# UN Food Systems Summit National Dialogues

Webinar 1: Growing Greener – food production and a healthy environment

2pm to 3.30pm Australian Eastern Standard Time,

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## Transcript

**David Pembroke:**

Hello and welcome everyone to the first of the Department of Agriculture Water and the Environment, National Food Systems Summit Dialogues, Growing Greener - food production and a healthy environment. My name's David Pembroke. And on behalf of the department, can I thank you for joining us for today's dialogue. Can I begin today by acknowledging the traditional custodians of the land on which we meet today, the Ngunnawal people. We acknowledge and respect their continuing culture and the contribution they make to the life of this city and region. We extend that recognition to the traditional custodians of all other lands on which this dialogue participants today are gathered, and to all Aboriginal and Torres Strait Islander peoples attending today's event.

**David Pembroke:**

This year as we enter the decade of action for the UN's 2030 agenda, the UN secretary general has called for a Food Systems Summit to highlight the critical role of agriculture and food systems in achieving a sustainable future, particularly as it relates to all 17 of the UN's sustainable development goals. In the lead up to the summit all around the world throughout 2021, people are encouraged to participate in a series of dialogues to discuss how we can make the world's food systems more sustainable, healthy, and resilient. Joining me to explain Australia's approach is Fleur Downard, Australia's national dialogue convener, and a director at the Department of Agriculture Water and the Environment. Fleur.

**Fleur Downard:**

Thank you, David, and welcome everyone to today's webinar. The Australian government is providing a platform for you to raise your views and think about solutions for issues facing our food systems. The aim is for these discussions to be open and transparent and most importantly, to represent your views. However, it is important to note that the views expressed today are independent to the views of the Australian government. We will be summarising feedback from these webinars directly into the UN Food Systems Summit processes. The Food Systems Summit webinars are designed to start a conversation. After today, if you have more to say and to contribute, that's great. You can visit the department's Have Your Say platform for the Food Systems Summit. I'll talk more about this at the end of today's webinar.

**David Pembroke:**

Thanks a lot Fleur. The topic for today's dialogue is Growing Greener food production and a healthy environment. In this discussion, we'll explore the role of Australia's agriculture sector and highlight the many ways that its stakeholders are already working to make agriculture production more sustainable through adopting innovative technologies and market-based mechanisms. We hope that this dialogue may also help to identify future areas of both collaboration and progress. We will commence today's dialogue with a series of short presentations from three panellists, addressing the themes of today's webinar. We will then have a question-and-answer session to delve a little deeper into some of the issues that are raised.

**David Pembroke:**

We are very grateful today to be joined by Fiona Simson, the president of the National Farmers Federation. Professor Richard Eckard, who is the professor of sustainable agriculture at the University of Melbourne and Professor Andrew Macintosh, who is the associate dean of research at the Australian National University's College of Law. During the question-and-answer session, I'll also call upon Melinee Leather, who is the manager of the Leather Cattle Company in Queensland. And Melinee will provide some real-life examples of how Australian agriculture stakeholders are already working to deliver a more sustainable future.

**David Pembroke:**

So, to our first presenter today, Fiona Simson, who is the president of the National Farmers Federation. Fiona Simson is a farmer and has been a long-time agriculture industry leader. She is the first female president of the National Farmers Federation and has been instrumental in setting the NFF's 2030, 100 billion target for Australian agriculture. She has launched the NFF's first diversity in Agriculture Leadership Program, as well as working on the stewardship of natural capital and biodiversity.

**David Pembroke:**

Another priority for Fiona is building connections between farmers and urban consumers. Fiona currently chairs the recently established Future Food Systems CRC, is a commissioner and chair of the Australian Centre for International Agriculture Research. She sits as a director on the boards of Australian Made, Australian Grown and the NRMA of New South Wales and is a patron of National Rural Press Club, of the national rural press club, I should say, and the Gunnedah Gatepost Community Support Centre. So, thank you Fiona, over to you.

**Fiona Simson:**

Thanks so much, David. It's a great pleasure be here today. And I think Fleur said that this is a conversation that is just starting and that these webinars are a great way of starting the conversation. But in actual fact, this is a conversation that the farmers of Australia have been having for some time. And I think if we go to the first slide, Alison, if we could, that's there, that gives you some of the pillars of our roadmap. So, David, you referred to our hundred-billion-dollar roadmap by 2030, which is a roadmap which all of industry has endorsed that industry actually put together themselves through a series of round tables across Australia, talking to farm owners, talking to stakeholders, talking to people involved in the food supply chain about what we wanted our industry to look like in 2030.

**Fiona Simson:**

The hundred billion dollars is around the value at the farm gate, but to get there, we recognise, and our five pillars most certainly recognise that it's not just about growing more and doing more of the same, it's actually about doing things differently and focusing on these five pillars that are on your screen now. And under each of those there's key metrics that we follow, that we report on annually. And we're really serious about following this map, and really proud that industry has actually charted a vision for its future.

**Fiona Simson:**

We're also really proud that government and other stakeholders have really come on board and are helping us really achieve this vision. As you can see, growing sustainably is one of the key planks of our future vision for our industry. The key metrics under there include targets around carbon neutrality, targets around water use efficiency, targets around how much of Australia we farm. And of course, a really important goal there too around food waste, which is also about sustainability, making sure that the food supply chains are working and that people across the planet, not just in Australia, because we export 70% of what we produce here in Australia, have enough food to eat wherever they live.

**Fiona Simson:**

Thanks, Alison, I'll have the next slide. So, what do we mean? What do we think when we're talking about growing sustainably at the NFF? First of all, very much a carrot rather than a stick approach. We believe that farmers are absolutely some of the best environmentalists in Australia. It makes sense that they are looking after their assets and their land to produce the best food and fibre. And so, for us, it's certainly about marrying some of those environmental goals, marrying production and profitability with sustainability and that locking up land is absolutely not the best approach and can actually create perverse outcomes.

