches and the timing of potential actions to reduce the flood risks that they found.

The Government in publishing its post-implementation review of the Flood and Water Management Act said that, if any strategies are still outstanding by the end of March this year, they will consider using their power to instruct a different risk management authority to intervene and do the strategy for them.

Chair: I think we will follow that up with Ministers. Geraint, you had a supplementary.

- Q29 **Geraint Davies:** Briefly, I used to be chair of flood risk management in Wales, adapting Wales to climate change in respect of flooding. I want to ask specifically about surface water flooding and, in particular, about roof water capture and storage. As you will know, the problem is a lot of water comes down and there is more concrete put down, the sewers basically come up and we have a big problem. There is an opportunity, clearly, on roofs to capture the water to store it in butts and to gradually let it go into the system so you take out the peaks of the cycle. I was wondering whether you are aware of any work being done in this field and whether that is something you might consider promoting.

Daniel Johns: Work not in relation just to green roofs, blue roofs and so forth.

- Q30 **Geraint Davies:** It is capture and storage on butts as opposed to just green roofs with trees on them or something.

Daniel Johns: Sure. As I say, there is nothing specifically to that kind of measure, but obviously that is one of the range of measures you can take as part of a sustainable urban drainage system. Obviously, we have been promoting the need for stronger Government policy in favour of SuDS in new development, before we even think about trying to retrofit SuDS in existing developments, which would also be necessary. Certainly, the general consensus within the construction industry, developers, planning authorities and so forth is that the existing SuDS policy is not working. It is not strong enough because the basic barriers to the widespread uptake of SuDS, which Sir Michael Pitt identified back in 2008, still have not been addressed.

- Q31 **Geraint Davies:** Baroness Brown, do you have any views on roof water capture and storage?

Baroness Brown of Cambridge: No, that is not an area I have specific knowledge of, but it certainly sounds like a good idea as part of the overall picture, so we will take that back. We have all noted it down.

Q32 **Chair:** Excellent. We expect to see a sedum roof on your building when we come on our visit.

Baroness Brown of Cambridge: You have obviously challenged us on the picture for the future.

Chair: You can now plant the lawn on the roof. We are going to move on to questions on food and agriculture from Kerry.

Q33 **Kerry McCarthy:** You already mentioned the difference of opinion between the committee and the Government on food security and risk to food systems. Could you say a little bit more about that? Do you think the Government are being rather too complacent about the risk?

Baroness Brown of Cambridge: I am going to hand that one over to Daniel because, of course, all of that detailed work was done before I took over chairing the committee. He has a much better sense of what the experts were saying very directly. I have done the reading but I was not there at the time.

Daniel Johns: Sure.

Kerry McCarthy: Yes. The Government seem to have done separate research. Could you explain why their experts are not coming up with the same results as you?

Daniel Johns: I think they endorse all the six priority areas we identified in the Climate Change Risk Assessment, including that there is a risk and that climate change both here and overseas will pose risks to the food system. Obviously, in recent years we have seen impacts, not necessarily climate change-driven impacts but price spikes to both feedstock for livestock and impacts on food for consumers.

I think where the difference in opinion lies is what you do about it. We think there is sufficient evidence to take more proactive action to manage the risk of price spikes, food substitution and potential changes in food quality, whereas the Government's response said that they have more confidence, I suppose, in international markets responding appropriately

and having a diverse source of supply. I guess the question is what your appetite for risk is on this issue. The markets will respond but the markets will respond through having price spikes, and when you have price spikes you have substitution like the horse meat scandal. Another example is apparently 75% of cumin seeds come from one region of India, the Gujarat region of India. There was a failed harvest in 2014, which led to a very big price spike, and then that meant that almond and ground-up peanuts were being substituted into cumin powder, which was then arriving in prepackaged foods and in spices into the UK and had to be recalled. Again, it was a failed harvest. It probably was not necessarily a climate change event, but it shows that the markets will respond but they will not necessarily respond in ways that protect UK consumers.

Q34 **Kerry McCarthy:** For people with nut allergies, that would be a real problem.

Daniel Johns: That would be a bad thing.

Q35 **Kerry McCarthy:** In terms of the markets responding, the Government would basically then take the view that, if it is not a one-off failed harvest, but a more permanent shift in climate, certain areas would just stop producing things and move into other areas. Rather than sourcing our iceberg lettuces from Spain, to use a topical example, there would be somewhere else that would rise to the challenge and we would be able to get them.

Baroness Brown of Cambridge: It reinforces the issue that we have that we will get in due course longer growing seasons in some areas, but unless we have the soil quality that has been maintained and improved and the irrigation, the drought management in East Anglia, for example, to benefit from those longer growing seasons and to benefit from our ability to grow some of these crops more closely associated with warmer parts of Europe, for example, at the moment, we will miss an opportunity that the changing climate brings to us. It does emphasise the need to address some of the other issues in the natural environment that we flag up.

Q36 **Kerry McCarthy:** Where do you see the balance? On farmers taking a forward-looking view and thinking, "I am going to want to move into this area. I need to adapt my farm to deal with that", whether it is looking at soil quality or whatever, where do the Government come into that?

Matthew Bell: One of the things about the food security issues is that they are a confluence of many factors. You have the immediate event, which causes a harvest to fail or whatever might happen. Then you have the reaction of Governments and consumers to that initial failure. One of the things you see, for example, in previous wheat harvest failures or failures in soya harvest—again, we are learning from other events that are not necessarily climate change-related because we think that the climate change will happen in the future—is that Governments respond by restricting exports. The Russian Government will say, "We are not exporting any of our wheat because there is a world shortage of wheat". That is not something that farmers themselves can control. It is those kinds of things where you need not just a UK plan but arguably also a more global strategy where Governments understand, in the event of harvest failures, the types of actions that they will take. Farmers individually will also be taking actions to shift their production, to better manage their soils, to move from one location to another, but there are also wider systemic impacts that take place that really only Governments are well placed to handle.

Q37 **Chair:** Farmers can take action. I just wanted to come back on what you said. I remember the wheat harvest failing and I remember the Russians banning it. I think it was 2011-12, around then. That was climate related because it failed in the prairies of North America. Farmers can insure against risk. There is a lot more farm insurance in the US than there is here. Is that an area that you have looked at in terms of farmers' insurance, livelihoods and incomes—there is no harvest this year so how are they going to get through?

Matthew Bell: I don't think we have done any specific research on farm insurance, but again that is right, that is part of the package of measures that you look at. The insurance will be there to supplement farmers'

income, which will be useful but, again, it might not help the consumers who are trying to buy the products that are not available at the time.

Chair: Absolutely.

Baroness Brown of Cambridge: We will be renewing a number of the members of the committee over the next year or so, and I would very much like to get somebody from the insurance industry, being a strategic area, on to the committee because I think it really is crucial that we have their insight and the kind of research that they do as an input and, indeed, how they will support the mitigation of climate change risk going forward.

