House of Commons

Environment, Food and Rural Affairs Committee

Oral evidence: Soil Health, HC 963

Tuesday 9 May 2023

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Watch the meeting

Members present: Sir Robert Goodwill (Chair); Geraint Davies; Rosie Duffield; Barry Gardiner; Dr Neil Hudson.

Questions 73 - 163

Witnesses

I: Richard Bramley, NFU Environment Forum Chair; Professor Pippa Chapman, Chair in Biogeochemistry in the School of Geography, University of Leeds; James Robinson, Nature Friendly Farming Network England Vice Chair; and James Woodward, Sustain Alliance, Sustainable Farming Office.

Written evidence from witnesses:

– University of Leeds

- Nature Friendly Farming Network

- Sustain Alliance

Examination of witnesses

Witnesses: Richard Bramley, Professor Chapman, James Robinson and James Woodward.

Q73 **Chair:** Welcome to the second session of the EFRA Select Committee inquiry on soil health. The first session produced an overview of the problems facing all kinds of soils and this session focuses specifically on agricultural land.

We have four expert witnesses before us. Please introduce yourselves, starting with James on my left.

James Robinson: I am an organic dairy farmer from south Cumbria and I am here representing the Nature Friendly Farming Network, a group of farmers who are doing some great stuff on soil health.

Professor Chapman: I am a soil scientist, and I am a professor in Biogeochemistry at the School of Geography in the University of Leeds.

Richard Bramley: Hello. I chair the NFU Environment Forum and I am a crop farmer from south of York.

Chair: I actually visited your farm and saw some of this in action last year.

Richard Bramley: Yes.

James Woodward: Hi everybody. I work at the Sustain Alliance, Sustainable Farming. I work on policy advocacy and campaigning around agricultural policy.

Q74 **Chair:** I will start the questions off. What improvements for soil management techniques are we already seeing in the agricultural sector to restore our soils, and to what extent are sustainable soil management techniques—such as regenerative farming, organic farming or agri-forestry—on the rise or already being practised? I will start off with Richard because you are one of the standard bearers for this. To what extent are you typical of what is going on? Are you an exemplar in leading the way?

Richard Bramley: I think you used the term "trend" there and I am very much part of a trend. Whether I was an early adopter or not, certainly in any farming publication, radio show, podcast, anything like that, soil health is very much part of the language. It has been now for a number of years. It is very pleasing that it has been latched on to by the Government as well as something that is critically important.

Soil produces our food. Our agricultural systems provide for society, and if our soils are not doing things right we are not there to provide that production for the people of this country. It is something that is growing.

It needs to continue to be encouraged and I will definitely say that we are on the right track.

Q75 **Chair:** Thank you. Pippa, it is so easy to get a view as to how pure air is from testing and everything else, but soil is a much more complex material. There are hundreds of different types of soils. Are we in a position to know where we are and where we are likely to be, and with the current changes in agricultural practices that have been brought in—things like the sustainable farming incentive—are we moving in the right direction or did we turn the corner some time ago?

Professor Chapman: It is a good start and, as Richard said, with soil health we have an awareness of it increasing, within farmer communities and the supply chain, realising that it is a natural resource that forms the basis of our food production and we need to protect it and farm sustainably and regeneratively.

As you say, soils respond in different ways and soils are currently in different situations. Some soils have less organic matter than others and a poorer structure, and so tend to be in a worse state. Others particularly have living roots and have more cover, like in permanent pastures. They have a higher organic matter and a better structure, so, yes, our soils vary across the country. The state that they are in varies across the country and, therefore, where we need to put our emphasis to improve, protect and regenerate our soils varies across the country. It is a bit context specific in that way.

Q76 **Chair:** If you travel from Malton to Scarborough in my constituency, you will go through an area of blow away sand, as we call it, and obviously you can farm hydroponically. You are just basically putting in the nutrients. Do you think that we have been a little bit fooled into this idea that as long as you spoon-feed the nutrients to your crop you will get good yields, and we may have disregarded things like organic matter, soil structure and that sort of thing too much in the past?

Professor Chapman: Yes. You are driven by both science and policies, bringing synthetic fertilisers and pesticides into agriculture. They have their benefits, but then they also have their disbenefits. Perhaps we have not realised that and we need to be more aware of the pros and cons, when to use them and perhaps to use them more sparingly and work with nature a little bit more to make sure we do protect soil organic matter and the soil structure, which are key to soil health. They are some of the soil parameters that are key to soil health.

Q77 **Chair:** James, obviously "sustain" is in your organisation's name. Are we moving into a more sustainable position with soils, or is there a lot more work to be done before we can say we are actually in a good position with soil health?

James Woodward: As Pippa said, a start has happened. A lot of farmers are thinking about this idea of transitioning their farming system, and a lot of farmers have started on that transition. There is probably still quite

a long way to go in getting a much broader church in a wider part of the farming sector on that journey as well. Hopefully, environmental land management will kick-start that. There is still some way to go to be able to understand how soils are impacted when you change practices, so I think there is a combination of policy and science. The farming sector is starting on a journey but has some way to go yet.

Q78 **Chair:** James, you are obviously in organic farming. The majority of organic land in this country is grassland. What sort of lessons do you think that the rest of the sector can learn from the organic sector, if not going over completely to organic production, using some elements that you have learned through your application of organic farming to the rest of the industry more widely, particularly in the arable sector where it might be more difficult?

James Robinson: Grassland farmers in general are probably a long way behind arable farms in their knowledge and their relationship with soil. They are planting something annually or even biannually and our rural farmers learn much more about the soil and have been doing so for generations. Grassland and livestock farmers do not see the soil so much. I know that I did not pay too much attention to the soil until we became organic and I realised that we weren't able to put the artificial fertilisers on.

We took soil tests and stuff at the time. It was just like an N, P and K and a pH type of soil test. When we converted 18 years ago we expected the P and K levels on our farm to be degraded because we were not putting artificial fertilisers on, which was biannually. Those P and K levels now, when we are retesting soil 18 years on, are still the same. The indexes are still the same, so either those nutrients were leaching away or we have managed to create better soils that are able to capture the nutrients naturally rather than having to put them on. There is a lot that the livestock and grassland farmers could definitely learn from the organic sector.

Q79 **Chair:** I have read articles saying that the ELM system, the new way of supporting farmers, is much simpler to understand if you are an arable farmer than if you are a livestock farmer. Do you have concerns that some of the systems in place to support agriculture—particularly livestock farmers and hill farmers who are probably the most in need of help—are not tailormade to your sector?

James Robinson: We applied for the intermediate soil standard as soon as we were able to—last August, September—and I found it the easiest scheme I had ever applied for. It fitted our organic system very well. There are flaws with it. It is not ideal. There is no ambition within that either, so it does not give us an option to grade up annually or after five years or something. There are options, there but there need to be many more options for grassland farmers. There are only two that we can do currently.

Chair: Yes. I think Geraint is going to take that a bit further in the next question, please.

Q80 **Geraint Davies:** My question, as the Chair stated, is whether the environmental land management schemes are fit for purpose for all types of farms to get more sustainable soil management. James, you have already touched upon that. Your view is that it isn't sophisticated enough.

James Robinson: It is a good start and to get people's feet on the ladder, but as an industry we heard that ELMS was going to be a groundbreaking scheme and that it was innovative and ambitious. Those ambitions have fallen a long way short.

Q81 **Geraint Davies:** What more should be done to take a holistic approach that actually sustains soil?

James Robinson: I would like things to be joined together. I would like the soil standard to be linked to the grasslands and legume standard, for instance. If you do those two plus perhaps a hedgerow one, which of course can be very good for trapping nutrients and stuff, you might get a top-up payment or something, to try to link everything together, a whole farm approach rather than just a piecemeal individual thing. Then I would like ambition as well, so once you have reached this stage you are able to go further and further up. That would give a far better return for money as well and give farmers somewhere to go.

Q82 **Geraint Davies:** Pippa, on the same question is the current environmental land management scheme for delivering sustainable soil for all sorts of farmers fit for purpose and what changes should be made?

Professor Chapman: I completely agree with James. I think the design needs to follow the science and combine options in a more logical way, which results in an improvement of soil health and also works for the farmer, so that you are looking at through rotations and not just at short term. It needs to be a lot longer term. We know that moving to improve soil health you may need longer rotations and more variety in your crop, so just doing this over three years is very short term. That would be worth looking at, as well as a more structured approach to measure soil health and to find the practices that are appropriate for each soil type.

Going back to your question about soil type and farm type, I suppose the advice about which options to choose and the combination of options that work for your farm type, for your location, is what is missing.

Q83 **Geraint Davies:** Richard, would the NFU welcome a more sophisticated approach or would it become too complicated for everyone to understand?

Richard Bramley: It is probably fair to say that the scheme has stuttered from the start. I often want to go back to the beginning on this one. The ELM scheme is a mechanism for recognition of delivery of public goods by farmers, and public goods were being delivered by farmers

before the phrase was coined. One of the issues that we have is that we have not had a baseline. Farms could already have been accessing public good payments if they had been assessed in what they are currently doing. This is as pertinent to soil as it is to any other aspect of the farming system.

I joined the SFI pilot, which was like the precursor to the sustainable farming incentive. I think I was one of 850 farmers. I found myself through that process trying to shoehorn a scheme to fit my farm. I was fairly determined that that was how I was going to approach this. I would then have a baseline value and I would be looking for incentives to be able to top that up.

It is developing. I think that is one of the reasons why we have seen so many different options within this to allow farmers to tailor it to their farm. We are here talking about soils and there are hundreds of different soil types in this country and everyone has a different response to how it is managed. The person who knows about that, as Pippa has alluded to, is the farmer, and that goes for everything else on that farm as well.

Farmers themselves are unique. Some of them have been there for generations. They are small; they are big. They are producing large amounts of food for big companies as part of a system. Some might be quite small and quite niche and producing locally.

