HOUSE OF COMMONS

Environmental Audit Committee

Oral evidence: Soil Health, HC 653
Wednesday 27 April 2016

Ordered by the House of Commons to be published on 27 April 2016.

Written evidence from witnesses:

- Department for Environment Food and Rural Affairs

Watch the meeting

Members present: Mary Creagh (Chair), Peter Aldous, Geraint Davies, Mr Peter Lilley, Caroline Lucas, John McNally, Rebecca Pow.

Questions 209 - 295

Witnesses: **Rory Stewart MP**, Parliamentary Under-Secretary of State, Department for Environment, Food and Rural Affairs, and **Maggie Charnley**, Natural Capital Committee Secretariat, Department for Environment, Food and Rural Affairs, gave evidence.

Q209 Chair: If I can begin by welcoming the Minister and Maggie Charnley as our witnesses here with us today. This is our concluding session into soil. We have had a fascinating inquiry into urban and rural soils and have quite a wide range of things we would like to discuss with you today. I would like to kick off, Minister, with a question about contaminated land. We heard that Defra reduced its capital grant funding for contaminated land from £17.5 million in 2010-11 to £500,000 last year and some local authorities are no longer carrying out assessments of contaminated land for fear that they won't have the resources to clean up the land in the event that they find something contaminated there. What is your reaction to that?

Rory Stewart: The key thing to understand is that responsibility for contaminated land rests and has always rested with local authorities. It is true that the central government provided support over time to local authorities to encourage more action on contaminated land. That has been a programme where over 100 different key sites have been restored, but the decision of the Department is that that responsibility now needs to rest with the local authorities to prioritise them on the basis of their own cost benefit analysis.

Q210 Chair: How can they work out a cost benefit analysis if they have only £500,000 to split between them? Are you basically saying it is their problem to sort it out?

Rory Stewart: The central government funding, the Defra funding, was designed as a top-up to the money that local government itself spends on doing this. This was designed as surge funding in order to help us clear some of the backlog, which allowed us to tackle

over 100 key sites, but it was not designed as a replacement for the money that the local government itself spends on research into contaminated land and amelioration of contaminated land.

Q211 Chair: Your report on contaminated land shows that the original polluter can only be found in 9% of cases. What you are saying is that essentially the clean-up costs will end up falling overwhelmingly on local taxpayers.

Rory Stewart: This is essentially a question of what are local responsibilities and what are national responsibilities and what is paid for by national taxpayers and what is paid for by local taxpayers. For certain parts of what the Department does, for example flooding, the national taxpayer picks up the bill. For other parts of the work that the Department does, for example in noise or light pollution, local taxpayers pick up the bill. Soil contamination is a local lead. It is the division of responsibilities between national and local government.

Q212 Chair: You have recently announced a new pot of money that includes contaminated land remediation, alongside other issues, and I think our understanding was that that was coming out of some of the high value council house selloffs. There are no details on how that pot of money will be administered, where the money will come from, or how much will be set aside for remediation. Are you in a position to clarify those issues for us?

Rory Stewart: No, madam Chair, I am not in a position to do that.

Q213 Chair: Okay. Obviously if contaminated sites are not detected, there is a potential danger to human health. Has anybody in Government done an estimate about the increased cost to the health service as a result of that reduction in funding for remediation and detection?

Rory Stewart: My understanding is that no specific survey of that sort has been undertaken. You will be aware that in general these surveys tend to be undertaken by university centres. Such studies have been undertaken on air pollution, noise pollution, where there is an estimate of £7 billion to £8 billion from the impact of noise pollution; organic farming, there have been estimates on health. These sorts of social costs go all the way from carbon through to land use, but generally those will be driven by non-profit organisations or university centres rather than by the Government themselves.

Q214 Chair: The Government's policy is brown field first. We are going to ask you a little bit about the recent study that you have published, but we know that the Government want to build on brown field land. Do you think there is a danger that if local authorities are not looking for contamination, because they do not have the central government money to remediate and they do not have any local resource to do so, that we could end up in a very unfortunate situation where we are building new homes on contaminated land and only finding out later with self-reported health problems?

Rory Stewart: It is the clear responsibility of the local authority to ensure that that does not happen. They have a statutory responsibility to ensure that building does not happen on contaminated land.

Q215 Chair: But one witness told us that without the prospect of remediation being funded it would be a reckless local authority that determined a site was contaminated. It seems that local authorities are adopting a "don't ask, don't tell" policy. They are not going looking for contamination because they don't want to find it because they don't have any money to clear it up. What do you say to that?

Rory Stewart: A local authority that permitted building on land that was seriously contaminated and posed a significant threat to human health would be failing in its statutory responsibility.

Q216 Chair: It also applies to green field sites. Just because something is green field doesn't mean it is not contaminated.

Rory Stewart: Sure.

Chair: Thank you very much. I am going to move on to Peter Aldous.

Q217 Peter Aldous: Just taking that line of inquiry a little bit further forward, Minister, the Department recently published an update on the state of contaminated land in England. The survey had only a 60% response rate from local authorities. Would you agree that this means that our knowledge of the state of contaminated land is poor?

Rory Stewart: This is not a compulsory survey. We go out on a voluntary basis and a 60% response rate, as somebody who looks at surveys conducted, I am afraid is not that unusual.

Q218 Peter Aldous: Is it acceptable? Were you disappointed?

Rory Stewart: When conducting a voluntary survey, a 60% response rate is fine. That is perfectly within the realm of what we would anticipate.

Q219 Peter Aldous: Can you get valuable feedback from that?

Rory Stewart: We believe we can reliable information from a 60% response rate, yes.

Q220 Peter Aldous: I think I am right in saying that the update is released every seven years. Do you think that timescale is sufficient? Obviously things change in a seven-year period. Would you agree that our knowledge is poor if we are looking at it over such a long period?

Rory Stewart: The key thing to understand, to come back to what I said to the Chair earlier, is that the responsibility for questions of contaminated land is for the local authority and in particular it is the responsibility of the individual developer to convince the local authority that a piece of land is suitable for development. The onus is on the developer to do that. This is not a system that is based on the idea that the central government or some Defra team are the best-placed people to decide what happens on every piece of land across the United Kingdom. It is safer for residents and it is better policy practice that it is a local decision made locally.

Q221 Peter Aldous: It is obviously not your Department but DCLG has ambitious plans for building houses, a million over five years, and a policy, as the Chairman said, of brown field first. Don't we need a large pool of evidence to be able to see whether those policies are achievable?

Rory Stewart: I think we need to break it down to an individual site. If you are looking at an individual brown field site, the developer has the responsibility of convincing the local council that that brown field site is suitable for development. We have to break it down to that level. The danger around this conversation is that we are implying that there is some alternative mechanism whereby civil servants in Defra are going to be able to come up with a solution for every piece of land in the country that has previously been utilised. The best way of doing that is to follow current planning regulations.

Q222 Peter Aldous: The figures show, in the authorities that did respond, that only a few hundred sites have been remediated since 2000. Given that there are an estimated 325,000 contaminated sites, do you regard this as unacceptably slow progress?

