OFFICIAL REPORT
AITHISG OIFIGEIL

Rural Affairs and Islands Committee

Wednesday 19 April 2023

Session 6

The Scottish Parliament
Pàrlamaid na h-Alba

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RURAL AFFAIRS AND ISLANDS COMMITTEE

11th Meeting 2023, Session 6

CONVENER

Finlay Carson (Galloway and West Dumfries) (Con)

DEPUTY CONVENER

*Beatrice Wishart (Shetland Islands) (LD)

COMMITTEE MEMBERS

*Karen Adam (Banffshire and Buchan Coast) (SNP)
*Alasdair Allan (Na h-Eileanan an Iar) (SNP)
*Ariane Burgess (Highlands and Islands) (Green)
*Jim Fairlie (Perthshire South and Kinross-shire) (SNP)
Christine Grahame (Midlothian South, Tweeddale and Lauderdale) (SNP)
*Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con)
Mercedes Villalba (North East Scotland) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Tim Benton (Chatham House)
Ian Boyd-Livingston (Stockfree Farming)
David Harley (Scottish Environment Protection Agency)
Professor Pete Smith (University of Aberdeen)
Morgan Vaughan (RSPB Scotland)

CLERK TO THE COMMITTEE

Emma Johnston

LOCATION

The Mary Fairfax Somerville Room (CR2)

Scottish Parliament

Rural Affairs and Islands Committee

Wednesday 19 April 2023

[The Deputy Convener opened the meeting at 11:00]

Future Agriculture Policy

The Deputy Convener (Beatrice Wishart): Good morning, everyone, and welcome to the 11th meeting of the Rural Affairs and Islands Committee in 2023. Before we begin, I remind members who are using electronic devices to switch them to silent.

We have received apologies from Finlay Carson and Mercedes Villalba.

Members will note that Jenni Minto has left the committee and has been appointed as Minister for Public Health and Women's Health. I thank her for her contributions to the committee over the past two years and wish her all the best in her new role.

Christine Grahame will join the committee, but, due to a previous constituency engagement, she is not able to be here this morning and has given her apologies for the meeting, too.

Item 1 on the agenda and our main item of business is pre-legislative scrutiny of Scotland's future agricultural policy, focusing on ecological resilience.

We are joined in person by Ian Boyd-Livingston, deputy director, soils and sustainability for Stockfree Farming. Joining us remotely are Professor Tim Benton, director of the environment and society programme at Chatham House; David Harley, chief officer for circular economy at the Scottish Environment Protection Agency; Professor Pete Smith, chair in plant and soil science at the University of Aberdeen; and Morgan Vaughan, farm manager at RSPB Scotland.

I welcome all our witnesses. Those who are joining us remotely should type R in the chat box if they would like to request to speak at any point.

We have 90 minutes for questions and discussion. I ask each panellist to give a short assessment of the current resilience of Scotland's environment and farming systems, drawing on their subject expertise.

Professor Tim Benton (Chatham House): Thank you very much. It is a broad question and we will tackle it in different ways.

As 2022 showed us with the invasion of Ukraine, coupled with recovery from Covid and various climate impacts, the global food system is somewhat irresilient in the sense that it is a tight global market and, if events happen overseas, they drive up input prices and market prices. They drive all sorts of different changes. On top of that, we have the precarious finances of, in particular, upland farms in Scotland with the less favoured areas and post-Brexit changes.

Those three things together are coupled with the likelihood that shocks to the global and local food systems driven by climate change interacting with geopolitics and geostrategic matters—as happened in 2022—will increase in frequency. As you look ahead, the business model for farming around the world will be creaking, particularly in the United Kingdom and in upland areas. The ability to cope with fluctuations in global markets in food means that food prices—in the UK context, that is the main driver of food insecurity—are likely to increase and be more volatile as we look decades ahead.

With climate change already happening and with increasing volatility in weather events and in the business environment, many negative things can happen. There are some positives in the situation, but it is largely negative. As you look ahead, the drive to produce more yield and intensify agriculture where possible is real. The business environment will fluctuate significantly, so, for many farmers, the overall farming system will be tricky and the system as a whole will increasingly lack resilience.

David Harley (Scottish Environment Protection Agency): From an environmental point of view, the water environment in Scotland is good. Eighty per cent of our water environment is of a "good" or better status. However, of the remainder, in 13 per cent of the water environment, diffuse pollution from agriculture is a very challenging and serious problem.

We also have an issue with water scarcity. Last year, we had to withdraw the ability to abstract from irrigators in the east of Scotland. That was the first time that we had had to do that, because of the severe conditions in the Eden catchment, in particular. The situation will only be exacerbated by climate change.

With regard to climate change, carbon emissions and greenhouse gases, agriculture accounts for just under 20 per cent of Scotland's emissions. On current projections, we are not going to meet our national climate change targets unless we make a step change on greenhouse gas emissions. In addition, we have a related biodiversity crisis, and agriculture has an impact on that. Therefore, a step change is now needed. There is an urgency about that at this point.

Professor Pete Smith (University of Aberdeen): The responses from Tim Benton and David Harley were very good, so I do not have much to add except to build on the point about the biodiversity crisis and the drive to net zero. Agriculture is not on track to reduce emissions and meet net zero, so we must make a step change, as has been pointed out.

Some of the changes that we will need to make to the land system and to the agriculture and food system could confer greater resilience on the system if we get it right. If we implement the right mix of land use and the right incentives to incentivise that land use, we could improve the resilience of the food system to future shocks—future shocks in the global food system, as Tim Benton outlined, but also future shocks with regard to climate change. By using more regenerative or agri-ecological approaches to agriculture—if we can incentivise those—we can improve the resilience of the whole farm system and the agricultural production system to future shocks.

We have an opportunity here to move forward in a way that benefits the agriculture sector, the food system and the environment by improving the resilience of the system and building that into anything that we try to incentivise.

Morgan Vaughan (RSPB Scotland): Thank you for the invitation. I would like to echo a few of Professor Smith's points. My area of expertise is west coast livestock farming. We have a very good opportunity here to build resilience, especially when we think about marginal upland areas that will benefit not only the food system but wildlife and the environment. There is the opportunity to do both of those things, so this is a unique time and opportunity to capitalise on.

With regard to those systems, there is a really exciting opportunity to have low inputs and to further reduce inputs where possible. That can deliver on biodiversity in a big way, so there are lots of opportunities to reframe this. For west coast farming, in particular, there are big opportunities to build a more resilient system going forward, and change is obviously needed to do that.

Ian Boyd-Livingston (Stockfree Farming): Good morning. I will look at the broader context. I am sure that some of us will have seen the synthesis report from the Intergovernmental Panel on Climate Change. It says that the average global temperature now is 1.1°C above the pre-industrial average. However, the secondary figure shows us that the average global temperature over land is 1.6°C above the pre-industrial average. From that perspective, the Paris agreement has already gone. I found it terrifying to see that figure. I hope that that makes us all sit up and take note.

At Stockfree Farming, we support farmers who wish to switch away from livestock farming to farming in a way that is more climate positive and that does more for biodiversity and for people. We know that there are farmers in Scotland who want to do that right now. That could quickly make a difference to our attempts to reach net zero by 2032. Frankly, I think that reaching net zero by 2032 will be too little, too late. That is a difficult thing to say, but the science points out that, if we stay on our current track, we will go way beyond a temperature rise of 2°C. I echo the comments of some of my colleagues on the panel.

As far as what we do next is concerned, given that most of the farming in Scotland is livestock farming, we need to reduce that. It is vital that we do so. That puts a just transition front and centre, because we have a duty to support those farmers who are currently livestock farmers but who want to switch away to doing something else. That is the point that I really want to get across.

When it comes to ecological resilience, I do not think that our ecology is resilient—it is that simple.

The Deputy Convener: And 2032 is not far away.