**Fiona Simson:**

What we're working at the moment is something called the agricultural sustainability framework, which is going to allow us to benchmark some of those biodiversity targets that we have and to allow that existing and any emerging sustainability schemes to actually be able... the farmers to access those schemes if they can get the benchmarking lined up. We certainly support as an industry a net carbon zero by 2050 economy wide target with a couple of caveats at each industry. A lot of our commodities have a much more ambitious target than 2050. We certainly think that we are lacking some of the data and the frameworks and the benchmarking and the science that actually needs to go behind some of this, but our commodities are well on the way to their goals.

**Fiona Simson:**

Thank you. I'll have the next one. Of course, climate change is not just the only focus of sustainability. In Australia, we've been looking and focusing on water sharing for some time and water use efficiencies. We recognise that we need to empower farmers with knowledge and up-to-date data and knowledge and practises to give them options about the way that they manage their land. And I think looking forward to increase sustainability outcomes. That sort of knowledge absolutely has to be paramount if we can actually make sure that farmers are adopting the best and the latest techniques and practises and making the most of the options that are available to them.

**Fiona Simson:**

Some of the feedback that we get quite regularly is that the government programs that only focus on improving your assets and improving the land are actually a deterrent to farmers, because that actually often rules out farmers who are doing the right thing by their land anyway, they may well be achieving fantastic soil outcomes, fantastic carbon outcomes, fantastic water use efficiency outcomes, but in actual fact, a lot of the schemes that government has had in the past, really because of the additionality requirement, rule farmers out who are doing the right thing by their environment in any case.

**Fiona Simson:**

Soil is a huge focus in Australia, the government in its budget, just a couple of days ago, allocated $200 million around about 200 more million dollars for soil testing. We absolutely need to look at the opportunities that soil creates in Australia. We are one of the few countries with large tracks of land here that really offer some opportunities for the sequestration part of the climate change puzzle. And so, it's really important that we focus on making sure we understand our soils, making sure we know the science and the data behind them, listen to the soil scientists and look at the options there as well.

**Fiona Simson:**

Thank you, Alison. So just some examples here... As I said, Australian agriculture leading the way in environmental sustainability and all of those industries on the screen. Now, the cotton BMP, cotton industry, the grains industry, the dairy industry, and the beef industries all have sustainability frameworks that they're enacting and well on the way to achieving now. Next slide, thanks. And also, some fast facts about Australian agriculture, because I think we don't just talk the talk, we walk the walk here in Australian agriculture in terms of sustainability.

**Fiona Simson:**

And some of those statistics are absolutely amazing. The first one, water use productivity and efficiency in cotton improved by 48% since 1992, Australian rice uses 50% less water than the global average. The dairy farms are unbelievable in statistics there with 94% implementing practises that are reducing the global greenhouse gases, the beef industry is a standout performer with the 2030 target in place, and it's reduced CO2 emissions by 56.7% from a 2005 baseline. And at the end of that we've got to recognise that just 8% of Australia's land mass is suitable for cropping, but large areas of range land grazing really do offer some amazing opportunities going forward.

**Fiona Simson:**

Next slide, thanks Alison. Talking about grazing, I think it's important to just touch on here and I'm sure there'll be questions about it later. Red meat, we believe that both animal and plant-based proteins absolutely have a role to play in our food systems and a balanced diet, which of course, the nutritionists and science tell us is essential for human health. As I said earlier, red meat industry in Australia has a really ambitious target in terms of emissions and is also undergoing a huge amount of work at the moment in terms of looking at the whole carbon cycle, because Australia is a little bit different to a lot of the Northern Hemisphere systems.

**Fiona Simson:**

We do have a large amount of range land grazing. We do have, as I said before, a lot of soil opportunities, a lot of soil that could sequester some of that carbon and cover off a large number of our emissions in Australia. So, we really need to make sure we look at the facts here, that we look and read research and circulate and understand research that is peer reviewed and sensible. We don't all listen to our social media too much. And I think, look at the opportunities that the range lands in particular in Australia present, because there are huge opportunities there when we're talking about sustainability.

**Fiona Simson:**

The next slide is just a little a snapshot of what we're actually doing, if we could have the next one, Alison. The next slide is just a little snapshot of what we're doing in terms of the net zero 2050, economy-wide target in agriculture. As you can see, there's a climate initiative there that is led by Australian Agriculture Innovation, which is a conglomeration of the RDCs in Australia. The CN 2030, which is led by MLA and the red meat industry, which is the commitment to the red meat targets by 2030. CRSPI as we call it CRSPI, bottom left which is led by the Commonwealth state governments and trying to make sure that all the commodity assessment methodology is aligned which is, and interact, and that we have consistency across those commodities, which of course is going to be really critical when we come to accounting.

**Fiona Simson:**

And lastly the government initiatives which is talking about work plans for agriculture adopt to a lower emissions economy and climate change. At the moment, some of their targets in relation to soil testing, for example, to get it down to about $3, a tonne a hectare is quite innovative and we certainly support government's focus on a technologically neutral approach and looking to technology, particularly in the soil space to help us, sorry, to give us some of that data that we need going forward to put the carbon in the soils, which is what the farmers actually want, to create healthy animals and healthy plants. And of course, to keep that cycle, that natural cycle that happens going around and around.

**Fiona Simson:**

And that, I think David is that for the moment, and I look forward to answering people's questions, but certainly I think when we look at our place in the world and how we compare Australian farmers and Australian agriculture is well ahead of the global game when it comes to looking at sustainability and preparing our industries and becoming more and more sustainable and lifting our sites in that space. Thanks so much.

**David Pembroke:**

So, thanks a lot to Fiona for that presentation. And we now move on to our second presenter and I'd like to introduce Professor Richard Eckard. Richard Eckard is professor of sustainable agriculture at the University of Melbourne and a director of the Primary Industries Climate Challenges Centre, a research centre addressing the impacts of a changing climate on agriculture. His research focuses on sustainable agricultural production with a recent focus on carbon neutral agriculture and options for agriculture to respond to a changing climate. Richard developed the first greenhouse gas accounting tools for agriculture, with his research and expertise providing the science on which six Australian carbon offset methods are based. Welcome to you, Richard.