Rory Stewart: A lot of this is dealing with our industrial heritage so it is a very complex issue. We are dealing with everything from cadmium and zinc mines up in the hills, which are putting minerals into water courses, through to the silting up of docks in some of our major industrial cities, right the way through to our nuclear industry. What successive Governments have done—it is true of the previous Labour Government as much as the previous coalition—is to focus on the most extreme high-risk cases. The most dramatic example of that, where we are putting in literally tens of billions of pounds of public money, is in cleaning up nuclear waste sites. But you are correct, we have a very long industrial heritage. We can see it in the Lake District, for example, that you would normally think of as a relatively clean area, which is littered with old industrial mines pumping cadmium, zinc, mercury down river courses, poisoning fish, poisoning lakes. It is an enormous job. We were the first country into the industrial revolution. I am afraid the practices in the late 18th century through to the 1950s were not what we would always want and we have a huge job of cleaning up. The nuclear industry is probably the most dramatic and costly example of the clean-up costs involved.

Q223 Peter Aldous: Do you think that rate of remediation since 2000 is acceptable?

Rory Stewart: To spend tens of billions of pounds to clean—

Peter Aldous: No, the number of sites that are being—

Rory Stewart: As I say, the public purse is currently spending tens of billions of pounds cleaning up contaminated land, most of that directed towards the nuclear industry. Do I think that is the right thing to do? Yes. Do I think that is a lot of money? Yes, I do think that is a lot of money.

Q224 Caroline Lucas: Just going back to the original issue about the contaminated land capital grant scheme and the fact that that was at £17.5 million in 2009-10 and is now projected to go to a phase-out in 2017, would you say that you feel completely confident that in spite of that reduction in funding, contaminated land can be sufficiently well found and decontaminated? It seems extraordinary to lose that amount of money out of the system.

Rory Stewart: I think we need to see that money for what it was, which was an attempt to pump-prime councils bringing forward projects, and we have done that. It was not intended to be a permanent grant. When that money was made available it was made clear that this was a temporary grant. It was made clear that the responsibility rested with the local authorities and the central government were providing money in that period to accelerate. We pushed through over 100 schemes over that period, and I think that was the right thing to do.

Q225 Caroline Lucas: But you will know that local authorities are under a massive spending pressure because they are losing huge amounts out of their budgets as a result of other cuts.

Rory Stewart: You are right and I suppose it is true that both national and local government budgets are under pressure, so taxpayers, whether nationally or locally, are under pressure. Contaminated land is one of a number of different statutory responsibilities that local councils have and that they have to weigh up against their other responsibilities.

Q226 Caroline Lucas: But given that there is a finite pot of money, would you accept that there is at least a risk that, as the Chair was saying earlier, if there is a way of not spending the money by not looking for a problem, it is not unreasonable to think that councils will take that option that could be putting the public at risk? I just want to know whether you think that is a risk.

Rory Stewart: I don't believe it is. I would be interested if you have evidence that anybody has done that. It is one of the things that I do trust local government in. I think it is extremely unlikely that a democratically-elected local council would knowingly allow someone to build on contaminated land.

Q227 Caroline Lucas: No, it is not knowingly, that is the whole point. They don't know. They are not going to check because they think that it could—

Rory Stewart: They do check and any council that tells you they don't check—have you had a council give evidence to you saying that they don't check whether land is contaminated before they allow development?

Chair: We have had the Chartered Institute of Environmental Health, which is the body that represents those officers in local authorities.

Rory Stewart: Saying they don't check?

Chair: Not saying that. Just saying, "It would be irresponsible to go looking for contamination if you do not have the funds to remediate it". That is a direct quote from one of our witnesses.

Rory Stewart: Okay. My experience of local councils—and I think this presumably is true for the rest of you—is that they will not be doing this. They will not be allowing people to build on contaminated land. The developer has to prove to them that the land is suitable for development.

Q228 Chair: Can I take you back to the Defra funding? It was announced in 2015 that Defra would invest £100 million into environmental schemes to remediate contaminated land, restore peatland habitats and increase woodland planting. That is also in your single departmental plan. You said you were unable to say what stage that was at. Could you write to us, please, with some clarity on how much of that funding will be dedicated to contaminated land, what form it will take and how it will be allocated? Presumably it is not going into budgets this year. It will be for 2017-18. I think that would be helpful.

Rory Stewart: Sure.

Q229 Chair: The other thing is we thought that there had been a Defra plan to complete identification of contaminated sites within 30 years. I wondered if that target still stands and if you could write to us on progress towards that target, or if Ms Charnley has anything to say on that?

Rory Stewart: I don't want to drop poor Ms Charnley in it. I am very happy to write to you on that.

Chair: Thank you very much.

Q230 Rebecca Pow: Rory, I am going to move us to arable lands, soils and arable land. Trends of soil carbon in arable land are extremely worrying. There is a decline of 11% of the soil carbon between 1978 and 2007 and the Committee on Climate Change says that some of the most productive arable land that we have is at risk of becoming unprofitable within a generation due to the loss of soil organic carbon. Soil organic carbon has been highlighted as a particular indicator of soil health. Could you tell us what has been done since 2007 to combat the decline?

Rory Stewart: There are probably three different ways in which you can look at agricultural soils and soil organic matter. The first thing is to understand what the situation is and that is about monitoring changes over time. The second is looking at the compliance mechanisms that we have in place through our regular farm inspections to make sure that people are treating their soils correctly. The third is to make sure that we are investing in better practice in soil management, in particular soil management that is designed to increase soil organic matter and not just soil function.

Q231 Rebecca Pow: You mentioned being aware of what the situation is but the most recent data on soil organic carbon levels dates back to 2007. Isn't it the case that we don't know what has happened since then, whether this trend really has got worse, because we simply have not monitored for such a long time?

Rory Stewart: I don't think it is true to say that we don't know what is happening. There is a number of different monitoring programmes. A number of universities are running monitoring programmes at the moment. We also have a monitoring programme being undertaken, for example, by the Crown Estate, which is taking soil samples on every one of its farm. I think it has nearly 700 separate farms where it is taking soil samples. That includes not just an analysis of pH and nutrients but also an analysis of soil organic matter. By and large, our sense is that you are right, that particularly on some of the agricultural soils on the east there is reason for concern because of nutrient and fertiliser use since the

early 1980s, because of compaction, certain kinds of heavy machinery, because of certain kinds of ploughing or tillage techniques, and potentially reasons for concern through the use of certain kinds of crops. That is why soil is absolutely at the heart of our 25-year plan. That is why we are now looking actively at ways of updating our monitoring programme, particularly using new technology in monitoring and measuring soil, and why we are particularly interested in championing some of the best practice that is now emerging around precision farming.

Q232 Rebecca Pow: I would like to ask you specifically about monitoring. You have the Crown Estate, for example. At the moment we are very much depending on random voluntary testing for our information about soils? There is not a specific national scheme?

Rory Stewart: We are not reliant on random voluntary testing. The Rural Payments Agency and its inspectors conduct soil analysis as part of the standard farm inspection package.

Q233 Rebecca Pow: But I don't believe they look at things like carbon, do they? Now we have these serious knock-on effects with the implication of air pollution aside from organic content.

Rory Stewart: There is a direct relationship between soil organic matter, which you are calling carbon, and the agricultural practices that the Rural Payments Agency inspectors are looking at. Those include the planting of cover crops, the season when nutrients and fertilisers are spread and particular types of ploughing techniques. If somebody from the Rural Payments Agency turns up on your farm for an inspection and discovers that you have ploughed a field at the wrong time of year and the topsoil from that field is flowing down the hill, that will not simply be something that will bring you into breach on compliance and therefore end up in a fine. It is also something directly related to soil organic matter. The topsoil that the inspector is observing coming down the hill is that organic matter.

Q234 Rebecca Pow: Just to talk about the monitoring scheme, we have had evidence from a number of people here seriously concerned about the fact that there is not an overall monitoring scheme and that we could have one quite simply. For example, you have had a Defra report on it, commissioned by the Environment Agency, detailing how we could combine previous monitoring schemes, but that has not been acted on. Could you tell us why that has not been acted on?

