



Northern Ireland
Assembly

Committee for Agriculture, Environment and
Rural Affairs

OFFICIAL REPORT (Hansard)

Briefing by the Expert Working Group on
Sustainable Land Management

8 December 2016

NORTHERN IRELAND ASSEMBLY

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Members present for all or part of the proceedings:

Ms Caoimhe Archibald (Chairperson)
Mr Oliver McMullan (Deputy Chairperson)
Mr Sydney Anderson
Mr David Ford
Mr William Irwin
Mr Patsy McGlone
Mr Harold McKee
Mr Robin Swann

Witnesses:

Professor Sue Christie	Individual
Dr John Gilliland	Individual

The Chairperson (Ms Archibald): I welcome Dr John Gilliland, chairman of the expert working group; and Professor Sue Christie, member of the expert working group. I ask you to give us your presentation and take up to 10 minutes, and we will then have some questions from members.

Dr John Gilliland: Good morning, Chair. Thank you very much for asking us to the new Committee. We gave evidence to the old Committee. I wish you all the best in your deliberations on agriculture and the environment. May I introduce my colleague Sue Christie? Sue has been one of the 12 key members of the expert working group, which was challenged with the job of putting this together.

I want to remind the Committee and tell people who were not at our previous evidence session that the work of the land management strategy was called upon out of the Agri-Food Strategy Board's 'Going for Growth' report. Recommendation 22 is that, if we are to deliver on the scale of ambition that is laid out in the 'Going for Growth' document, we need to look at how we better manage our agricultural land in Northern Ireland and do so more sustainably. The challenge was then laid with the Department of Agriculture and, as with all recommendations in Going for Growth, a team was designated to look at that. I was approached by the permanent secretary in September 2014, and the working group came together two months later. The membership of the working group included a cross section of stakeholders such as farmers, people with considerable environmental interest, policymakers and a representative from the food chain to help explain that. From day one, a key part of that was that we wanted the predominance of people to be active land managers and farmers. The majority of the committee members are farmers, because we believe that it is them who have the biggest job to do in implementing the land management strategy.

The aim of the strategy was set out to do three things. One is to help deliver the ambition in Going for Growth, which has the potential of increasing the value of output by 40%. The second one was to look at how we can improve farm incomes, and the third was about how we reduce our environmental footprint. The aim was to do all three of those simultaneously. It is fair to say that I do not believe that any other working group in Europe was asked to deliver against an agenda of increasing output, increasing profits and improving the environment.

We did a horizon-scanning exercise to look at some of the big issues coming forward and also did a snapshot of the current state of the industry and the environment. One of the key things that came out in that process was to do with the fact that Northern Ireland, as you know, is a grass-based agricultural industry on the whole, and one of the key metrics through which we measure success is a thing called grass dry matter utilisable yields per year. Our top 5% of farmers were hitting 16 tons per hectare, yet our average in Northern Ireland is down at 5.1 tons. We said, "Hold on, there is something that we need to get our head round". When we delved into that, we found that we needed to go back to basic principles and look at our soils. We found that only 2% of soils in Northern Ireland get soil-sampled every year, that only 18% of our land was at optimal fertility and that we had a structural problem where land is rented in conacre in that the insecurity of the 11-month lease meant that people were not liming it and not putting habitats on it. This needed to be addressed.

We looked at the environmental performance. A lot has happened since 2004, when the nitrates directive was introduced, on nitrogen and phosphate, which are two key metrics that the European Commission monitors our performance on. Our total nitrogen balance in Northern Ireland is down 10%, which is positive, and our efficiency of use is up 12%. Phosphate is really our issue, not nitrogen. Our total phosphate balance is down 32% and our efficiency is up 28%. That is good, but there is a "but". If you compare where we and others are with the water framework directive, you find that 62% of our water bodies fail good-quality status against an EU average of 47%. When we teased into that, one of the key issues was about phosphate, and one of the newer pieces of evidence that we uncovered is that most of the phosphate — up to 80% — that goes into our water does not travel through the soil but travels over the top of the soil in extreme rainfall. That brought a new dynamic to how to go forward with that. If I were to put a bag of nitrogen in water, it would disappear within about a month, but if I do it with phosphate, it will be there for maybe 50 years. Therefore, our big issue is how we deal with a legacy that is as extensive as that.

On top of that, only one of our 49 priority habitats in Northern Ireland is in good status, so there are some big issues around the environment. That is compounded by the way that we look at environmental regulation and the governance of environmental regulation. We have a unique system in Northern Ireland — different from Edinburgh, different from London and different from Dublin — where our Environment Agency is both an advocate, giving advice, and also the cross-compliance inspector. That is different. In Scotland, if a farmer wants environmental advice, they phone the Scottish Environment Protection Agency (SEPA) or maybe Scotland's Rural College, and they come out and give advice. Here, when you ask for that advice, you have a cross-compliance inspection first and then you get the advice. Surprise, surprise, not many people are asking for advice, and we feel that we need to turn that around.

Looking forward, we wanted to focus on two key principles. We believe that the biggest challenge that we have is getting farmers to engage and getting a behavioural change. We believe that key in that is personalising the information. That means making it relevant to them, not to their catchment or to their county but to their own land. Second is working on a principle that has worked very well in the intensive poultry and pig sectors. It is around the concept that, if you can measure something, you can manage something. Currently, we do very little managing around soils and land and grass. So, embracing those two principles, we feel that we have no other choice but to create a really robust baseline of information today to which then we can measure against. We are advocating that, across the whole of Northern Ireland over the next five years, we need to carry out GPS soil sampling and soil analysis to get that database on fertility and to look at the pH of our soils, the phosphate of our soils and the organic matter of our soils. Organic matter is very important. It is not normally tested for, but we need a check and balance because quite a lot of farms are going to have to put lime on to correct their pH, and we do not want to see lime being put on high organic soils. Therefore, part of the test is to do that.