Ian Boyd-Livingston: Indeed.

Alasdair Allan (Na h-Eileanan an Iar) (SNP): This question is not meant to sound provocative. I understand the need to tackle the climate emergency. However, I am curious to know whether Mr Boyd-Livingston has ever had a meeting with a common grazings committee in the crofting counties and used the phrase "stock free". As a representative of such an area, I am struggling to visualise what stock-free agriculture would look like, other than agriculture-free agriculture. Do you recognise the ecosystem resilience that already exists within low-intensity farming that includes stock?

Ian Boyd-Livingston: It is better to have no stock. All the things that I will talk about today are backed by independent peer-reviewed research. I know that the committee has heard about a lot of research, and it is important not to take my word for things, but it is also important that, when people mention research and science, we look at where that comes from. After the meeting, I can send the committee a list of the research that I refer to. Independent peer-reviewed research is the gold standard, so let us look at that.

I completely understand that going "stock free" is a horrific thing for members of a common grazings committee to contemplate without support. That is why a just transition is so important.

Alasdair Allan: A transition to what?

Ian Boyd-Livingston: To non-livestock farming.

Alasdair Allan: In an area like that?

Ian Boyd-Livingston: Yes. Most of the livestock farming in Scotland is in areas such as less favoured areas. My background is in permaculture and the Soil Food Web, which is the method that Dr Elaine Ingham pioneered. All over the world, people are growing food in places where they were told they could not grow food. We need to focus on growing food for people.

We will depend on the farmers we depend on now far more in the future. We know that there are farmers who want to switch away from livestock farming, because we conducted a qualitative survey in which 36 per cent of the farmers and crofters we interviewed said that they would switch away from livestock farming today if there was support from the Government for them to do so. There is no such support. The existing system does not support that, and the new agriculture bill does not support it either. For example, in payment regions 2 and 3, the restrictions will continue—if a farmer does not have a certain livestock density, they will have to go through a lot of surveys and various other things in order to get any support at all.

It is a provocative question, but I understand why you ask it. We have a transitional period, in which we can make—

Alasdair Allan: I was not trying to catch your eye—I was trying to catch the convener's eye. Please finish your point.

Ian Boyd-Livingston: Switching away from livestock farming is the quickest way to make the most significant change. Livestock farming cannot be net zero. There are many reports and much research that show that. A report in 2020 by the Centre for Innovation Excellence in Livestock said that, much as with carbon capture and storage, the technology to help with that has not yet been invented. We are relying on things that cannot yet be used.

11:15

Alasdair Allan: I have two other questions. First, do you accept the arguments that are being made by, for example, RSPB Scotland that, in many areas of Scotland, biodiversity—certainly in terms of wildlife—depends on a grazed environment? It is difficult to see how that will happen for certain species if there is no such environment.

My other question, which is related to that, is about what you are advocating should be grown by these people. More to the point, how are you going to encourage behavioural change that does not involve all the people in this country who currently eat meat—whether that be right or wrong—simply getting that meat from Argentina or wherever?

Ian Boyd-Livingston: We are talking about helping the farmers who want to switch—we are not here to force people to do anything. However, there are farmers who want to switch; indeed, 36 per cent of our interviewees said that they would switch right now. Given the number of farmers and crofters in Scotland, which, according to figures produced by NFU Scotland, is 17,500, that means that there are potentially more than 6,000 farmers and crofters who would leave livestock farming behind today. That would be of huge benefit to climate change, our goals and so on.

The fact is that biodiversity benefits when there is no grazing. It benefits a bit from low-intensity grazing as opposed to high-intensity grazing, but, if we look at what you might call traditional Scottish nature, we see that there is a section in the Scottish Government climate change plan updates that talks about scrub, for example, as if it is something to be avoided. However, montane scrub, which is the band that separates the forests from the rocky mountain tops, is a vital habitat and is hugely important for biodiversity. It is almost all gone because it is grazed, and it will not come back unless the grazing stops. There are lots of different examples like that.

Let us help the farmers who want to switch, because it will be a huge win for biodiversity and our climate goals. We can help them to grow food, for example. You will be able to grow food in many LFAs. If you drive round Scotland, you can see crops being grown to feed animals; in fact, I think that more than half the crops are being grown for that reason, whereas we should be growing crops to feed people.

The LFAs where food cannot be grown could be rewilded, and there could be tree planting. If we are talking about carbon sequestration, I would point out that, according to the latest science, it is not what we thought it was. Carbon is cyclical—the carbon that goes into the ground comes out again, some of it very quickly. The best way of locking up carbon is in the fibre of trees; so, in those LFAs where you cannot grow crops, tree planting would provide an obvious and very secure approach.

Alasdair Allan: But that will not work in an area that is made up of peat.

Ian Boyd-Livingston: If you are talking about peatland restoration, peat, of course, provides a fantastic environment in which you can lock up carbon for longer. However, there are essentially two types of soil carbon. Again, this is from the most recent research. The first type is particulate organic matter, which is the larger stuff that comes out through erosion, grazing and all these other

things. The other type is mineral-associated organic matter, which is more microbial in nature. That sort of carbon is locked up for much longer, but it plateaus. Indeed, I heard recently that the carbon in the test fields of Rothamsted Research—which has been looking at this issue since 1850, I believe—is plateauing, which suggests that there is a limit to how much carbon can be stored.

Alasdair Allan: Thank you, convener.

The Deputy Convener: I will bring in Morgan Vaughan and then take a supplementary from—

Rachael Hamilton (Ettrick, Roxburgh and Berwickshire) (Con): Can I just ask a specific question about Ian Boyd-Livingston's survey, convener? How many people were surveyed?

Ian Boyd-Livingston: Fifty-one people had the full qualitative survey. In other words, we went door to door and talked to them.

Rachael Hamilton: And what was the lowest and highest acreage of those involved?

Ian Boyd-Livingston: I am afraid that I do not know that—I am a recent arrival at Stockfree Farming. I will get that data and send it to you.

Rachael Hamilton: Thank you.

The Deputy Convener: I will bring in Morgan Vaughan at this point and then take a supplementary from Jim Fairlie.

Morgan Vaughan: It is important to note that RSPB Scotland has been a staunch advocate of livestock farming, particularly on the west coast, for the past 30-plus years.

When we talk about resilience, a key issue to think about with regard to biodiversity and food production is cattle. The farm that I manage has a low-input system. We have 40 breeding cows that complement the landscape and also produce food. That is particularly key to biodiversity on the west coast. We are managing for red-billed chough and corncrake, and it is unlikely that those birds would be here if we did not have those livestock. The populations of those birds are on a knife edge in Scotland, but they are important species for biodiversity and are critical to the ecosystem. If we did not have the ability to use livestock as a conservation tool, there would be severe biodiversity losses on the west coast.

If we look at the broader picture, we see that many communities on the west coast are based on farming cattle or sheep, and it is really important to look at how we can support that in a resilient and sustainable way. Reducing inputs is key, and things will have to change to meet future targets. However, if we look carefully at how to do that, it will be possible to deliver both food resilience and biodiversity. It is critical to point that out.

The Deputy Convener: Jim Fairlie has a supplementary question.

Jim Fairlie (Perthshire South and Kinross-shire) (SNP): I have far too many broad questions to go into this with a supplementary. I may come back to that.

Ian, 85 per cent of Scotland is LFA, with only 15 per cent of our land being non-LFA. We cannot grow crops in this country without livestock, which are a major part of our fertiliser production. Are you advocating that we stop eating meat? That is my first question.

Ian Boyd-Livingston: I am advocating that we should help farmers who want to stop farming livestock. That is the result of our survey.