Q38 **Kerry McCarthy:** To what extent do you think the risk is growing? We have had a pattern over recent years of floods being described as once in a lifetime, once in a century, and then worse rainfall occurring four or five years down the line or whatever. Is there a similar trajectory in terms of the impact on food growing and food production? The Government talk about the system being resilient. It is one thing being resilient to what has happened over the last century, but in terms of what is going to happen over the next few decades, centuries or whatever—

Baroness Brown of Cambridge: Of course, the same kinds of things are happening but differently globally. We have the same incrementing of risk and, if we look at the number of homes affected by flooding, we see that, even with measures in place, that is going to go on increasing in the UK even with the best will in the world. Clearly, that is the same situation.

Daniel Johns: Obviously, the core problem in the UK is that much of our food production is on the east side of the country where the projections of water scarcity are the most difficult and projections of soil aridity are also very severe, which means that what might be grade 1 agricultural land now, by the time we get to mid-century because of soil aridity, water shortages and so forth, is likely to diminish to grade 2, grade 3 and grade 4, which means you will no longer be able to grow the very highly profitable salads and horticulture type crops.

The other issue, I suppose, is about soil quality and the continuing loss of the peat-rich top soils in East Anglia and the Fens, where we are seeing over time about an average of 1 to 3 centimetres of top soil being lost because of wind and rain erosion. These kinds of combinations of factors will mean that the highly profitable, productive land that supplies a large proportion of UK food will not necessarily still be producing as much food in 50 years' time.

Q39 **Kerry McCarthy:** Do you think the Government are doing enough now? Is it going to be in the 25-year food and farming plan in any meaningful way? Matthew, you are smiling.

Matthew Bell: We don't know, clearly, what is going to be in the 25-year food and farm plan. The committee has said very clearly that both the 25-year environment plan and the food and farming plan need to incorporate climate change considerations going forward. The only way that those plans will deliver a sensible strategy is if they take into account the projections, and there is a range of projections, for climate change impacts over that kind of timetable, not just in the UK but internationally because we know half of our food roughly is coming from overseas and the other half from here. We know that that supply chain is affected by actions both in the UK and overseas. Both of those plans when they come out need to consider those environmental projections and the risks associated with them.

Q40 **Chair:** I just wanted to clarify two things before we move on. We studied soil in great detail last year and we share your concerns. There is 1 to 3 centimetres of top soil being lost. Is that over 10 years or one year?

Daniel Johns: That is per year.

Chair: Per year?

Daniel Johns: Per year every time. We have lost about 85% of our peat-rich top soils in East Anglia and the Fens over the last 150 years or so.

Q41 **Chair:** Of course, there is the carbon capturing side of that as well, isn't there?

Daniel Johns: Indeed, yes.

Baroness Brown of Cambridge: Absolutely.

Chair: That is really important and totally neglected.

Q42 **Geraint Davies:** Sorry, 1 to 3 centimetres per year? That is an enormous amount of soil to lose every year.

Daniel Johns: It is, yes. I cannot remember the figure, but I think it is millions of tons of top soil every year. Whenever you see a very heavy rainfall event, if you look at satellite images of the UK, you can see these brown plumes coming out from all the estuaries. It is the very rich top soil being washed off the land into the watercourses and then out to sea.

Q43 **Chair:** Pretty depressing stuff. Okay, we are going to move on to Brexit. But before that I wanted to ask you: roughly half of our food is imported. Have you done any modelling of price and food security if it were to move to, say, 60% over 10 years or 70%? Does it get cheaper or more expensive? Brexit obviously affects all of that, but if you can reverse engineer Brexit, what does it look like?

Matthew Bell: One of the other research priorities that we have pointed out is the need for more systematic land use modelling to precisely look at some of those issues. We are currently doing some work in that area that will slowly try to shed light on those and the wider land use issues, but there is a lack currently of a UK-wide ability to do scenarios around land use that look at food production, carbon sequestration and flood management, and say, "We are using the land for all of these different things. What are the trade-offs and what are the constraints that all these different things create?" That is an important thing to do both to understand the risks going forward but also in the context of the discussions over the common agricultural policy in terms of what incentives we want to put in place for how the land should be managed.

Q44 **Chair:** Say, 30 years ago, how much of our food was imported? Do we know?

Matthew Bell: I am sure we do, but I don't off the top of my head.

Chair: All right. If you find out, could you let us know?

Daniel Johns: It is important to say that we do not see increasing self-sufficiency, I suppose, of UK food. That is not necessarily the answer because that puts all our eggs in one basket. We think it is sensible to have a good balance of imports and exports, being able to source a range of products from a range of places, because otherwise we just suffer from failed harvests here.

Q45 **Caroline Lucas:** Have you looked at the climate implications of more food imports because the oil linked to that is traditionally thought to be quite a strong driver of climate?

Daniel Johns: In terms of carbon emissions?

Caroline Lucas: Yes.

Daniel Johns: Certainly, we have reports looking at the carbon footprint of food and imports.

Q46 **Caroline Lucas:** I am just surprised you have come to that conclusion because everything that I have read has suggested that more self-reliance is usually perceived to be better for the climate than not.

Daniel Johns: I guess I am saying there is a balance there somewhere. I am just saying that there are some people who would argue we should be completely self-sufficient for food, but that creates other risks in terms of, say, becoming reliant on domestic production.

Baroness Brown of Cambridge: The risk of a very severe drought in East Anglia is something that—

Caroline Lucas: But you could argue that the risk of a severe drought in East Anglia is increased by the extra oil being employed in more food imports.

Q47 **Chair:** We have had market failure. We have had a crop failure in Spain with the floods, but we can all still buy tomatoes in our supermarkets because they are coming in from Holland and they are coming in from other places, aren't they?

Matthew Bell: At a higher price often, so it is that—

Chair: We must close soon. We are going to end with the knotty challenge of Brexit.

Q48 **Peter Aldous:** Just for transparency purposes, I am a partner in a family farm in East Anglia, but that is not relevant to this particular issue. I think in your last report Brexit had come a little bit too early to assess its full implications, though you did say the magnitude of some risks and opportunities may be affected if legislation, policy and funding derived from the EU relevant to climate change adaptation are changed. Your next progress report I think is coming out in June. You have obviously had an opportunity now to do some assessment and I wondered if you could give us an idea of what may be likely to be in that report and whether you are optimistic or fearful.

Baroness Brown of Cambridge: I think there are areas of anxiety and areas of potential optimism. I gave a very strong message about the opportunity to use CAP-type payments more effectively than the current CAP to incentivise farmers on things like respiration of peatlands, which has biodiversity benefits and farming benefits and water management benefits and, as your Chairman has pointed out, CO2 benefits, and also the flood risk management aspects. Those things are positive.

Clearly, there are anxieties around some of the research funding support coming from the EU and some of the research collaboration. We will be looking closely to and talking to UKRI about what the plans are for continuing to support that kind of work in our universities and, indeed, collaborations between universities, international partners and universities and industry in some of those areas.

The particular concern, which I am sure is the concern this Committee and the House of Lords Europe Committee have had, is that even if we can translate all of the legislation and regulation, the enforcement side of it, the monitoring and enforcement from the Commission and the European Court of Justice disappears. What will we put in place in the UK to replace that to ensure that people know that these are not optional,

they are things that have to be done? Will we have processes that keep people as focused and are as fast to follow up? I am sure both Matthew and Daniel have been doing a lot of thinking about this in both adaptation and mitigation contexts.