In the principle of measuring and managing, we want to introduce a system where farmers actually do measure. If you are a grassland farmer, there are new tools. One is called a Grasshopper, with a sliding plate and a digital recorder on which you can measure grass on a weekly basis. There are forage harvesters that have yield monitors, just like combine harvesters do. With those, we can measure where our yield of grass is against our soil fertility. We want to commission a new piece of

technology called LiDAR (light detection and ranging), which is an aerial survey that gives you a three-dimensional, accurate map of your landscape. The reason we want to do that is twofold. The first is to try to focus on where water runs off agricultural land. If we know where it happens, we can do something to slow it down, pull the sediment out and pull the phosphate out. LiDAR allows you to do it. There is a good piece of work being carried out by Rachel Cassidy at the Agri-Food and Biosciences Institute (AFBI) in Hillsborough that looks exactly at that. That will allow us to put in a landscape intervention. The second reason is that we also want to look at the value of our hedges and farm woodland in ruminant landscapes. At the moment, trees and hedges are totally ignored on farms, but they consume greenhouse gases, even though cows release greenhouse gases. We want to get a value for that, and LiDAR allows us to do that.

On top of that is looking at water quality. The big issue with water quality is actually personalising that information. We want to build on the success of a project in the South of the island, the agricultural catchment pilot, that is run by Teagasc. We want to look at 80 catchments where we do real-time water monitoring on an hourly basis. That water monitoring is sampled and fed into a catchment discussion group to show people the water quality going past their fields, so that you start with informing people first, and then, when you change practices, you can see the results.

Key in creating all of this information is creating a database to hold it all and creating a decision support tool that will be freely available to all advisers going out on farm. When an adviser goes out on farm, that farmer will put in the GPS coordinates for their farm and get personalised information on soil fertility, water quality, topography and where to put in a landscape intervention to slow dirty water down if necessary. So, it is really personalised.

We believe that there is a collection of things that need to happen to implement the strategy. First, we have to review and revise environmental governance. Our Environment Agency has to be an advocate first. The Scottish and Irish models have separated advocacy and enforcement in regard to cross-compliance, and we need to look at that. Nowhere did we hear anyone saying no to enforcement. That is not the issue. The issue is allowing people to reach for the phone without the threat of fear. Secondly, we believe that there are around 1,200 farmers who will have no land solution to the spreading of phosphate. We recommend that there should be a once-off scheme to put in nutrient recycling technology on those farms to precipitate phosphate out and to take it away from those intense areas of phosphate to arable areas that are short on phosphate.

Key to this is driving profit. It is far easier to get farmers to engage when they are making money. So, right at the heart of this, we have been looking at how we can help farmers to do something that is in their control. Market prices are not in their control. Managing grass is. We recommend a target of shifting grass utilisation per hectare per year in Northern Ireland as an average by one ton and improving grass quality by 7.5%. That will greatly increase profits on beef and dairy farms. At the same time as we are doing that and not putting more phosphate on, we deliver on the concept of mining surplus phosphate. When the soil analysis is done, some land will be very high in phosphate; some will be very low. The idea is to take that phosphate out of the land and accelerate the reduction of that phosphate legacy.

There are two or three things that are really pertinent in the structure of the industry. We want rented land to deliver better for the environment and for production. We have a letter of clarity from HMRC saying that any landlord who goes into a lease of five years or longer will not be negatively impacted for agricultural property relief and capital gains tax. That is key to reassure landlords. We would like to incentivise leases of five years or longer for landlords. The Republic has had a very good scheme running for three years now, which has been quite successful in getting landlords to switch from an 11-month lease to a lease of five years or longer. That is by giving tax exemptions to their income, which are tapered depending on how long they go into the lease for. We want something similar here. We also want to look at accelerating succession to get young, educated farmers in. It is very clear that when an educated farmer takes control of a business, there is an increase in the financial output quite quickly by up to 12% or 15%.

Closer to the industry, then, we want to look at precision farming. Now that we are going to know where our fertility is good and where it is bad, we can apply our nutrient, whether slurry, farmyard manure, artificial fertiliser or lime, using precision technologies. These are already available in the arable sector in other parts of these islands but are not currently used on grassland. So, it is about spreading lime, slurry and fertiliser by using the GPS soil analysis. We want there to be grant aid for those technologies to help bring in variable-rate spreaders. We want to encourage farmers to analyse their slurries and farmyard manures. It is one thing to have soil analysis; it is another thing to have precision application. However, if you do not know what you are applying, it makes a nonsense of it.

We want that to be accelerated through ready reckoners that help farmers to decide what the dry matter content is and what the phosphate content is.

Key to the drive for grass utilisation and grass quality is to improve the economics and reduce our phosphate legacy. We asked AFBI to do an independent economic and environmental impact assessment on those recommendations. It has shown — I am happy to show the Committee — that we can deliver on all three things: an increase in output, an increase in profit regardless of the price from the marketplace, and a considerable reduction in phosphate balances, which is the key metric that we are checked on. There is a downside, and there is a trade-off, as by doing that we will increase nitrogen in water by a very small amount. To put it into context: it will be by 2 to 3 milligrams against a baseline of 50 milligrams, and we are currently sitting at about 18 milligrams. We have headroom on nitrogen. We have no headroom on phosphate. Certainly, when we have talked to the Commission, it is happy that this is the right strategy going forward.