Jim Fairlie: Your survey was of 51 people. I have been in farming for most of my adult life and have never yet met a farmer who would want to give up their livestock on the basis that livestock are bad for the environment. They might give up livestock because they cannot make money from them, but that is usually a forced choice rather than a cultural one. I simply cannot see how a pastoral country such as Scotland, with the topography that we have, will ever be able to be livestock free. We have heard from RSPB Scotland that livestock create biodiversity and can help us to maintain the areas that we want to maintain. I have seen and done that myself. I do not see how livestock-free farming, especially at 2,000 or 2,500 feet, can ever be anything other than non-viable.

Ian Boyd-Livingston: I would challenge the LFA system. Every soil is unique, and you have to understand the soil in almost every field, which is a labour-intensive process. We should not just accept the LFA designation. We should be out there, looking at those things, which is what Stockfree Farming intends to do. We are going to say to farmers, "Let's help you. Let's begin by seeing what else you can do with the soil that you've got."

I totally agree that there are some areas where we cannot grow food. In those areas, we can look at rewilding or planting trees.

Jim Fairlie: If you are going to rewild or plant trees in those areas, how many tenant farmers have you spoken to about that system? The landowner might get something out of changing over to rewilding, but what about the tenant farmers? There are many tenant farmers in LFA areas.

Ian Boyd-Livingston: Forgive me—I do not know how many tenant farmers were interviewed as part of the survey, but 36 per cent of

respondents said that they would switch today to more climate-positive farming, which could include tree planting, rewilding or growing crops for people, which are the three areas that we focus on.

Jim Fairlie: I accept that we can do tree planting or all of those things, but we should still have livestock as part of the equation. I simply cannot see how you can take livestock out of the natural cycle.

Ian Boyd-Livingston: Livestock farming is not part of nature’s cycle. It does not happen in nature; it is a situation that we impose on the landscape.

Jim Fairlie: Let me ask you another question. If we take all the livestock off those areas, what are we going to do about the deer and the hares?

Ian Boyd-Livingston: We want to support the farmers we interviewed and surveyed who said that they want to do that now. If you extrapolate that 36 per cent and add the 28 per cent who said that they might do that, we may be talking about more than 11,000 farmers.

Jim Fairlie: You have taken that figure from a sample of 51 people.

Ian Boyd-Livingston: That is right. As I said, it is a qualitative survey, and you do such surveys with lower numbers. I am just extrapolating from what we have found. We will go out to find more.

I suppose that what I really want to get across is that we need to support those farmers and—

Jim Fairlie: Given Scotland’s diverse topography, from its coastline to the top of its hills, are those 51 farmers representative of everyone across the entirety of that topography?

Ian Boyd-Livingston: They are from across all farming in Scotland. The survey covered the Borders right up to Sutherland and beyond.

Jim Fairlie: Okay.

Alasdair Allan: I realise that none of us want to live in a country that is all intensively farmed—we realise the benefit of wild places. I do not want to get hung up on words, but have you considered just how badly the word “rewilding” goes down in marginal communities—that is, marginally viable, fragile rural communities?

Ian Boyd-Livingston: Unfortunately, we are stuck with that jargon. “Rewilding” can mean so many things—

Alasdair Allan: I would not use it, if I were you.

Ian Boyd-Livingston: Let us not, for example, put bears back into the woods and that sort of thing, but I suppose that—

Alasdair Allan: The problem is that it implies that there are no people.

Ian Boyd-Livingston: —it is about bringing back biodiversity and nature. I again use montane scrub as an example. That vital habitat is lost because of grazing. There are many other examples.

I would focus on tree planting rather than on rewilding—I fell into the trap of using an ecologically fashionable term. It is about bringing back nature, and nature does better where there is no grazing.

Alasdair Allan: I am just offering you the advice that, if you visit those communities, you should not use that word.

Ian Boyd-Livingston: Okay. That is good advice. Thank you.

The Deputy Convener: Are there win-wins for the ecosystem and business resilience? What policy levers would need to be available to maximise those win-wins? I put that question to Morgan Vaughan.

Morgan Vaughan: Again, it is about looking at things as a whole. From RSPB Scotland’s point of view, it is about looking particularly at the mechanism for payments. It is less about looking at direct payments, which large landowners can take advantage of, and more about supporting high nature value farming.

In a lot of places, including the west coast—I keep banging on about the west coast—a lot of high nature value farming is delivered on a small scale. That could be quickly added together. If that is encouraged, we would have big wins in terms of resilience, good systems and biodiversity.

We need to look at that broader picture, to get the best of both worlds. You could then be looking at a system that is resilient in terms of food production and extremely resilient in terms of biodiversity, which all of us here are talking about in relation to the climate and nature crises that we are currently facing.

It is about looking at things at that level and addressing where the money is going and the outputs that we get from it, which need to be a lot more measurable and defined. They must have a clear purpose as well.

The Deputy Convener: Does anybody else want to respond to that?

David Harley: I am happy to respond to that. Our work with farmers has been focused on areas of Scotland where we have severe diffuse pollution—in the south-west, where it is mostly dairy farming, and in the east, where there is a mixture of farming, although it is largely arable. We find that those catchments are significantly

degraded. A cascade of challenges are associated with soil loss—soil erosion, nutrient and pesticide run-off, associated flash flooding, biodiversity problems, and fisheries—and there would be significant win-wins from rebuilding those systems. I emphasise that those would be win-wins not just for the environment and the wider public good, but for the wider resilience of agriculture.

I will give just three examples of where we think those win-wins lie. The first is soil management. We know that better soil management can reduce greenhouse gas emissions, that it will reduce pollution and that, essentially, it will keep soil on the land. Soil is a finite resource, and the loss of soil is of great significance to the future of agriculture.

Another area is the management of fertiliser and slurries. Again, if that is done in the right way, that will really help with the greenhouse gas issue, decrease pollution and save money. Those valuable resources are becoming increasingly expensive.

The last point that I want to emphasise concerns making space for rivers—that is, increasing the riparian zones and buffers, potentially with trees. Again, that will mitigate against climate change by ensuring that we do not get erosion from floods. It will also increase biodiversity, help with fisheries and flooding and secure agriculture into the future.

It would be helpful to explore those win-win areas.

11:30

Professor Smith: Agriculture is one of the few industries that we provide public money to support, so we have a great chance to influence what we want from agriculture and our food system.

The former payment under the common agriculture policy—the single farm payment—was not very targeted. The proposed agriculture bill and the other agriculture reforms that are planned give us an opportunity to use the tier 1, 2 and 3 funding to better target money towards farmers who are delivering outcomes that deliver public goods. Private goods are the food products that they sell in the private markets, for which they are recompensed. However, we should all recognise that they provide vital public goods such as carbon sequestration, good water quality, good air quality and biodiversity habitats, and we should reward farmers for providing those public goods, too. If they can demonstrate that they are providing good outcomes in terms of public goods, that is where we should target the funding.

We have the opportunity to do that because we are designing a system of support for agriculture. We must not miss that opportunity. We must provide funding to support the farmers through a just transition in a way that ensures that they can still produce food and that the funding that we provide means that they provide those public goods—public money for public goods.

Professor Benton: The literature is increasingly clear that the market does not reward farmers for farming in a way that is environmentally friendly and sustainable. The notion of public money for public goods as a means of correcting that market failure is a strong one. There is also some new literature coming on stream that shows that farmers make the most profit if they reduce their external inputs to a minimum, even if that reduces their cash flow. We are in a situation in which farming in an unsustainable way is rewarded by the market and farming in a sustainable way is not. If someone farms in a sustainable way, that reduces their yields, which might improve their overall profitability but does not improve their cash flow.

The notion that, if we want to maximise public goods, we must farm in a way that is good in terms of biodiversity, pollution, climate and soil is key. However, the downside of that is that, in typical farming systems, doing so will result in reduced yields. Therefore, the clear question that I pose to you is, what is the system boundary of this discussion? Are we talking purely about farming and ecosystem services, or are we talking about food, diets and food security? If Scotland produces less and imports stuff that is produced with greater externalities, we might gain locally but make the system worse globally. Where, in all the thinking, does the idea of what is a healthy diet for people in Scotland fit into the idea of public goods?