Daniel Johns: As an example, the Government already have biodiversity targets for 2020, which they set themselves. For example, I think it is 50% of freshwater sites of special scientific interest should be in good condition by 2020. Well, they are off course. Only about 25% of freshwater habitats are in good condition at the moment. They are clearly not going to meet the 2020 target and I guess the question is: so what? That model has to be the default position for any future targets that the Government may set themselves in the 25-year environment plan.

I guess there is also a danger in the 25-year environment plan that it sets these aspirational long-term targets for 25 years' time in order to leave things in a better state for the next generation, but it distracts from what needs to be done now to meet the Government's existing targets, which are still really important and need to be met. Part of it also is that the devil is in the detail and we don't yet know what the status of the water framework directive and habitats, birds and so forth is going to be post-Brexit.

Q49 **Peter Aldous:** Just picking up one point, in preparing your progress report, do you see the continuing absence of the 25-year environment plan as a major disadvantage?

Daniel Johns: Certainly, it is. At this stage we were only expecting the framework consultation. It was not going to necessarily have the substance. That means that the period between the framework document and the White Paper is being narrowed and compressed all the time, but also in policy terms we keep hearing from the Government, "We will do something on soils but we will tell you what we are going to do in the 25-year environment plan". In 2015, we said that the Government have an aspiration for all soils to be managed sustainably by 2030 but they had not set out what policies and approaches they will take to achieve that.

That has been postponed until the 25-year environment plan. There is a kind of hiatus, I suppose, of policy, nothing new coming through because everything is now bound up in what the environment plan will be able to deliver.

Matthew Bell: Pulling those two together in a sense, going back to your question on Brexit, there are almost two parts to it. There is one part, which is there are a series of ongoing things like 2020 biodiversity targets, like soil type, which should be carried forward notwithstanding Brexit and everything that that entails. It is important that those things continue to happen. Then, as you rightly say, there is ensuring that whatever deal comes out of the Brexit process that continues to allow for both the enforcement and the medium-term aspirations.

I think the difficulty that we will have in the June report to Parliament is that it is still not clear enough what will emerge through the negotiation. I don't know if we will be able to say much more. The one thing that has happened since we last looked at it is the Brexit White Paper, which was the one that committed to transferring the framework into UK law and certainly made a very clear commitment to the Climate Change Act and the climate change targets and processes. That at a very high level is the only real statement we have had of intent so far.

Q50 **Peter Aldous:** Do you believe that British farming and British agriculture has what I would call the competitive ability that we need as we leave the EU and that our food supply chains are also sufficiently resilient?

Daniel Johns: In terms of the general competitiveness of the farming industry, that is not something we look at. We do look at the productivity of the agricultural industry and for many years there has not been much by way of productivity gains, although I think there has been a slight uptick in the last couple of years. Certainly, we have not looked in general at the competitiveness of the farming industry.

Q51 **Caroline Lucas:** I just want to probe the identification of opportunities post-Brexit when it comes to what we can do with greening the support

measures to farmers, given that, as I understand it, right now the Government could have allocated far more to Pillar 2 if they wanted to in terms of the amount and they have chosen not to. On what grounds can we reasonably feel optimistic about the future?

Daniel Johns: As I say, the Ministers that I have heard do seem to recognise, first of all, that the common agricultural policy has not delivered as much as it could in terms of environmental improvements, and that there are systems and ways in which the money could be much better spent. I suppose from our perspective, building on the land use work that we do, we know we need the land in this country to deliver much more for us in terms of carbon sequestration, agricultural food production, but also enhancing natural capital in order to manage flood risk and to improve biodiversity. Personally, I believe that leaving the EU and reforming the common agricultural policy is a genuine opportunity to get some of these outcomes better aligned and a much better set of policies in place to drive the improvements we need.

Q52 **Caroline Lucas:** I do not deny it is an opportunity, it is just how realistic is it given what we know about track records to date.

Matthew Bell: The committee is neither optimistic nor pessimistic. It sees that there is an opportunity there that we will assess.

Caroline Lucas: There is indeed an opportunity.

Baroness Brown of Cambridge: We will be making recommendations to make sure that Government are reminded of this.

Q53 **Chair:** One of things the farmers will be grateful for is the opportunity to grow Britain's wine industry, but you are talking about aridity in the south. Is that a problem for England's burgeoning wine industry—and Wales's.

Geraint Davies: Wales, yes.

Chair: It has not hit Scotland yet.

Baroness Brown of Cambridge: I think you have made some specific comments about that, Daniel.

Daniel Johns: In our next report we are going to talk about the fact that we have seen a large increase in the number of vineyards in the UK, and it is not just in southern England. They are spreading northwards and westwards through the country. Like I said, we probably have not looked into the detail of the types of soil and the amount of irrigation they may need in future but, certainly, there is the potential for more soft fruits, even olives, and vineyards in this country.

Q54 **Chair:** Just finally on the water framework, we have been concerned about a variety of issues and we are currently looking into chemicals and the water framework translation across into UK law. You have identified that as a potential problem. What are the issues with it?

Baroness Brown of Cambridge: Absolutely, and I look to Daniel to fill you in on the detail.

Daniel Johns: In terms of the water framework directive?

Chair: Yes. In terms of transposition into UK law, the cut and peel process with the Repeal Bill.

Daniel Johns: As I say, I am not close enough to the detail in terms of what is likely to emerge as regards a future framework for the water framework directive, but clearly it is key not just in terms of water quality but also for things like flood risk. One of the things the water framework directive requires is for water courses to be taken back and put back in a more natural state. A lot of our rivers have been straightened and narrowed over the years through dredging and, obviously, there is evidence that that creates a greater downstream flood risk because the water is running off the land so quickly. So I guess the water framework directive is important for a range of different reasons. It is one of the areas that we will be looking at when the details become clearer on what will replace it.

Q55 **Chair:** We shall await that with interest. Thank you all very much indeed

for coming. That concludes the session.

Baroness Brown of Cambridge: Could I just finally say I would like to record my thanks, and those of the committee, to Lord Krebs for his outstanding chairmanship of the ASC and, indeed, for putting in place the framework for adaptation planning and progress monitoring in the UK? I wonder whether the Committee might also like to recognise his contribution.

Chair: That is a very good point. Thank you for bringing it to our attention. I was unaware that he had gone, actually, so we will write to him to thank him for his work and, of course, his landmark study on badger and bovine TB, which rumbles on. Thank you very much indeed.

Examination of witnesses

Lord Gardiner of Kimble, Dornford Rugg and Molly Anderson.

Q56 **Chair:** We are moving on to our second session and apologies for starting a bit later than we would have liked. It is my pleasure to welcome Lord Gardiner, Parliamentary Under-Secretary of State for Rural Affairs and Biosecurity; Dornford Rugg, head of the climate adaptation team from Defra; and Molly Anderson, head of the climate adaptation evidence and analysis team at Defra. Welcome to you all.