Q84 **Geraint Davies:** I will ask you about a specific example and you can tell me if ELMS can help it. There is a proliferation of mass chicken producers along the River Wye, and you know there is an environmental issue about enormous tonnages of chicken excrement affecting water quality but also the nature of the soil. Does the ELM scheme help? I am sure you are not involved in this, but if you were a corporation owning this sort of chicken and chicken poo producing facility next to a river, does the environmental land management scheme help you move towards something sustainable? Do you have any ideas of how we could convert that pollution into something that was a sustainable system?

Richard Bramley: As James said, having farmers get a good understanding about what is going on in their soils is a starting point, because then you can understand where you might be short, be it organic matter or phosphates, which is a particular issue with chicken manure.

If you go back 150, 200 years, the most valuable product on the planet was guano. We are currently mining mountains in Morocco to find phosphates to put on to our landscape. It is a very important resource. I do not see currently how ELMS is part of it, but healthy soil delivers benefits for all water and air quality. It delivers resilience to too much and too little water. It is good for biodiversity and it is good for food production, so there is a whole host of benefits that come from it. I do not see how we then ensure, within a scheme for delivering public good, better use of our nutrient availability, particularly from organic sources,

but it definitely needs to be something that we are looking to in the future.

Q85 **Geraint Davies:** James, do you have any thoughts about how good or fit for purpose the environmental land management scheme is for different sorts of farmers? I don't know if you have a comment on the particular point I have raised on whether we can do something positive about the phosphates coming out of the backsides of chickens.

James Woodward: As Richard mentioned, ELMS seems to have stuttered, and I think one of the problems with that is it has not had a proper vision or strategy behind it since it was first conceived. That is creating problems for DEFRA in understanding when to bring in things at the right time. That is also part of the bigger agricultural transition plan around phasing out the basic payment scheme and things like that.

It promised quite a lot early on, and I think that as it has gone through its process of design and implementation thus far it has lost a lot of its momentum. The two soil standards that are part of the SFI scheme so far are okay for farmers who are starting on a journey around soil health, but as James said, they are probably lacking in ambition. They are probably not pulling farmers towards that kind of regen agriculture, organic farming-type system. A lot of farmers are probably finding it in some ways easy to fit into their farming system but quite difficult in some ways as well. There is a very narrow group of actions at the moment, although some of the actions could be quite positive for soil health.

On the second question, as far as I understand it, ELM is probably not going to work for chicken farms where they have only chicken production. It is very much tailored to farms that have land. A lot of those chicken farms will not have much land and so they won't be able to make the actions and the payment rates stack up. I imagine that the way the ELM is being designed, it is probably always going to be quite difficult to make it work around reducing pollution from big chicken farms because it is based around per-hectare payments. As I said, often those farms will not have much land unless they are part of a more diverse, bigger farming system.

Clearly something needs to be done about it. Whether that is through ELM or whether there is a separate thing that comes into the agricultural policy, the wide agricultural transition plan that we have, it is certainly important that something comes in to support those farmers to reduce pollution in a fair way and maximise use of that manure in different ways as well. It could be a vital resource for producing different types of inputs—fertiliser specifically.

Q86 **Geraint Davies:** Pippa, as a biochemist, do you have a final thought about what we should do about chicken poo coming out in abundance in one place?

Professor Chapman: It is a very good question. It is related to the high protein content of the feed that they are given. Obviously, a lot of the phosphorous passes through the animal into the manure. As others have said here, if you are applying a lot of that manure to a small area of land you will get phosphorous runoff into our rivers and nutrification and problems with water quality.

You could look at the wider circular economy, but this is not really more sustainable agriculture, but as it is at the moment ELMS does not really address that. There are different ways that these things could be looked at. I think the current soil SFI standards encourage the addition of organic matter, but it does not state how much organic matter to apply. It just says "Once over three years", so some farmers might apply very little and others might think they are doing a great job and apply lots and then obviously have the issues that may come with that. Like you said, there is the issue in the Wye where you are potentially putting on more phosphorous than the land needs.

It is a balancing act and there is definitely the need to be using these resources more efficiently. Like Richard said, phosphorous is a limited resource and we need to look at whether we can process that and move the organic matter from where there is a lot in the west where we have livestock farming, and lower amounts in the east where we have the arable soils, which are the ones that have less organic matter in them and need more organic matter applied.

There are a few things here about the SFI standard, about the advice on how much organic matter to put on, the circular economy and using the nutrients more effectively.

Geraint Davies: We could put a cap on it as well, which would incentivise the transfer and reuse. Thanks, I will leave it there.

Q87 **Chair:** Thank you. Just before I move on to Rosie, may I ask about any particular challenges facing smaller farmers. I know, Richard, some of these big cultivators, the min-till or direct drills, are very expensive pieces of kit. Tenant farmers may be more restricted in what they can do by their landlords. Are there going to be problems in spreading out some of these better soil management systems to tenants and smaller farmers?

Richard Bramley: Yes. Two things there. From the point of view of a smaller farmer, making an investment is always a bigger deal. If a change in practice is going to need investment in new machinery, there is a potential there for them to be caught out. From the point of view of tenants, a tenancy can be quite short term and farming and farmers are thinking extraordinarily long term often, particularly with something like soil health. Short-term tenancies do not really lend themselves to that.

One of the things that the Rock review was very keen on was that tenants would get due regard for their efforts to improve soil health, thereby encouraging them to make that investment. I am not sure what

that will look like, but we certainly need to make sure that no matter who has the tenure of that land we are able to shift all soil management on to a more sustainable footing and hopefully improve those areas where we have had a degradation of soil.

Q88 **Chair:** Machinery grants are currently only available for brand new machinery. Do you think it would help if DEFRA looked at second-hand machinery, which might be of—

Richard Bramley: We have made the point that a lot of the ground schemes—extremely welcome though they are—can be quite restrictive by focusing on a particular type of machine. I am not saying it happens necessarily, but this can increase the starting price for those, so it is not necessarily such good value for money. There is also a good second-hand market there.

Ultimately with a system of grants, what we are trying to achieve is to help people with that next step. If a piece of machinery or a change in system will allow them to do that, I suggest that having a more flexible approach to those—if you can demonstrate your aims and what you need to achieve those aims—should be worthy of support in the future.

Q89 **Chair:** Thank you. The Committee is hoping to visit Groundswell to see some of those big, shiny new drills in action, but there are plenty of Moore Unidrills and stuff like that around.

Richard Bramley: They are out of my reach, Robert.

Q90 **Rosie Duffield:** Is the Government's target of having 60% of agricultural soil under sustainable management by 2030 achievable and ambitious enough? I know that there are lots of people who do not think so. Who would like to start first?

James Robinson: I can have a go. It obviously seems a bit too ambitious, given the level of uptake that there is at the moment. I would love to see that amount. I think there needs to be far better communication from DEFRA. The communications have been very patchy and what there has been has been quite poor. I think some farming organisations don't help either, or lots of farming organisations don't help. There is a constant negativity towards new schemes coming on, but then we are not getting the information back the other way either. We need good information that is long term as well, not just six to 12 months' time. We need to know what will be happening over the future, so we need—

Q91 **Rosie Duffield:** Sorry to interrupt. We have heard from farmers that you get the information literally and then you are expected to put everything in place.

James Robinson: Yes. As colleagues have said, farming is a long-term thing. Five years is long for government. That is like the blink of an eye for a farm, so we really need long-term thinking. We need five, 10, 15

years of vision as to how things will look, and if we are going to do that we also need to record where we are as a baseline.

Going back to the intermediate soil standard that we have undertaken on the farm, on 80% of our land, we have done 20-odd soil samples, soil assessments. There is nothing to record that on a database anywhere, so that information is at home but there is nothing for the Government to say, "This is where we are at now. That is our vision of where we are going to get. How are we going to get there?" If they don't know where we are now, well, there is no pathway to that.

Q92 **Rosie Duffield:** Does that mean that that system relies on individual farmers filling out the thing and then just—

James Robinson: Then storing it somewhere on a bit of paper, pretty much, or on a computer somewhere. It would have been dead easy to do some sort of map on the form where you could have geolocated your location, where you did your soil sample, upload that to something and then the data would have been there to be used nationally. That to me would—

Q93 **Rosie Duffield:** They could have sent someone out and said, "This is how we want you to do it".

James Robinson: It would be a very simple thing to do, a fairly low-cost thing. Farmers could do it there and then. It could have been fed in, you have your phone on you when you are doing your soil sample and it would be easy to do.

Q94 **Rosie Duffield:** Thank you. Does anyone else want to jump in on that one?

Richard Bramley: There is a habit of sometimes creating a target before you realise how you are going to achieve that target, and I have seen it in other areas. That in itself creates a problem because very quickly people are there to jump on you for not achieving your target. It is the wrong way round of doing it. A bit like with the public goods that I raised in answering the last question, where are we today with our soils? We do not have that current baseline to understand where we are on that 60% journey.

Again, targets are great, but they can sometimes set you up to fail. Progress is often progress. One of the things that is a very clear narrative that you feel as a farmer is that somehow the issue is to do with you and you are also the solution, whereas the issue is actually considerably broader and the solutions rely on far more than just farms changing what they do.

The Government work on the land use framework is something that I am personally very interested in, because we only have so much land and we are creating a lot of demands on it—all these targets piled on top of each other. We may not have the space to achieve all these things, but we

have to be smart about how we do it. We certainly need to improve what we do and how we manage our land, all within the wider context.

James Woodward: A couple of quick points. Obviously, that target is already a reduction in the original ambition of sustainable soil management by 2030. On the ambition part of your question, I suppose that has already been dropped.

Then the other side of it is that we were promised a soil health action plan from DEFRA, which also seems to have gone by the wayside. That would have gone a long way towards helping to set out how the Government were going to work with the agrifood sector to achieve that. I think that probably a missing tool in the sustainable soils management target is having that soil action plan.

Q95 **Rosie Duffield:** Pippa, do you want to come in?