Alongside that, there are landscape measures — what we call our "multifunctional technologies". For example, we have known for years that clover is an asset as it takes nitrogen out of the sky, fixates it and creates fertiliser in the ground. Very few people know that clover also opens the ground up and allows rainfall to get through the soil up to 12 times faster than straight perennial grass. One of the key things in driving grass utilisation is not necessarily more grass; it is how to use it. Our problem is that it is normally too wet to graze the grass that we grow, so bringing in things like clover will also help us to do that. It will also give us more protein so we have less to bring in.

We are very keen to see the work being done by AFBI in Loughgall on agroforestry and grassland being encouraged. On the day we visited, in February, it was soaking wet. We walked through a ryegrass field to get to it, and it was squelch, squelch, squelch, until we went into the agroforestry, which was bone dry. The trees were drying out the ground, yet they were grazing animals quite happily. Using this as 5% to 10% of your grazing platform, you can de-risk — you can get some stock out a little bit earlier and keep them out a little bit longer, and you can keep them out during extreme weather events in the summer. It is about looking at new tools to de-risk weather and our wet weather here.

We are very keen to see the concept of woody riparian strips being positioned in places of overland flow. Instead of having buffer strips parallel to a river, the LiDAR tells you exactly where the dirty water runs off, and you put half an acre of woody trees there to slow the water and take the deposits and phosphate out of it. The water will eventually go into the stream. Then you coppice it and take the nutrient back off it again. Likewise, immediately downhill from a farmyard, where you have grey water coming off concrete and septic tank outlets from houses all going in, it is about trying to find biological ways to stop it going near our watercourses.

We were asked to look at knowledge gaps where we need further research. One area is about the time and conditions in which we spread nutrient. We currently farm by calendar date, which has been our policy under the nitrates directive. Take the last three months this year: the closed period started on 15 October, and the last week running up to it was a fairly miserable week; the two weeks after it were stunning. The weather was dry; the soil temperatures were high; yet, we are not allowed to spread. There are technologies used in the irrigation industry in southern parts of Europe — in places such as Galicia — where they are using soil moisture potentiometers and thermometers, linked by SMS to computers, which can tell you every hour what the moisture or temperature of your soil is. When we talked to the Commission about this, it was not averse to using science to look at giving derogations to people who invest in new technology so that you apply the nutrient when the ground is right and not by calendar date. We want to see that happen.

We also want to see investment in a better ready reckoner for farmyard manures and slurries, so that farmers know exactly what they are spreading. We want smart ways of reducing the biosecurity risk of moving manures from one livestock farm to another to be looked at. We have no other choice; we will have to move some nutrient from one farm to another, but vets are concerned about the spread of TB and other livestock diseases, so we need to look at the biosecurity risk.

There is a policy anomaly. Sometimes policies create a perverse outcome. At the moment, it is easier for a farmer to buy artificial fertiliser imported into Northern Ireland than to go to a neighbour and use their surplus slurry. We have got our bureaucracy wrong. We would like farmers to use local slurries and farmyard manures first and artificial fertilisers second. We need to revisit the bureaucracy around that. That is a perverse outcome of policy.

At the end of the day, we believe that, through this, we will create a very transparent way of leading behavioural change, empowering farmers and land managers, showing them best practice and personalising the information, but have a way of measuring it. Built into this is a collection of indicators that we will measure annually to look at how we are doing against that trajectory. We believe that, regardless of the politics and economics outside farming, if we do this, we can empower farmers to take control of their own destination and drive their and the environment's prosperity. We need to do it transparently, so that we can show transparency to the global marketplace that wants our products.

Chair, I heard that you were with Bord Bia, and I am sure that you will have heard about Origin Green. We want to go beyond that. Why should Northern Ireland not champion something and do it in a very transparent way so that international customers come to us as an international exemplar in best farming and environmental practice?

The Chairperson (Ms Archibald): Thank you very much for your presentation. It is a very good piece of work. I could ask loads of questions about it, but I will try to limit it. The first and, I suppose, most obvious point is that it ties in quite well with the Programme for Government's outcome on protecting the environment. A lot of things that you mentioned in your presentation will require significant investment. What resources will be necessary to roll it out? Do you want to pick up on that first?

Dr Gilliland: We were asked to deliver the strategy first, and we have done that. In her acceptance speech for the strategy, the Minister asked the expert working group to do two or three more bits of work, one of which will look specifically at ammonia, which is another issue. She also asked that, when asked, we help the Department on how to implement it. We have offered that help.

The Agri-Food and Biosciences Institute was asked to look at the positives. We believe that, if we can shift by just one ton — shifting Northern Ireland from 5.1 tons to 6.1 tons — against a capability of somewhere between 12 and 16 tons — it is not an overly stretching target — we can lift total farm income in Northern Ireland by between £120 million and £160 million a year. If you look at, say, a five-year payback, I would argue that that allows for quite an investment. I do not have a detailed costing of the exact figure, but we are quite confident that the lift in total farming income will show a payback within five years for any public expenditure. It is also about private expenditure, because a lot of what will have to go into it will be things like reseeded and putting more lime on the soil, which are all things that farmers will have to do. It is a partnership; it is not just about pitching at the public purse.

The Chairperson (Ms Archibald): Significant expertise and scientific expertise will be required for a lot of the work. Do we have that expertise at the minute, particularly on the soil analysis and those types of things?