**Prof. Richard Eckard:**

Thank you very much. So, on the topic of Growing Greener food production in a healthy environment, I thought like a good scientist, I would challenge the paradigm. We talk about, we need to address the issues of climate change, biodiversity loss, more food for a growing population with less environmental impact. I think we need all those things, but do we really need more food from less land. We see typical graphs like this one here where see the world population increasing and we see the amount of arable land per person in decline and that is a cause for concern. But at the same time, do we need to change our own patterns? Do we need to change our consumption patterns? For example, here, there's a clear graph that as you increase in personal GDP or affluence, there's a greater consumption of animal-based protein.

**Prof. Richard Eckard:**

And so, we've got half the world desiring to move up that curve and the other half probably sitting at two higher consumption. And so, by coming all meeting in the middle, we might actually have a more moderated consumption pattern. Now that leads on to, do we distribute food equally? There's apparently enough food in the world to meet our 2050 target already if we just spread it around properly, because if you look at the world hunger map, it's obtusely the reverse of the world obesity map. So, we've got a problem with food distribution. We've got half the world eating too much and the other half not getting enough. And so, should we be addressing issues of food distribution to ensure adequate distribution? And then we've all heard about food wastage, and I think there was on one of the slides that Fiona showed. One third of all the food produced in the world is wasted.

**Prof. Richard Eckard:**

In the developing world, most of the food is wasted in the paddock before it gets to consumption. In the developed world, we waste most the food post-supermarket. It's those bananas that get rotten on your shelf every week. So, we can all contribute to reduce that 1.3 billion tonnes of food that is wasted around the world every year. Another analysis out of Oxford University would suggest that if we just reduce food wastage, we could meet the 2050 target for global food. So, we need to pay attention to that as well. And then I think we need to think about whether the cheap food is better. We've got supermarkets that promote cheaper, cheaper, down, down prices, come to us for the cheapest food.

**Prof. Richard Eckard:**

And I would say to you, cheaper food is not better food, cheaper food is not better for the environment, cheaper food doesn't reward farmers for their additional attributes they can contribute. And we as consumers are probably partly guilty of sending the wrong signal to our farmers saying, "We want volume rather than quality." And if we were willing to just pay for the quality, or reward farmers adequately for the quality of produce, they would respond to that quite equally. So, I think there's some challenges for us there, notwithstanding the need for greater environmental sustainability, but I think there's some obvious things we can do.

**Prof. Richard Eckard:**

So, on some of the solutions where we can look at carbon neutral, ethical, more sustainable production, I thought I'd leave just two tangible examples of what we can do. Fiona mentioned soil carbon and the budget that I was talking about that. Where we look at solutions, we've got to look at the co-benefits, because in a lot of analysis we do, we get guilty of focusing on say, soil carbon for carbon trading purposes and ignore that the co-benefits of soil carbon are actually more financially rewarding than the carbon credit benefit. Give you an example, higher soil organic matter improves biodiversity, one of the targets. It enhances the longer-term productivity of the soil through greater water attention through greater nutrients recycling, greater nitrogen mineralization.

**Prof. Richard Eckard:**

So, it reduces our dependence on fossil fuels, fossil fuel put inputs of nitrogen. It increases the resilience of those systems to rainfall variability. So, part of our climate change adaptation strategy is more soil organic matter. And then it can contribute to carbon neutrality. If you add up the co-benefits and put some value on the productivity, you will find that they far exceed the carbon trading value of soil carbon. So, there's other reasons why we should be looking at this from a co-benefits point of view. Give you another example that's tangible, it's more legumes. We've known about the value of legumes in agriculture for a long time, but the adoption hasn't quite been there. But if you think of legumes, not only do they reduce our reliance on fossil fuels, fertilisers, and nitrogen, because they fix natural biological nitrogen, it will reduce our need for inputs of expensive fossil fuel-based fertilisers.

**Prof. Richard Eckard:**

A lot of the legumes contain secondary compounds like Leucaena, for example, has tannins that reduces methane from the livestock with grazed it. So, there's a second benefit. The third benefit is because a lot of legumes can go into nitrogen deficient grazing systems or ecosystems, cropping systems, they help to improve the root growth of companion grasses or companion crops. So, you get better soil organic matter out of the deal. And then you can put that all together, legumes can contribute to a net zero target through reducing methane, improving soil carbon, and reducing our dependence on nitrogen fertiliser. So, I guess the point is here's two examples of where we could focus on the co-benefits in providing solutions for farmers, where the co-benefits actually end up with greater value than just a reductionist view of carbon as an incentive mechanism. So, thank you very much.

**David Pembroke:**

Richard, thank you very much for that presentation, a clear and compelling and certainly plenty to think about. So, we do come to our third and final presentation today as part of today's dialogue. And I'm pleased to introduce Professor Andrew Macintosh, the associate dean of research at the ANU's College of Law. He is also an environmental lawyer and a policy scholar. Professor Macintosh is an environmental markets expert based at the ANU and where he is director of research. He is regarded as one of Australia's preeminent experts on environmental policy design and evaluation, particularly the design and administration of environmental markets and environmental certification schemes.

**David Pembroke:**

He's currently the programme lead for the Australian Government's Agriculture Biodiversity Stewardship Package. He also recently chaired Accounting for Nature Limited Standards and Accreditation Committee and prepared its accreditation standard for environmental accounts, the first of its kind in Australia. Last year, he served as one of the three commissioners on the Royal Commission into the National Natural Disaster Arrangements, otherwise known as the Bushfire Royal Commission. A big welcome to you Andrew.

**Prof. Andrew Macintosh:**

Thanks very much, and thanks for having me. Hello to all the other panellists and everybody out there. As you can tell from the bio, I've got a bent towards environmental markets. So, what I'm going to say is concentrating on basically the emergence of environmental markets and the opportunities that that provides for the ag sector. But before I get into that, I think in order to understand where those markets are going and what the opportunities might be, I think it's important to look back and to see how we got here. From my perspective, there's been five phases of agricultural related environmental policy in Australia, and it's probably better not to call them phases, they're more like somewhat of a sandwich that a new phase comes on, but the other one doesn't necessarily disappear, and they stack upon each other.