Rory Stewart: The basic soil sampling in this country has been done in regular bursts taking place every decade or two decades in a regular set of sequences. The work done between the 1940s and the early 1980s created the soil map, the association series for the United Kingdom that laid out the different types of geology and soil across the country. Since then what we conduct is reviews that will happen every decade or two decades and we would intend to have another one of those reviews.

Q235 Rebecca Pow: Is it every decade or every two decades?

Rory Stewart: The first time it was two decades. The first time there was a 20-year gap and then there was a 10-year gap. This is the way British Governments have done it, so the

question is what happens now. I would certainly intend that we do a review relatively soon on this and it has been a significant period of time since the last review. The reason why you space them and do not do them every year is that changes in soil organic matter are slow. They take a long time to feed through. Poor agricultural practices could take five to 10 years to be represented in the soil.

Q236 Rebecca Pow: But erosion, runoff, happens very quickly so you could say you should be doing it every year. With our extreme flooding, our extreme weather and our growing of maize, you can see it very quickly, not in 10 years but in one or two years.

Rory Stewart: I think there are two separate issues here. You can see soil erosion and runoff very quickly but what we attempt to do through these long, spaced-out, multi-decadal studies—and I hope these are studies that not just we are are going to do but future Governments are going to do for the next 100, 200 years—is to find long-term trends. Soils change very slowly and that is true of pH levels, nutrient levels and soil organic matter. These are very slow processes.

Q237 Rebecca Pow: I put it to you, though, and it has been raised in evidence, that soil degradation is costing us about £1.4 billion a year, so it is a very serious issue. A number of people who have presented to us have suggested that there are monitoring schemes that could very simply and effectively be swung into action, not carried out every 10 years but carried out almost on a yearly basis, just to keep the whole system going. Would the Government be considering some of those or looking at them?

Rory Stewart: I am very open to sitting down with people and talking it through, but we do need to do a serious cost benefit analysis. The normal view of soil scientists has been that it does not make sense to conduct these kind of national reviews every year. These are longer-term reviews picking up longer-term processes, but if you have scientists saying something different, I am very happy to sit down with them and talk it through.

Q238 Rebecca Pow: That is great. Just finally, the UK has joined the French "4 per 1,000" initiative as part of the COP21, which aims to increase soil organic carbon in order to help mitigate climate change. Could you explain what concrete actions you plan to take in order to achieve the goal of 0.4% annual growth in soil carbon, how will it be measured and how do you expect the target to be met?

Rory Stewart: Soil organic carbon broadly speaking falls into three separate categories, peatland, grassland and agricultural soils, and we have different approaches to each one of those. I have spoken about agricultural soils a little bit and we could speak about it a little bit more, but essentially increasing organic matter in agricultural soils is a relatively rapid process. It works through the planting of cover crops or leaving land fallow. You can restore an agricultural soil and the carbon content of an agricultural soil relatively rapidly. We are talking about something that could take two to three years to restore the organic content of an agricultural soil. At the other extreme, of course, is peatland soils. They have much less organic content in the first place because they are often located in places with very high rainfall and very low temperatures. They store an enormous amount of carbon and can lose an enormous amount of carbon if they are destroyed, but they take much longer to restore. We are engaged as a Government—

Q239 Chair: We are going to have a specific question on peat. We have a whole line of inquiry on peat. If I can just return you to the question about the COP21 and the 0.4% annual growth.

Rory Stewart: The answer is that our investments in peatland, grassland and agricultural soils are the way in which we will increase soil organic matter.

Rebecca Pow: But we don't know what those are.

Q240 Chair: Can you maybe elaborate on where most of the benefit will come? Will it come from peatland? Is it a 30:30:30 contribution, or is it 50% for peat and 25% from the two others or—

Rory Stewart: The biggest single contribution is likely to be in peatland and it is probably likely to be in about the first 100,000 hectares of peatland. This stuff is quite difficult to model. In relation to grassland, there is a huge difference between looking at upper fellsides and lowland meadows. There are technicalities in diversity of grasses and legumes, but if you want a broad answer, most of it is likely to come from peatland.

Q241 Chair: You said agricultural is quite easy to restore within two to three years. Where are the incentives for farmers to do that? You have talked about the fines if they have runoff and there is an inspection but obviously we can't have a farm inspector on every field. Where is the incentive for farmers to do the right thing?

Rory Stewart: The primary incentive to do the right thing is that it is good for their farm business. We have to do all we can to communicate to people that eroding your soil is effectively like burning your house down. You have a farm business and you are reliant on that soil in order to grow crops and maintaining a healthy soil is maintaining the basic bedrock of your business. That is the biggest incentive. The second incentive is smaller financial mechanisms. For example, the planting of a cover crop can result in you not having to spend £40 a hectare on spreading nitrogen fertiliser on the land, so you can save yourself in that way. The third kind of incentive structure that you would bring in would be through agri-environmental schemes.

Then we do a lot through Government support for trade bodies. AHDB, for example, does a big communications programme. I was just talking about the Crown Estate, which is a big public estate, so that is 250,000 acres of public land where we are setting an example by introducing soil management systems. That is making every new tenant farmer on that public land sign up to a soil management system that would define exactly what crops they are going to plant, when they are going to plough, increasing the use of micro-tilling as opposed to deep ploughing, making sure that they have good drainage so that the land does not get sodden and there is not too much runoff. Those are the kind of measures we are using in agriculture.

Q242 Chair: You are saying about the use of agri-environment schemes, but at the moment there are no payments linked to improving soil organic carbon. Is that right?

Rory Stewart: There are no payments directly linked to improving soil organic carbon, but the reason is that for soil organic carbon it takes some time before a measurable difference is discovered. You could be farming your land in a very aggressive and harmful way and it

could be five years before that was detected. Equally, you could be taking a very good approach to your farming and it could be five years before that was detected. We tend to reward through the agri-environmental schemes and tend to punish through compliance. Particular farming practices have a good correlation with soil organic matter but we don't directly target soil organic matter as the metric.

Q243 Rebecca Pow: Just to go back to my point, doesn't this highlight that if we had a monitoring scheme much more regularly it would be much easier to tie up these correlations and then to direct a payment for good practice?

Rory Stewart: I am happy to sit down, but basically many of these things take nearly seven years to work their way through the soil, and that is the fundamental problem.

Q244 Rebecca Pow: Topsoil and humus can disappear very quickly and can't be built up very quickly. You are saying carbon can be put back into the soil quite quickly but you can't do that with topsoil and humus, so it is a very serious issue. I am suggesting that we are not taking it quite seriously enough.

Rory Stewart: Soil erosion, topsoil and humus loss, is something that farmers are obliged under the single farm payment, inspected by the Rural Payments Agency in accordance with the compliance rules, to prevent happening on their land and they will be fined if they don't.

Q245 Geraint Davies: Would you accept all the same that there can be quite dramatic quick effects on a localised basis? I know you were talking about the national system. In particular with nitrogen fertilisers that are releasing nitrous oxide, which is a greenhouse gas, if there is a runoff you can have rivers and oceans that are dead zones for fish and algae blooms and this sort of thing. Wouldn't that be a case for more regular testing and intervention in case some of these dramatic effects do occur?