Dr Gilliland: Nearly everything that we have seen, we have seen commercially available across these islands, but not necessarily here. On soil analysis, for example, I manage a farm in the Republic of Ireland where that is automatically mechanised. We have a guy with a quad bike, an automatic soil sampler and GPS. It would not take long to get one or two of those in Northern Ireland. Northern Ireland currently uses a lab in England called NRM for soil analysis, and I am led to believe that it has the capacity to do it.

It would be impossible for all of Northern Ireland to be done in one year. We see it happening in a four- or five-year programme, with the hope that people who were in year 1 will want to come back in year 6. We want people to come back. It is a journey. What is really interesting is that, when you have measured first and then implemented your management changes, it is nice to measure again to see the benefits of those changes. So, we will also be advocating for people to come back. It is our belief that key planks are available.

The database and software will need some precision work. Government has commissioned big databases before, for example, the animal and public health information system (APHIS). So, there is expertise there, and there are commercial companies that would love to be in this space. I would like to see something indigenous, because we have brought this from the ground up, and, at the moment, it is being hailed as an international exemplar. Only two weeks ago, at a water frameworks conference in Brussels, WWF stood up and praised Northern Ireland for its vision as the exemplar for Europe. I have never spoken to WWF, but I have spoken in Bratislava and have spoken to the Commission, and it is very interesting that one of the global leaders in NGOs is saying that this makes sense.

Mr McKee: Thank you very much for your presentation. It was very interesting. Are ammonia emissions from all grazing livestock? Is that a by-product of nitrogen deposits?

Dr Gilliland: To give a degree of clarity on this: the current land management strategy was not able to look at ammonia in detail because it was about a land management strategy as such, but the Minister has extended our piece of work to look more at ammonia. I am prepared to say that, so far, what we have learnt about ammonia emissions is that they are a by-product of all animals — grazing livestock and intensive sector. Currently, the intensive sector is regulated and has had a lot of restrictions put on it. It would probably be fair to say that 70% of ammonia emissions in Northern Ireland come from ruminants, which are grazing livestock. There are some challenges around that. Ammonia emissions create nitrogen deposition, and some priority habitats have been quite badly hit by nitrogen deposition. So, we, as a working group, respect why the Minister has asked us to do it, and it is our plan, in the next six months, to come forward with a similar methodology on land management with ammonia to try to help the industry in reducing its footprint on ammonia.

Mr McKee: On grassland management, have you seen any merit, particularly for the dairy men, in zero-grazing as opposed to grazing?

Dr Gilliland: We focused more on the soil than the methodology of grazing. It is very clear that we want to see farmers increase grass utilisation. We did not purposely look at zero-grazing. We looked at how we would get better quality grass. So, we looked at the soil pH and soil structure, and then we looked at how you would dry out the swards to get longer grazing. Longer grazing could also mean longer periods to do zero-grazing, because both zero-grazing and conventional grazing are totally determined on how wet the soil is and whether you can travel with a tractor or whether you can put cattle out there without poaching it. So, what we have looked at is not the tool that you utilise but how you make the ground more robust to extend the number of days that you can graze it. That increases utilisation. So, we have not made a recommendation of grazing over zero-grazing. We did not go there. We focused on the land itself rather than whether it should be a cow or a machine.

Mr McKee: I had written down "slurry spreading in correct conditions, not dates", before you mentioned it. The mindset of Europe is, "This is the way that you are supposed to do it". What are the chances, subject to article 50 being triggered and us being in charge of our own affairs, of us as a government and a Department having a look at this and seeing if it can be done?

Dr Gilliland: We have asked, as a very clear recommendation in the document, that the science needs to be validated in Northern Ireland conditions. If the science is validated and proves that it is of use to the industry, we would recommend that ways are made to allow that to happen. How I envisage that happening is that people who are seen to be investing in a technology, can prove that they have invested in it and know how it works, would then get a derogation from the likes of the closed period. I do not believe that we would be allowed to get rid of the closed period in the short term but if you could use science in a better way that allowed you to do it, that is how I would see it happening. I have presented to every commodity committee around the farmers' union and the Young Farmers. Certainly, when we spoke, they were up for it. They saw it as a welcome development.

I have to say, whether it be in wintertime or summertime, putting nutrients on the ground when it is wet does not make sense. There are nitrous oxide emissions. Nitrous oxide is nearly 300 times more potent as a greenhouse gas. If you put nitrogen on the ground in wet weather, it just goes straight up. If you put phosphate on the ground in wet weather, the run-off goes straight into the streams. The key principle at the core of the land management strategy is to go back and look at science. What does the science say? What are the practical outworkings? We believe that it is better to spread nutrients when the ground is dry and warm. We would like to see whether there are sensor technologies that are robust enough to work in a Northern Irish situation. If they are robust enough to work for vegetables and irrigation in Spain, we could make them work here. I do not think that it is a big leap of faith to get them here, but I cannot convince an environmental regulator to go that way until we validate it. We need AFBI or whomever else to validate the science. Once it is validated, then, absolutely, we should look at this and encourage it. As we have recommended for GPS spreaders, that technology should be supported.

It is in the public's best interest to see the industry switching over. I believe that, where public money is going to be invested, it is about promoting best practice, getting people to change their behaviour on the best practice and having science as the driver. What has happened before is that, sometimes, policies are made in the absence of science. The closed period was one example. I was president of the UFU when nitrates were being negotiated. It frustrated me that we were being beaten up on the

nitrate directive when we had a phosphate problem. It was in the absence of science at that stage. Now that the science and technologies are better, I believe that we should look to move that way. I see it as a great signal to the next generation, the educated generation coming through, and gives them heart that there is a future in the industry and that they are allowed to use the latest innovation. We should reward innovators. There is nothing wrong with innovation.