You could broaden the public goods notion beyond carbon storage and biodiversity to include public health and giving rewards for growing things that are nutritionally better for people. Scotland is notorious for poor diet, rates of obesity and all the rest that comes from not eating the right sort of things in the right amounts. There is a question about where public goods in the public health system fit into that as the output of the UK's—and particularly Scotland's—farms.

Jim Fairlie: I have a quick supplementary on that. You said that the market does not reward the kind of farming that will inevitably reduce output. However, is the other side of that not that we demand or require food that is affordable for the people who are going to buy it? How do we square that up?

Professor Benton: That is a good question. The answer is that we have spent 60 years designing a system that is predicated on an increasing supply of cheaper and cheaper calories rather than on nutrition. At the moment, as

somebody mentioned earlier, only 7 per cent of the grain that is produced in Scotland is consumed by humans—the rest goes into alcohol and livestock feed. Across Europe, 60 per cent of grain goes into livestock feed. That is not an exogenous market demand; it is created by innovation in the farming system to make food cheaper. It is now economically rational to grow grain and feed it to livestock, whereas 30 years ago it was not. The demand for animal source food is a consequence of the innovation in the system.

If we were to feed everybody in a sustainable and nutritious way, we would be growing very different things in very different ways. I suggest that we have a large-scale market failure in the sense that the market provides for diets that are radically unhealthy, particularly for the economically marginalised. It provides for those diets in ways that come with significant externalities to the environment, and it does not create public goods in the way that we need them. If we were to design a market to provide healthy and sustainable diets, we would do things very differently—for example, by putting incentives in different places, creating different sorts of policy envelopes and having different trade agreements. I would say very strongly that it is not the case that people demand; rather, the market has created demand for goods that are unhealthy for people and for the planet.

Jim Fairlie: I will follow that up very quickly. I agree with you, particularly about the sheer power of supermarkets driving what people eat. However, we also have a cultural demand in this country for cheap food. It has been one of my bugbears for many years—stack it high, sell it low.

If we do what we are talking about too quickly, how will we get the people who are buying the food on board with that change of culture? Effectively, we are talking about trying to change our culture. We are trying to do that with the Good Food Nation (Scotland) Act 2022, and we are trying to do things gradually. If we do things too quickly, how will we get the public to buy into that?

Professor Benton: That is a very good question. You will not. Over the past 60 years, we have been on a journey of driving down food prices, making food cheaper and more available, and driving up consumption.

To answer your question directly, there are ways in which you can decrease the price of the better food and increase its availability while increasing the price of the worst food and decreasing its availability, as well as putting downward pressure on waste. Even though some foods would become more expensive, the household food bill would not necessarily go up, because you would be changing the composition of the diet and reducing waste. It is not immediately clear that the sorts of things that we are talking about would drive up all food prices and household food bills. Things might be more expensive in some areas and less expensive in others.

However, I think the primary point is that this has to be a journey over years. We have made food increasingly cheap since the 1950s and 1960s, and that has become an economic driver to encourage consumption. The less people spend on food, the more they can spend on other things, which drives economic growth. The consequence is that household spending on food has declined radically over the past decades but the ability of households to rapidly switch is practically zero, as we are finding with the cost of living crisis, because what was spent historically is now being spent on long-term contracts for household services—mortgages, car loans, Netflix and other things. People are unable suddenly to respond to a doubling in food prices, as we have seen this year and last year.

It has to be a journey over time, but it has to be a deliberatively and strategically led journey to signal that, as has happened over the past 60 years, diets will change. Our food system is shockingly bad from a health perspective, and we need to change diets from a health perspective. Let us drive diets in the right direction by making them consist of things that we can produce with pride at home, that we produce sustainably and that contribute to the wider public good. Let us get the system to work and get the market to work at producing the goods that people need.

Jim Fairlie: Thank you.

Ian Boyd-Livingston: In terms of quick wins, I would say let us support the farmers who want to stop farming livestock and pursue a different kind of farming, because livestock farming is the worst for being climate negative. If I leave the room today having left one thing on your minds, I hope that it is that we should support the farmers who want to do that—that is my main point.

On a more general point about the proposed bill, I would focus on actions rather than on outcomes. We are talking about nature. There is a lot of talk of measured outcomes, but it can be very difficult to take that approach, because nature is a complex system. When you tweak one thing, you do not necessarily get the result that you think you will get.

The more actions we take, the more good results we will get, but rewarding farmers for doing the right thing will be incredibly important. Some of the outcomes can take years, if not decades, to achieve, but farmers can start to do the right thing very quickly. With some of the systems that we see now—again, the soil food web can be used as

an example—there can be results in a single growing season.

Frankly, we are at the stage where we need more action than talking. However, to continue on the subject of talking, just putting the language of the agriculture bill proposals into action would be fantastic. For example, there is the phrase

“to farm and croft with nature”.

I have seen agriculture proposals and bills from different countries, and that phrase just leaps out from the Scottish agriculture proposals.

I hear people say things like, “We need to keep farmers in farming,” but we are going to need far more farmers, and we will depend on the farmers who are already there even more. There are farmers who do not want to farm livestock any longer, sometimes because of the trauma that they have experienced—we have found out about the moral harm that is being done to a lot farmers who have to send livestock to slaughter. However, if they stop farming, that will be a huge loss for Scotland. We need to bring more farmers in and keep the current farmers in farming.

The other point is that, as the Scottish Government documentation says, Scotland is

“committed to ending our contribution to climate change”.

That is a huge statement to make, because, as long as we are pumping CO_2 and equivalents into the air, we are contributing to it. We may not be able to get to absolutes here, but we can get very close.

Those are the very quick wins.

The Deputy Convener: You may come in very briefly, Jim, but we have to move on.

Jim Fairlie: Ian, you say that farming livestock is the worst thing that we can possibly do in agriculture. What do you have to say about the example of Macedonia, where they got rid of their livestock completely?

Ian Boyd-Livingston: That is taken from the James Hutton Institute’s report. If you look at our report, you will see that that is not quite what the research was saying. I will have to send you the results. The situation is not quite as straightforward as it has been put before the committee. As with all these things, it is nuanced. It is not the case that removing livestock meant that they could simply not grow anything. I read that report in detail, and I will submit something on it to you in writing if that is okay.

Jim Fairlie: Okay. Thank you.

The Deputy Convener: We move to questions from Rachael Hamilton.

Rachael Hamilton: I have a number of questions for David Harley. How much is SEPA investing in nature-based solutions for flood risk management, in financial terms? What is the current water storage capacity in Scotland, and how much does it need by 2050 to allow sufficient water abstraction to protect food security in Scotland?

11:45

David Harley: On the question about investment in nature-based solutions for flooding, we are not the flood authority; we are a strategic planning adviser on flooding, and we work with local authorities on the flood risk management planning process. Therefore, we do not actually contribute the investment, although we work with local authorities on strategic flood risk management plans. We do not have that information, but I will see whether I can get something for you after the meeting.

The other thing that we are very much—

Rachael Hamilton: I will give some context to show why I asked those questions, to make it slightly fairer, I suppose.

David Harley: Thank you.

Rachael Hamilton: Last year, in Fife and the Borders, the abstraction licences were suspended, which had a direct impact on broccoli and soft fruit growing. Farmers were up in arms about that. One action that SEPA is taking is to ensure that there is more riparian tree planting to provide more soil stability on river banks—that is mentioned in one of your reports, so it is a bit confusing when you say that you are not the authority but you allow others to work and spend that money.

My point is similar to that of Roger Crofts from NatureScot, who has said that, instead of SEPA putting down concrete and spending £1 billion on flood risk management, we should be working with farmers and using a catchment management approach to ensure that farmers and communities get the benefits. We need to ensure that the river flow helps farmers as well as communities, rather than expend all that energy on concrete and contractors when that does not necessarily benefit local communities.