Professor Chapman: Yes. The devolved nations have taken very different approaches. Leeds was involved with the soil nutrient and health scheme in Northern Ireland, where they are currently doing a baseline of the nutrient and carbon status of all farms, and also a survey to understand the practices that farmers are currently using. Therefore, over time they can resurvey the soils, resurvey the farmers to see what changes in practice they have made and how the soil nutrient and carbon status has changed over time.

I know that we have talked here and we have heard about the lack of a baseline, but also there is a lack of understanding of what farmers are currently doing and how that might change over time through the ELM scheme. I think that will be very useful.

Q96 **Rosie Duffield:** You are all saying that they have missed out steps. They have not started from the beginning. That is a bit of the message that you—

James Woodward: If I can just quickly add on to that. I think it is very important that DEFRA has not set out its monitoring and evaluation processes for ELM yet either. Obviously, a very important part of understanding the policy is doing what it needs to do.

Richard Bramley: In anticipation of the soil health action plan, last year we worked on one of our pieces of work called the "Foundation of Food", which is focused very much on soil health. It is available online. I printed it off and brought a copy here, but I would certainly encourage the Committee to have a look at it.

Q97 **Rosie Duffield:** Thank you. Carrying on with these questions, have the Government sufficiently defined the meaning of "sustainably managed"? It sounds like they haven't.

James Robinson: To me, "sustainably managed" means we are sustainable, keeping things as they are now. We need to regenerate

things and improve things. Some soils are atrocious. Some soils have organic matter in a very low percentage. In turn, that gives us a lot of room for improvement. At the moment we can store huge amounts of carbon in some quite poor soils, so that will do a huge job in getting us to net zero.

Rosie Duffield: Have they defined that enough? It sounds as though you are interpreting it one way, but does that mean that everyone has their own interpretation of it?

James Robinson: Yes, because it hasn't been put down I suppose.

Q98 **Rosie Duffield:** The whole message is about communication, isn't it?

James Robinson: Yes. "Sustainable", "regenerative region", whatever, they are words that are bandied about with gay abandon at the moment. I think they are almost a bit of a label to greenwash things and we need much more of a definition.

Q99 **Rosie Duffield:** Thank you. It sounds like we have covered the next part of the question, which is: should the Government's soil management targets be more specific or measurable and, if so, does the panel have any suggested goals? We are sort of getting there. Does anyone want to come in on the way it could be improved?

Richard Bramley: I certainly agree with what James has said. There are some soils that are in good condition and we certainly need to be sustaining those, but there are others that need to be regenerated. I totally concur that a lot of people can easily use a word without really thinking about what it means. We know what we are trying to achieve in farming.

As to what can be done, we know that in Northern Ireland soil testing is a government service. I think that that would be a good step. From that you would gather a lot of data. I know we have to be very careful about how that data is used. It belongs to the farmer, but it can be aggregated to create a picture of—well, we have to start from somewhere so you start with a baseline and then, incrementally over time, you can start to see how that alters.

It always needs to be taken in the context of cropping situations. Certain cropping situations are not particularly helped by current ELMS. A lot of horticultural production is slightly disregarded and yet it is critically important when it comes to the food that we are producing. Providing that it is done objectively and context is given, I think that that would be a good step forward. It would really bring people to understand what is going on on their farms. You are probably going to need some sort of advisory service to support that. You are certainly going to need labs and technicians to process this data.

I brought along an example of the sort of thing that—these are quite expensive to produce, but this is producing a soil health index and you

get an index at the bottom. You get a nice coloured bar chart. These are the sorts of things that visually a farmer would be able to buy into because they can see something quite simple, which is either going to encourage them to do more or make them feel proud and pleased about what they have achieved so far, but it will need investment.

Professor Chapman: I will add that this is very useful information that farmers can get—test their soils. They get back the nutrient content, the pH, the organic matter, but then what do they do with that information and what advice is available for them to understand how to move from where they are now to where they want to go? It is important that that advice is available, and where do they go to get that advice?

We are all talking here about changing practices to improve soil health. However, we all need to remember the scientific evidence we currently have that shows which combinations of practices are most effective at improving soil health. We lack that information in certain areas, or where we have strong evidence—and I looked through some of the written evidence that was provided and many encouraged the use of layers within rotation to improve soil health. Again, that may be an option within ELMS that could be highlighted, but that really isn't there at the moment.

There is scientific evidence that already exists, which could be incorporated more, but there is also a lack of evidence and we need to ensure that we gather that at the same time as changing or improving the ELM scheme.

James Robinson: I would like to add on to that that AHDB does a great score of cap soils. It is quite a simple thing and it gets farmers looking at the soil. As I said at the start, grassland farmers have not really done that as really livestock farmers. They are looking at the soil texture, doing worm counts and stuff like that. If that information is stored and is used in a sensible way, collated, that could then give us a picture of where we are now.

Then there is peer-to-peer learning; farmers love to learn from farmers. They are nosey. They like going on farm walks, or we like going on farm walks, and just learning from other farmers really. They will learn from other farmers, who are either doing it or are already on that journey, far better than they will from anyone else. Having some sort of network of farming mentors or monitor farms or something could be a focus for farms within that locality, because every locality is very different.

Q100 **Rosie Duffield:** It really sounds like some of the stuff we are hearing about ELMS, doesn't it? Communication and getting farmers together and that feedback from you there, rather than leaving you on your own with a set of instructions that you just have to—

James Robinson: Then you have the information so where do you go from there? It is the next step thing all the time that seems to be

missing. I think the foundations of the scheme are right enough. They are not perfect, but they are right enough; we just need to know where we are going next. It is almost like we are at the start line. We don't know if we are going in that direction, that way or where we are going.

Q101 **Rosie Duffield:** Thank you. One more bit from me. Should the Government aim for more farmers to eventually join the countryside stewardship plus scheme and, if so, how should it go about encouraging farmers to join?

James Woodward: First of all, we have no idea what the countryside stewardship plus scheme will actually look like. There is talk that it will come into place I think next year or in 2025, but so far there has been some very high level, "This is what it will look like and this is what it will do". Part of the challenge is that farmers don't know what is happening beyond this year with ELM. They don't know what more is coming forward and what that looks like, so I think DEFRA needs to lay that out and then communicate that very quickly to farmers in a clear way.

When that is in place, if we said hypothetically it was in place now, I think DEFRA needs to encourage farmers by being able to offer a real package, so making sure that the SFI and countryside stewardship-plus join together seamlessly and that farmers can apply into it in a seamless way as well. DEFRA was talking about starting an IT system that would allow farmers to apply for everything in one place rather than having to go to lots of different things. That would really help.

We have seen a lot more farmers go into countryside stewardship, net zero, for the past two or three years as improvements have been made to the current version of the scheme. DEFRA could probably keep learning its own lessons around making it more joined up, offering packages, making sure that the schemes pay fairly as well, making sure there are enough actions in there that all link together and can be moulded into different farm types, different farming systems.

Q102 **Rosie Duffield:** Thank you. Does anyone else want to come in on that?

James Robinson: We have been on the stewardship scheme on our farms for 30 years now, so constantly. Never in that time have we had an assessment of how things have gone either. We have had a huge amount of public money coming to our farmers. There has never been any appraisal at the end of what has worked for us and what has worked for public money or DEFRA. That needs to change, because we have had no option for feedback.

Q103 **Rosie Duffield:** So as far as DEFRA is concerned you could have been doing it all wrong?

James Robinson: We have had some inspections, but we have never had an appraisal at the end, where it is us and our adviser or whoever it might be. We have never had a one-to-one, a sit-down or any sort of survey at the end. Obviously, that is not great for public money. At the

end of every five or 10-year scheme there should be an opportunity to give feedback. We have been on these schemes for a long time, but capital payments are always the slow thing for us. We have ended up out of pocket for long periods.

Payments are very slow. Sometimes your claim for RPA can be for capital items that you have evidence for. You have sent the photographs in, for instance. You have given all the evidence that it needed and the job has been done. It can take 12, 16 weeks; it could take six months, nine months, so that money is outlaid in bank accounts, from our banks for a long period of time.

If there is to be any ambition at all with any of these—stewardship-plus or whatever it might be called—they will have to sort out the payments far faster, because we have been out of pocket for tens of thousands over that time. We only manage by having an understanding bank manager and having a bit of dough, a good monthly cashflow. However, for sheep and beef farmers, whose cash flow is much more lumpy, it is quite hard. Probably the main thing for me is cash flow, if they are going to have any sort of ambition with it.

Professor Chapman: Currently for countryside stewardship the applications are processed via Natural England. They can take quite a long time to be processed before you know you are on the scheme. If there was a high uptake within the farming community, do we have the staff and resources to process the applications in a timely manner? Also, we have heard that payments are often very late, so these are issues that need to be considered if you are going to upscale from what we currently have with the countryside stewardship to a much more ambitious scheme and engaging with a larger number of farmers. I think there could be resource implications.

Q104 **Chair:** The current stewardship schemes have a number of elements, some of which work against good soil health. One is over winter stubble on strong land. On my farm we have some land that we have left exposed to frost. On the over winter stubble, which we were incentivised and paid for, we still have the trailer tracks and the combine tracks. In a wet spring it has been an absolute nightmare. Are there some elements of stewardship that have not delivered very much in improving soil?

Professor Chapman: I think that is partly because the countryside stewardship was designed with protecting biodiversity at its heart, so the options are very much geared around biodiversity. Your over stubble would be for bird food and things like that, encouraging farmland birds. More recently it has included options that protect water, so protecting water quality.

I think that currently it does not explicitly state that it will improve soil health. Going forward with the countryside stewardship-plus scheme, it would be very advantageous for farmers to understand which options are more likely to improve soil health, because at the moment if you look at

the options very few of them actually mention soil health at all. It is all about biodiversity, climate change and water quality. Those are just my thoughts.

Chair: That is a very good point and one I hope you will see reflected in our report.