Mr Ford: Thank you, John and Sue, not just for coming in but for the work that you and your colleagues have done over the last while. Having read the report and heard the launch at Hillsborough, it certainly seems to me that you have covered the agricultural and environmental bases extremely well and in a way that needs to be taken up. If I have any slight quibble, I am not sure whether, when you look at the issue of 30% of land being in conacre and two thirds' being below the proper pH status, we are really into precision farming being the key issue in many cases at this point as opposed to just getting some basic overall improvement. Having said that; accepting the tenor of your report, one of the points that you make is that there should be no cherry-picking of the options. However, at a time of financial stringency, there may be phasing as opposed to cherry-picking. Have you had any discussions with the Department about that?

Dr Gilliland: We have made a recommendation on that. We respect that phasing is the most likely way in which it will happen, given where we are at the moment. We see two or three different approaches to this. The first is the new business development groups that have been set up. You have 3,000 people there and they are probably producing nearly 60% of all the food that comes off Northern Ireland land. They are already engaged through the College of Agriculture, Food and Rural Enterprise (CAFRE). This is one of the quick ways in which to get that out. There are also one or two catchments where LiDAR and water monitoring have already been done. I am aware of the Minister's recent announcement about maybe using some of the emergency money to look at how you build on those platforms and road-test how you would roll this out on a Northern Ireland basis. Then there are significant landowners, whether the National Trust or others, who have the ability to road-test this on their own farms as it rolls out.

If we are going to get public funds to do soil analysis, it is equally important to get the sampling done right. We want something that is absolutely accurate. Technology has moved on but bringing in an automatic sampler with GPS is not much more expensive than sending someone out with a soil auger and a pair of wellies to go walking. For the same kind of money, you can get real precision. If we are going to do it, why not do it right once and for all? Ultimately, we wanted to leapfrog a lot of other regions that exported food onto the international market against us. We wanted to get an edge over everybody else. One of the things you talked about was a food marketing body or whatever else. This is to give it as much ammunition as possible when it goes out to market Northern Ireland produce. In the world of uncertainty that we are now in, we are going to need every extra penny we can get out of the marketplace, so anything that builds credibility and transparency is welcome. From day one, we said that we wanted to go down the route of GPS and precision because that brings us a better total package. We think that it is better value for money and, ultimately, gives us a credible story that none of our competitors has.

If and when we get our act together in how we market our food for Northern Ireland, we will have a story to tell that is unprecedented. We can focus on how we position our product on the international market and increase value for the product that is grown here.

Mr Ford: There is a lot to be done in engagement with DAERA. As I understand it, land law is the responsibility of the Department of Finance. If we are to look at a proper reform of the conacre system, as opposed to getting round it, is there also a need to engage with the Department of Finance and do something under a form of land law that has not been proceeding for a number of years?

Dr Gilliland: We do not believe you need to look at land reform. There are perfectly good templates of medium-term tenancies. Landlords should have the ability, if they want to go to a five-year lease or longer, to make that choice. If they want to stay for 11 months, that is also their choice, but we are not going to incentivise them to do that. We have not made any recommendation on land reform. However, we do need to engage with the Department of Finance. If we want to give landlords a tax break to incentivise them to switch from 11 months to five years or longer then we, in Northern Ireland, do not have the ability to do that. It is a Westminster issue.

If we were to set ourselves an optimistic challenge to get 50% of conacre into a five-year lease by 2020, that would be a very good success; but the issue is quantum. It represents only £5 million or £6 million, which, in the total picture of where we are going, is insignificant. However, you then make

such a dramatic difference to the productivity of the land in food and environmental goods. It is absolutely time that we looked at it.

We felt that land reform was such a political hot potato that it distracted from just getting it done. We were quite taken by the Irish. They did not go into land reform; they just did this and are getting behavioural change. I want behavioural change. I want to see more land on long-term leases because that will deliver on the remit we were given.

Mr Ford: The difference being that the Irish are the sovereign Government who can alter tax rates.

Dr Gilliland: They could do it far more easily, but we have looked long and hard at this issue. When we came to this Committee in its previous guise, conacre was a very big hot potato around this table. The message that we got was this: tinker with conacre with care. That was certainly the signal we got. We have listened. Rather than make a recommendation to remove conacre, we have said that there should be an incentive set to move people away from it voluntarily. If it becomes a political battle, we could lose behavioural change. At the present, farmers are really suffering out there. I argue that, regardless of how much or how little money the public contributes, everything that we have put into statute makes economic sense to farmers. The key reason why we are asking for public help with this is to get behavioural change or cultural shift. This makes economic sense. There has to be a big change in the culture. I am proud of the culture I come from: I know where I come from; I know my peers; I know myself. OK? We need help with that big shift.

Mr Ford: I fear that the difficulty will end up with the Treasury, even if our Department of Finance is arguing for us. It may end up being easier to reform land law in Northern Ireland than to persuade the Treasury to change tax law. I hope not.

Dr Gilliland: I understand where you are coming from, but we may have a few other tricks up our sleeve.

The Chairperson (Ms Archibald): You make a very important point regarding precision sampling. If we are going to invest money in the pilot, we really need to emphasise that the samples need to be quality samples.