We have had a very interesting session with the Committee on Climate Change Adaptation Sub-Committee this morning, and I wondered if you could kick off, Lord Gardiner. What new conclusions have the Government taken from the 2017 Climate Change Risk Assessment report?

Lord Gardiner of Kimble: Thank you very much indeed. I have been looking forward to this session because it is a subject that I think is one of the most pressing. What has been tremendously helpful in the relationship we have with the independent Adaptation Sub-Committee is

that they identified the six priority risk areas, which we very much agree with, where we are taking action already and where we need to take continuing action. Obviously, I am referring to the flooding and coastal change and the risks of that. Risk to health, high temperatures, risk due to water shortages, risk to natural capital, risk to food production and risks from pests and diseases and invasive non-native species are the six key priority areas. There are obviously areas that we will be working on as well, but we think these are the very strong priority areas that they have identified, which we entirely agree with.

As I say, I place great importance on the fact that this is an independent Adaptation Sub-Committee that is working in the two and the five-year cycles with us. Therefore, in our change risk assessment—which we published in January this year—we very much endorse those six priority areas that the Adaptation Sub-Committee identified. As I say, we are already working on acting on those risks but this is obviously in the flow of work that we need to undertake, both in Defra and across Whitehall. Perhaps I could emphasise the importance that this needs to have, which needs to be embedded across Departments beyond Defra, which has many of the responsibilities. I think that is hugely important in the work we are now obviously working very strongly on to bring forward the second National Adaptation Plan for next year.

Q57 Chair: One of the criticisms of that plan was that there were 370 actions over 30 different areas. Are you going to reduce that and focus on the things that matter, because isn't the problem with having hundreds of actions over lots of areas that things get lost in the weeds?

Lord Gardiner of Kimble: What has been very helpful in what the Adaptation Sub-Committee has given us is to reflect on the priorities where we think that we can get the most direct benefit of resilience for the country, so that has been very helpful.

The other thing is a lot of the work in that first plan—I think the emphasis was on the fact that this was the first one, so probably a lot of actions were put down, which we have either addressed and we have worked on.

I see the second plan being very much more focused. I think the first one was wide open, the biggest and the complete picture, whereas I think that, probably through resource but also through gaining greater resilience for the country—you are absolutely right in your suggestion—we should prioritise in the areas that have been identified, but, at the same time, ensuring that we don't drop balls along the way. This was the first. There were many more actions identified. Now with Departments—whether it is the Department of Health or the DCLG—we are building more resilience into the mainstream of Departments beyond our own, and we are doing work in Defra to carry that across Whitehall, and I am more confident that it does not need to have as many for our second plan.

Q58 Chair: The Government have noted that there was a Public Health England leaflet and a poster campaign to raise awareness of overheating. I just wonder if you could tell us how effective the campaign was. How many people did it reach? Are there any plans for future awareness campaigns? Because overheating has been completely neglected by the Government in terms of: no changes to building regulations, no changes to new builds that in some cases are reaching 50 degrees centigrade in the summer and no real plan for tackling overheating in hospitals and prisons.

Lord Gardiner of Kimble: The first thing I would say on the Heatwave Plan for England, which is to protect the population from heat-related harm to health, is that the Department of Health has commissioned a two-year independent evaluation of its Heatwave Plan for England. That started in January this year. This plan is updated each year and I think it is very important that we do have a better understanding of the effectiveness of the campaign. That is why it is very important to have an independent evaluation of that. I am looking forward to seeing that myself because, clearly, this is an online document to provide advice to professional organisations and individuals to enable them to plan and respond. I am obviously very keen that we understand whether this has helped in terms of health, whether there is a better preparedness and

whether the general population are aware of the risks, so I would very much—I am not sure whether the right word is, “concede”. I would definitely say that we want to have a better understanding in the Department of Health in taking that forward.

The other point, of course, is that very recently DCLG has commissioned new research because there is a need for a better understanding of overheating, particularly when it comes to new homes. It is absolutely clear that we need better preparation if there is going to be rising temperatures, so that anything we are building now deals with that. So, again, that new research on that point will be very helpful, not only to DCLG but obviously in how we build in greater resilience.

Q59 **Chair:** What research do you need—if buildings are too hot and overheating in the summer—to convince DCLG of the need to change the building regs in the same way that we have done to have lower carbon homes and energy efficient homes?

Lord Gardiner of Kimble: I suspect—and I will probably need to get some further detail of the precise terms of reference—that this is to ensure that we get the right answers on the ways in which technically building could better accommodate the style of building, the use of materials, so that, as we look to rising temperatures, there is a much better understanding of what precisely should be contained in future arrangements to deal with that.

Q60 **Chair:** Are they doing that at your request or is this something they have undertaken independently?

Lord Gardiner of Kimble: Do you mind if I cross-reference that?

Chair: Sure.

Lord Gardiner of Kimble: I will get the right answer, but should I say that we are leading across the departmental group—which obviously includes DCLG—on overheating generally?

Molly Anderson: DCLG has commissioned the research itself but there is—

Chair: Not at your instigation then?

Molly Anderson: There is a cross-Government group; the Department of Health, DCLG and Defra sit on a group. It is through those discussions that we identify needs and, I guess, progress the co-operation between Departments.

Q61 **Chair:** Is that going to happen in the Ministry of Justice? Do you think there could be issues? We have had some big issues in prisons. What happens if they end up at 40 degrees and there are no windows to be opened?

Molly Anderson: Do the Ministry of Justice sit on the group?

Dornford Rugg: The Ministry of Justice do not sit on the group but certainly, as part of the work that we will be doing in developing a National Application Programme, we need to look at all the departmental issues that are affected by this risk. I cannot say what MoJ and others will be doing but that will be part of the work that we will be doing to develop the NAP.

Q62 **Chair:** You cannot say what they are doing. So they are not doing anything?

Dornford Rugg: It is not saying that they are not doing anything. At the moment—

Q63 **Chair:** You are sitting on this group, so do you not know what they are doing?

Dornford Rugg: MoJ are not sitting on the group. The immediate interest of the group was to address issues around building of new homes and other things.

Q64 **Chair:** Not the existing public sector buildings that we have, like hospitals and prisons—they are not included in that?

Dornford Rugg: Certainly hospitals and so on are included, because the Department of Health sits on the group and the Department of Health are looking at that. That is part of the work they do under the existing NAP development work. I have to say that we haven't spoken with MoJ about the business.

Lord Gardiner of Kimble: If I may, I would like to take that very strongly back so that I am absolutely clear about the public sector and the buildings, existing and new build, because clearly we do need to ensure that there is a better understanding and evaluation across the piece.

Q65 **Chair:** Thank you. We heard last March that there were about 38 local lead flood authorities that simply had not produced a flood resilience plan for their area, nine years after the Flood and Coastal Risk Act has been produced. DCLG has said that it would work with any authorities that have not produced a plan by the end of March this year. Can you tell us how many of those local lead flood authorities have still not produced a plan?

Lord Gardiner of Kimble: I am looking for the note here, I am sorry.