**Prof. Andrew Macintosh:**

You'll hopefully understand that metaphor when I go through these five phases or sandwich layers. The first one, I think we're probably all aware of is what might be called the laissez-faire, the ignorance phase where English typically migrants came across to Australia and tried to apply European farm practises to the Australian landscape. That didn't necessarily go that well. We had quite widespread natural resource management problems, including spread of weeds, spread of pests. We're all probably aware of the rabbit plagues of the late 1800s, and we also experienced quite widespread erosion and often as a consequence of those pest species.

**Prof. Andrew Macintosh:**

That led to, what I would say, as somewhat of a revolution in the use of information instruments, most famously through things like the Soil Conservation Acts that were introduced in most Australian jurisdictions starting in the early 20th century and particularly from 1930s onwards. They were incredibly successful and demonstrated that policy interventions in the ag space don't necessarily have to be either a stick or a carrot. There is an alternative actually arming farmers with good information and probably the greatest legacy I see out of that was the soil conservation services and the extension offices that came with that.

**Prof. Andrew Macintosh:**

Unfortunately, we lost some of that capacity over the past 25 years, but it did bring about wonderful changes in land management practises and great improvements across many landscapes. Not long after the introduction of that information revolution I'd probably pictured as, we saw the introduction of regulations. And regulations started with trying to stop land management practises that were posing a real threat to agricultural production and productivity. So, we saw bans for example, on clearing in riparian zones, we saw bans on clearing in areas of high slopes and those sorts of things.

**Prof. Andrew Macintosh:**

And then all the way through to probably the more interventionists restrictions on clearing land clearing on a broad scale that have been subject of a lot of contestation since the mid-1990s in particular. The introduction of that later phase of regulation was accompanied by the versioning of the use of grants and volunteerism, things like land care and a lot of the grant-based schemes that look to defray some of the costs that landholders face when they try and undertake land management activities.

**Prof. Andrew Macintosh:**

And again, what might the information revolution we saw those measures achieve a lot of successes, but I think in a lot of people's eyes and probably my own included, I don't think it went far enough. And that has led to both contestation around regulation and the under success of those brand scheme has led to the final phase or the final layer in the sandwich being environmental markets. And this is quite distinct from the grant base, if the past 20, 30 years is focused there on terms of the positive incentives is focused on helping farmers and providing mechanisms to defray some of their costs.

**Prof. Andrew Macintosh:**

This new wave is about paying farmers for ecosystem services. And the ones we're most aware of are the ones that Richard was just alluding to, was carbon is probably the most well-known, and now I believe arguably the most well-established, but there's also markets in biodiversity, so biodiversity offsets. There are also schemes being run by federal and state governments to pay farmers for ecosystem services related to biodiversity. There are schemes in a number of jurisdictions to provide joint revenue streams for both carbon and biodiversity, and there's even other schemes for other types of ecosystem services, including solidity. Now, this is, I see, as providing an amazing opportunity for many farmers.

**Prof. Andrew Macintosh:**

This is not in most cases, there's no intention from the designers of these schemes to design schemes that incentivize farmers to displace agricultural production. The incentive is to try and integrate conservation measures in a way that compliments agricultural production. The most obvious ways it does that is by providing a new revenue stream for agricultural producers, providing a revenue stream that is more drought resistant than normal commodity markets or commodity orientated production. And the other way is trying to design incentives to undertake land management activities that actually boost production as opposed to displace it.

**Prof. Andrew Macintosh:**

These markets have come in three forms. The first one is the government voluntary form, probably the one that's most dominant at the moment, there's also emerging private voluntary markets and then there's compliance markets. And compliance markets refer to those schemes where an entity, a developer for example, has an obligation to offset an environmental impact, whether it be carbon or biodiversity, and that provides opportunities for landholders to sell services to those entities with those compliance obligations.

**Prof. Andrew Macintosh:**

Now, while my bio suggested I have this great bias towards environmental markets, and I probably do, I should emphasise that I'm in strong agreement with the likes of Richard who doesn't see environmental markets or seemingly doesn't see environmental markets as the cure-all for everything. I certainly have not that view. I'm strongly with the view in terms of promoting conservation and sustainability measures that there is room for an absolute need for multiple measures that stretches from continuing use of information measures and probably from my perspective, I'd like to see a revitalization of the extension officers that started with the sole conservation works in the 1930s.

**Prof. Andrew Macintosh:**

There's also a role for regulation in some spaces and also a continuing role for grants with one of the areas where I see the greatest tension in this space. And I think Fiona's presentation touched on it, is there's an obvious desire from a lot of agricultural producers to be paid for what they're already doing. And there's a strong equity argument for that. These farmers and many farmers are doing really positive things in the landscapes, and they ask themselves, "Why shouldn't I be paid? Whereas my neighbour whose done nothing for the past four years. All of a sudden has this opportunity to participate." And that is perfectly understandable. And I think there needs to be some mechanisms to accommodate that desire on behalf of farmers.

**Prof. Andrew Macintosh:**

On the other hand, there is finite resources that we can devote to conservation. And if we're paying people to do what they're already doing, then that's almost always not going to be the most efficient use of a scarce resource. And we as policy designers have to find a way to balance that need to respect the argument for equity from farmers, while also making sure our conservation dollars go as far as they possibly can. Now because I'm a lawyer I could stand here and grab it at you for many, many hours, but I've been told to keep it short. So, I'll stop it there. And thank you again.

**David Pembroke:**

Great, thanks a lot Andrew, and interesting to hear that valuing of ecosystem services and the practical opportunities that they do offer to our farming communities. So that's great. And thank you for the questions that are coming in and we will come to those in a moment, but just reminding you also that we will be hearing from Melinee Leather to give us the practical on the ground examples of what is already happening out there in Australian agriculture to address the challenges that are the subject of today's dialogue.

**David Pembroke:**

So, stay tuned to hear from Melinee, but we will come to the questions now and if each of our panellists feel that they have something to contribute, so please do and we will come to you in that answer. But first of all, Fiona, I'll direct the first question to you, and it says, "How do we set goals and develop policies to support the production of diets healthy for both people and the planet rather than driving towards financial targets, such as the $100 billion farm gate target set by the NFF?"