Q105 **Dr Neil Hudson:** Thank you, all of you, for being with us today. This has been really helpful. Your points about communication from DEFRA in articulating the schemes and getting the message across are well made and they chime in a lot with the evidence we have taken in our other inquiry on ELMS, so thank you for that.

Also, your comments about paucity of data. Data is being collected out in peripheral sites and also research institutes are doing that, but there should be some way of collating that to get a baseline. I think that helps us with our recommendations and chimes in certainly with some of the discussions we had when we went to visit the Rothamsted Research Institute as well, so I think that helps us with our inquiry.

Further to that, do you think that the soil actions under the ELM schemes will successfully restore soil health, or should further actions be included? James, you made the point that we want to sustain but we want to improve, that we want to restore but we want to get better. Do you think the soil actions under ELMs get us there or are they still a little bit too woolly?

James Robinson: If you take them in isolation they won't. That is why I thought it would be good if there was some way they were joined up. For instance, the legume option, which is in the grassland standard, on its own would probably do more than the soil standard would. In grassland areas, if you introduce legumes into a monocrop of rye grass, you will fix nitrogen, for one. It is deeper rooted, so it will enhance soil health, it aerates the soil, aids water retention so it is better for droughts, floods and so on. It is great for pollinators and minerals for stock. I think that doing that one thing of putting clover into a sward will do more for soil health than the soil standard would. Link those two together and it would be great.

Dr Neil Hudson: A joined-up approach.

James Robinson: Yes. It is all a bit siloed at the moment, and I think it needs a much more whole-farm approach across all the schemes.

Q106 **Dr Neil Hudson:** Yes, and you make that point really well. Certainly in our part of the world in Cumbria, we could join it up by improving the soil and also helping protect landscapes from flooding. We are doing a lot of these things. If they could be joined up, that again comes to DEFRA communicating and articulating that.

What about the other panellists? Do you think the soil actions are enough, or do they need to be made more specific with more actions

included, such as more support for organic farming or minimising soil compaction or set criteria? What do you think?

Richard Bramley: I think that it is a starting point to bring some of those who are yet to properly embark on it up to a level. It will be a process that will develop over time. As gaps are shown, there will be incentives there. I think that it is also worth pointing out that it must be fairly busy in the DEFRA office at the moment. It must be quite overwhelming with all the things that are going on. I think that we need to appreciate that, but that maybe comes down to funding. We have inherited a fixed funding amount, which stems from where we were under the CAP. We are not in the CAP now and maybe you ask yourself, "Is that funding adequate to deliver on all the multiple asks that we have there?"

In time, the schemes should progress. They should mesh together so that they become more farm-specific. I do not think you can, in Westminster, design a scheme that will find the sweet spot on my farm. I am the one who knows that, and with encouragement and advice from elsewhere, I can hopefully find other things that I could be doing to do it even better.

Q107 **Dr Neil Hudson:** Do you see the potential there? This is an iterative process, isn't it? If we can get more farmers enrolled, the more people who are enrolled can feed back what is working and what is not working and then those schemes can evolve and strengthen. It is chicken and egg, isn't it?

Richard Bramley: I think that there is only one direction of travel in farming, land management, biodiversity and water quality, and that is getting better. That is what we need to do. That is a long-term, multigenerational approach taken long before anybody who currently sits in this House. It needs to be something that is fixed as a core value of governance. To do that, you will need to have some sort of mechanism that almost embeds that in such a way that any farmer can see it very clearly.

I speak as a farmer who joined a scheme called the entry level scheme in 2005 and was frustrated by it because I wanted to do more but I could not. I had to take the step up to a higher-level scheme, which did not make financial sense on my farm. I got to 2015, having done 10 years of taxpayers' investment—a relatively modest amount—but I had been able to reinvest that to do further good. Then the scheme changed—whether it was the basic payment scheme, the single farm payment or whichever one it was—because it needed to have greening. I was suddenly disenfranchised, having spent 10 years doing that with positive results. A lot of farmers have been in that situation. They have said, "Okay, I will go along with this", and then they see the funding cut or the rules change and it becomes harder.

Q108 **Dr Neil Hudson:** Along those lines, should the Government strengthen the criteria for actions that potentially receive payment over time to help farmers along that journey?

Richard Bramley: Yes. That is the way to do it, but in time. We might come to that later in this discussion. It would not necessarily need to be all taxpayers' money. There is private finance out there.

Q109 **Dr Neil Hudson:** Do James and Pippa want to add to that or add to anything on my first couple of questions? I will come to the final part of my question. Are you happy with what has been covered? Okay, fine.

We have touched on this a bit with some of our earlier questions, but following the announcements made earlier this year, some people have described the Government as taking a bit of a "pick and mix" approach to payable actions under ELMS. Do you agree with that assessment? I guess you have answered this earlier, but what alternatives could be used? James, you have made the strong approach about joining up a lot of these schemes and having more logic to it. Do you agree that it is a bit pick and mix? If so, what can we do to change that? How can we as a Committee advise DEFRA to change it for the benefit of the people using the schemes? James Woodward, do you want to start on that one?

James Woodward: Thank you, yes. I agree that the approach thus far with the SFI is very much pick and mix on actions. Farmers could go in and choose to pick actions that they want to fit into their farm. Obviously, that could have some potential benefits, but at the same time it could also have downfalls in trying to get farmers to do more.

Q110 **Dr Neil Hudson:** How else could they do it then?

James Robinson: I think that offering packages could be helpful. They did that with the countryside stewardship mid-tier scheme, and that seemed to get more farmers into that scheme. Providing some direction of choice might be helpful.

I think that there are probably other ways that DEFRA could design the scheme to incentivise farmers to pick more than just a couple of actions and to pick them across various different standards, not just soils but bringing in other actions that would also benefit soil health around IPM, hedgerows or whatever it might be. James mentioned the idea of top-up payments, if that is a possibility, where the amount of money per hectare goes up slightly based on the number of actions that you have taken, for example. Whether these are things that fit into WTO rules is probably something else. I think that can be a hamper to doing payments slightly differently, but I certainly think to find ways to not just say, "Here are standards with actions with these set payment rates—you choose".

Q111 **Dr Neil Hudson:** We need to incentivise more, and we as a Committee have pushed hard about the level of payments. We have been pushing DEFRA to say, "Look, you need to up the level of payments". I am interested in your ideas. If you join some of the schemes together, could you then get a top-up? It is almost like a bonus payment because you are joining the dots for the Government in that sense. Is that something that you could see has a bit of mileage?

James Robinson: I was thinking about funding for that. There is £1,000—£20 per hectare up to 50 hectares—for the management fund that is coming in later this year. That could be moved in a few years' time to funding a more joined-up approach and the bonus figure. If the funding is not there, you will have to top up any other payments, and that could essentially be moved once people are actually in.

Professor Chapman: I do not know how to link to this, but I will just say something about resilience within farming and climate change. Perhaps that has not been woven into these options. Are there options that could be integrated that would highlight the fact that if you did this you would have a more resilient farming business? That is what we have heard from James, that you can bring these options together. Say you are livestock farmer. We know that we will get hotter temperatures, so there are benefits of hedges and agroforestry for shade. I think that highlighting that would be useful.

Q112 **Dr Neil Hudson:** That would help to articulate the public goods to the people funding it as well.

Professor Chapman: It is delivering public goods, but it is also highlighting the benefit for the farming business.

James Robinson: I think that is probably where the peer-to-peer learning would come in as well. Farmers who have already gone down that approach can see the wider benefits of what they are doing, rather than just looking at the figure that they get from Government. They can see that the benefits to their farm are far more than the figure that they get from Government.

Q113 **Dr Neil Hudson:** That will help with uptake, won't it? The more peer-to-peer learning, the more people will join the wagon.

James Robinson: People can just look at the business side of it, the farming side of it, rather than the paper side.

Professor Chapman: I like the idea of this bonus payment. If you take these five or six options, we know that the benefit will be much better than just taking two or three of them. It also links to regenerative agriculture and the five principles there to improve soil health. If you take more options that cover more of those principles, it is more likely the soil health will improve. You could link that together and it will be much more beneficial.

Dr Neil Hudson: Thank you. That is really helpful. I am aware of time so I will hand over to the next person. Thank you.

Q114 **Barry Gardiner:** What was the process by which the Government calculated payment rates across the ELMS?

Professor Chapman: That was going to be my question to you. It would be good if they were transparent about that, with costs and income

forgone. There is a big debate about whether that is the same in the uplands and the lowlands.

Q115 **Barry Gardiner:** One of the recommendations that you would like to see from this inquiry is that DEFRA should publish the basis for the payments that it has made in the annexe to the ELMS update.

Professor Chapman: Absolutely, yes.

James Robinson: In the argument about uplands and lowlands, I think that generally the options are far more costly to deliver in uplands because of the topography. Even something like capital works on fencing, for instance, if you are trying to fence on a flat field or up a mountainside, which one will the contractors do for the same price? We need to look at the cost of implementing not just the capital items but these SFI options as well on more marginal areas.

Richard Bramley: Transparency on how the budget is being used is something that we have been very keen to know. It was promised as BPS was reduced that that payment would come back to farmers. It is a bit foggy, to say the least.0

When it comes to income forgone, I would not suggest that that is an incentive to do anything. This needs to be an income stream, and consequently using an income forgone calculation is not particularly handy. Understanding how a farmer will get the best out of that, I agree with the idea of bundling packages and that being an extra incentive, but I think there is inevitability to go back to your point about pick and mix, with farmers trying to make it fit their businesses. When you design something from afar, you will inevitably end up with a pick and mix. Perhaps somebody does not like the toffee penny so they will pick all the other ones because it does not suit their farm.

Q116 **Barry Gardiner:** If the payment rates are currently not attractive, what do you think will happen with uptake?

Richard Bramley: At the moment, there is nowhere else to go, so we shall see. As an organisation, we have just run a series of roadshows on the sustainable farming incentive. I am told that they have been well attended, so there is definitely interest out there. I suppose only time will tell.