Q66 **Chair:** That is fine. Perhaps, while officials are looking for the answer, could I ask you if you have any specific examples with the Department for Transport about infrastructure vulnerabilities? Obviously we have seen railway lines washed away down in the south-west and in Scotland in the north-east, landslips down towards Brighton, so we have had some very heavy flood-related impacts on our infrastructure. I wonder what cross-departmental working has gone on. You have mentioned working with health and DCLG. What happens with transport?

Lord Gardiner of Kimble: Again, that is clearly part of what we are ensuring with the £2.5 billion investment. Clearly the protection of infrastructure, railways, roads—I am looking because there is already, I think, 205 miles of railway and 340 miles of roads that will be part of the further protection, so the infrastructure in our £2.5 billion. In addition to homes, it is forecast that there will be a very considerable reduction in

risk to agricultural land, with £1.5 billion-worth of direct economic damages to farmland prevented and also, as I say, 205 miles of railway and 340 miles of roads.

But clearly, on infrastructure and the National Flood Resilience Review, we need to make sure—and we are working with the utility companies—of their commitment to increase the flood protection of their key infrastructures. That was very much part of the audit, whether it was telephones, whether it was electricity, whether it was water treatment works, sewage—an increased requirement that there needs to be this resilience built in. I think—

- Q67 **Chair:** It is meaningless, isn't it? Because once the floods hit—as they did in Leeds this year—we have the police Airwave system down because all of the telecoms in the centre of Leeds went down. Your failure as a Department to mandate and target resilience levels for electricity, for water and for telecoms means that we are completely in the dark about where the vulnerabilities in our city systems are. Don't you think that is an unconscionable risk to be taking?

Lord Gardiner of Kimble: We are working to reduce the risk. That is precisely why—

- Q68 **Chair:** How do you know where it is if they are not mandated to tell you to what level they are protected? How do you know where the risk lies?

Lord Gardiner of Kimble: We already have reports back from considerable numbers of local authorities, and we will be working on that. In fact, one of the things I will be considering is the voluntary—we will be evaluating the differences between voluntary and mandatory. I have the figures somewhere of how many have responded and the range.

- Q69 **Chair:** Removing the mandatory target, the Committee on Climate Change told us, meant that they had 100 responses to their first National Adaptation Plan and 80 responses to the second. They are going to write to us with the figures on that, so surely a fifth fewer national organisations responding, and the quality of the responses being—they

didn't say it—a bit of a tick box exercise, should be of concern to you as a Minister, at a time when flood risk is increasing all the time, should it not? Is that not something you would seek to change?

Lord Gardiner of Kimble: It is certainly something, as I have said, we are going to evaluate. I have the figures. It is 86 have reported already to the second plan, compared with 106 that reported in the—

Chair: So 20 fewer?

Lord Gardiner of Kimble: Yes. As I say, that will be part of my review as it was voluntary, but 86 is the figure.

Q70 **Chair:** If you give people the choice, then they choose to do something else. This Committee has been very clear, in our flooding report, that we think there should be mandatory resilience levels set for transport, road bridges, railways, water infrastructure, and the sewage systems of cities— all of those things. Obviously, this is a cross-party Committee but some of us have had first-hand experiences of our cities flooding and seen the impacts on people.

Lord Gardiner of Kimble: That is a course, if I may say, Chair—that is why the investment of £2.5 billion, to protect our country better, is much bigger than in the previous Parliament and indeed in the one before that. If I may respond, I don't think the investment that the current Government are putting in, both in terms of capital and maintenance, bears out that this is an area that is lacking attention. I have seen the winter preparedness working with the Environment Agency—which I should say is Thérèse Coffey's direct connection. Because of the joined-up nature of the Department and the ministerial team, I am well aware and have had briefings on the winter preparedness, the Environment Agency and Natural England. I am confident that the work of preparation is much higher than we have seen before. For instance, look at the much greater range of temporary defences—there are four times as many temporary barriers as last year—and there are pumps in seven strategic locations around the country.

In terms of preparedness, obviously, I am absolutely adamant that we need to work very closely with infrastructure companies, with the local authorities in partnership because, clearly, I am well aware of the people and communities that have been dramatically affected by this. I have been in many places—in Cumbria, I saw the devastation, so I am very much aware, as indeed are all the ministerial team. I would say that the work of the Environment Agency on the winter preparedness—as we all know, if the tide and the wind had actually co-ordinated in the way—thank goodness we didn’t see the onslaught into those communities that we were so fearful of. The preparedness was as strong, I think, as anyone could ever recall in terms of the use of new technology, communications, warning communities and so forth.

I absolutely accept that we need to do more. It is the human condition that we need to do more, and I am very keen to review the quality of the responses taking this matter for the future—

Q71 **Chair:** Do you have the actual figure for the number of lead local flood authorities that have not yet produced a plan? No. Perhaps you could write to us with that and tell us which authorities they are.

Lord Gardiner of Kimble: Yes, of course.

Chair: We would also be very keen to hear which lead local flood authorities will be carrying out their plans and how that co-operation work is going to be undertaken, because that has been a long-running source of concern for the Committee, as has been our concern about the stop-start nature of the funding, which is reactive: cut when it is dry and put back in when it rains and there is a flood. We have written a whole report on it, so perhaps we can have a chat about that at a future date. I am keen to move on. Caroline.

Q72 **Caroline Lucas:** Thank you. I must apologise. I have an eye infection that has required my removing my contact lens, which means I can see neither you nor my notes. I am trying to work with those shortcomings.

The Committee has previously raised its concerns about Defra’s capacity

to manage and execute its key tasks, especially with the additional pressures caused by Brexit and the backdrop being, obviously, the cuts that we have seen in the Department. How can you be confident that your Department does have the capacity and the resources to produce an adequate response to the risks identified by the ASC?

Lord Gardiner of Kimble: Thank you. Obviously, any Department keeps these matters under review, but I am confident, given that the officials are specifically working on this and given the embeddedness across the piece, which is that this is a priority for the Department. In fact, the Defra group strategy, which we published yesterday, specifically mentions resilience to climate change, greater resilience to climate change, as one of our aims within the Objective 1 Environment, so it is very much a key component of both Defra and the Defra families, so, for instance, on the Environment Agency and Natural England, where is the resource? The resource is across Defra and the Defra family working on the 2018 plan, which obviously is going to be tremendously important. We are continuing, particularly the Defra family with the Environment Agency, to refresh the national flood and coastal erosion risk management strategy. I think it is very important that we are constantly refining and looking at whether we have a better understanding of where we should best manage our resources. It goes back to priorities. For instance, there has been important work where we have commissioned the Met Office to give us updated climate projections, which will be available next year. These are all areas where we want to get further and the most contemporary information we possibly can, so that we are targeting and prioritising with the best possible knowledge. It is very important that we get the best information we can, that we are confident, for instance with our flood defence programme, and that we are prioritising getting the best results we can in terms of ensuring greater resilience.

Q73 **Caroline Lucas:** Can we talk actual numbers? How many staff members are on the adaptation team at the moment in Defra?

Lord Gardiner of Kimble: We have nine, and that compares with 35 in the first.

Q74 **Caroline Lucas:** Does that not strike you as an incredible reduction?