**Fiona Simson:**

David, I think that's actually intrinsic in our target. So, the headline is of course about farm gate value, and value can actually be value adding, it can be producing a more niche product, it can be intensifying in a way what you produce too. It's not, as I said earlier, whilst it's a nice headline and it's captured everybody's attention, and of course, financial viability and sustainability is also critical part of general sustainability. I think farmers that are focused on the future and farmers that are focused on being sustainable, they know that environmental sustainability is a critical part of that as well. And that's why we are really global leaders in a lot of the commodities and in a lot of the spaces that we operate and recognised quite rightfully so.

**Fiona Simson:**

It's just that at the moment most of the financial rewards we get from that are through the products that we produce in terms of the quality, in terms of the QA systems that we have, to including the traceability systems that we have. And as we look to some of the environmental issues that we have in Australia, there's no secret that the biodiversity is declining, that we're seeing problems with our soil, identify problems with some of our soils. We can do much better. So, I think it's always important to be asking ourselves, "How can we do better?" And if farmers are motivated by environmental outcomes, which I'm telling you Australian farmers are and they're achieving them. In fact, they're overachieving them when you compare us to some of our peers globally.

**Fiona Simson:**

Then we need to look at different things and some of the methods that David talked about in terms of what is the next generation, I guess, of encouraging farmers and recognising what farmers are doing environmentally. So yes, the hundred billion it's a nice target, it's captured the imagination of everybody and its captured farmers. And it's important, because as I think somebody said earlier, it's very expensive. It's not always, financially it is a huge costing for sometimes to be putting in place the conservation tillage mechanisms, to be putting in place some of the regenerative agriculture outcomes or the natural fertilisers or whatever it is that farmers want to do. So, I think it's important that yes, we have the financial sustainability, but it goes hand in hand with environmental sustainability and the next generation of production practises and techniques too.

**David Pembroke:**

Richard Eckard, the question also probably looks at some part of your presentation as well, where you were looking at, the spread of food and the importance of healthy diets and also the influence and role of commercial supermarkets in the treatment of foods. What's your view around this? The importance of matching production and encouraging healthy diets for people in the planet, rather than looking at financial targets.

**Prof. Richard Eckard:**

This goes to how we value food in the future. I think there's a growing awareness that food needs to come from healthy ecosystems, and I think we just need to start making sure the consumer understands that cheap food isn't better food. I think that's the point I was trying to make there that we've got to remember that a lot of the supply chain are publicly listed companies. They respond to shareholders, then what are the shareholders concerned about? The shareholders are concerned about consumer preference in the future. And so that's why we see a lot of multinational substitute supply chain companies setting targets consistent with the Paris agreement.

**Prof. Richard Eckard:**

So, we see these companies they are, and so in some ways it empowers consumers because, what are the companies responding to? They're responding to consumer perception about future buying trends in order to deliver shareholder value. So, it empowers us as the consumers. We've got to remember that of the 100 largest economies in the world, 69 are companies, not countries. And so, where's this change coming from? It's probably not coming from government policy as much as it's driven by the food supply chain.

**David Pembroke:**

All right. Thank you very much. To the next question, and again, a question for you Fiona, you highlighted our strong position in regard to greenhouse gas emissions and red meat, and agree it is true that developed nations like Australia and the US do far better, but the simple fact is still that per unit of food, plant agriculture, produces fewer greenhouse gas emissions. You mentioned the evidence facts, current evidence indicates it is crucial countries who have the ability to do so like Australia, shift to more plant-based diets. Do you agree, or do you not agree?

**Fiona Simson:**

No, look, I don't agree at all. And I unfortunately think this current focus on plant-based diets and some of the claims that are being made about plant protein particularly, they don't necessarily reflect the Australian situation and they don't necessarily reflect the science and the data that is actually out there. Now I'm not a scientist, so I'm not going to trade scientific publications with the person who's asked the question. But I think one, when we do look at the accepted peer reviewed science, we know that in actual fact, we do as humans need to eat a balanced diet, that animal protein and plant protein, both have a place in that. And as a grain grower and a red meat producer, I see both production systems as quite complimentary. And I see the inputs that go into my faba bean production systems and my chickpea production systems, my lupin production systems.

**Fiona Simson:**

And I see the inputs that go into my grass-fed grazing systems as well. So, I think while we're collecting the data, we shouldn't have a one or all approach. We should not be masked by people who are making a claim that it has to be one or the other. At this point in time, most definitely I think the red meat system and the animals, particularly the range land system, as I mentioned before that we have here in Australia offers an amazing opportunity and amazing opportunities. And so, we need to very much make sure that we continue to question articles and science, that we continue to look for the facts and the data and continue to develop the facts and the data because Australia, as I said earlier in that Southern Hemisphere as we are, has also quite different systems to some of the North systems too.

**David Pembroke:**

Okay. Richard or Andrew, do you have anything to add to the person who asked the question?

**Prof. Richard Eckard:**

Look, yes, I can add to that. I think those sorts of diet change questions. No one is questioning diet moderation and I think that from a human health point of view, we can argue some diet moderation. The idea of diet change to reduce environmental impact ignores that the research has moved from the days when we can do very little about livestock methane, to the days where we now have technologies coming through that will reduce methane by 80%. So, we're looking at a future where research can actually address some of these issues. And then there's no doubt that the extensive range lands of the world are vital to food production on the planet. And a ruminant has a unique system to convert fibre into food. And so, you and I can't live on grass, but ruminants can turn that into food. So, removing that out of the equation, just compounds a global food equation and is very unhelpful.

**David Pembroke:**

All right. Thank you very much, Richard. A question before we do come to Melinee and it is to Andrew. Thanks, Andrew, could you please speak to what the barriers or opportunities around increasing and revitalising extension services might be? How might these services align to the objectives of ecosystem services markets? Andrew?