David Harley: We are talking about two linked areas: flood risk management and water scarcity management. Those are linked but they are different in some ways. On flood risk management, SEPA absolutely does not promote the on-going use of concrete for flood prevention. It will not actually work, because you cannot build more walls to deal with climate change. Flood risk will increase. Our role is to work with local authorities on the wider catchment plans and

mitigation across catchments in terms of flood risk management, and that includes a degree of agricultural consideration.

On water scarcity, I agree that we were in a very difficult situation last summer. Luckily, we did not have impacts on growers. We were days away from that, but we did not have impacts on growers. However, that is a real risk and we are working with the sector and with the Scottish Government on approaches to deal with water scarcity and how we might respond to such situations. The consideration of the new water and sewerage bill will involve looking at the issue and seeing whether we need more powers to consider water scarcity management.

It is, absolutely, holistic—we are talking about whole catchments, so a holistic approach is needed. Some of the approaches that I mentioned that can deal with other environmental issues to do with riparian zones, soil management and drainage management will also help with water scarcity and flooding. It is very much a holistic approach.

Does that help?

Rachael Hamilton: It does, but the point that I am trying to make is that, with regard to the agriculture bill, the issue is connectivity between the very many stakeholders, not just farmers. We have heard a lot about removing livestock, but I, too, could debate this issue for pretty much the rest of the day, setting out the benefits of livestock for biodiversity, soil stability and habitat restoration. However, this is about every single person—all stakeholders—having an interest in ensuring that we have good food security and all the rest of it and about improving farmers' ability to do their jobs well. In the future, we might need to bring these elements together instead of just looking at them in isolation.

We have heard, for example, about the need for more investment in slurry storage. Farmers who have come before this committee have told us that they are putting their hands in their own pockets to do things and make improvements in animal health, animal productivity and efficiency but the Government is not giving them enough support to carry out measures or to meet the targets that the Government expects them to meet. Does anyone else want to come in on that?

The Deputy Convener: Do you have any other questions, Rachael?

Rachael Hamilton: I saw Morgan Vaughan nodding in agreement at some of those points, and I just wondered whether he wanted to come in.

Morgan Vaughan: A lot of the points that you have made sum up what we need to be looking at just now. For me, livestock and soil health go hand in hand. Indeed, in a system such as mine, the livestock are part of the health of the soil. At the moment, we are managing our inby fields specifically for corncrake, but a whole range of farmland birds benefit from the same management. In other words, we are looking at whole-field management. Come September, we have a grass cut in some areas, and then we are out grazing with our cattle. That returns goodness to the soils in a natural, regenerative way.

That side of things is key as we move forward. We need to match these things up. We hear a lot about soil health, but the question is how we support the practical side. Again, it is almost a behavioural issue. We need to support those kinds of behaviours if we are to get the best for soil health and fertility. The biodiversity that comes from that is enormous. That is why I was nodding vigorously to the points that you were making.

Rachael Hamilton: I have just one more quick question for Morgan Vaughan. Given your role as a farm manager supporting RSPB Scotland, do you agree that direct payments should remain?

Morgan Vaughan: I think that direct payments that go to the right places should potentially remain. RSPB Scotland is a huge beneficiary of direct payments to some of our holdings, and we need to think about where they are going and targeting them at those areas. As Mr Boyd-Livingston has said, this is as much about the actions that go along with these things as it is about the outcomes. It is about marrying those things up. Money needs to go to, for example, the livestock enterprises that operate and sustain their outputs on knife-edge budgets. What we, at RSPB Scotland, would like is support for approaches where the livestock delivers biodiversity and, ultimately, food production. We should be looking at direct payments in the right places.

The Deputy Convener: I think that David Harley wants to come in. I will then bring in Tim Benton.

David Harley: On the point about complexity and the multiple stakeholders, we are talking about complex systems, and getting the win-wins that we are aspiring to achieve will require a landscape or catchment approach.

Just to build on the previous comments, I think that tailored investment and support are key to all of this, but advice and facilitation will be critical, too. After all, there are complexities here.

In our work with farmers on diffuse pollution, we visited 6,000 farms in the past 13 years, and we found very little complaint. We achieved significant compliance with diffuse pollution regulations. The main reason for that is that we invested time in that work. We had experts who understood

farming, but we also provided the advice in a way in which farmers could see the advantage of those required actions to their business—they could see where the savings were. I guess that I am really pushing for that landscape or catchment-focused approach that is supported by good advice. We have to invest in that advice and facilitate co-operation between the farmers at a landscape scale.

Professor Benton: I have two quick points. The literature around agricultural subsidies shows that direct payments are not particularly efficient at providing public good outcomes, hence the move towards the public money for public goods mantra.

Secondly, I want to comment a little bit on the systemic nature of the challenge. Again, you have lots of moving parts in this discussion. You clearly have farm business and the rural environment, and you also have also food production and the markets into which that food goes.

The most recent questioner talked about food security, and there is an open question about the degree to which Scottish production is linked to Scottish food security, how the price transmission across the market might work and so on. You need to put all the parts together and think about what Scottish production is for. Is it to give a livelihood to farmers, to boost the Scottish economy or to provide food security? Of those three, the last one is probably the weakest link at the moment, but, in the long term, it may need to be a stronger link. You cannot divorce that conversation from the issue of whether agriculture is about producing food if that is part of the broader landscape in which you are having to think through the trade-offs. There are trade-offs between farming and the environment, as we have been saying, but there are also trade-offs between farming, the environment, food production, who eats the food and who benefits from that food production.

Professor Smith: As Tim Benton said, direct payments are not a great way to incentivise public goods. However, the proposed tiered payment provides opportunity where tier 1 is what everybody gets and tier 2 or tier 3 is more conditional on the activities that are undertaken by farmers or groups of farmers to deliver public goods. That could be measured at the outcome level, but, as we know, outcomes take a long time to measure. There are some activities or actions that we know could deliver good outcomes, so we could incentivise those payments at tier 2 and tier 3.

The trick is going to be in getting the balance between how much you pay in that basic payment and how much you allow farmers to opt in to tier 2 and tier 3 with plans to improve their farm management to deliver public goods. That is the key. You have the mechanism with which to do that, so it is just about getting the details right to allow the system to deliver the public goods.

On David Harley's point about landscape-scale management, many of the benefits that we will get through improving our agricultural system will be made not at the individual farm level but at the landscape or catchment scale. The regional land use partnerships will play a vital role in that, and we have to adequately finance those to allow farmers to collectivise and get together to make plans at a regional or catchment scale, so that we can get a good co-ordinated change that allows a just transition for the farmers and delivers public goods.

Ian Boyd-Livingston: Direct payments are essential. Stockfree Farming wants to see the repeal of the restrictions on payment regions 2 and 3, so that farmers in those areas who do not want to have livestock can obtain Government support.

12:00

Ariane Burgess (Highlands and Islands) (Green): I have a number of questions to ask under question 3, the first of which is for David Harley. You might not be able to respond to this question, but it is triggered by work that SEPA has been doing. I am aware that SEPA has been working on a sector plan for livestock production. Is livestock production more at risk from climate change than other farming sectors, because of heat stress in animals and a shortage of forage? If that is the case, how can the sector adapt to climate impacts while minimising its contribution to climate change?

David Harley: I will struggle to answer that.

Ariane Burgess: Is anyone else able to take that question? Maybe no one else was paying attention because I said that it was for David. Will livestock production be more at risk from climate change than other farming sectors, because of heat stress in animals and a shortage of forage? If that is the case, how can the sector adapt to climate impacts while minimising its contribution to climate change?

It seems that those questions were too geeky for people. Brilliant—we have some takers. We will hear from Morgan Vaughan, then Tim Benton.