Q117 **Barry Gardiner:** Richard, the NFU has said that if the standards do not become more attractive it is unlikely that many farmers will enter the SFI agreement and that will make future goals more difficult to achieve. Sheffield University has said that so far the uptake is less than 2% of farmers receiving the legacy basic payments scheme—to be replaced by ELMS—signing up for the scheme.

Richard Bramley: Certainly last year there was a real lack of enthusiasm. Payment rates have been adjusted and there are more options now. There is probably more interest. There is certainly more

curiosity about how this could look on farm. Up and until Government get those payment rates right and get the right number of farmers to engage—and they have set some fairly ambitious targets on that front—then as you point out it will be difficult to achieve those targets.

James Robinson: I think that high livestock prices are masking a lot of the problem at the moment. Lamb and cattle prices are high. I think people think that they do not need any schemes because they will get the return from the market. As those prices inevitably come down, because prices generally come down, there will be more interest, I am sure.

Q118 **Barry Gardiner:** You do not want us to recommend that there should be a reduction in lamb price?

James Robinson: No, certainly not. We need to see the overall benefit from farming in the way that ELMS is trying to direct us towards.

Q119 **Chair:** If I may, Barry, one point that has been made to me is that all the consultants drawing up these SFI schemes are currently doing the BPS payments ahead of the deadline on 15 May, so things might change once they have finished doing that work.

Richard Bramley: If I could use my example as a member of the SFI pilot, it is worth me doing it because of the way I have approached it. I am not doing much. I am doing a bit extra, but I am not doing much extra yet because I was keen to establish a baseline. I am under no illusion. It is a cut in where I have been under BPS, a considerable cut.

Q120 **Barry Gardiner:** Matthew Orman of the Sustainable Soils Alliance spoke to the Committee. He said that the payments "do not reflect either the environmental costs of degraded soils or the costs required for implementing the changes needed". Do you agree with that?

Richard Bramley: I am inclined to agree.

Q121 **Barry Gardiner:** Does that not suggest that this Committee in its recommendations should be looking not just to tinker or to be explicit about how we have arrived at the current payments but to specifically look at it in the context of the whole of the UK's natural capital and say, "What is the benefit to the UK from ensuring that we have sustainable soils? Is that public good worth public paying for?" At one point, Pippa counter-proposed sustainable soils and biodiversity. Without sustainable soils, we will not have any biodiversity, will we? This is not an either/or. This is an absolute fundamental, is it not?

Professor Chapman: Absolutely, yes. Soils form very slowly. The rate of soil erosion has been much faster than the rate at which soils form. Many of the costs of soil erosion are felt downstream, such as deterioration of water quality, highways and things like that. We could save that cost if we keep the soil in the fields where most benefit will be had.

James Robinson: I think that if you did the figures properly, it would be massive. The cost per hectare of keeping that healthy soil in the field

rather than it either blowing away or washing away would be phenomenal. There would be less silting up of rivers and less flooding. It would be absolutely phenomenal; the amount of nutrients that we buy in to put on to that soil to replace stuff that is washed away.

Q122 **Barry Gardiner:** Like all preventative medicine, it is a bargain in the long run, isn't it?

James Robinson: It is a fair cheaper way of doing it, absolutely.

Q123 **Barry Gardiner:** How should this Committee be framing its recommendations to go to that fundamental heart of it? James, you have been very silent so far.

James Woodward: I think that we are asking DEFRA to increase the overall budget for environmental land management. It is only £2.4 billion per year for England. When you consider Government expenditure as a whole, it is a tiny amount of money for an extremely important part of our lives, the environment.

Q124 **Barry Gardiner:** Do you know what the uplift in the Environment Agency to be spent on flood defence was, for example?

James Woodward: I do not.

Q125 **Barry Gardiner:** It is probably about eight times that, isn't it?

James Woodward: I would have thought so.

Q126 **Barry Gardiner:** Yet here we have something that could materially impact flood alleviation.

James Woodward: The cost of water companies having to remove sediment from drinking water probably far outweighs the budget for ELM, for example.

Barry Gardiner: The payment rates should better reflect the environmental benefits of these actions. We are all agreed. You would like to see some recommendations from this Committee that address the global issues and the overall value to the public good from the natural capital that we are trying to protect here. Thanks very much.

Q127 **Chair:** Farmers get income from selling food and they get money from the Government to support them, particularly in some of the less favoured areas. We are now looking more at nutrient trading and carbon trading as a source of income for farmers. To what extent do you think that farmers could be incentivised to improve the carbon content of their soils by entering into these trading arrangements and being paid by British Airways or some other business that burns a lot of fuel and produces that carbon? Who wants to jump in first? James, you are very brave.

James Robinson: Yes. I sincerely hope it is not used for greenwashing by people like BA. I think that they should clean up their own act before

they start using farmland to do that. I would like to see farmers, the actual farmer, working the land and making the management decisions, benefiting from it. Small family farms have been the hardest ones to link that money to. We know there are billions in the City in private funding that they have to spend on green funding. There is a huge amount of money there. How you link it down to the actual farmer doing the actual work is difficult. We also need to make sure that tenants, for instance, are secure in their tenure rather than getting thrown off via landlords who are keen to take some of the easy money.

That is my take on it, to ensure that the actual guy at the bottom is the one who is getting the money and is protected.

Q128 **Chair:** With carbon sequestration, the obvious thing to do is plant trees possibly, but that will be in land that is producing food or timber. Pippa, as a soil scientist, do you think it is realistic to measure the changes in soil carbon that have resulted in a farmer taking a different management practice? Then reward that farmer in a way that everybody looks at and thinks, "No, this is not just some sort of Ponzi scheme. This is actually working. It is fixing carbon and it is fixing support for farmers as well."

Professor Chapman: Yes, I think that it is. There are challenges, and it will not happen quickly. Changes in carbon stocks occur over five, 10, 20 years. It is long term and you need to think about the permanency of that carbon as well, even further into the future. You cannot suddenly adopt these practices for five or 10 years and then stop doing them. There would then be the potential that you could release that carbon back into the atmosphere. The permanency of sequestering this carbon needs to be taken into consideration, and, like you say, the way you monitor that increase in the carbon in the soils. There are developments in this area. There are techniques where you can take a soil sample down to the bedrock and analyse it. It is time-consuming and it is expensive, so the smaller the farm, the more expensive it is. It does scale up with size.

I also want to make the point that currently these carbon markets are unregulated. I think that there is perhaps a lack of confidence in them for farmers and they are unsure whether and when to engage with private finances. There is an urgent need to regulate the carbon market.

Q129 **Chair:** That neatly takes me to my next question. The British Standards Institution is developing standards for ecosystem service marketplaces. Would this biodiversity—carbon, phosphates, potash and the rest—give the market some degree of confidence?

Professor Chapman: I think that it would help. If they do come up with a set of regulations that codes must meet, such as a set of principles and minimum standards for the design and operation of these codes or markets, I think that will bring some consistency in them and provide more confidence for both the seller and the buyer.

Q130 **Chair:** I was talking to somebody the other day who had been looking at this whole area. They were concerned that some countries in Africa, for example, may sign up to this and say they will plant all these trees and do whatever, but they were not particularly confident that that would necessarily happen because of the corruption in some countries. We could find ourselves undercut by people not playing by the rules. Is that a real risk?

Professor Chapman: Yes. I think that some of this needs to be looked at globally, not just within this country. I agree.

Richard Bramley: Within the farming community there is a bit of a stalemate going on with these markets. Soil carbon is a difficult thing to measure. You can take samples a yard apart in a field and get two different answers. There is also a concern about the long-term nature of the project. You need to keep that carbon in there once you have it there, and we are working in the outdoors and things do not always go to plan. I speak from first-hand experience. There is a concern that some time in the future you might find that a test comes forward that shows that that carbon is depleted and you suddenly have a problem.

On land that is tied up in environmental schemes, we have a consultation going on at the moment around how that will be viewed from a taxation point of view. There are still a few dots to join on that front.

Q131 **Chair:** Are you talking about from an inheritance tax point of view?

Richard Bramley: Yes. I think that there is definitely a need to get more money into the system. The £2.4 billion is breadcrumbs really for all the asks that are being placed on our farming communities and the landscape. That is not just money for farmers. It will be money for people to help undertake measurements and give advice and support to deliver on all these asks. Somehow there needs to be a way of getting that money in. I do not think that offsetting is a particularly good way of going about it. Produce from our land comes with all the extra value of having been produced here on a farm that pays attention to how it looks after its soil and the biodiversity that exists alongside that production system. The value of the actual product is one way you could get money back on to farms rather than through something slightly more surreptitious such as a carbon scheme.

Q132 **Chair:** I have to deal with those lovely people at British Airways, but rather than offsetting, the Government should be the broker and they should be an inset rather than offset, I suppose you might say.

Richard Bramley: There is an opportunity. We will probably see it through some supply chains—we are already with the scope 3 emissions, where the impact of the product that we produce on their carbon footprint is something that they are paying attention to for legislative reasons, stemming from Government. It will start to filter into farming one way or another. Sorry, remind me what you said there.

Q133 **Chair:** I said rather than a deal directly between British Airways and me as a farmer or a broker on my behalf, actually the Government should.

Richard Bramley: Yes. This is where the Government can act as a facilitator, a primer to these schemes to set it going. One of the frustrations that farmers feel already is that there is no differentiation in the marketplace between a lot of products, and on a global scale as well. I compete pricewise with most of my products based on global prices. I know that a tonne of wheat produced in a field of mine—which has its hedges cut every three years, which has margins, wildflowers, water body buffering and a soil health programme with cover crops, organic manures, an integrated pest management approach and diverse cropping—has no resemblance to wheat on the world market, but that is how my marketing runs.

I am also acutely aware that if we are not careful how we handle the production side of the equation here in the UK without changes in how people behave when it comes to consumption, we will just increase potential degradation elsewhere in the world. We have to be extremely mindful how we handle it. Like everything in agriculture, it is linked to a lot of other things and very complex.