**Prof. Andrew Macintosh:**

Yeah, thanks for that. I think the primary barrier is cost. I mean, actually employed people as extension officers is not a cheap exercise. We have, what is it, 56, 57 in our groups at the moment out there that do extension services, but I'm sure I wouldn't get too many objections for them if I asked them whether they wanted to have more resources to do what they do. So, I think that's it. The primary thing is cost. Where do we find the resources to employ the people that are necessary to do this? There are probably these days somewhat of a labour shortage in that space. There's probably a need for further training to get people, to make sure they have the skills to perform that task.

**Prof. Andrew Macintosh:**

And then the second part of that question you asked was, can those services integrate with environmental markets? And my answer to that is absolutely. At the moment, I think one of the big barriers to the uptake or participation in environmental markets is their complexity and the need for farmers to be armed with information. At the moment, this service has been provided by a relatively small number of the entities that... And as a consequence, there's not a lot of competition in that space. I see a real role for both NRM groups and possibly also extension services run by state governments to compliment the services that are currently provided by those organisations in order to inject some competition in the space and provide another avenue by which farmers can provide information and a way through to participate in these markets.

**David Pembroke:**

Andrew, thank you very much for that very comprehensive answer. And again, if I could encourage you, we do have a number of questions, but the more questions the better. And if you do have a question for the panellists today, please type it into the Q&A box at the bottom of your screen. And we will come to those questions throughout the balance of the day. We're just reminder that we do finish at 3:30. So there is plenty of time for your questions to be answered at this point in time. But for the moment we'll actually now come to our special feature panellist Melinee Leather.

**David Pembroke:**

Now Melinee is a beef producer from Central Queensland, passionate about sustainable grass-fed beef production and the future of farming families in Australia. Their family beef cattle enterprise covers an area of 17,600 hectares and runs four and a half thousand head of cattle over three properties breeding and finishing cattle for the Organic, Global Animal Partnership, Australian Certified Humane, EU and Grasslands markets. Welcome Melinee, and as a farmer, what does sustainable beef production mean to you and how do you put it into practise on your farm?

**Melinee Leather:**

Thanks. So yeah, look, sustainable beef production is about securing a future for my family, and it's also about the contribution we can make to global food security. So, I'm part of a multi-generational farming family, and I've got a real responsibility to ensure we remain sustainable for future generations. And we can do that by protecting our environment, our animals, our people, and our business. And we've also got to think about our customers and consumers of our beef and be mindful in meeting their expectations around sustainable food production.

**Melinee Leather:**

So, to do that, we strive for continuous improvement and embrace new technology and innovations. And we put that into practise on our properties by taking a multifaceted approach. So, if we're thinking about the environment, we maintain that like basic principles, like maintaining good ground cover and soil health by using rotational grazing and measuring and monitoring, using grass budgets. We're focused on correcting areas of erosion to ensure water quality is preserved.

**Melinee Leather:**

And if we're thinking about technology, we use digital mapping and we can get real time access to paddock scale ground cover and pasture biomass information via five daily satellite imagery maps with 10 metre resolution. And this shows us within paddock estimates of ground cover and pasture biomass. This information supports our grazing management and land condition monitoring and reporting with credible and verifiable data. We can also get seasonal and annual woody vegetation change monitoring to support future natural disaster mitigation response efforts.

**Melinee Leather:**

And as Richard spoke about earlier, the introduction of Leucaena and other legumes will improve infiltration of water into soils and reduce emissions from our cattle between 20 and 40%. And the woody growth on that Leucaena sequesters carbon as well. So Leucaena is one of the most productive and sustainable legumes available. And we continue on our properties to increase plantings. Other projects we're doing in collaboration with Queensland Government and the Fitzroy Basin Association, we're currently undertaking a tree planting project to increase biodiversity, by increasing habitat for wildlife.

**Melinee Leather:**

And by positioning the plantings in an area that's adjacent to remnant veg, it will eventually act as a corridor for wildlife to move across fragmented landscapes. This will promote healthy gene flow for wildlife populations and these trees so 700 in total, we'll be planting. Will also have the added benefit of increased water and nutrient cycling, shelter and reduced heat stress for our cattle and native animals, and they'll stabilise soil and reduce sediment loss and carbon offset income opportunities if we want to go down that pathway. We're also participating in a project called, from method to markets, and so unlocking ecosystem service opportunities for livestock producers.

**Melinee Leather:**

And from this, we'll get a whole farm carbon account and then look at methods to reduce methane emissions per kilogram of red meat produced, whilst improving land condition and biodiversity. So currently we're undertaking condition assessments of our grazing land for biodiversity to demonstrate sustainable management of our properties and identify where we can make some improvements. The use of renewable energy is another tool used to reduce the environmental footprint on our enterprise. And one of our properties is 100% solar powered. The energy generated from the system powers the homestead, worksheds and stock water bores.

**Melinee Leather:**

And in total across our three properties, we have 27 solar powered stock water bores. Another of our properties has 13.5-kilowatt solar system reducing the amount of grid supply that's required on that property. So, we've got huge amounts of sunshine and solar energy at our fingertips. And Australia is a renewable energy powerhouse, so looking after biosecurity and controlling feral animals and weeds is another priority. And just quickly, if I talk about animals and sustainability on our property, things like making genetic improvements, accelerating genetic gain for productivity and profitability in beef cattle using genomic technologies.

**Melinee Leather:**

So, we DNA test heifers for early puberty and the ability to get in calf again in the second year. We use EBV, so estimated breeding values for bull purchases, and we're running younger, more productive cattle. And if we look at animal health and nutrition, the use of pain relief, faecal testing to check diet quality, crude protein percentage, and digestibility percentage. So, I have to say I agree with Richard around points that he made around the environmental markets, and that's not what drives our business. I think our decision to become carbon neutral and certainly Andrew's point around the need for extension is important as well.

**David Pembroke:**

Melinee, comprehensive just to think that that is one organisation who is your family enterprise, which is adopting all of those practises, certainly suggest that this is an issue that is being considered on a regular basis and discussed, and obviously being integrated into your future business practises. All right. So, to return to the questions, Andrew, this is one for you. I want to ask Andrew how we can avoid the very high transaction cost associated with measuring ecosystems services, such as greenhouse gas reductions via soil carbon increase? Wouldn't it make sense to recognise that certain easily observed farming practises are certainly going to contribute and then reward those who are applying those practises? For example, ensuring that grazing pressure is constantly adjusted according to rainfall. So, Andrew, a question for you to start and other panellists, if you have a view, please jump in when Andrew is finished. Andrew.