Morgan Vaughan: To give a practical answer to your question, even here, on Oronsay, we have had issues with summer drought over the past few years, which have caused problems for the raising of livestock. The key thing to note when it comes to the agriculture bill is an emphasis on breeds. Native breeds tend to be more resilient—in a very general sense of the word—to such events. It is a

case of having the right breeds of livestock in the right places to do the job of food production, as well as to increase biodiversity and reduce inputs.

At the moment, RSPB Scotland is doing a lot of work to look at our enterprise from the point of view of reducing the physical size of cattle. We are considering having more native breeds. My colleagues and I are thinking about switching to native Angus cattle. There are benefits in relation to climate change as regards the feed that those animals need—we are talking about moving to a more grass-fed system. Obviously, resilience in that respect is tricky when we have a particularly hot summer, and the extent to which that is possible will vary from farmer to farmer, depending on their ground. We are quite fortunate here in that we have a mixture of Junegrass and hill ground, which always provides some level of input for our animals.

Native breeds will play a big part in reducing emissions from the livestock system and when it comes to nature restoration, because they use the landscape differently from generalised commercial breeds. There is some mileage in that as well.

Professor Benton: The issue of forage is key. I live in the Yorkshire dales, and my hill farming neighbours have suffered recently because of the drought issue and lack of forage, although they have been able to buy it in.

Heat stress is a reality for farmed livestock, but the real question here is whether Scottish livestock are under threat because of competition with large-scale industrial systems, whereby animals are kept in sheds, which, increasingly—in some parts of the world—are air conditioned. Will Scottish farmers with lower-yielding native breeds, which can cope with less forage and are grass fed and so on, end up at a competitive disadvantage? The risk to the livestock sector in Scotland from climate change might be more of an economic one—leaving aside the citizen pushback against eating meat that is prevalent in some parts of the community—rather than a direct result of climate change in Scotland itself.

Ian Boyd-Livingston: Apart from the heat stress issue, there is the issue of novel diseases. Quite apart from the immorality of treating sentient beings as commodities, their lives will become more miserable because new diseases will arrive and there is no way to fight them at the moment. We rely on new technology that does not exist for that.

Ariane Burgess: Thank you very much for that. It is important for us to be aware of all those issues.

My next question comes under the area of ecosystem pressure points—we have started to touch on that matter already—but it is also related to the agriculture bill. I hear the points that have been made about the need to point towards actions rather than be focused on outcomes. The bill will be a framework bill, which will be challenging in some ways.

I will address my question to Pete Smith and then Tim Benton. I am interested in hearing really clearly what should be specified in the agriculture bill to ensure that policies and financial support are put in place to enable the sector to adapt to climate and environmental change in the most ecological and sustainable way. We have talked about agro-ecology and regenerative practice, but what do we need in the bill to ensure that any future subordinate legislation, any powers that are given, or the tier 1, 2 and 3 payments move our farming production in the right direction so that it addresses the weak link on food security that Tim Benton mentioned, which is concerning?

That is perhaps a big question. I will start with Pete Smith and then go to Tim Benton.

Professor Smith: The agriculture bill has to acknowledge the nature crisis and the climate change crisis. Those are the critical twin crises that we face, so it has to say something about nature-friendly farming and climate-resilient or climate-smart farming, which includes mitigation, such as reducing emissions and creating sinks, and adaptation—improving resilience to future climate change. It has to say something about being climate smart, nature smart or climate and nature smart. I do not know the exact wording, but it should be something along those lines.

It would be important to communicate that the bill moves beyond food production. Food production is important, of course, because it is agriculture’s primary private good, but we are also interested in the public goods and the vital role that agriculture and land use play in meeting both of those targets. We cannot do it without the land sector—agricultural and forestry.

Professor Benton: We could spend a whole day in debate on that question. Without trying to be difficult, I would say that the answer to the question in part depends on Scotland’s view of whether food production is important from a food perspective or because it is the private goods that maintain the livelihoods of the farmers.

There are two contrasting visions for a sustainable food system, which are antithetical to each other. One is that you put a fence around nature and use the land that is available intensively regardless of whether it is sustainable intensification or just intensive. The other is that you accept that you are going to reduce your productivity and farm in a more agro-ecological way that is more nature friendly, more biodiversity friendly, better for soils and better for carbon.

However, the challenge to the latter view—which is the right one in the round—is that farming systems such as that tend to produce less food. Therefore, the real challenge for the Scottish Government from a strategic perspective is to think through the question whether food production is important for the public good and whether food security is a public good even though the private goods enter the market, as Pete Smith noted.

In a sense, the answer to your question depends on whether you pay public money for public goods and those public goods include the food security that might arise. In that case, the question is how you link up Scottish production to Scottish food security as opposed to linking it up to Scottish economic growth, the free market of food and the imports that you get from the rest-of-the-UK common market and overseas.

Did that make sense?

Ariane Burgess: Thank you for that response. I will move on to question 4, on resilience, if that is appropriate. My question follows on from what Tim Benton was just saying. I am sorry if that muddles things up, deputy convener.

I will stick with Tim Benton, because you said that you could talk about this all day. You have touched on this, but it would be good to continue with the idea of food security. The papers for today's meeting make it clear that ecosystem resilience affects food security and the resilience of farm businesses, which you have been talking about.

Our nation's ability to continue producing food and feeding our citizens depends on working within planetary boundaries. You have described two ways of doing that: intensive farming and working with nature. What do we need to see in our agriculture and land use policy, including in the agriculture bill—which I keep coming back to, because I really want us to get it right—and what should be the criteria for support in the future payment framework in order to ensure long-term food security? What do we need to see in the payment systems?

Professor Benton: Every time you ask a question, I think about the system boundaries. For a long time, the UK Government's position has been that food security is a function of the market. The events of 2022, along with Brexit and some work on food price spikes that Pete Smith and I did a long time ago, put a different spin on that and raised the issue of food security as a real part of national security.

Given that the bulk of the food that is eaten in Scotland is not produced in Scotland, there is a question about the best way of achieving food security here. Is it by increasing self-sufficiency, in which case we should be growing different amounts of different things in different ways, or is it about ensuring trade relationships, both with the rest of the UK and internationally?

However we slice and dice that question, you could imagine a food secure Scotland that is based on trade and has a soft farming system that preserves the environment and in which farmers produce fewer, but premium-quality, products that go into niche markets and make a profit. That system would not be built on driving food production based on the notion that we are feeding ourselves, because we are not feeding ourselves and the UK is not feeding itself. However, that might become more important as geopolitical tensions ramp up over the next decade or two, following the war in Ukraine.

That is why I keep coming back to the idea that the future of your agricultural strategy, with respect to the environment, is crucially dependent on the degree to which you think food production is a key national security issue. If it is key, what food should farmers be producing, or should that just be left to market incentives? Or should you be using your post-CAP agricultural policy levers to encourage farmers to grow different things, instead of just providing public goods and essential environmental outcomes?

Ariane Burgess: That is probably something that we should take away. We should reflect seriously on the idea of food being part of our national security, given how events have brought that idea to the fore.

The Deputy Convener: Karen Adam has some questions.

Karen Adam (Banffshire and Buchan Coast) (SNP): My apologies convener. Is this question 3d?

The Deputy Convener: Yes.

Karen Adam: I thought that we had moved on, but we have not skipped that question.

What adaptations have been put in place for climate change, biodiversity challenges and ecosystem issues? Do the witnesses have any particular examples? I ask Morgan Vaughan to start.

12:15

Morgan Vaughan: Looking forward to the agriculture bill, it is about having a strategic plan for what we want to address. I oversee an agri-environment climate scheme that contains very direct actions for us to take here. We measure those on a yearly basis, and that forms part of a five-year plan for our farm and reserve. The Government should consider having a period of

programming in the agriculture bill, which would provide some measurement against the outcomes. In relation to biodiversity, that is key to seeing where we are going. It is all well and good to say it, but we need some kind of measurement of gains and reductions to see whether we are going in the right direction in areas such as emissions. That will be a big part of achieving any of the goals that are before us over the next few years and of bringing emissions down.