Mr McMullan: Thank you for a very interesting presentation. I have only a couple of quick questions before I have to step out for a few minutes. We talked about land management. You talked about beef and milk but you did not mention sheep or hill. I know that there are different problems associated with them. Where do you see this fitting into the land management question, John? How can we get better productivity from the hill?

Dr Gilliland: We have not differentiated the hill from any other land. The principles we have bedded into land management are exactly the same on the hill as in the lowlands. It really depends on whether you are in a severely disadvantaged area (SDA), how much heather you have got and what the grazing regime is.

Mr McMullan: We will not have any more SDAs when the Minister does away with the payments.

Dr Gilliland: Back to the core; sheep production becomes more profitable if we can grow better quality grass. There is a stark contrast between grass utilisation on beef and sheep farms in Northern Ireland. Hills will never do the top figure. The top figure is up around 16; CAFRE says that we should be hitting 12. Dairy farmers are 7.5; the average is 5.1, and beef and sheep are down at 4.1. There is a lot that we can do to help beef and sheep producers improve their grass quality and utilise it better. That is right at the heart of this document. We did not pull figures for sheep out, but we pulled figures for beef and dairy out. I can ask AFBI to run the same figures for sheep and I will be astonished if those do not show a similar uplift in profit per hectare.

Mr McMullan: On the hill, not on the finished carcass on lowland.

Dr Gilliland: It is about grass, whether on the hill or not. Your profitability in an area at a time of no subsidies will be from grass utilisation and how you use the small amount of grass that you have wisely.

Mr McMullan: That is very interesting. I could speak to you longer on that, John. It will be interesting to see the figures for sheep and hill when those come back from AFBI. I agree that the whole thing about clover and all that on grassland is vital.

Dr Gilliland: We have a clutch of case studies on hill situations in the report too. We had two full engagements with the hill farming community in the farmers' union and a written submission. We also got quite a lot of evidence from Wales about some of the successful projects there, including the localisation of fencing to control grazing. If you take stock off, there are negative consequences to the environment from under-grazing. On a lot of hill and in an area where there is no subsidy — I do not know when that might happen — under-grazing will be a really big issue. In one of our Welsh case studies, we flagged up where they have put appropriate fencing to manage grazing at the right stocking density.

Professor Sue Christie: This is only one aspect of how Northern Ireland agriculture and land are managed. There is also the 7% of our land which is in designated sites, and then areas of outstanding natural beauty (AONBs) on top of that. A lot of it is hill upland and it needs to be managed in a slightly different way than pure grass production in the lowlands. We recognise that there are other types of land which may need to be managed for the sundry services that it can provide such as water-holding capacity, carbon sequestration and flood alleviation. We need to think about those aspects as well in the uplands because there are many different products that uplands can offer whereas, in lowlands, we are mostly talking about grass production that leads to sales.

Dr Gilliland: We had a very good visit to Glenwherry courtesy of CAFRE. We took the whole team up there because of the need to understand how important hills and upland areas are, and we are very grateful to CAFRE because that really brought home some of the challenges in managing our uplands. We have written a report and sought advice beyond Ireland, and we particularly got information from Wales as some of the Welsh case studies are well written up, which is helpful to us.

Professor Christie: The whole point is that all land is not created equal. All land is not the same, and we have got to manage each bit of land as appropriate. As we scientifically analyse what it can produce and what it does produce, in some areas that will mean much more limited grazing because the land is delivering other benefits.

Mr McMullan: I agree, and where you are coming from on that is interesting. I would like to see it in your report. When you talk about the Welsh examples, they are working under national park rules. In quite a lot of Wales, it is not what we here would class as field grazing.

Dr Gilliland: I am not certain whether our Welsh case is in the national park. I will follow that up.

Mr McMullan: That would be interesting. It has been said for years that drainage contributed to flooding from hills, which came from forestry and open drains etc. A brown flood in a river took about half a day or a day to gather, and now you can have a brown flood zone in about an hour. Have you had a discussion with Forest Service on that aspect of drainage?

Dr Gilliland: No, because our remit was to focus on agricultural land and not forestry. We have focused predominantly on agriculture. We are very clear in our report about looking at agricultural land and how to get it to absorb more water and not let water run off. It is why we specifically looked at the roles of clovers and legumes in upland grazing situations and how they open up soils and let water percolate through the soil and not run off it. It is also why we looked at the agri-forestry work in Loughgall, which has a tree every 10 metres and has done a fantastic job of drying land and reducing the amount of run-off from it. It is extending the grazing season; so, animals can graze for longer, which helps in profitability of sheep production or suckler cow production on uplands as you can use your grass in a better way. Grass is your cheapest feed. Silage is more expensive, and bought-in concentrate is even more expensive again. We are trying to get people to use grass, which is the cheapest, and to graze it better and longer.

Professor Christie: At the moment, DAERA is working on possibly developing a natural capital asset index, which would look at what the land can provide, what it does provide and how it can better provide goods and services for people beyond just agriculture production. It is aimed primarily at the designated sites but it is also looking at all the upland sites. There are world-class examples in Northern Ireland of blocking peat drains for water purification. Northern Ireland Water has been

looking at that in the Garron plateau, where blocking up drains has slowed down water flow and is increasing carbon storage, decreasing flooding and possibly increasing carbon —

Mr McMullan: It would be interesting to know where the budget for that comes from, because this Minister has nearly wrecked the hill with her decision to cut the area of natural constraint (ANC) payments. Sue, you talked about the dangers to the hill from under-grazing. That will be a real danger. If the stocking levels on the hill drop, we will have a major problem, and it will only take about one year at most to see that coming through. It is not a long-term thing but a very short-term thing.