Rory Stewart: I absolutely agree. That is a serious problem. Nitrogen runoff into water courses, into rivers, is a very serious problem. It leads to eutrophication within the river system. Targeting nitrates and phosphates in particular getting into our river system from agriculture is a top priority. The way in which I think we need to do this, to take your idea forward, is through nitrogen vulnerable zones and the way in which they are managed. For example, we need to set very clear seasonal restrictions on the spreading of nitrogen fertiliser to make sure that this is not spread in seasons that statistically are wet so that there is a likelihood of the rain running this into the river course. We need to encourage the building of larger slurry tanks on dairy farms to make sure that slurry is absorbed rather than being spread on the fields. We need to encourage precision farming to make sure people are not wasting. Often one of the problems is that the nitrogen and phosphate that is getting into the river course is completely unnecessarily on the field. It is not being absorbed by the soil. In fact, by definition if this stuff is ending up in the river, somebody has screwed up. It is a real waste of money to do that. People are essentially washing their money down the river. I agree with you on all of that.

Q246 Geraint Davies: Are you doing the monitoring regularly enough to pick this up?

Rory Stewart: That is done through the Environment Agency that does very detailed monitoring of the chemical composition of waterways and that is then connected into the nitrogen vulnerable zone process.

Q247 Rebecca Pow: Why shouldn't soil testing be done exactly as we do water? We do water quality testing well. It is a good programme. My point is that we should do the same for soil. Do you agree?

Rory Stewart: I am very happy to sit down and talk about this in more detail with the specialists. I will try to make the other side of the argument.

Rebecca Pow: Excellent. Thank you.

Chair: We are going to move on to peat with Peter Lilley.

Q248 Mr Peter Lilley: We are told that soil carbon degradation is particularly affecting lowland peats and the amount of peatland in the UK has declined dramatically over several centuries, if you can have a drama lasting several centuries. Is the objective of the Department to halt, slow down or reverse the decline of peat?

Rory Stewart: The objective is to begin to gently reverse the decline; so halt first and then make it better. We would like to get a situation where at the end of our planned period there is more healthy peat in the country than there is today. That is where we want to get to.

Q249 Mr Peter Lilley: What action are you taking to achieve this?

Rory Stewart: Various things. The first thing is we have become much more conscious of the importance of peat, so an increasing amount of peat is now protected under the SSSI legislation to stop you going after certain kinds of peat. We have spent considerable sums of money buying out peat works. If you go to Bolton Fell End, for example, you will find that Defra and Natural England have bought out a peat works in order to stop them extracting the peat and to begin the process of restoring the peat. We have invested in schemes where we have dropped sphagnum moss aerially in order to reseed peat bogs. Sphagnum moss is what allows the peat composition to reform. We have done a great deal about blocking up inappropriately laid drainage ditches that are drying out the peat. We have worked with the horticultural industry to minimise the amount of peat used there. For example, we have done a great deal of work with one of our arm's length bodies, Kew Gardens. The final thing, which might appeal to you, is that we are developing a peatland code to try to create a market mechanism that would allow people to invest in the restoration of peatland for its carbon and biodiversity benefits. There are a lot of landowners out there who are sitting on a great deal of peatland and what we are trying to do is work out how we monetise that process.

Q250 Mr Peter Lilley: I am probably the only person on the Committee to whom that does not appeal. What proportion of our agricultural land is peat?

Rory Stewart: I don't have a figure on the proportion that is peat, but broadly speaking there are two types of peat in Britain. There is upland peat and lowland peat and a great

deal of the stuff in places like East Anglia is a lowland peat that creates very rich agricultural soil. The proportion of our agricultural land based on peat, any views?

Maggie Charnley: We are just doing a bit of analysis that should be able to give you a more precise answer, but I think it is around 3% of our arable land.

Q251 Mr Peter Lilley: Does that mean we are going to take 3% of our arable land out of normal arable production?

Rory Stewart: No. It is likely that we will focus our first action on bits of bare peat where the land is absolutely useless. Bare peat is no good for anything, for agriculture or sheep grazing.

Q252 Mr Peter Lilley: Why does one have to do anything?

Rory Stewart: Bare peat?

Mr Peter Lilley: It has got there without anybody doing anything. If no one is doing anything now, why does one have to do anything at all?

Rory Stewart: It is my fault that I am not explaining clearly enough. By bare peat I mean black exposed peat with no coverage of vegetation that will begin to dry out and release a lot of carbon into the atmosphere.

Q253 Mr Peter Lilley: But how did it get there in the first place?

Rory Stewart: It got there in the first place because in the 1950s and 1960s people were given grants to drain that land, so they often inserted drainage. Then it may have been over-grazed; it may have been planted with commercial forestry. There are various kinds of destructive land management techniques that result in bare black peat. That black peat is a catastrophe in terms of carbon emissions; it is no good for grazing or agriculture. That is where we need to target our activities first and I think there may be as much as 100,000 hectares. We don't have the exact sum but it is something of that level where there should be the potential to restore that peatland. We restore it, essentially, by seeding sphagnum moss back into it and blocking up the header drains.

Q254 Mr Peter Lilley: What estimates have you made of the additional greenhouse gas emissions from peatland degradation and the cost of mitigating those emissions?

Rory Stewart: This is a real question from you, Mr Lilley, greenhouse gas emissions. The answer is that we are currently working with an organisation leading on the peatland code and trying to get a best estimate on the cost of trapping carbon through restoring peatland. From the meetings that I have been in recently—I would not want to be overly pushed on this because we have more research to do—it looks as though there are some areas of peatland where we ought to be able to do it at a cost of about £16, which would compare very favourably with the social cost of carbon but would probably be more than the cost of a tradable carbon credit.

Mr Peter Lilley: £16 per—

Rory Stewart: Sorry, this is my fault. I am not putting her on the spot. £16 per unit of carbon lost, and I have managed to get myself in a muddle on what the unit of carbon lost is. The information I got in the last seminar was that the tradable cost was at about £8 or £9, peatland restoration would come in at about £16 and the social cost was coming in at something around £30, something of that sort.

Q255 Mr Peter Lilley: We could buy in emissions permits for €6. Could we do that instead and save £10 per tonne?

Rory Stewart: This is not the Department of Energy and Climate Change speaking here, but you are right. That is the comparable figure, that you could buy your carbon credit for I was told €8, you maybe could buy it for €6, and it would cost us about £16 is what we believe at the moment. The justification for it is that the social cost of carbon assessed through the Treasury Green Book process is higher than the tradable market value of €6.

Q256 Mr Peter Lilley: I can see you laughing at this implausible excuse because you still save money whatever the social cost of carbon. One molecule of carbon, let me assure you, is much like another wherever it comes from and it has the same social impact.

Rory Stewart: I think it is a bigger public policy debate about to what extent do you wish to be doing it in the United Kingdom or you wish to be paying for some other country to save your carbon.

Mr Peter Lilley: It could just depend on whether you are a masochist or not, whether you like doing things that are more costly, more painful rather than doing things that are cheaper and more efficient. I have concluded my questions.

Q257 Chair: I wanted to ask the Minister a follow-up. Just to go back for a second, the Committee on Climate Change called on you to do an action plan. You have described certain actions. Is there an action plan? Does it exist?

Rory Stewart: Yes. The action plan is integrated into the 25-year environment plan that we are working up, but soils and particularly peat is a very important part of that. The reason I am doing all these meetings with the peatland code people is so we can feed it into the 25-year environment plan.

Q258 Chair: The action plan on peatland loss will be integrated into your 25-year plan?

Rory Stewart: Correct, yes.

Q259 Chair: When is that going to be published?

Rory Stewart: There have been some discussions on the timing of it because of the EU referendum. I am hoping that we will have a draft out this summer.