Lord Gardiner of Kimble: That would be the first question. My reply, of course, would be—I specifically said this—that the reason for the difference in size, although we would keep these things under review, is because—this is an issue and why I mentioned it is in the mainstream of Defra and the Defra family objective—this work is embedded across Defra, the Defra family and across Whitehall. At the very beginning of the National Adaptation Programme, this was a fresh piece of work. I think the number of actions has already been referred to. I agree with you, nine compared with 35, as you rightly say, is a big drop, but it is because of the different conditions in which we are securing our second plan, where this is embedded across many Departments in Whitehall.

Q75 **Caroline Lucas:** We know that in Defra, 900 staff were cut in 2014-15 because of the cuts that were mandated by the Chancellor and so on. Are you genuinely saying that the reduction from 35 to nine is entirely positive because it is simply a reflection of the wider embeddedness across the Defra family, as you call it? Or would you acknowledge that some of that is because Defra has had to bear a disproportionate number of financial cuts?

Lord Gardiner of Kimble: I am confident that, with the embedding that we have across, the nine very skilled people will produce for us a very strong adaptation programme. I am obviously keeping these matters under review. Any of these arrangements are kept under review. It is also the case that there are certain cycles in the five-year programme.

However, if you are asking me whether, with the nine—with all the embedding that there is and the fact that we are chairing groups across Whitehall—I am confident that we will not only have the right skills, but get across Government and across the whole of Whitehall—I will take that back with me—an understanding of the requirement for resilience across the whole range, the answer is yes, I am confident.

Q76 **Caroline Lucas:** A number of the risks identified require further research to inform policymaking. I want to know how the Government are prioritising the pressures between on the one hand the need for more research and, on the other, obviously the need for speedy action. Can you say a little bit about how you try to balance those two needs?

Lord Gardiner of Kimble: The important issue here is the Environment Agency work, which is about looking at refreshing risk over the next 50 years. That is an important aspect. That is the first priority risk area. We are spending a lot of time and resource on that. The Environment Agency is looking at that, and the research and the assessment of it.

We are also looking at research in another area, in terms of food and agri-tech innovation—how we build in greater resilience. In the varying ranges of those six priority areas, we do have research. For instance, in the National Adaptation Programme, there is further research into living with environmental change, UK marine climate-change impacts, adaptation and resilience in the context of change—these are all areas that we need to work on to ensure that we have the right prioritisation. I have already mentioned the research that we have commissioned on climate projections, which we hope will provide us with better information on how the climate of this country may change over the rest of this century.

Q77 **Caroline Lucas:** The question is whether or not you think that the need for more evidence in particular areas will affect the Government's ability to make policy decisions before the next CCRA. Or do you have enough evidence to make some policy recommendations before that?

Lord Gardiner of Kimble: At the moment, we are getting a lot more information in, which I believe will help us. Obviously, in producing the second plan by next year, we will need to get as much of the research in—it is why I want to see if we can get all this updated research into climate projections because that clearly will be very important.

Q78 **Caroline Lucas:** What is worrying us, for example, is information from the Maritime and Coastguard Agency saying that they quite simply have

not made progress to address information gaps because they have had to spend all their time moving forward in other ways. Does that alarm you, as it alarms us?

Lord Gardiner of Kimble: I certainly take all these matters very seriously. Obviously, I would want to know, and I am constantly looking to see if there are areas, particularly on these six priority risk areas, where we do not have sufficient understanding and research that we are commissioning through the research councils. Although their budgets are considerable, I am very keen that we can try to secure some of that if we need further research. However, for instance, I am very keen, being Minister for Biosecurity, when it comes to pests and diseases affecting people, plants, and animals, that we have—and continue to ensure that we have—as much research available to us as possible. That is why the plant health risk register has identified 900 pests. It is very important that we are constantly refining our scientific knowledge. We have, for instance, a monthly ministerial biosecurity meeting precisely to work on threats and the ability of plants that might not have lived here perhaps in the future to find a route.

Q79 **Caroline Lucas:** Can I go back to the Maritime and Coastguard Agency? If I get a bit closer to it, I can read what they said. They said, “We have not made progress to address information gaps. Priority and resource has been given to practically addressing the effect that climate change is having on our sites and protecting the assets for the future”.

In other words, they are talking about a conflict of priorities between having the resources to do the research and having the resources to address the immediate effects of climate change.

The question I want to get at is, how can you be sure that organisations such as the Maritime and Coastguard Agency have the capacity they need to do both the research and carry out immediate action? Our concern is that the resources do not appear to be there to do both.

Lord Gardiner of Kimble: I need to take that away and get some further details.

I think our track record in terms of the Marine Conservation Zones has had all sorts of recognition of the importance of this. Obviously there has been the investment in the David Attenborough boat, which of course has been recently spoken of. That is very much to have a better understanding of climate change, particularly in the deep oceans, which I think is a very important feature of research. I don't want to say if it was £120 million or £200 million but that was an investment in a vessel that I think will help us enormously in understanding some of the deeper waters in particular. However, can I take that back, please, and give you more information? Thank you.

Chair: If you can write to us, that would be helpful. We are going to move on, with Matthew.

Q80 **Dr Matthew Offord:** Lord Gardiner, you said, "If we need further research we can undertake that with some of the research bodies". What method are you using to establish the research needs?

Lord Gardiner of Kimble: It goes back, again, I think, to prioritisation. I will go back to the six particular areas. They are the areas where I, and we, would want to say, are there areas here where we have got a data gap? In other words, we are constantly looking at—and recognise that we don't know all the answers to—some of these dilemmas. On, for instance, the risk to food production, natural capital and water shortages, I think these are all areas where more work is going to be needed. Commitment to investment in the agri-tech and the innovation centres is going to be very important, as is investment on water shortages, and understanding more on water shortages. In fact, only today, we are going to be setting out a greater resilience duty for water companies so that we can begin to ensure—well, not begin to ensure—to have a further confirmation of longer-term resilience because of the concern, following projections of climate change, that by, say, the middle of this century, water shortages could be evident.

We are looking particularly at the prioritisation of those areas. If it would help the Committee, I do have research work and investment that are

going on particularly in the varying sections. I wonder whether it might be helpful to have a more detailed submission of what is happening by way of investment and future work on those six priority areas.

Chair: Yes, that would be useful to the Committee, and also more detail on the duty that has been announced today. I am sure we will be able to find that, so that is interesting that we—

Lord Gardiner of Kimble: Literally, I am using the privilege that, while we speak, it is probably—it is a WMS. It is to set off a strategic objective to challenge the water sector to plan and invest to meet current and future needs. I have figures here. By the 2050s, England is projected to face a water deficit of between 8% and 22% of total water demand. So this is again an area in the six priority risk areas where we are wanting to do more work. This is an example of what we in the Department recognise as some of the key challenges that we face and that we are working very strongly on, both here and at the devolved Administrations. The Adaptation Sub-Committee is submitting a UK view, so the devolved Administrations are receiving the information, quite rightly, as well, and they have their own plans as well, but it is very important, as I see it, that we work both nationally, in terms of the whole of the United Kingdom, but we also work on a global situation as well, as well as right down to the grassroots local resilience plans, too.

Q81 **Dr Matthew Offord:** On the research that you have already commissioned, has that all been completed?