Does that answer your question?

Karen Adam: Yes, but what are the cost implications for those who are trying to mitigate the direct effects of climate change, in particular? We have had a lot of storms up here in the north-east, which has created challenges for our local agricultural sector that it has not faced before. How do such things affect the whole farming industry?

Morgan Vaughan: As we have touched on, we have had some very different summers over the past few years, particularly here. Some years have been incredibly wet, with a lot of rain, which can make things difficult. We have also had the heat. We are a very small island and we are very sensitive to such changes. There can be a huge financial implication if things get particularly bad for feeding livestock. If all the grass burns off, that takes us into quite a tricky position.

Being on an island, we obviously have multiple logistics to consider if we are to get any additional fodder or anything like that across here. We rely heavily on CalMac getting ferries here, which can be extremely difficult for us. Biodiversity resilience is put at quite a disadvantage when there are consistent changes in the environment, and it becomes very unpredictable. There can be a significant cost to our farming business, and we have added costs, too. A lot of folk on the west coast face that issue—the pure logistics of reacting to the changes in the climate.

Professor Smith: Two things spring to mind. First, improving our soil health, which has already been mentioned, improves our resilience and it improves resilience to future climate change and future shocks. When we increase our soil's organic matter content, we improve the soil's water-holding capacity and its resistance to drought. We also help it to support crop growth with nutrients. Improving our soil health is an underpinning thing that we can do to improve resilience across all parts of Scotland and across all sectors, as has been mentioned.

Secondly, there is some really good research evidence, both in agriculture and in forestry, that more ecologically diverse systems and more complex systems have improved resilience compared with monoculture plantations. Forestry in monoculture plantations is less resilient than forestry plantations with more diverse species and stands with trees of different ages in them, and the same is true in agriculture. Catch crops, cover crops and more diverse rotations tend to be more resilient to disease, climate change and other environmental shocks than simpler monoculture systems. Moving to regenerative agricultural practices and/or agri-ecological practices and diversifying the landscapes will improve resilience and will help to confer better outcomes for biodiversity.

Ian Boyd-Livingston: Demonstration is the next stage for us. We talk a lot, but, if we can help a farmer who wants to switch out of livestock and show what can be achieved, other farmers will want to follow suit. We need to get boots on the ground and get it done. We have the expertise, but we need Government support. We have an advisory board of people who have been doing this down south, and we are ready to go. Demonstration will start the ball rolling for us and for Scotland.

David Harley: I can point to our diffuse pollution work in certain catchments of Scotland as an example. There is a particular focus on soil management and on fertiliser and slurry management. We have also established buffer zones with a view to protecting the water environment, and those have multiple benefits for farmers, for greenhouse gas emissions and for biodiversity.

As a country, we need to step up our level of work and adopt a landscape approach. We should really push on with getting co-operative action from farmers.

The Deputy Convener: We have 10 minutes left and will move to questions from Alasdair Allan.

Alasdair Allan: I will keep it brief, in that case, as many of the issues have already been touched on by others. Does anyone want to give a couple of examples of actions? We have heard today that actions are more important than outcomes. When we think about future food production systems, how do we get from here to there? Can anyone give a couple of examples of quick wins that would get us to where we want to be environmentally?

Ian Boyd-Livingston: Pete Smith mentioned soil health, which has been mentioned before. That is where it begins. The first thing to do is to go to a field and do all the analysis that we can do. There is a lot that can be done without a laboratory. Farmers could do that themselves, and it would be an important part of knowledge transfer. I spend a lot of time glued to a microscope. I do a lot of soil microscopy because we know that soil microbiology is far more important now than it was before. Once the soil

food web is established in a field, there is a virtuous circle. We should begin with the soil, because everything starts there. Life starts there.

Morgan Vaughan: Effective support for high nature value farming across the board is really key. Farming systems that have a high nature value have benefits in every area that we have been talking about today, including in the reduction of emissions and the promotion of extremely high standards of animal welfare. Scotland could continue to be a real leader in animal welfare through those systems.

The ground, particularly on the west coast, is well suited to low-input, low-intensity systems. High nature value farming ticks all the boxes that we are talking about today and delivers as much for nature as for any other context. Communities on the west coast often focus on low-input, low-intensity farming. If we champion that, we will tick all the boxes for agriculture in the future.

Professor Benton: As well as soil, the other important characteristic, which Pete Smith mentioned, is biodiversity at both farm and landscape scale. That will build resilience. Ecological complexity aids biodiversity, and landscape heterogeneity allows pockets of trees, hedgerows and a range of other things. Anything that encourages complex rotational mixed farmscapes will be beneficial to the environment, even if it is not so beneficial to food production.

The Deputy Convener: Ariane Burgess, do you have a supplementary question?

Ariane Burgess: Yes. My question comes back to questions around ecosystems and food security in Scotland. I will direct it to Morgan Vaughan and Ian Boyd-Livingston. In the papers that we received for today's meeting, there is the statement that

"agroecological approaches can provide sufficient nutrients for healthy diets without impinging on natural habitats".

However, we are told that

"these assumptions imply systemic change which, while possible, would require significant political and social shifts, and shifts in production systems to support e.g. more fruit and vegetable production."

What do we need to see in the bill or in the criteria for support payments to incentivise the required political and social shifts and a shift towards more fruit and vegetable production?

Morgan Vaughan: We are in no doubt that, in order to achieve all the ambitious targets that the Scottish Government has set and those that the RSPB has set, there will have to be a reduction in the eating of red meat, which will require a behavioural change by everyone.

Systems such as the one on the farm that I run offer a high-quality product in low quantities. It is about moving away from the idea of giant, intensive, almost factory-sized systems, particularly when we are talking about rearing cattle, and towards a system like the one that I run, which is incredibly low input. The cattle are outdoors all year round, as the breed is supposed to be. To do that would be to move towards a more sustainable system.

Livestock farming ticks all the boxes in terms of the soil health question in Scotland. We have a high level of welfare and it is backed up by things like, for example, Quality Meat Scotland. We have regular inspections and work to an extremely high standard, so we can back up that side of it.

The biodiversity that cattle deliver could not be matched if we were to take that away from the less favoured areas, which do not lend themselves—logistically, in the first instance—to moving to fruit and vegetable production. Where we are, specifically, it makes sense to us—as ecosystem managers, effectively—to have the animals here in order to maintain an extremely diverse ecosystem. What they do, from maintaining soil health to generating food for wildlife and invertebrates and to what goes back into the soil, is enormous. I do not know how that could be replaced.

I hope that that answers the question.

Ariane Burgess: It kind of does, yes.

Ian Boyd-Livingston: Livestock farming does not exist in nature, and nature is better off without it. That is cut and dried. The issue is really that removing it would be a huge shift for Scotland. In her foreword to the proposals for the new agriculture bill, Mairi Gougeon says:

"We should not shy away from being clear that we are on a journey of significant transformation."

That is where we are. It is about a cultural and societal shift. We have a choice about doing it at the moment, but climate breakdown is impinging on us every day—I see that today's news is about drought in Asia—and I fear that it will reach our shores very quickly. To a certain degree, it is here already, so we need to make the change while we have the chance to do it at a reasonable pace.

In the bill, we need support for farmers who want to switch away from livestock farming, but we must keep them farming. Keeping farmers in farming is part of the Government's commitment. We will need every farmer that we have, and we will need more. Because of the food security issue, we will become more dependent on our farmers in a way that we have not been before.