Q260 Chair: That is helpful. The Committee on Climate Change report to Parliament said that we are still losing those lowland peats. You have talked about uplands but not lowlands. Do you have a plan on lowland peats?

Rory Stewart: Yes. That will be integrated into the same thing but we probably need to approach it in a slightly different way. In the upland environment if you have a piece of bare peatland, as I was saying to Mr Lilley, a piece that does not have any sphagnum moss on it, the cost of repairing it is quite low. You are not displacing other kinds of economic activity, nobody is grazing on it, nobody is planting it. When you are looking at lowland peats and high value agricultural areas, they are often associated with high value agricultural soil. If, as Mr Lilley said, one bit of carbon is much like another, you could make a cost benefit analysis for focusing particularly on the low-hanging fruit, which would tend to be the bare upland peats.

Q261 Caroline Lucas: I wanted to go back to the issue of incentives. In order to encourage sustainable management of soils, we clearly need an incentive structure that encourages restoration and improvement of soil quality. We heard quite a lot of evidence to say that current regulation of farmers through cross-compliance seems to focus on avoiding more damage to the soil but doesn't reward people who are positively improving the nature of the soil. There are no regulations on soil structure or soil biota like earthworms. The question is: do you think the approach to soil regulation is too light touch?

Rory Stewart: I think the problem or the challenge here, as somebody who wants to increase soil organic matter over the next 25 years, is working out what is the right public policy lever to do this. A regular inspection mechanism that was monitoring microbacteria in earthworms in a given bit of soil across every farm in the United Kingdom clearly is not what you are pushing for, because that would be incredibly bureaucratic and laborious. I think that it is probably more realistic that you would get the improvement in soil organic matter and through the improvement of soil organic matter the improvement of all these other things—soil functions, microbacteria, earthworms—through encouraging better precision farming techniques, better ploughing techniques, more consistent planting of cover crops, more rigorous focus on issues such as soil erosion, rather than attempting to conduct a universal annual soil sample.

I am very happy to talk openly about what the costs and the benefits for doing that would be. I think we all agree that what we want to do is improve soil organic matter particularly in agricultural soil. There are some problems in grasslands but probably the more pressing problems are in the agricultural soils.

Q262 Caroline Lucas: We have had a lot of evidence from people like the National Trust, the Wildlife and Countryside Link, the British Society of Soil Science and many others, essentially saying that the so-called good agricultural environment conditions, GAEC, just are not fit for purpose, that they are either measuring things that have stopped happening anyway, in other words trying to see whether or not people are pursuing policies that have already been abandoned or, alternatively, that they are not ambitious enough in terms of proper soil improvement. What is your comment on that?

Rory Stewart: I think there are two different issues there. The first is the issue that I have raised with Ms Pow, which is that most of the normal measurement techniques on soil are often picking up historical problems that could be five or seven years in the past, but we don't really have a scientific answer to that. We don't have an answer to the problem of the fact that soils can change quite slowly and particularly soil organic matter can take quite a long time to detect poor management techniques in the past. You are right, there is

a problem that you are often getting a snapshot of what happened some years ago rather than what is happening today but I don't think there is an obvious scientific solution to that problem yet available.

The possible solution to that is modelling. We are getting better at modelling. If you are projecting forward and let's say you wanted to increase soil organic matter by 20% over the next 20 years, which is what the Soil Association is pushing for, we do have better understanding of our models. We have better understanding of how planting of cover crops could increase the soil organic matter and we would have a relative confidence in predicting forward. Your second point I guess is about lack of ambition.

Caroline Lucas: Or lack of incentive in order to trigger that ambition.

Rory Stewart: I am very open to anybody coming forward with clear ideas on what those incentives would be. We know what good agricultural practice looks like. It is not, oddly, an environmental policy. This is something that is not quite rocket science. We know how to improve soil organic matter. Essentially you just need more organic matter sitting around on the top of the soil and it needs to get through. These things I am talking about, how deep you plough, whether or not you plant a cover crop, how you do your drainage, is a pretty reliable way of improving soil organic matter. The question is what sort of agricultural inspection subsidy incentive regime are these guys proposing that will allow that to happen, but I am very open to those kind of ideas.

Q263 Caroline Lucas: Defra is moving towards a natural capital approach to the environment and one of the proposals would be to make cross-compliance requirements structured to reward positive delivery of ecosystem services for society in general rather than merely attempting to discourage a few harmful practices. But on the issue of cross-compliance, do you know how many farmers have been prosecuted for not meeting cross-compliance criteria when it comes to loss of soil carbon?

Rory Stewart: Not the exact number but in the 2013-14 period I would guess, off the top of my head, about 250 farmers would have been done on cross-compliance issues on soil.

Q264 Caroline Lucas: Is that data regularly published? I understood that Scotland does publish data and I am not sure that England does, if I have read that right.

Rory Stewart: I am not sure whether the RPA publishes that data. I can look into that.

Caroline Lucas: Can we look into that, because I think that would be useful?

Rory Stewart: Yes.

Q265 Rebecca Pow: I would just like your view, Minister. Isn't it true that with the way the CAP payments are geared at the moment there is not a particular category that is simple for farmers to access that would deal with improving your soil? Isn't that an area that could be worked on?

Rory Stewart: I think the challenge is working out what exactly—

Rebecca Pow: If a farmer's top priority was to have a system where he had lots of topsoil and soil organic matter in the soil—so that would probably mean he would have to be a

livestock farmer and grow grass or on a rotation and not grow maize—should we be moving towards enabling farmers to think about these things more because it is better for a sustainable environment?

Rory Stewart: The basic approach across all European countries has been to take a compliance approach, which is to assume that farmers have a direct interest in their soil, and I would imagine the vast majority of farmers would say—I don't know what they have said in testimony to your Committee—that they understand the importance of soil. Our farmers increasingly have been through agricultural colleges where they have studied soil science and they understand how important it is for the future viability of their business that they maintain good soils and they have an increasing understanding of how you maintain good soils.

Q266 Rebecca Pow: There are very few courses dealing with soil science, Minister, as far as we have been told.

Rory Stewart: Every single farmer going through an agricultural college will have studied soil as part of that course. Farmers have a very good understanding of soil.

Q267 Chair: Sorry to interrupt, Minister. The evidence is that we have lost 11% of our soil organic carbon between 1978 and 2007, so over 30 years 11% has gone. I suppose what we are concerned about is that maybe there is a younger generation of farmers coming through who have had the benefit of elements of soil science in their degree but we know there is an age issue with farmers as well. The education is not coming in so perhaps compliance could be another route. To follow up from Caroline's question, I am happy for you to write to us about how many farmers had their payments reduced for violations. That would be really helpful in informing our report. We would be grateful for that.

Rory Stewart: Sure.

Q268 John Mc Nally: Minister, looking ahead to the future plans on soil health, the overwhelming view of our witnesses was that having two separate 25-year plans, one for farming and one for the environment, is a bad idea and that soil health should be central to a plan for farming. Doesn't splitting these plans and confining soil health to just one of them undermine the integrated approach to soil health that is needed?

Rory Stewart: A number of your witnesses have said the same to me in different meetings. One answer to that question is that the farming plan focuses primarily on issues such as farming exports. If you are looking at the question of fundamental land management and soil, that tends to be dealt with within the environment plan. There is going to be a very large element of the 25-year environment plan that is directly relevant to farming and very closely integrated with the 25-year plan on farming. But we also believe, as the Department, rightly or wrongly, that there are distinctions between the two and that we don't want to conflate the whole thing into one plan. Why? To be honest, if I am working in a 25-year farming plan on the question of how you increase the sale of Lake District cheddar to Emirates Airlines or the production of Wensleydale cheese and how exactly Wensleydale yoghurt finds itself on to Tesco shelves, you are going quite a long way away from the environment into the question of food businesses and food production.