Q134 **Chair:** Yes. Indirect land use change, I think they call it. I suppose in a way what you said is justification for the Government giving money to farmers to do things in a greener way than farmers would do in Brazil or Argentina.

Richard Bramley: I do not think that degrading our production here in the UK only to import an awful lot and increase degradation elsewhere make sense. It is one globe; biodiversity and carbon are a global thing. We can have everything pristine here but be exporting our footprint elsewhere. As a country, we have probably not the greatest history when it comes to exploitation of some of the poorer areas of the world. We need to be extremely reflective in how we manage our own credentials. We have to be smart about how we do it.

Q135 **Dr Neil Hudson:** This is following up, James, the point you made about tenant farmers and the potential unintended consequence of some of these schemes that big landowners are not renewing tenancies, so people in small holdings are not having their tenancies renewed. Rural communities are struggling if we are losing people off the land. That is something that I and our Committee are getting increasingly exercised about, that unintended consequence. We have asked questions of Government about this and we have asked expert witnesses as well. Can I ask the panel, with your networks that you are in—I am picking this up when I meet regularly with my local farmers—how widespread is this phenomenon of tenancies not being renewed because of the changes in the schemes? If it is widespread, what can we do to get DEFRA to address this? What do you see as the problem?

James Robinson: Obviously in Cumbria it is known. There are large estate owners doing it now and have been doing it for the last couple of years, with a view to the ELMS coming on. They saw it coming so they have not been renewing tenancies or they have been patiently buying them out at the end of the agreement.

I had a meeting—I am sure I can name names—where Mark Spencer was there maybe two months ago, and he said, "We need to make sure the payments are just enough", that is just enough to incentivise us as a tenant or land manager to access the scheme or to want to access the scheme but not enough for the landlord to want to push us off. I thought that was a poor way of looking at it because you want to incentivise us a bit more than "just enough", but I got what he meant. It is a very tricky thing trying to ensure that it is not just too rosy.

Q136 **Dr Neil Hudson:** How widespread is this phenomenon? Are you picking it up in your networks?

Richard Bramley: Yes, I am picking this up as well. This is happening. There is also a certain kudos attached with rewilding, which is certainly something that is rising up the agenda. It is not to say that it will not be appropriate in some places, but I am sure it was clearly stated within the Rock review that we have to be very mindful of the people who have been managing that land to date. These are people, they are communities, there is social cohesion, there of a lot of these. There is a history. It is something that you need to be extremely fair with.

Dr Neil Hudson: The Committee feel very strongly about this and we will be looking at this in greater depth, but I thought, as you had brought it up, I would try to get something more on the record today moving forward.

Q137 **Chair:** Have any of the panel picked up landlords threatening tenants with dilapidations? When you leave the farm you are meant to leave it in the same state you got it, so mending gates, painting things, saying, "If you leave now we will let you off the dilapidations?" Has anyone picked up on that?

James Robinson: Yes, not too far from us. The landlords are now rebuilding a lot of boundary walls and stuff. It is very much happening.

Q138 **Chair:** Turning to where farmers can get advice. Certainly in my case the lovely Linda fills in my BPS claims, and she is good at doing some of the stewardship, but she is not a soil scientist, she is not an environmental scientist. Is the advice out there for farmers going into these schemes to look at their soil types, look at their farming practice? In the old days with ADAS, there were more ADAS people than you could shake a stick at. Now ADAS is very much a limited resource.

Richard Bramley: I have probably said already that this will need people, I have no doubt about it, people who are there to support

farmers. It is getting very busy in the world of farming. If I think back 30 years ago when I first started on my career, for want of a better word—I do not think you have a career in farming; it just sort of happens.

Chair: You are born into it.

Richard Bramley: The next thing you do, you wake up and it is 30 years later. It was about growing stuff and selling stuff whereas now there are a whole host of—everybody is interested in what we do. We have fewer people working the land and yet we have a lot more that we have to deal with, and there will be more coming. I do not doubt that having the advice to get the best for the farmer, the best for the farm, the best for the landscape, very much tied in with the outcomes of the land use framework, will hopefully bring a bit of realism into the discussion because I feel that, to a degree, we are lacking that. There is everybody expecting everything. That is a bit unhelpful.

But when a farmer comes in from milking from 4 o'clock and sits down to have their breakfast, and then has to wade through all sorts of paperwork to make sure that their carbon is right, you will need quite a few Lindas.

Q139 **Chair:** That is why they all voted to leave the European Union because they wanted less paperwork, wasn't it? Pippa, there is obviously a lot of scientific work, and we have been to Rothamsted. Is that scientific information getting through to Government or to farmers or other people?

Professor Chapman: It is a good question and, like we have heard from the others, knowledge exchange is important to see changes in what farmers are doing. As academics at the University of Leeds we work with a number of different farmer groups. They could be funded through the Countryside Stewardship Facilitation Fund, AHDB, the Rivers Trust, water companies; they are all supporting these farmer groups to learn things.

It is not just about advice but it is about a lack of training or the training for agronomists or for the next generation of farmers. We need to be making sure that the next generation are hearing all these different ways of farming more sustainably, more regeneratively, what that means, how can we reduce synthetic inputs, how can we change our pesticide use and the alternative ways that we can do that. I think it is important that we look at the training of our advisers, agronomists and our next generation.

James Woodward: Obviously, there is some advice there at the moment, but I think it is very difficult for farmers to access a lot of that advice. There is a massive challenge with advisers, which is that to work with a farmer with lots of these natural processes takes a long time. Building relationships with farmers and farming communities takes time, and then working with farmers to adapt practices—everything takes time.

There is a challenge, from what I am hearing, around retaining advisers for some time. There is an issue around the farm and environmental

advice sector not being one that pays very well, so people come into the roles and then leave quite soon after, within two years. That is a big challenge in getting advice to work well, getting advice to be the long-term thing that we need. We should bear it in mind that access to advice and the training of advisers is important, but also trying to retain advisers for long-term as a career is vital to get these things happening around soil health.

Q140 **Chair:** I did a year's soil science at university and did a crop production degree, but I cannot get my head around what we are meant to be doing at the moment. It is not something we were taught. Soil was an inert thing you added fertiliser to when I was at university.

James Robinson: I can probably agree with that from my time. Starting in college, you start in education when you are young, so these are the farmers, these agronomists that are coming on in the next five, 10 years; these are the ones we will have to educate. Delivering advice, peer-to-peer learning is a thing, getting groups that are already out there doing stuff. NFFN, for instance, NFU, groups that already have farmer members are easier to access.

But on delivery style, there is the farming in protected landscapes, which has done fantastic work in the Lakes and in other protected areas. That worked because it was on a local level. You had someone you could phone, you could speak to, you could get out to your farm, and you could see them—so having that local person that you can speak to. That money was ringfenced as well. That was the perfect thing. That is why the farming in protected landscapes funding has worked well. If that model could be rolled out nationally I think they would get far better input.

Richard Bramley: Another big shoutout for peer-to-peer learning. We had the campaign for the farmed environment that I worked with for quite a lot of years from 2009 to 2015. The engagement level with farmers for a very small budget was good. Prior to that the voluntary initiative. Currently I lead an innovation group that looks at water quality and improving soil health. One of the things that they produced is—I might have shown you this in September—a dashboard of how a cover crop can capture nitrogen phosphate, potassium, total value to the farm there, and carbon as well.

It is a snapshot. It is like any sort of testing, it only gives you a feel for it, but you get a group of farmers stood in a field talking about something like a cover crop, you get an entomologist there with a sweep net in November capturing all these insects, you have birds popping up all over the place. It can offer real encouragement. If we can start to get incentive there as well, I think that you will find that farmers will happily seek out that advice.

Professor Chapman: Can I just talk about this? You asked the question about scientists and farmers working together, and that is important. The sector is changing very rapidly and farmers are trying different things. A

lot of the evidence is anecdotal so it is important to provide some independent evidence to scientists, but working together is critical. There is the innovative farmers scheme where farming groups come together again and work with scientists to ensure that the evidence has been collected and can be exchanged with the farmer groups. I think it is quite a good scheme as well.

James Woodward: It will be important to try to get as much of that advice to be independent. By that I mean having advisers less connected to fertiliser, pesticide manufacturers. I think things have probably moved on and changed slightly, but there is still a concern that advice that is not independent could come with some of these issues around sales targets and things like that. I think that is an important part of trying to make advice as independent as possible.

Chair: I think most farmers have now worked out that getting free advice from your chemical supplier is not necessarily free advice.

Q141 **Barry Gardiner:** When was the last comprehensive national soil survey?

Professor Chapman: In 2007. It was a countryside survey that was carried out by UKCEH for DEFRA; so a very long time ago.

Q142 **Barry Gardiner:** A very long time ago. What is the benefit to farmers of having that national survey that enables them to benchmark their land against others?

Professor Chapman: Like you said, by having a national survey you can see how soil health and some of the soil properties vary over the landscape, different areas and where you are positioned, and you can compare your soils that are under similar land use with others in that area. That is important to provide a target about what is achievable in improving soil health. The different targets will be different in different regions and for different land uses.

Barry Gardiner: Perhaps one of the recommendations that this Committee should be making might be about reinstating a comprehensive national soil survey, if it is that important.

Professor Chapman: Absolutely. There has been some recent funding, but at a much lower scale to resurvey some of the soils in some of the areas. But it is important to have these national databases that we can compare things to.

James Robinson: There is the option for the citizen science from the SFI, which could easily be fed into that. Tens of thousands of soil samples will have been taken over the last year and they are just sitting on farmers' desks individually.

Q143 **Barry Gardiner:** One of the issues though is about standardisation, isn't it? I know at Leeds you have made certain recommendations about standardisation of the way in which samples are taken. Can you again

elaborate for the Committee why that is so important and what sort of recommendations we should be making in our inquiry about that?