Lord Gardiner of Kimble: No, not all the research. As I say, the heatwave plan being renewed—

Q82 **Chair:** When will it be completed?

Lord Gardiner of Kimble: The varying elements—I was just going to run down some—perhaps in that note, I can have the completion dates. For instance, some of this has been recently commissioned. Overheating— DCLG recently commissioned that, as an example. We have commissioned the Met Office, for instance—updated. That will be

available in 2018. There are a range of different elements of work to give us better data and information. What I will do in the further paper is write with the end dates for the arrival of the data, the information and the end of the research programme.

Q83 **Dr Matthew Offord:** Excellent, thank you. Will all that evidence, data and research be published?

Lord Gardiner of Kimble: What is the usual, if I may ask? I have no—

Chair: We are 15 minutes now before the Prime Minister's statement, so we need shorter answers, please. Just yes or no will suffice.

Molly Anderson: It is on a case by case basis, because each bit of the research is being commissioned by different bodies.

Q84 **Chair:** Paid for public money, so why wouldn't it be published?

Molly Anderson: The standard is that it is published if it is funded by public money.

Chair: Right, thank you. We are going to move on to flooding.

Q85 **John Mc Nally:** This Committee has previously raised concerns over the lack of a long-term proactive strategy to address the challenge of flooding and this Committee still remains unconvinced that such a strategy is in place. What is the Government's long-term strategy for the increased risk of flooding as a result of climate change?

Lord Gardiner of Kimble: I would say that this a priority area. That is already shown by the investment in both capital and maintenance, recognising that there are considerable threats to communities from flooding. I think it is a larger investment, recognising both the need for maintenance of existing defences and enhancing our defences in the arrangements that we have with climate change. The greater use of natural capital is a great advance. I am very keen that we do more on that. I think the demonstration projects have been successful in showing that we need to do more. On Cumbria and other areas and the Calderdale flood action plan, those are all about upstream management of flooding.

So there is much more of a joined-up strategy of use of natural capital and hard defence. The investment is at record levels. The preparedness is, I think, at a better level than we have seen before. We recognise there is more to do in terms of investment, we recognise that the Environment Agency long-term investment scenarios are very clear about a need for continued spending. The example that the Government have set in this particular area has been strong.

- Q86 **John Mc Nally:** I know there is a shortage of time, Chair, but I wanted to ask you if the Government have any plans to review how the statutory rights and responsibilities can be used to improve flood management. For example, flood victims in England do not have the right to sue developers or planners if the buildings that they build are authorised, but flood victims in Scotland have, and that came as quite a surprise to members on a recent visit. In practice, this means that local authorities in Scotland can be held accountable more easily and plan accordingly. Do you have any plans or any comments that say maybe this practice should be adopted down here in England? Should it be implemented? This would really be helpful to people who are suffering, individual households as well as communities.

Lord Gardiner of Kimble: The first thing to say is the sustainable drainage system that new developments should implement, particularly in high-risk areas, is clearly for new build. That is essential. In terms of the sustainable drainage system, that is very important. Obviously the other advance in terms of insurance—with Flood Re, I think 53 policies have already signed up, which is an example of recognising that there are great difficulties for certain communities.¹ We are working, prioritising where most the defences can be immediately restored, where we need to have enhanced defences. Certainly with DCLG, the whole purpose of the sustainable drainage systems is to ensure that with new build houses there is a greater recognition of flash flooding and arrangements need to be accommodated in the new developments for the understanding that we need to look at flood management.

¹ The witness subsequently stated that the actual figure is 53,000 (rather than 53).

Q87 **John Mc Nally:** I would come back on that and say there should be a natural prejudice against building in areas that flood. I visited somewhere recently—

Lord Gardiner of Kimble: There is, there is.

John Mc Nally: There doesn't seem to be. I visited somewhere just outside Leeds recently near Tadcaster and they had built houses and converted them in a reservoir. Not actually in water, but an overflow of water into a reservoir area. These people are left in terrible circumstances and it beggars belief that people should be allowed to build.

Lord Gardiner of Kimble: I would very much like to hear that specific case—

John Mc Nally: Yes, I can do that.

Lord Gardiner of Kimble: The advice, which 98% is accepted—the Environment Agency submission on development in high-risk flood areas. It is very, very rare indeed, I understood. May I take that specific case?

Chair: You may, yes. The issue on sustainable urban drainage is also that you have not mandated that, the Government have not mandated it to be followed. Given the choice, developers choose not to.

John Mc Nally: Correct.

Q88 **Chair:** That is simple, mandatory. Regulation is the tool to solving this, not encouragement. That is the long lesson of those of us who have been involved since 2007 in flood risk areas.

Can I just press you on the flood resilience review? In that, you identified 120 infrastructure assets in extreme flood risk areas, but there is no more detail about how many people are affected, where those assets are, what their assets are and what actions were taken to mitigate the risk against them. Are you able to give us any more detail on that?

Lord Gardiner of Kimble: I would like specifically to have more detail than I have, because I know of the considerable investment in temporary

defences, pumps, barriers and the commitment of utility companies, but I think to give you precise numbers of electricity substations—

- Q89 **Chair:** We know that £12 million has been spent on temporary flood defences and they fail in a third of all cases. We are not interested in sandbags being moved around. I am asking about the infrastructure assets, the water, electricity, the telecoms assets in flood risk areas, what are they and how many people are affected if they are to fail?

Lord Gardiner of Kimble: I will need to write to you with full detail on that.

Chair: Thank you, that would be helpful. We are going to move on to talk about food. Kerry.

- Q90 **Kerry McCarthy:** The Government seem to be taking a slightly different view on the need for policy to manage the risk to food supplies from that taken by the ASC, as we have heard this morning. Could you say a little bit about why—you obviously recognise it as a priority—you think that the market will help us cope with it?

Lord Gardiner of Kimble: It is a partial disagreement. It is a partial disagreement because we have existing analysis from the national food security assessment that doesn't align with the Adaptation Sub-Committee's analysis. That is why we are going to update this national food security assessment, which is that there are continuing functioning markets and diverse sources of supply. It is not so much that we have rejected this out of hand, it is just that we had existing analysis independently.

- Q91 **Kerry McCarthy:** When was that done, the assessment?

Lord Gardiner of Kimble: It was published in 2010. Having received this analysis and it was different from what the sub-committee offered, it is why, as I say, it is a partial disagreement. We think there is more research to be done, because we do have advice that there are sufficiently diverse supplies and that the market is functioning. I would not want the Committee to think that we are rejecting this at all. It is not

that. Because obviously food security is an absolutely intrinsic part of national life and it is an intrinsic part of the risks in this whole area, I want to have a better understanding of what new information might come from updating this security assessment.

Q92 **Kerry McCarthy:** What is the timescale then for doing the extra research? Could you not rely on the information that the ASC was looking at?

Lord Gardiner of Kimble: As I say, we recognise that this is an area that we have a research priority upon, so it is not as if there is no work going on on this, because in fact with agri-tech—

Kerry McCarthy: Sorry to rush you a little bit.