There is a reason and it also reflects the structure of our Department and the structure of our Ministers why those things have been done differently, but we are with each other all the time, we work together very closely. The soil team, for example, is as much part of George Eustice's agricultural bit as it is part of my environment bit. Those bits of farming that are directly underpinned by the environment will be covered in the 25-year environment plan.

It is difficult for Government. If we had put them both together we would have had a lot of people from farming and the environmental lobby saying, "Why aren't there separate plans? Why isn't there a plan for the environment? Why isn't there a plan for farming?" If we do them separately, everybody says, "Why didn't you integrate them and do a single plan?" This is a little bit semantics. We have to make sure that we work closely together and the two plans don't contradict each other and that they reinforce each other, I guess.

Q269 John Mc Nally: We are talking about the 25-year plans due to be published this year and their success can only be measured by the actions that result from them. When should we expect the first actions and initiatives relating to soil coming out of these plans? I am aware there is a conflict between farming and the environment. The second part of that question is: how do you ensure that these measures are balanced against one another?

Rory Stewart: On the 25-year plan, I suspect we will probably be back in front of the Committee talking in detail about the plan once it is published and has given you a chance to dig into the detail of it. In terms of conflict, one of the things the plan is trying to do, in fact probably the most important thing the plan is trying to do, is identify those conflicts or trade-offs in advance to make sure that our environmental policy is genuinely consistent. One of the dangers in the past has been that you set a target on peatland and a target on woodland. Let's say the Government set a target of 100,000 hectares more of restored peatland and 100,000 hectares more of forestry and 1.5 million more houses and 500,000 more dairy cows; eventually you are looking at quite a small island in which you have to fit all this stuff.

One of the most important things within this plan is to make sure we really challenge each other within the Department and make sure whatever bright new ideas are coming up—if I come up with a big bold proposal that we are going to improve soil organic carbon by 20%, to really think about what the costs and benefits of that are and what the perverse consequences might be for other stuff we are trying to do in the environment so that I don't end up with a world in which five years down the line I say to someone, "What on earth is going wrong with our flooding policy?" or "What on earth is going wrong with our farming and birds policy?" or "What on earth is going wrong with our agriculture?" and somebody says, "That thing you signed up to on soil organic carbon means we are not allowed to do X, Y, Z".

I think that is what the whole 25-year plan process is about. What I hope when we discuss it in front of the Committee is that we can talk about these really difficult trade-offs. The most famous example, of course, has been the question of whether environmental policy on white-clawed crayfish was or was not contributing towards flooding. The point about this plan is to try to make sure we think about all these things in advance and they all add up and we don't end up in a world in which—for example, Ms Pow is pushing hard for the

listing of all ancient woodland. We need to think through what the costs and the benefits of that would be and whether that is a net benefit to the British environment.

Rebecca Pow: There are great soils underneath them that need protecting.

Q270 Geraint Davies: You say it is all going to be integrated in 25 years but you will also be aware that agriculture contributes something like 14% or 15% towards global warming, in particular methane from livestock. My understanding is that you or your Department has gone to Europe to water down attempts to reduce livestock carbon contribution and that the plan is to have an extra million cows. Obviously this is about soil and land management as well. How does that add up to a sensible sustainable approach?

Rory Stewart: There is a fundamental question you raise there, which has been raised by many other people, about livestock in general and their contribution through waste, through the two ends of the animal, to the release of methane and also there are issues about ammonia and nitrogen. The answer is that in comparing ourselves to European countries there is an issue of animal welfare, which I care about and which people maybe are not talking as clearly about as possible. European models, particularly in places like the Netherlands, tend to keep the animals indoors much more. That is better from the point of view of methane. They can put scrubbers into these sheds to make sure that they catch the emissions from these animals. At the same time, in Cumbria I am trying to encourage people to adopt a New Zealand system of keeping cows outdoors. Why am I encouraging them to keep cows outdoors? I think it is better for the cows, but more importantly than it being better for the cows, we have this amazing, free, sustainable resource of grass, which these cows can simply go out and graze, as opposed to what is happening in a continental system where they are having to buy in inputs, which they are putting into these sheds to feed the animals.

There is a very difficult balance between two completely different types of farming system, but we have to weigh up the question of climate change emissions, methane emissions, against I think very good environmental arguments for why you would want to conduct pastoral agriculture outdoors and make use of that free resource, which is the grass, in order to create meat. If you do not do that, you end up in the situation that we are equally aware of, which is the environmental movement pointing out, quite rightly, over 20 years that we have destroyed a lot of the Brazilian rainforest in order to plant soy, which is then fed to cows, as opposed to putting the cows on my Lake District hills where they can eat the grass for free without having to do any of that.

Chair: I think we are in danger of getting off the subject here.

Geraint Davies: Yes, fair enough.

Chair: I am keen to get back to soil.

Q271 Geraint Davies: I want to go back to peat and maize, but just on this, what we are talking about is carbon capture in peat and the reality is that methane, as you will know, is 83 times more harmful to global warming than carbon. If we are producing enormous amounts of methane and you are encouraging an extra million cows, all your efforts to overbid for peat or buy carbon seems to be not very effective in those terms, does it?

Rory Stewart: I think there is another thing that we would have to think about and we would have to look at realistically, which is given the nature of global prices, given global demand, given dairy prices, for example, is it realistic that there is going to be an increase in 500,000 cows?

Geraint Davies: Yes, okay. I am going to move on to something else.

Q272 Chair: Before you move on, can I just ask a couple of things? I wanted to ask the Minister on this soils policy stuff, have you looked at the Welsh approach, which is to put soil health indicators as part of its departmental-spanning wellbeing of future generations? Have you looked at that?

Rory Stewart: Yes, I am very impressed by the Welsh Government on a lot of their environmental policy.

Chair: So are we.

Rory Stewart: They are great. I think they are great on recycling, fantastic stuff on recycling. I think this on soil is very interesting. We are trying to learn closely from what Wales is doing.

Q273 Chair: Okay. Would you be working with other Departments like DECC and DCLG to monitor the downstream effects of soil degradation? Who in those Departments would you be working with?

Rory Stewart: In relation to DECC, I have had meetings with Amber Rudd. We have meetings with DECC officials, particularly around the carbon budget, because I believe that we can, through our policies on peatland and our policies on woodland creation, help achieve the UK carbon budget. Maybe not in the way that Mr Lilley wishes, but I think we can make contributions. We have very regular conversations with DECC colleagues.

Q274 Chair: Finally, will the plan that you are about to publish on soil health set out how you are going to meet your aspiration to have all soils managed sustainably by 2030?

Rory Stewart: Yes.

Chair: That will be clearly set out?

Rory Stewart: Yes, it will.

Chair: Thank you.

Q275 Geraint Davies: There is no bid to try to promote vegetarianism or anything like that, presumably, to stop people eating methane-producing animals?

Rory Stewart: Are you a vegetarian, Mr Davies?

Geraint Davies: I am not, but obviously in Wales we had an Agriculture Minister who was vegetarian and that was not very popular but might have helped the atmosphere. I wanted to ask just very briefly about the double subsidy on maize, which is produced for

anaerobic digestion. As you know, maize is quite damaging to soil health. What do you think about that and what should be done about it?