Professor Chapman: That is a good point. To compare surveys that have occurred over time, it is important to use the same methods in collecting the soil but also in analysing the soil so you have confidence that the change you are seeing is due to changes in climate or practices and not due to differences in collection method of the soil or the different types of analysis. That is important.

Maybe James and Richard could say something because there are different labs you can send your soils to. You can collect your soils at different times of the year. You would not want to obviously be influenced by adding your fertiliser and then collecting a sample. There are things that need to be considered to ensure that you are recording a change, and that is why it is important. The advice again to farmers about how they collect soil samples, to what depth they collect soil samples, are all important factors that need to be considered.

Q144 **Barry Gardiner:** Couch that in terms of recommendations that this Committee ought to be making to the Government.

Professor Chapman: There are two things. You could relook at the national database we had that was created in 2007. Can we go back to some of those sites, use the same methods and collect those properties? But we might want to add different things to that as well that perhaps were not so important back then. Soil biodiversity is an area that we have less information on and definitely carbon stocks were not being calculated so much.

I also think that there is this opportunity with the requirement for farmers to carry out soil sampling to give farmers consistent advice about to what depth they sample the soil, when they sample it, and where they sample it. Then I think you can have some advice to the labs that are analysing this soil on the farmers' behaviour. There are different areas where you can provide advice or recommendations to the Government.

Q145 **Barry Gardiner:** The costs of taking soil samples vary quite substantially. If it is just soil carbon it might be £5, other tests might go up to about £40 a test. It is unlikely the cost of those will be covered by the ELMS payments. Have you had an opportunity to look at the national testing programme in Northern Ireland and the soil nutrition health scheme in Scotland?

Professor Chapman: I am involved with the one in Northern Ireland. The Government there is paying for that sampling of soil analysis.

Q146 **Barry Gardiner:** How important has that been to getting the standardisation and the comprehensiveness of coverage that we said was so important?

Professor Chapman: There is a standard. They have employed a consultancy to sample the soil and analyse it. There is consistency there, so you can have confidence that you are comparing like for like. I think the scheme is something like £40 million.

Barry Gardiner: Peanuts, isn't it, when you think of the benefit of that?

Chair: Northern Ireland is quite a small place though, if you're scaling—

Professor Chapman: When you look at the scale, yes.

Q147 **Barry Gardiner:** Scale it up to England, Chair. I would be very happy if it was 10 times that. I think it would be certainly worth it. Once appropriate indicators have been established, should measuring all elements of soil health be a requirement of all ELM schemes?

Professor Chapman: This is the challenge. Obviously it would be great if you could measure soil health with one indicator, but unfortunately we cannot. Soils have biological, chemical and physical properties. Together they have an influence on the soil health.

Chair: The wet autumn can make a big difference as well.

Professor Chapman: Yes. I know that there is much debate among soil scientists and farmers and everything about what properties or what indicators should be included to determine soil health—perhaps we can hear from others here—I think to make it easy to determine. There are some things like soil structure. SRUC has come up with a VESS score—a visual evaluation of soil structure—which I think is great and it will be interesting to hear what Richard and James have to say about that. Counting worms has been made popular, but we must be mindful that climate has an impact on worms. They are not so keen to come out when it is dry.

Infiltration rate can be measured by farmers and you can get an idea. There are other things that are not so easy to measure on a farm and need to be sent to a lab. I think it is determining what those are: whether it be soil carbon; we have talked about soil organic matter. There is aggregate stability again, quite a good one to measure. There are lots of different things, but it is to determine which ones—the AHDB scorecard has made a start on this.

Q148 **Barry Gardiner:** Professor Emmett said to the Committee that soil testing laboratories could open up their datasets. The National Institute for Agricultural Botany has told the Committee that it is already attempting to pull together such data from laboratories. Do you think DEFRA should be supporting that initiative?

Professor Chapman: I think those labs already collate the data and give a summary of the range of data that have been analysed. Again, I do not know if it is bias towards more arable farms and livestock farms. We know that arable farms tend to analyse their soils more regularly than

livestock farmers. All this data out there could be combined and collated to give an overview. I think that would be a good recommendation.

Q149 **Barry Gardiner:** We have had quite a few recommendations; this is good. We are getting progress. The Sustainable Food Trust argued that subsidies from Government should only be given to those farms that can demonstrate they are providing a public good. RSPB has warned that without outcome-based payments ELM schemes could end up paying farmers for minor interventions with "relatively little benefit to nature". But paying for outcomes has its problems as well, so could you elaborate those and maybe explain to us again what the Government might do to square that circle? We all want the eventual outcomes to be positive, but there is difficulty not only in the time taken with outcomes but in establishing those. That makes it difficult to quantify the payment regime.

Professor Chapman: Payment for outcome has been investigated. There have been quite a few trials. I know that the Yorkshire Dales National Park was involved with biodiversity. Again it is an idea; it required training of farmers, a network, and it does not necessarily take into consideration the impact of climate that might have on, for instance, a bird species; or a pest might come along that we did not know about and things like this. Those things need to be taken into consideration if you are going to pay by outcomes, a climatic variation and pests that come along, but it would be interesting to hear from others.

James Robinson: Farms have boundaries, but birds tend to fly outside.

Professor Chapman: Fair enough.

James Robinson: But if you are going to pay for the benefit of good soil management, even that is hard to measure. You cannot measure the runoff that might end up in an estuary 50 miles downstream, but you are benefiting that. How do you pay that back to the actual farmer? The wider benefits from one individual action are huge and almost immeasurable and very difficult to quantify, but getting this baseline data on anything is a start and baseline data on where we are now with our soils has to be collected.

The trouble is that farmers are making changes now to improve the carbon in our soils, the organic matter in our soils and the nutritional makeup of it. We are making changes now, but we need to be measuring it now otherwise if it is going to be payment on results they might already be too far down the line.

Richard Bramley: The word I wrote down when you were talking about soil sampling and the standards there was "practicalities". Exactly the same applies to an outcome-based approach. You can do everything that is advised. With the best will in the world, we are working outdoors in an environment that we cannot control and anything can come along and undo that.

When it comes to soil sampling, we traditionally have always sampled over winter when it is a quieter time on an arable farm. But being part of the SFI pilot and having to do worm counts has meant we are having to shift that to May because, measuring that biological activity, it is the better time to be looking.

Q150 **Barry Gardiner:** How do you assure the British public that May is no longer the winter? Some of us have doubted it.

Richard Bramley: If in the standards it is accepted that the best month to do a soil sample is May, the labs will get a pile of soil to deal with in June. I do not envy the soil scientist approach, but I think that soil scientists should be something that—we are seeing more and more people come forward through education excited by it because there is no doubt that there is a lot to learn when it comes to soil. It is almost infinitely diverse and there are so many nuances. Every year is different as well

Barry Gardiner: You mean not just the inert substance that Robert used to throw fertiliser on to?

Q151 **Chair:** I would argue, in May we have just put on our phosphates and potash for spring crops. We always test now straight after harvest because we take the view that that would be the lowest level because the crop has been removed and then we start adding things again. We have lots of soil tests and we show them for the Red Tractor and everything, but we have never uploaded them anywhere. I certainly would be happy to do what three words. I probably could not give the grid reference, but what three words would enable you to identify where I took the sample. There are thousands of tests all over the country that could be easily uploaded to some scheme, particularly if we have a little bit of an incentive to do it.

Barry Gardiner: Can I push that, Chair? Would it make sense to have an open access database here?

Richard Bramley: It depends how it is used.

Barry Gardiner: Open access could be used in pretty much any way anyone cared to, but what would be the downside of having all of that information publicly available?

Richard Bramley: I suppose it would depend how some used it. If it showed a decline, for example, off the back of an extremely difficult farming season, it probably would not be particularly helpful.

Q152 **Barry Gardiner:** In what way? Surely that is helpful because you know what is going on.

Richard Bramley: From an objective point of view, yes. It is a good way of understanding but it is how some others might interpret it.

Barry Gardiner: You mean they might say so-and-so is a bad farmer?

Richard Bramley: You come to have a certain amount of thick skin working in farming, but we do tend to receive a lot of blame for a lot of things. That is not to try to absolve any responsibility. We have a responsibility there, but we are part of a bigger picture.

Barry Gardiner: There are those externalities that you just simply cannot control.

Richard Bramley: You can try your hardest and still come unstuck.

James Robinson: Data can be countywide or whatever it might be or regional, it does not have to be specifically farming. I could not go and see what the neighbours have been testing their fields at. That will be far too much information. If you are going to have the information it needs to be grouped in a much wider thing so people cannot look at individual farmers.

You say there is not much information on grassland. Grassland farmers—me being one—never really test our soils or we used to only test our soils if we were going to reseed. That was mainly for pH, just so we know whether to chuck lime on or not. That was pretty much it. If you are reseeding 5% of your farm a year probably, no more, that is 20 years before you get another soil sample again. There is very little information on grassland, and that needs to change. Things might be fantastic. We might have loads of organic matter stored in our soils, but we just need to know.

Professor Chapman: I think the results so far from the Northern Ireland scheme showed that 25% of farmers had never had their soil sampled. It can highlight some big things like that.

Barry Gardiner: Long grass in Northern Ireland.

James Woodward: As James was saying, there are probably ways you can set out that data so it is not very specific to a specific field or a specific farm to get around some of those issues, but also I think soil should be seen as a public asset as well as a farm asset. Where the public is paying for soil tests and soil management plans that come with testing payments, I think it is important that the public should understand that.

As you said, seeing the impact a bad year of weather or whatnot has on soil is very useful for farmers to understand the flow and change as well. Trying to find a way to make it publicly available in a way that does not specifically—there would be GDPR rules around this anyway, but making sure it is not specific to a specific farm. I am sure there are different ways to do that.

Q153 **Barry Gardiner:** Is there a consensus on the panel to have open access data but to have that data aggregated in some way so that it is not directly attributable to farmer X on this particular patch of land? In

principle, that would be a good recommendation for the Committee to put forward?

Richard Bramley: Yes, I think so.