We can do it. Some people will ask about the World Trade Organization rules that mean we cannot simply stimulate production of crops and

things like that. However, when we are talking about farming that is climate positive and good for biodiversity, the WTO has what it calls a green box, and we have been talking about this kind of regenerative agriculture for a number of years, so we know that the techniques are all out there and have been tried in different places around the world. Scotland's climate is not unique. We can do it, and we can do it within the existing international strictures without breaking any rules, so I think that we should just do it.

The Deputy Convener: I think that Pete Smith wants to come in. Can you hear us, Pete?

12:30

Professor Smith: I could not hear you before, but I can now.

On the east coast of Scotland, we have some of the most productive land for producing fruit and veg anywhere in the world, so we should be using that land and incentivising the farmers in those areas to produce that fruit and veg. It goes back to Morgan Vaughan's point that it is horses for courses—or regions for regions, if you like. Over on the west coast, in Morgan's conditions, raising livestock is obviously a better option than trying to grow fruit and veg, but on the east coast it is a different matter.

We must reduce our consumption of meat and dairy significantly if we are to meet our climate change targets. We use a lot of our growing land to produce animal feed for livestock. If we were to reduce our overall consumption of meat and dairy, we would not need so much land to produce feed for livestock and we could use that land more sustainably and more healthily to grow fruit and veg, particularly over on the east coast. We must have policies and support mechanisms that support different actions in different areas, because Scotland has very bioclimatically diverse regions and we must support the most appropriate form of agriculture in each region.

The Deputy Convener: Two members of the committee still want to ask questions. If the witnesses would bear with us and stay for a bit longer, that would be appreciated.

Rachael Hamilton: I want to ask about the relationship between ecosystem resilience and food security. I would like to concentrate on legislation that is not connected to the agriculture bill that could have an impact on ensuring that we can grow more food locally or improve the efficiency and productivity of livestock production.

Earlier, I gave the example of rainfall and flooding. This question is for David Harley. The Flood Risk Management (Scotland) Act 2009 focuses on flood protection, but it does not look at the flow of rivers or the maintenance of soil quality and quantity. In order to help farmers to achieve all the things that we expect them to achieve in the context of the agriculture bill, should we not also be looking at other legislation alongside the bill, such as the 2009 act?

David Harley: When it comes to water scarcity, we can improve our resilience, and the Scottish Government is looking at that as part of its work on the water and sewerage bill. That is being explored at the moment.

When it comes to flooding, I am not so sure. Flooding is not my area of expertise, so perhaps I can get back to you on that. I cannot answer that question.

Rachael Hamilton: I am worried about the fact that, as Tim Benton mentioned, there is parched ground on Scotland's uplands even though, on average, rainfall in Scotland has been fairly consistent. We have had a few peaks and troughs but, on average, it has been consistent. We are also seeing flooding. Is there not an argument for circularity here and for SEPA looking at a completely different way of ensuring that we do not have parched uplands and flooded lowlands?

David Harley: For a start, I do not think that rainfall and climate have been consistent. We are getting increasingly drier summers and increasingly flashy floods. It is that significant shift that is responsible for that situation.

Land management has a role to play in increasing resilience, and that can involve soil management, riparian buffer zones and so on. We can make our land more resilient with regard to what we grow and how we grow it, but, off the cuff, I cannot think of any situations that require greater powers for or considerations on the part of SEPA.

Rachael Hamilton: Okay. I want to open up the question to the rest of the panel, because there are certain people who believe that the agri bill is the panacea, and I am concerned that we are putting all our eggs in one basket and that everyone is looking to farmers for the solution—or, indeed, blaming them for the situation. There are many other things that should be looked at alongside this in a—to use that dreadful word—holistic manner. I wonder whether Tim Benton has an opinion on that.

Professor Benton: I agree with you in the sense that, if you look at the UK's national food strategy, it covers, I think, 19—[*Inaudible*.]—departments including—[*Inaudible*.]—innovation. Land use and its impact on the environment, food production, health, the trade environment and the economy are not agriculture issues. If there were one issue that I would want to leave on your desk to think about, it would be that.

On the broader question that you put to David Harley, blocking drains on the uplands makes a big difference to the flashiness of the floods downstream. There are lots of examples of that, and I am sure that David is fully on board with that view. The issue is the degree to which approaches to such matters are incentivised from a land management perspective through the agriculture bill versus their being incentivised through other ways and how all the pieces are all connected, but you really need to take a systemic approach. To use the terminology in the IPCC's special report on climate change and land, in which Pete Smith and I were involved, I would just say that land can do a lot but it cannot do everything. In the same way, agriculture and the agriculture bill can do a lot, but they cannot do everything to solve all of these complex problems.

Rachael Hamilton: Convener, did you notice whether anyone else wanted to come in on that?

The Deputy Convener: I think that Ian Boyd-Livingston does, and then we will have to move on to Karen Adam.

Ian Boyd-Livingston: All that I will say is that Scotland is going to depend on its farmers far more in the future. Blaming them does not achieve anything. If a farmer is doing the wrong thing, they should be encouraged to do the right thing. There will be no food security without Scotland's farmers—it is that cut and dried.

Rachael Hamilton: We cannot eat trees, can we?

Ian Boyd-Livingston: No, indeed.

The Deputy Convener: Karen Adam has the final question.

Karen Adam: I also have a supplementary, convener, so I will try to be smart and blend the two questions together. Please bear with me.

I have found the evidence session really interesting. Picking up on what Pete Smith was talking about, I would just say that the climate here in the north-east, where I am, is fantastic, with perfect growing conditions for fruit, including soft fruits, and vegetables. However, one of the issues is that, even though we are growing all this fantastic food and we have the best soil possible and so on, there is no one to pick anything, and the fruit and vegetables are going rotten in the fields. It has been really interesting to hear how interdependent we are on so many factors when it comes to food stability, our ecosystems and so on. Everything is part of a chain, and, if we are to have the good food that we have been talking about, we must look at everything in the round.

Although it has been fantastic to hear what everyone has had to say, I am going to try to wrap things up by asking whether there is anything that you feel should be included in the agri bill that we might not have spoken about and that we might need to tie into it.

Ian Boyd-Livingston: There needs to be support for farmers who do not want to farm livestock. That is fundamental.

Professor Smith: This has already been brought up, but the fact is that, although agriculture can be viewed in isolation, it does not happen in isolation. We need cross-references with the biodiversity strategy, our net zero commitment, the Climate Change (Scotland) Act 2009, the updates and various other things, and we might also need to cross-reference with other agriculture legislation, because we cannot solve this in isolation.

Professor Benton: As I have said, the question that keeps coming up is about the implicit assumption that Scotland's food production goes towards Scotland's food security. That is not the case. It might be increasingly the case in the future, and one might argue that it should be the case if it were incentivised in the right way. At the moment, though, Scotland's food security does not depend on its food production. The question, then, from a strategic perspective is whether food security and public health, from the point of view of diet, form an important part of the holistic thinking or whether you are thinking purely about agriculture and the environment.

Karen Adam: I find that really interesting. According to a publication that has come out today from the Rowett Institute, the 19 per cent inflation on food prices is going to have serious health implications for citizens in Scotland. I absolutely agree with you—I just wanted to reference that paper, too.

The Deputy Convener: Does Morgan Vaughan or David Harley want to come in on that question?

Morgan Vaughan: For me, we need a support mechanism for high nature value farming, with a high proportion of the budget going towards policies that are targeted at nature restoration and emissions reduction overall. That is what the bill has to do.

David Harley: I reiterate that we need to support farmers by providing them with advice and that we must facilitate co-operative action across landscapes and catchments.

The Deputy Convener: I thank the witnesses for their evidence to the committee this morning and for staying a little longer than was anticipated. That concludes the public part of our meeting.

12:42

Meeting continued in private until 12:46.

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Published in Edinburgh by the Scottish Parliamentary Corporate Body, the Scottish Parliament, Edinburgh, EH99 1SP

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