Rory Stewart: That is really an issue for the Department of Energy and Climate Change. It is predominantly about energy policy, renewable energy policy and the different types of renewable energy policy, but we certainly within the Department are looking closely from our point of view at the costs and benefits of that kind of activity.

Q276 Geraint Davies: You are arguing that the subsidy should be withdrawn or reduced with that Department?

Rory Stewart: No, Mr Davies, just to reiterate, we are looking closely at the costs and benefits of the policy in maize, but it is primarily a question—

Q277 Geraint Davies: You accept there is a problem here, don't you, with double subsidy and soil erosion from maize for anaerobic?

Rory Stewart: I accept that maize planted incorrectly, harvested at the wrong time of year or in the wrong climatic conditions can contribute to soil erosion.

Geraint Davies: Yes, but you are not doing anything about it—

Rory Stewart: Sorry, just to be clear about that, if you are doing that, if your maize processes are contributing to soil erosion, that is in breach of your cross-compliance regulations and the RPA can then fine you for doing that.

Q278 Rebecca Pow: But has anybody been fined for that, Minister? It is an issue. Even farmers themselves talk about the runoff from maize fields. I fully understand about the subsidy and the need to get energy from other sources, but do you think many farmers have been prosecuted for that? That would be interesting.

Rory Stewart: As I say, my understanding is that between 2013 and 2014 about 250 farmers were prosecuted for soil-related offences. I do not know the answer on maize.

Q279 Chair: Are those indicators broken down by compliance issue? I imagine they probably would be.

Rory Stewart: Yes.

Chair: Okay. You are going to write to us with those details. I think that will be very helpful for the Committee.

Q280 Geraint Davies: Amazing facts, yes. Finally, I want to simply ask about burning peat; not Peter Lilley, peat burning, which is very damaging. How do you see that problem? What are you doing about it?

Rory Stewart: Again, we have regulations around proper approaches to peat and we also have very active research on peat, very active conversations with land managers around best practice in peat. It goes all the way from the fact that if you do something to your peatland that contributes to soil erosion you could be prosecuted, right the way through to

encouraging best practice in terms of if it needs to happen at all, when it happens, what seasons, how it is done and how it is controlled.

Q281 Geraint Davies: Coming back to Rebecca's point and previous points, I think you are now going to provide us a breakdown of all the prosecutions, but I was wondering how you felt the level of enforcement compared with the level of infringement overall, these areas where there is peat burning or maize misuse and all the rest of it. Do you have the armoury and are you taking action to deter or is it just going on anyway and people are fined?

Rory Stewart: In fairness to the Department, we need to be realistic about the different kinds of environmental issues that we face as a nation and getting the right resource is a different thing. Ms Pow has raised the fact that she had an estimate, I think, that soil loss was costing the nation about £2 billion—

Rebecca Pow: £1.4 billion.

Rory Stewart: £1.4 billon, that is right. Noise pollution is costing the country about seven times as much as that. Air pollution on the same calculations, exactly the same maths, would generate an air pollution factor of maybe 12 to 14 times as much as that. We need to put this in context. I think there is a real issue around soil. It is absolutely central to our 25-year plan, but our major concern is not about upland soils. Our major concern at the moment in relation to degradation is in relation to agricultural soils. There can be problems around heather burning, but if you wanted me to say where the big issue is, where you would want your RPA inspectors focused, where the compliance problem is greatest, my instinct probably would be sown agricultural fields in the east of England.

Q282 Rebecca Pow: I just want the Minister's views. A lot of what we are discussing, particularly about the maize being encouraged with grants or energy—that is one issue you have to address—but then perhaps being degrading to the soils, doesn't that indicate just how important it is that our Government Departments must work together?

Rory Stewart: We do work together.

Rebecca Pow: Indeed, for your environmental plan, this must be crucial?

Rory Stewart: Absolutely.

Rebecca Pow: Increasingly so.

Rory Stewart: Indeed, our officials are currently meeting with DECC on the issue of biofuels. We work very closely together on these issues.

Q283 Geraint Davies: On this thing about climate change and cows, if it is the case that 15% of our global emissions in terms of greenhouse gas are from cows and livestock, shouldn't you be taking this a bit more seriously? What you seem to be saying is, "Oh, well, we will just have an extra million cows. We do not really care about that". This is a big issue because they are locked up in Holland, the cows I mean.

Rory Stewart: I am not saying that we are not aware of it. There are many different things that you can do to reduce the methane emission from animals. We are actively looking at research taking place in the ways in which the animals are fed in order to reduce the

amount of methane that each animal emits. There are techniques that you will be aware of that have been developed in Japan, which so far are not legal in the United Kingdom, which include the feeding of pills in order to essentially improve the digestive capacity of the animal so that it is emitting less methane. If you are asking am I going to be dragged into the broader debate about whether the whole world should go vegetarian, that is a different kind of debate.

Chair: We do not want that debate, honestly, Minister, I promise you.

Geraint Davies: I was hoping you would be dragged into that debate, to be honest.

Chair: Tempting though it is. We can discuss that outside. John, you had a supplementary and I have one as well.

Q284 John Mc Nally: Yes. I just want to go back. During the many other sessions that we have had here from the professionals, and Geraint mentioned it earlier, do you talk to the Scottish Government, particularly on the peat? I know that Scotland's soils are estimated to contain 3,000 million tonnes of carbon, 16,000 tonnes of it in the peatlands. I just wondered if you used the Scottish soil framework and the Government to learn from that. I am not having a go at the Westminster Government. We did say that we have lessons to be learnt from them. Well, I am having a go, but I just wondered if you are talking with each other.

Rory Stewart: We are talking very closely and, in fact, the peatland code initiative, which I have now hosted twice in Defra since the beginning of the year—it alternates between Defra in London and Edinburgh—has been driven forward essentially by a Scottish movement. That is Scottish NGOs. That is Scottish land managers. It has been backed by the Edinburgh branch of Savills. It has been backed by the Scottish Government and a lot of what we are doing in peatland involves learning from Scotland because Scotland has an incredible amount of peatland.

Q285 Chair: Could you explain why Natural England's 2012 inquiry into burning of peat was called off?

Rory Stewart: I was unaware of that. It is before my time. I am very happy to write to you about that.

Chair: That would be brilliant. Thank you.

Q286 Rebecca Pow: Minister, Defra says that soil is a farmer's most important asset. Do you agree that incentives should be structured so that farmers are motivated to maintain the long-term health and quality of the soil they are working on? We have touched on this already, in fact.

Rory Stewart: Yes. I certainly think that at a bare minimum farmers should be obliged to preserve the quality of their soil, and if we can come up with clear mechanisms that allow you to do what you are talking about, which is to encourage people to improve their soil, we should do it. Generally speaking, the most productive examples of doing that in Britain have been done on a voluntary basis and that is why again I want to return to the biggest example, which is a Government responsibility because it is a public landholding, which is

the Crown Estate where I think there is amazing stuff happening on showing what good soil management looks like. I think us demonstrating this across 144,000 hectares of land in Britain is one of the most powerful things the Government can do.

Q287 Rebecca Pow: I would question you: the Crown Estate's main remit is to make money for the Treasury, is it not?

Rory Stewart: Rather interestingly, it is correct. Since the 1960s their main remit is to make money for the Treasury, but what they have actually done, and the reason why I think it is good that they are doing it, is they are a business that is based on a commercial line. They have put soil absolutely central to that. They have insisted that every new tenant signs up to a soil management plan. It is an extremely ambitious soil management plan in terms of defining different types of ploughing, different types of crops. I think it is a real example to farmers across the country that you can make a lot of money for the Treasury but also do good soil management.