**Prof. Andrew Macintosh:**

Yeah. Thanks. That's from Greg Hayes I read on the board. So yeah, that's a really good question. As I think he's getting at transaction cost is what's currently clogging up a lot of environmental markets and making it very difficult for farmers to participate. In some cases, we're seeing aggregators by service providers taking between 25 and 50% of the carbon credits generated in projects. And that's partly a product of that complexity and the need for measurement, and also the lack of information there amongst farmers. The short answer is this, it's quite a difficult thing to answer at a high level. It often depends upon what system you're talking about and what method you're using. I think the simple answer is in a lot of cases with at the moment, we got transaction costs that are intended to improve integrity, but they don't really do that.

**Prof. Andrew Macintosh:**

A good example is that for all sequestration projects under the Emissions Reduction Fund, they have to go through a minimum of three third party audits. Those third-party audits cost between 10 and $15,000 a pop. And that means that for any small-scale project, you can be somewhere up to 30% of your project costs, can be sunk into those third-party audits. Now that is a major barrier to participation. In my view, that's really excessive in a lot of project types. Those three third-party audits are just not necessary. We can do a lot these days with modelling and also with the use of remote sensing technologies in order to detect things. The idea that Greg thought there about attaching payments to activities, now, in some cases, that is an excellent idea, and it works really well.

**Prof. Andrew Macintosh:**

In the example that Greg provided about soil carbon. I would probably argue that it's not, and for the simple reason that you are likely in that case to end up paying a very, very large number of farmers for doing what they're already doing. And if so, that comes back to the comment that I made in my presentation, that at the end of the day, we've got a finite number of resources that we can use for conservation. And if we're paying all farmers to do what they're already doing, then that ensure that we can achieve much with our conservation dollar. So, I'm very sympathetic to Greg's idea. I think that that one instance is probably not the best way forward in that case.

**David Pembroke:**

All right. Fellow panellists' a view on Greg Hayes' question. No, okay. Very good, we'll move on. So, to the next... Sorry. Yeah, Richard.

**Prof. Richard Eckard:**

Look out and just to take Andrew's point further. We do have two soil carbon offset methods, where one is measure before measure after, the other one is an activity-based method. But the sort of ultimate landing point has to be something that has integrity as Andrew said, but has a lower cost. And so, we can combine those, we can combine some stock measurements with modelling and satellite remote sensing to extend it, but you will never get away from actually repegging your model over time. So, I suspect that if you just wait, watch the space within about 12 months, we should see another method emerge that takes some of the costs out of it.

**David Pembroke:**

Okay. Stay tuned. All right. The next question, and perhaps Fiona I'll direct it to you to begin with. Has there been any consideration given to, or trials being run to commercialise the indigenous grain and other crops such as kangaroo grass, wallaby, grass, or yam daisy? These plants don't need as much water and they grow well in Australian conditions.

**Fiona Simson:**

Yeah. Look, I mean, farmers are very innovative, and this is also perhaps a question for some of the RDCs that look at these things too. But any of these, I think there's a place for anything and everything. And as we evolve and look now, we've been aware of multi-generational farm like Melinee and if I look back over the 90 odd years that our family has been on the farm, we've changed our enterprises, we've changed our production techniques. We've changed what we do on our farm in response to a number of things. One is the environment, and of course, right now with climate change, that's changing even more radically, which is seeing change again.

**Fiona Simson:**

And so, I think we're very happy and farmers are continually looking at what best to grow on their farms and how best to do that. But there has to be that economical reward at the end of the day, because as Melinee said, it's a business as well. So, if we don't run our business sustainably, then we're going to go out of business, which will mean that the environmental outcomes we'll be out business as well. And we've seen with some of the land that is locked up. Some of the outcomes that are achieved on that land that are not necessarily the best environmental outcomes that we could have been achieving.

**Fiona Simson:**

And I think when we reflect back over the long history of Australia, we know that our traditional owners have managed the landscape to produce their food, to produce their fibre. And we need to continue to look at how we best manage the landscaping current conditions and look at things that do grow well and can provide some sort of economic outcomes. So, I guess we look to the RDCs to do a lot of that research, but I know that there are in small scale, there are trials going on now.

**David Pembroke:**

Okay. Any of the other panellists' view on that particular question, if not, we will move to the next question.

**Prof. Richard Eckard:**

I'll just throw in something small. I think a lot of native grasses for example, can teach us a lot about climate change adaptation. What I mean by that is the whole dairy industry is very heavily leveraged on perennial ryegrass that grows best at 16 degrees centigrade. You give it 30 degrees and it's dead. Themeda or kangaroo grass grows outside Hobart in Tasmania, and it grows in the Kimberley. What genetic diversity is in that plant, you could pretty much throw any climate change at that plant and it will still survive. I think there's a lot we need to learn about those types of plants on their ability to survive in a highly variable climate.

**David Pembroke:**

Richard, thank you for adding to the answer to that particular question. And Richard I'll stay with you too with the next question. And it is, we often hear that consumers are partly to blame for the pressure on farmers, but consumers are influenced by their context. Could you speak to the role of supermarkets and big food corporates in driving the consumer demand around volume over quality, as well as the issue of equity affordability and how this may be addressed by governments?

**Prof. Richard Eckard:**

Look, it's a complex issue. And I guess it goes back to that statement that I made earlier that we see a lot of the supply chain publicly listed companies responding to consumer preferences in the future. So, we've been through a phase of responding to lower prices and the drive for lower prices. I suspect we're going to come into a phase where we start valuing other attributes of the food. Where we start seeing consumer preference going towards, this comes from a more sustainable farming system, and some of those attributes coming through, because these are publicly listed companies delivering to shareholders. They want to make sure the products always have a place in the marketplace. So again, I think it comes back to our preferences as consumers in driving that change.