Professor Christie: We are not allowed to do that under our designated site management plans and international commitments. I am sure that there will be mechanisms involved to avoid that.

Mr Irwin: I welcome the report. As a farmer, I declare an interest. Even modest improvements in grassland are of huge benefit, as you said. Departmental officials referenced the farm business improvement scheme some time ago here and I asked them why there is no grant aid for lime when reseeding. They said that Europe would not agree to it. Are you aware of that?

Dr Gilliland: We are aware of it and that is why, in our thought process, we still see that as a farmer cost. What we have said is that, where people are moving over, they will put lime on the land. Europe will not fund this because lime is a fertiliser and it does not fund fertiliser in any other way. Europe will not break that rule for lime. Europe sees it as a soil conditioner that releases natural fertiliser; so, it acts as a fertiliser.

We are saying that we will do two things. The first is that we will help you to determine the right lime for your soils. At the moment, only 2% of the land is done on an annual basis. A massive step is empowering people to know the right lime for their land. The second thing is that we will do it in detail. When you get the analysis of your farm, you will maybe see why one field has been grazing better than another. For the first time, you will get it in a pictorial way so that you can see pH levels in two-hectare blocks across your farm and see the variation. It is the same with phosphates. It will enable you to say, "Ah, I understand that now. I have always wondered why this field did better than that one". It personalises the information and gauges it. You will then find that, on your farm — it is the same on my farm — some land is quite good and some is not so good. Being able to put the right amount on the right spot is key.

We are saying that we will support the use of variable rate application technologies to harmonise your farm and bring it all up to the same level. Normally, most people will put on two tons an acre willy-nilly across the whole place, but some places do not need any and some need four tons an acre. There will now be, at least, a robustness around that and it will help people. Lime and reseeding will still have to be paid for, but we argue that the improvement in grass quality will far outweigh the cost of doing it. We are trying to, at least, explain the economics transparently. As a working group, we cannot magic up funds for lime. From day one, everywhere we went, people said, "We want grant aid for lime again". We cannot deliver that, but we can deliver other things.

Mr Irwin: I fully understand that, but reseeding lime is quite a cost today.

Dr Gilliland: Correct.

Mr Irwin: For a farmer who wants to do that, I thought that grant aid would be very useful to encourage it.

At the moment, there is no facility in Northern Ireland to analyse soil; is that right?

Dr Gilliland: At the moment, Northern Ireland uses two labs in GB. That is a reflection of how little soil analysis has been done over the past 30 years. When we started, soil analysis was done quite regularly, but it decreased, so, lo and behold, there was never enough volume to keep a lab going in Northern Ireland. Two labs are used in GB. I know that the Department has recently tendered, and I think that the current lab that it uses is NRM Laboratories.

Mr Irwin: I see that the objective by 2020 is to have 80% of slurry and manures spread by trailing shoe and shallow injection. Do you think that that is achievable? It would be great.

Dr Gilliland: The gentleman on this side was talking about ammonia. I do not know whether any of you are aware of this, but, two or three weeks ago, the European Commission told Holland to reduce its national herd of dairy cows by 11%. Why? Because it did not comply with reducing phosphates in the water. We have a problem with ammonia here. Our problem with ammonia is that we have some priority habitats that are in really bad repair because of nitrogen deposition. At some stage, someone will come at us with a big stick. The way in which it is currently treated is that anyone going to Planning about a livestock building — predominantly those in the pig and poultry sector — has to go into very complex modelling about ammonia plumes. We now know of one ruminant farmer who has been caught by that. Given that 70% of ammonia emissions come from ruminants, the ruminants sector will have to get its act together at some stage. The cheapest way of doing that is to switch from a splash plate to a trailing shoe. Do you know something? You will get a better yield of grass.

Mr Irwin: I am not against it.

Dr Gilliland: When I look at the environment and at agriculture, my mantra is this: can I turn an environmental issue from a cost centre to a profit centre in my business? Let us take that and apply it to the issue of ammonia. I do not want to prejudge the outworkings of the expert working group, but it is more expensive and takes more time to spread with a trailing shoe than a splash plate, yet the increase in grass yield outweighs the extra cost. At the same time, it is one of the easiest ways of reducing ammonia emissions.

In all the conversations about changing behaviour, there are trade-offs. People need to watch what the Commission has done in Holland. We are going down to speak to the ammonia team in the Republic of Ireland next week. I know that they are also talking about switching from splash plates to trailing shoes. When you do a cost-benefit analysis of all the abatement measures to reduce ammonia, you will find that switching from a splash plate to a trailing shoe is probably the cheapest one, and it improves your grass yields. We have to be mature about how we handle this going forward. There are some lands where it is just impossible to do injection, but trailing shoes are like a halfway house. Injection is the holy grail. There is, however, a lot of rocky, steep ground where that is not applicable, and a trailing shoe will go a long way to help.

Mr Irwin: You mentioned Holland. I read somewhere that there will be a cull of 170,000 cows.

Dr Gilliland: Yes. About three weeks ago, the European Commission issued an ultimatum to Holland, because it had not tackled voluntarily the issue of phosphates in water, which is one of our problems. If I am correct, it said — do not quote me totally on this — that Holland had to reduce its national herd of dairy cows by 11% in 2017. I have to say that the Commission has done that before. Around the time of the introduction of the nitrates directive in 2003, we had a big battle here in Belfast, and there was a big battle in Dublin as well. At the end of the day, the Commission went to the guys in Dublin and said, "If you are not going to implement it, we do not have to give you your rural development programme money". Surprise, surprise — the nitrates directive was implemented. Regardless of whether we are part of Europe, some of our produce, post us departing Europe, will be looking to go back into the European marketplace. As sure as anything, the European Commission will make sure that we have dotted every i and crossed every t. If we want to put our product into Europe, regulation will not be slackened just because we are leaving Europe.