Chair: I have dozens of tests on mine. We test every field every year virtually, and I would be happy to upload them and have a look at that.

Q154 **Dr Neil Hudson:** Much of the evidence that we have received suggests that the current soil regulations are not comprehensive enough or effectively reinforced. To what extent do you agree or disagree with that analysis? I see some nods.

James Woodward: There is definitely an argument to be made to Government having a better plan around regulation on where the SFI or the ELM is coming in. The regulation can follow a couple of years behind to a better baseline so that farmers are already supported to be doing more around soil health and therefore soil regulations could come up to a fair baseline.

Where regulations are in place, clearly enforcement has been an issue. We know that with, for example, the farming rules for water there have been some breaches of regulations but no enforcement of the regulations. I think there needs to be a more balanced approach between government agencies working with farmers to remedy an issue but then also coming back and saying, "Has that issue been remedied?" and looking at different ways to try to get that issue sorted.

There is also a big challenge around probably a lack of funding going into enforcement. We have seen budgets being cut from the Environment Agency, Natural England, RPA and so on. That is also a challenge probably.

Q155 **Dr Neil Hudson:** A recurrent theme seems to be discussion about this baseline, and now we are talking about a regulatory baseline. Some witnesses have previously suggested to us that a more stringent regulatory baseline should be established once more farmers and land managers are brought on board into the ELM scheme. What might this regulatory baseline look like?

Richard Bramley: It will revolve around protecting soil, as current regulations are, and protecting water quality that stems from that. It is all around building a better environment that we are working in. With the interpretation of farming rules for water there was a bit of confusion and there were some practical solutions, because again we are working in the outdoors and sometimes things do not go to plan. People often say you cannot farm by date, you have to go by what you are looking at, as long as there are practical considerations.

I often say to farmers that nutrients are valuable for you. The last thing you want to do is to see them leaving the field. Anything you can do to

encourage that nutrition to stay where you want it for your crop is good for your bank balance, good for your crops and good for the wider issue. I think the phrase that is often used is a bit of carrot and a bit of stick.

If there are any bad actors in the equation I do not think that is anything that anybody could support if there are deliberate acts to undermine.

Q156 **Dr Neil Hudson:** Along those lines, some have gone further suggesting that the soil regulations and the framework should focus on maintaining soil health and that then the ELM scheme should only be given for improving or restoring soil health. Is that a possible balance or would that not be a good way forward?

Richard Bramley: I think it will be different for different circumstances. We have large tracts of land that need to be improved and we will have to incentivise that improvement. We have talked a lot today already about how we can get that long-term thinking into our production and cycles. Farms can often be put under a lot of financial pressure working on narrow margins, taking on board all the risk. Contracts to supply, for example, particularly for root crops, can make that particularly difficult to manage because you cannot control what is going to happen.

We had 27 millimetres of rain on Friday—it was actually hail—in 10 minutes. I have never seen anything like that. We will get more of that sort of—you can regulate all you want, but if mother nature comes along and does something like that to you, you can unwittingly be on the wrong side of that.

Q157 **Dr Neil Hudson:** All this regulation and baselines and frameworks—it still comes back to the elephant in the room that we perhaps do not know what our baseline is. If farmers are improving we need to know where they are. Are they at point A or point B? At the moment we do not know enough about what is the national soil health that we are trying to maintain and then improve.

James Robinson: I think the wider communication for DEFRA should be on soil as an asset for that farm, often for any farmer, and the benefits to their business long term from managing that in a far better way than we are now. You might be the best soil manager in the world, but there is always something that you can do and something that you can improve. There is room for movement from everybody and if we can just get that communication over then that will—

Q158 **Dr Neil Hudson:** If we were going to bring in a new regulatory framework or baseline and we had better communication and the dataset were improved, what would be a reasonable timeframe for that to come in? You have talked about that farmers plan; they want to know things for 10, 15 years and political cycles unfortunately are a lot shorter than that. What would be a reasonable timeframe for us to have some of these frameworks so that farmers and land managers can be acknowledged and rewarded?

James Robinson: You can have the initial measuring over, say, two years. The initial measuring should be more than one season. People should get a chance to do it over two full cycles, two full seasons, and then you can perhaps tag it at five, 10, 15 years. If you wanted to go more generationally, 20, 25 years, but we need that ambition and we need that set out so we know where we are going as an industry.

James Woodward: It is important for environmental management to have been in place for some time, to have got farmers into it, so that farmers are doing more actions around soil health before a regulatory baseline comes in. Whether that is two, three or four years following the full rollout of ELM is probably something for others to say rather than me.

It comes back to what we were saying at the beginning of this—that there does not seem to be much of a strategy or a vision or a plan behind the post-Brexit agricultural policy changes, and this is one of the issues. There has probably not been much thinking going on in DEFRA around how to align these things in a way that fits into this idea of if people use this term "just transition", making it fair for farmers as well as for the environment, the public and so on.

Dr Neil Hudson: Thank you, that is helpful.

Q159 **Chair:** I had an idea when you were talking about the soil testing database. For those of us who test regularly for phosphate, potash, magnesium, sulphur and pH, maybe if the Government would pick up the additional cost of testing for carbon on the condition that that data were uploaded it would be a good deal for everyone. They would not be paying the full cost, as in Northern Ireland, but they would be paying for the additional increment. How much more is it to do carbon?

James Robinson: I think it is about £8.

Chair: Another £8? That might work. Do you think that would be a good idea or not?

Richard Bramley: It is a start.

Chair: A lot of my bright ideas do not necessarily get a good reception.

Barry Gardiner: I think the panel had already agreed the Government should pay for the lot.

Chair: For everything. But lots of arable farms are testing already.

Professor Chapman: Start by asking for most and then you can always fall back on that one.

Q160 **Chair:** It is already a Red Tractor obligation so it is something we have to do to jump through that particular hoop.

A final question. We have already talked about indirect land use change and how rewilding and solar farms, biofuels, and so on, are taking land out of production. Would that mean that, if we are meant to maintain UK food production, we would have to have more intensive farming on the land that is left, and could that work in the opposite direction to improving soil health?

James Woodward: That could be an issue. That could be a problem. I think there are various things going on that could cause that to happen. Things around trade deals is another issue, but it is important to find a way to balance land use change. Doing it in a transitionary way is important and, as Richard was saying earlier, just making sure that we do not start offshoring our environmental impact. It is also important to understand that doing rewilding and intensive farming in one place does not mean that all of the pollution from very intensive farming stays within the boundaries of that farm. Of course it carries through the water, the air, those sorts of things.

Richard Bramley: If intensification means degradation, I think that will lead you into more of a problem. The aim would be, yes, you might have to have more of a focus on food production in some areas, but if it was degrading at the same time you would find yourself in a worse place in time.

Q161 **Chair:** Pippa, does intensification mean degradation or can you do both?

Professor Chapman: That is a good question. Putting it into some of the evidence that we have and the ideas we have, we can intensify and maintain soil health. I think that is possible.

James Robinson: The NFFN UK chair, Martin Lines from Cambridgeshire, has shown that you can have high levels of output and nature friendly farm in looking after soils, looking after the nature not necessarily around the fields but within the fields. Patrick Barker from North Suffolk is the same. There are examples of having high output and high nature friendly farming as well. It does not have to be either/or, we can have them together.

Q162 **Chair:** Henry Dibley in his report to the Government made the point that 20% of land in the country produces only about 1% of the food. We are talking about the Lake District, North Yorkshire Moors, Cumbria and so on. Could that be one way forward? Are we just going to plant loads of trees on moorland and change the land? It is already happening in Dumfries and Galloway in Scotland. Is that one way we could fix carbon? We could deliver on that without cutting food production much at all, just a few sheep maybe.

Professor Chapman: I think we have to be careful with planting trees everywhere. It is the right tree in the right place. We have already seen that in the past with conifer plantations in the Flow Country, on peat, and now we are taking them down and restoring the peatlands. There are

examples in some of the upland areas, in the Yorkshire Dales, where schemes 40 years ago paid to plant trees but the trees are very stunted, not growing well in poorly drained soil, wet soil. We just have to be careful.

Chair: They sometimes blow over if you plant them on wet soil.

James Robinson: I think better management of what we have now; better management of hedgerows for starters. We do not need to plant trees in a lot of places because we have some poorly managed hedgerows; we just need some better managed hedgerows. That comes in with the SFI and the CS schemes and stuff, so we can get payment for doing that. That then benefits things like soil runoff anyway, so we are capturing carbon and preventing nutrient runoff.

Better management of the grassland that we have as well. There are lots of things we can do with what we have now. We do not need to plant a huge number of trees. Right trees, right place, and improve everything that we have already.

Q163 **Chair:** Is there any final point anyone would like to raise?

Richard Bramley: More trees in the landscape is a good thing. Certainly it is part of our net zero ambition. It was part of our tree strategy: right tree, right place obviously has been mentioned again. While some of these areas like the uplands do not necessarily produce a huge amount of food, they do deliver a tremendous amount of public good. At the moment they feel left behind in the whole public good agenda, which does not seem as tied to ELMS as I had expected that it would be. There is a lack of establishment of existing public goods and recognition for those. A lot of farmers have been doing a lot of good work for a lot of years. Then incentivise further improvements. Even a list of the public goods and some values attached to them would have been good from the outset. We are working with what we are working with.

We must not forget communities and the pressure that is on communities who live in these areas. The reason why places like the Lake District and the Yorkshire Dales are popular tourist destinations is because they are—

Chair: Do not forget the Yorkshire Moors in my constituency.

Richard Bramley: And the Yorkshire Moors—is because they are what they are. They are managed landscapes. This is all part of the conversation and what we have talked about today highlights, just from talking about soil and where we have led in this conversation, shows you how integrated our agriculture and our landscapes are. As a body, the NFU is keen to continue the engagement and to help shape this.

Chair: Any further points?

James Woodward: I do not think there is more I could add specifically on that.

Chair: Thank you very much. It is has been a very useful session. We have learnt a lot.