Q288 Rebecca Pow: A feel a visit ought to be coming on, Madam Chair. That is an interesting point because I have talked to lots of farmers and they say they will do anything and they are driven by finances. They will do anything; that is why they grow maize, because they are businesses. That leads me to my next point, which is—and we have heard evidence of this—that now in terms of land management systems lots of farmers are operating on short-term tenancies. Would the Minister agree that potentially this encourages farmers to over-exploit to get the most out of their land short term and that potentially damages the soil long term?

Rory Stewart: I think we need to be a little bit careful here not to slander farmers.

Rebecca Pow: I am not meaning to slander farmers in any way because they are hardworking and they are—

Rory Stewart: They are not just hard working and I think it is also not quite fair to say they are only driven by the bottom line. Most farmers genuinely care about their soil, genuinely care about the long-term future of their farms, and genuinely take measures to try to protect the long-term future of their farms. You are right, there may be people who could be exceptions.

Rebecca Pow: I am not saying they do it on purpose.

Rory Stewart: I think it is a small minority of people who knowingly set out to damage soils. Often, it is people coming in new to land that they do not understand fully, they have not fully studied the land management practices of their predecessors, but generally I do not think the primary issue here—this is where maybe I would challenge your previous statement—is finance. I do not think farmers are damaging soil because we are not paying them to improve it. I think most farmers want to improve their soil, understand that that is in their long-term financial interest to do. If they are damaging soil, it is usually to do with error rather than a desire to deliberately erode what is effectively the base of their business.

Q289 Rebecca Pow: Yes. I do want it on the record I am not saying farmers are deliberately damaging soils. I absolutely want that categorically on the record. They are efficient and hard working in the main. My point was really about the short-term tenancy system. Do you think that is beneficial to the way that they operate?

Rory Stewart: Short-term tenancies, by and large again I think most short-term tenants are responsible. You are right in theory—

Rebecca Pow: This was in evidence that was raised with us.

Rory Stewart: In theory, and this has been true for 100 years, people have always been anxious about short-term tenancies and what happens when someone takes a short-term tenancy. It is not a new issue. People worry about it in terms of fence maintenance. They worry about it in terms of hedgerow maintenance. They worry about it in terms of soil. I guess you worry about it, I am afraid, also in other areas of life, but by and large I think short-term tenants are responsible because they want often to get tenancies elsewhere. If they wreck a farm, they are not likely to be able to get a tenancy elsewhere.

Q290 Rebecca Pow: What action do you think might be taken to ensure they—

Rory Stewart: If they are deliberately setting out to wreck it, it is the job of the RPA to come in and get them on the cross-compliance. You are not allowed to do that and if a member of the public or a landowner discovers a short-term tenant deliberately setting out to damage the soil, they should call the RPA and the inspector should go in.

Q291 Caroline Lucas: I guess this is a concluding question about the relative importance that Defra gives to soil protection. I do not think this is a particular criticism of this Government; obviously, it is just something that systematically I think there is a lot of evidence that we have been taking that suggests that soil has not received the attention it deserves compared to, for example, air, water and biodiversity. I know you have touched earlier on the fact that there are different costs to society and there is a calculation to be done there, but generally do you think it is the case that, given how essential soil is for the success of agriculture, over time not enough attention has been given to it in terms of ensuring that we have the right systems to protect and to incentivise it and so on?

Rory Stewart: I am not, I guess, in the business of criticising predecessors. I would put on the record that there are certain things that have got better in soil. pH levels in soils, as you know, over 20 years have improved dramatically, almost certainly largely because of the work that we did with European partners to stop acid rain. That has made a huge difference to our soils. There are problems around soil organic matter. I absolutely agree with you that soils are essential, need to be at the core of the 25-year environment plan. I think evidence sessions like this are a really good way of putting it on the agenda. I think the work of people like the Soil Association has been very important. The work of Friends of the Earth has been very important. I think research institutes have been very important in doing this.

I do think it is a really important environmental consideration, but we need to put it, as you yourself have, in the context of the other environmental priorities we have and recognise that we also need to think about it in terms of how we compare to our European competitors and how our soil relates to how they are performing on soil. Some of that, our better performance generally, to some extent is not something particularly the Government

needs to pat itself on the back about. It is something to do often with our climate and the fact that our soils are less vulnerable than the soils in many other countries to the kinds of extreme climatic conditions that tend to lead to soil erosion in the United States or continental Europe.

Q292 Caroline Lucas: Can you get us some figures, assuming they are not just sitting on the top of your head—they probably are not—of how much is spent on soil health compared to the amount spent on air quality or water quality or biodiversity? Is there some sense that we could get in financial terms alone of the relative resource spend on this?

Rory Stewart: I will see if we have something. It is quite a complicated figure to derive. You would have to look at all agriculture interventions. Soil health is primarily improved through farmers planting cover crops, putting nutrients and carbon into soil. You would have to calculate how much money is being spent on that. I can tell you that improving nitrogen in soils through natural means, the planting of cover crops, is an investment of about £70 a hectare, but modelling that across the whole country is going to be quite complex. I will see if anybody has done that maths, yes.

Q293 Caroline Lucas: My last question was about statutory protection. Would you agree that there should be statutory protection for soil quality as there is for air and water and biodiversity?

Rory Stewart: I agree that there should be an obligation on people not to degrade their soils and that is currently what we are doing through cross-compliance and the RPA inspections. I am very happy to sit down, again as I said to you, and talk to people who think they have different solutions or different ways of doing this because we want in this 25-year environment plan to lay out a programme to improve our soils. In particular, carbon, soil organic content, we would like to improve over the next 25 years. Anybody who has clear ideas on how we do that in a financially responsible, environmentally responsible way I am really, really open to talking to.

Q294 Geraint Davies: On that specifically, Minister, obviously you will know that the EU has done dramatically well in supporting water quality in Britain. It is now behind a court case to bring up our air quality because we are not satisfying EU air quality standards. In the case of soil, do you think the EU should be doing more to ensure we do more and the rest of Europe do more to protect our soil and, through that, our planet?

Rory Stewart: I think that Europe has been a positive force in our environment. I think it has really helped us to frame good environmental policy. I tend to, I am afraid, think that Europe's real unique selling point is in cross-border issues, so migratory birds, cross-border air pollution, and in tradable commodities. There is an argument around the circular economy that Europe can play a useful role. In specific soils, which is something that is quite local, I would expect British Governments to take a lead on that and have a responsible environmental policy adjusted to local conditions. That does not seem to me to be the sweet spot of European intervention, but I do believe Europe has been really great for our environment. We should be very proud of the role that Europe has played in improving our environment over the last several years.

Chair: I am sure you have enjoyed reading our report on that, which was the subject of some controversy a couple of weeks ago. Rebecca, final question.

Q295 Rebecca Pow: Minister, I do welcome the fact that you are open for discussions on some of the evidence that we have presented on monitoring schemes and improving soils. I think it would be great if you could discuss it with people. Is it too late to work any of those ideas, if they seemed viable, into the 25-year plan?

Rory Stewart: No, certainly not too late.

Rebecca Pow: Good.

Rory Stewart: At this point I am going to drop poor Ms Charnley in it. We are very keen to make soil central to this plan. I absolutely commit that we will have a team of officials ready to go through your report very carefully. If you could provide half a dozen people that really impressed you, that you thought had really strong ideas around soil, we would love to sit down with them and make sure that their ideas are fed in.

Chair: Brilliant. Thank you very much indeed, Minister.

Rory Stewart: Thank you very much.