Mr Anderson: Thanks for your presentation. Sue, you said:

"All land is not the same".

The Deputy Chair touched on lowland, upland and other types. What work will be done with research and development and with AFBI to encourage farmers to take the proper decisions about what they need to do with their land, should that be increasing clover, as you talked about, planting more trees or dealing with water run-off? Will that advice be forthcoming to ensure that they carry out the best land management to suit their farm?

Dr Gilliland: We have said that we need an extension service to match the advisory service. Not all advice that goes out to farms comes from the public sector. There are a lot of private-sector individuals out there, too. One of the first things that we have asked for is that all advisers who go out, whether from the public sector or the private sector, be upskilled with the latest thinking and the technologies involved. We will have a database and a decision support tool that is cloud-based. Therefore, when advisers go onto farms, as long as the farmers give their permission, they will be able to access that data on an iPad, and the farmers will give them the coordinates of the farm. The

advisers will be able to tell farmers the personal information for their farm. That is unique, never having been done before. In situations in which I have seen that being done, the farmers are interested, because they can associate themselves with some of those results. They can say, "Now I understand why that field grazes better than that field" or "Yes, that is where the run-off takes place". It personalises it, and you get engagement. People are far more likely to do something positive if they believe in the data and what it says and if it is relevant to them. We have asked that there be an accredited training course to upskill all advisers, not just those in the public sector, because we want the private sector brought along.

I have presented to the Northern Ireland Grain Trade Association. It is part of the Agricultural Industries Confederation, which runs the feed adviser register (FAR) training programme. We have asked that advisers in Northern Ireland in that programme also come to this, and we have asked that it be accredited so that it is worth something to them. That would mean that you would get the upskill of the advisers. We are looking for a database and a decision support tool that advisers can go out onto farms and use. That is the platform that we envisage. We do not want it to be limited to a small group of people; we want it to be accessible so that every farmer who asks for advice can get it.

Mr Anderson: I am sure that you agree that we are coming from a very low base for soil sampling. A lot of education needs to be applied, not just the private sector but to all involved, so that farmers are encouraged to do what they can afford to do to improve their grassland —

Dr Gilliland: That is the engine for their economic growth.

Mr Anderson: — whether it will be profitable or not. That is where they want to get to. What information and research will they get on the grass that will best suit their land?

Dr Gilliland: We were not asked to write the implementation plan. We have made recommendations. If and when we are asked for an implementation plan, those are the kinds of things that we will tease out further. I know the advice that I get on the farms that I manage. I know how it is presented, and I am choosy about how it is presented. I love coloured maps; I hate screeds of writing. There are ways of getting a message over that work and ways that do not. On my office wall, I put my GPS soil-sampling analysis on a coloured map for 2014, and I have a coloured map for 2016. I can see from the changes in colour the improvement that I have made on that land in two years. It just screams off the map. Such tools are really helpful for behavioural change and personalising the information.

Professor Christie: Peer learning is another thing, where we have exemplar farms. People take that on and invite their neighbours in to see how their land has changed, the improvement that has been brought about and the improvement to profitability. There are already those clusters of farmers.

Mr Anderson: Do we have many of those farms?

Dr Gilliland: It is done through the new business development scheme. As part of the package that we suggest, we have asked that the resources to that be upskilled. Rome was not built in a day. We need to find out who are champions and ambassadors are. We already have 3,000 self-selecting people who have gone through the process as such. There is a structure around them, so it makes sense to build on that platform rather than reinventing the wheel and getting another platform. We have very clearly said that we believe that one of the key routes going forward is to use the new platform that has already been created.

Mr Anderson: Is that across all types of farmland?

Dr Gilliland: There are 23,000 farms, of which 3,000 farms are in the scheme. Within that, something like 60% of all food production is looked after by the 3,000 farmers that are involved. Therefore, as a quick way to get out to many of the acreages, this is a start. You can lead a horse to water, but you cannot make it drink. There are some people who point-blank will not engage with the scheme, and we have to accept that. However, there are some people who will engage, find it fantastic and get really good results. They will not stop at the 1 ton but will go for the 2, 3 and 4 tons.

Mr Anderson: You have to give them a good reason. They have to see results and need to be encouraged to engage.

Dr Gilliland: Correct.

Mr Anderson: They need to know what the endgame is and what they can achieve. Do you agree with that?

Dr Gilliland: The 3,000 will become the first wave. They are dotted about Northern Ireland. I saw a map of Northern Ireland the other day, and there is one in every ward out there — or as close as. They are really geographically spread out, except for the top of the Mourne.

Mr Anderson: OK. We could talk a long time about this, but thank you very much.

The Chairperson (Ms Archibald): Thank you very much for your presentation. We do not have any more members who want to ask a question. It has been very interesting, and I am sure that we will contact you again.

Mr Ford: Chair, I have just one quick point to make. Oliver mentioned national parks in Wales. The Pontbren scheme is not in a national park.

Dr Gilliland: I did not think it was, but thank you for clarifying that.

Mr Ford: I had the chance to check it. I did not think so either.

Dr Gilliland: It is the one that we case-study in our report.

The Chairperson (Ms Archibald): Thank you very much.