Lord Gardiner of Kimble: No, not at all. On when I will receive the food security assessment, I don't know the precise date, but clearly we need to have it. I will reflect on this in my extensive written note coming back to the Committee. It needs to be in brisk order because obviously if it now aligns with what the Adaptation Sub-Committee is suggesting, then I and the Department and the team need to reflect on this very strongly. But as I say, I did want to emphasise that it is not that we disagree that this is not an issue. It is definitely a priority issue. It is just on this specific point we have this national food security assessment that suggests that it doesn't align. I think it is responsible just to see what it is. But I want that as soon as possible.

Q93 **Kerry McCarthy:** We are expecting the 25-year food and farming plan soon. We are always on the cusp of it.

Lord Gardiner of Kimble: Both plans, both plans.

Kerry McCarthy: We are always on the cusp of expecting both of them, but do you not think that it is important to have concluded that research before? I don't know to what extent climate change adaptation is in the food and farming plan, but first, do you think it should be in there in quite a bit of detail, and secondly, do you not then think it is important the research is done before the plan is published?

Lord Gardiner of Kimble: Obviously we have a manifesto pledge on two 25-year plans, but we want to get the framework out as soon as we can, obviously. I think there will be all sorts of work that will need to come into this and climate change is clearly embedded. I say “clearly”. It is embedded in the environment. It is why I specifically at the beginning of this mentioned that greater resilience to climate change is specifically mentioned in the strategy that Defra published yesterday. It is embedded in all that we do. Clearly it is embedded in agriculture, food production. There are challenges and opportunities of climate change for food production both internationally and in this country, so they are very much part of it. But I will, if I can, escalate the assessment, the national food security assessment. We are working on the areas specifically we want updated, because as I say, at the moment they do not quite align. But I think it is important that I get better clarification and then we can take forward that area more fully.

Q94 **Kerry McCarthy:** We heard evidence this morning that the east of England in particular is likely to be affected by climate change, with things like soil aridity and erosion, water shortages. Will you be looking at that, possibly looking at what we could do for those areas of the country that may find that they have to shift production to other crops if we don't address those problems?

Lord Gardiner of Kimble: Obviously there is mitigation and there is adaptation. We want to try to mitigate as much as we can, as well as the adaptation side. Certainly in the dry areas, this is going to be a challenge. It relates to what I have said earlier about Ofwat resilience across the country from the point of view of water, food production, perhaps more on farm reservoirs or whatever, prioritisation of water, wise use of water, all of that, recycling of water, grey water. Those are all areas we are going to need to be much more conscious of. There needs to be—and will be—a lot more work as the decades go on. We need to be working on that now, because as you rightly say, the eastern counties are a very low rainfall part of the country anyway and it is also where a lot of our grain is harvested.

Chair: Thank you very much. We are going to conclude with a question on Brexit.

Q95 **Peter Aldous:** The Adaptation Sub-Committee, in the report they produced just in the wake of the Brexit referendum last year, did state that the magnitude of some risks and opportunities may be affected if legislation, policy and funding derived from the EU relevant to climate change adaptation had changed. Now, I think in their progress report coming forward in June, they are going to elaborate on their views and we heard that this morning. I just wonder, Minister, in the wake of that sort of warning from them, what your Department has done to assess those risks and opportunities to quantify them.

Lord Gardiner of Kimble: The whole area of the Brexit programme and the way it is going to affect Defra very strongly is absolutely embedded, as I say, in everything, because Defra is probably the Department where all of this area of our responsibility for climate change—the whole area of Brexit environmental legislation is going to be very, very much—and is—across Defra and the Defra family work that is the highest priority in many senses.

Q96 **Peter Aldous:** We heard from the Committee on Climate Change this morning and we have also heard from the Natural Capital Committee previously that the delay in the production of the 25-year plan is severely constraining production of policies and consultation. Are you able to tell us when we can expect to see that plan?

Lord Gardiner of Kimble: I cannot tell you a precise time. We do want to bring forward a framework as soon as we possibly can. But obviously consultations and work throughout with stakeholders, whether it is environmental, whether it is food and farming—we do want to bring forward our 25-year plans on both. They are absolutely meat and drink to the Department. Fulfilling a strong food and farming sector and leaving a better environment to the one that we have inherited are absolutely guiding principles of everything we do. The framework is obviously important, because we want to consult upon it, but the work with all the

stakeholders in both those areas is continuing all the time. As to when we—

Q97 **Peter Aldous:** In that respect, why did both the Natural Capital Committee and the Committee on Climate Change express their concerns that those plans haven't yet been published?

Lord Gardiner of Kimble: It will not be the plan, it will be a framework of the plan, because the whole purpose is to ensure that there is as wide engagement as possible. Although we haven't launched a framework, that work to furnish it is already happening all the time, but obviously the result of last June—there is a need to bring back all the EU legislation through the Great Repeal Bill—is very important. We now have, for instance, a 25-year environment plan, which needs to work on the fact that this is going to be through national arrangements rather than—as nearly all of it has been—through EU law. So all the EU law is going to be brought back in the Great Repeal Bill on the environment.

Q98 **Peter Aldous:** Is it all going to be brought back through the Great Repeal Bill? We heard the Secretary of State. I think the Chair's description was that we have a certain amount that is not.

Chair: A third.

Peter Aldous: A third is not going to be put into the Great Repeal Bill.

Lord Gardiner of Kimble: All the environmental protections—I think I will use the words "environmental protections"—that can be applied, as it were, will come back. I will again try to get clarification on those areas and the Secretary of State saying a third. It may be areas that are difficult to apply here for whatever reason. But the whole purpose of bringing forward or bringing over into domestic law is so that there is certainty and there are no cliff-edges or anything like that in terms of understanding for—

Q99 **Peter Aldous:** I think in your letter, if you are able to clarify that, that would be appreciated.

Lord Gardiner of Kimble: Yes, certainly.

Q100 **Peter Aldous:** In this Committee's report on the impact of the environment on Brexit, I think we did find there was a concern that farmers would be at risk of losing competitive advantage. There is also a concern that if we don't adapt to climate change we could find some other competitor nations in a better place than us. Is that something that your Department has been working on to assess how we address those particular concerns?

Lord Gardiner of Kimble: We think there is a very strong future for UK and British agriculture. We think we have very high brand, very high standards, some of the highest standards in the world, both environmental and animal welfare. We wish to enhance them. On the British brand and increasing food exports, that is an example of an acknowledgement that the—

Q101 **Peter Aldous:** We did hear from the previous evidence panel that productivity in UK agriculture has, I think I would say, stagnated in recent years. Is this a particular issue and how are you going to address it?

Lord Gardiner of Kimble: Yes, it is an issue. That is why in the rural productivity plan we recognise that we need to improve it, we need to be more competitive, we need to sell better in terms of our exports. So the essence of making the policies we wish to push forward and working with the farming community is about enhancing through agri-tech, innovation and research. I am going to let you have the figures, if that would be helpful to the Committee, on our research in those areas as well, so that you are aware of the investment.

Chair: Okay, that is very helpful. Thank you very much. We will conclude by saying that people have conceived and born children in less time than it has taken the Government to produce these two plans, but we do look forward to them arriving when they do eventually arrive.