**David Pembroke:**

Other panellists' view on that?

**Fiona Simson:**

I'll just add that. I think I don't know whether the consumers are to blame. I think what we do is we're always adapting to consumer trends and expectations. And NFF's done some research recently, where in actual fact we know that farmers are now in our urbanised economy here, particularly in Australia, there is some disconnection between farmers and the people who do live in urban communities. And it's important that we tell our story all the time, but I think communities are expecting, consumers are increasingly interested in the animal welfare outcomes, in the sustainability outcomes, in the climate change outcomes. And so, we as farmers want to react to that and respond to that and to keep making sure that what we sell is what consumers want. So, I think that's the important thing.

**David Pembroke:**

Okay. And Fiona, we might stay with you for the next question. And it is expanding urban sprawl seems to pose a threat to our high quality coastal agricultural soils. Fiona mentioned locking up land is not the right approach. How does the NFF view urban sprawl in the context of agricultural sustainability?

**Fiona Simson:**

Yeah. Well, I think it's actually it. So, locking up land is locking up land in terms of planting a grove of trees as an offset and just leaving it unattended, letting the feral animals, letting the weeds, but not worrying about soil quality under the trees, all of those things. That's what we regard as locking up land. What I think the question is referring to, David, is in actual fact policies that some countries do have about the very finite resource that is agricultural land. And I think the question is correct too, in that some of our very best lands are arable land. And in Australia, there's a very, very small percentage of Australia that is actually arable i.e., able to be cropped, a large amount that is able to be grazed, more range land type of system and of course, some desert, but in very small amount is actually arable.

**Fiona Simson:**

So, Australia doesn't have a policy around this very finite scarce arable land and protecting that, some countries do. Some of our states do have some policies and processes around looking at protecting that, but I have to say that I think when it comes to urban sprawl, when it comes to hospitals and shopping centres and accommodating more urban populations in Australia, I don't know that there's any state that has a proactive policy around that. And certainly, the discussions that I've been involved in, in places like Western Sydney has been trying to backfill a little bit when suddenly we've woken out and discovered that we have actually moved some of our really valuable local agricultural land in some of these communities and the ability to deliver local food to expand populations.

**Fiona Simson:**

So, it's a really critical question. It's one that I think some countries do better than we do. But with only 6% of Australia being arable then it's something that I do think we should be turning out minds to. And the NFF has a strong regional focus, at the moment we think the time is right to be not so much focusing on expanding our urban populations, but to be looking instead at some of the... And if we're talking about environmental sustainability, the sustainability outcomes from people living in rural regional locations where sometimes those sustainability outcomes are better where we're not impinging on some of that valuable agricultural land, might be a better outcome long-term.

**David Pembroke:**

Okay. Fellow panellists, any views there on urban sprawl and the impacts on urban sprawl?

**Melinee Leather:**

I just want to make a comment.

**David Pembroke:**

Okay. No. Yeah sorry, Melinee, yep.

**Melinee Leather:**

Yeah, just a comment there, not so much about the urban sprawl, but just to bring up the fact that 4 million hectares of cattle producing land is set aside for conservation practises, and there's about 300 million hectares where on farm management activities contribute positive environmental outcomes. That's, it's a really important thing to consider how much of that agricultural land, particularly around cattle production is used for conservation environmental purposes.

**David Pembroke:**

Okay. Thank you very much. And Melinee, if we might stay with you, there is a question for you and it is, who has a role in driving consumer demand for sustainable meat? Supermarkets are currently focused on marketing sustainability around plastic packaging, waste, and imperfect produce. How could you be better supported in creating the market for sustainable meat, both domestically and internationally, either by government, the public sector, the media, or other actors? Melinee?

**Melinee Leather:**

Thanks. Look, I think consumers just are very aware of the environmental impacts of the products and proteins that they're looking for. And I think for the beef industry, we're really fortunate to have the Australian beef sustainability framework. And for us, that framework defines sustainable beef production in an Australian context. So that's what consumers are looking for. It identifies the sustainability products, priorities of the industry, and that's clear for everyone that's inside and outside of the industry. So, consumers and customers and our producers.

**Melinee Leather:**

And it also establishes national indicators and measures for those priorities. And it tracks openly and openly reports on progress against the indicators to help show improvements being made and to identify areas that need more work. So, I think as a beef producer for me the framework is my best tool in how it informs us, and it gives us direction, how are we going to make the sustainability objectives and meeting now a customer and consumers needs and expectations around sustainability.

**David Pembroke:**

Okay. Fellow panellists, anything to add to Melinee's answer? Fiona?

**Fiona Simson:**

I just might add that I think that the red meat industry in Australia with that sustainability targets that it is so globally we are and the traceability that we have too in our system. We are the envy of the world with some of the systems that we have. So, it's very exciting as an Australian producer to have the access to some of the tools that Melinee talked about earlier, in terms of how she actually practically runs the business. And with the digital tools, particularly now that she's using as well, and the measurement tools, so that we can actually prove what we say. For some time, we've said we're clean and green, but now with the sustainability framework it's actually possible to put figures and facts and data behind that as clients, which is incredibly important.

**David Pembroke:**

Okay. Alright. To the next question, and perhaps to you Richard, to get this one started, how can we move from monocrop agriculture to diversified food production systems that produce more nutrients and that are most sustainable?

**Prof. Richard Eckard:**

Okay. I think there's a growing awareness with climate change and increased variability in the climate that monocultures are an increasing risk going forward, and that we might see that type of agriculture retreat to the reliable high rainfall zones where you've got good rainfall, soil camp combinations. But in the more variable zones, we start to see, say in Northwest Victoria wheat on wheat on wheat is no longer long-term sustainable. And we start to see farmers change into more rotations with pastures, with pulse crops to restore the soil organic matter, for example.

**Prof. Richard Eckard:**

So, I think we're starting to see that change, and diversification then becomes one of the tools to address more variability. So, you don't have all your eggs in one basket. And so, I think we're starting to see that train coming through now, already in agricultural systems. We might see it within a land unit, or we might see it over time. So, what I mean by over time is rotations where you're picking the seasons, and within a landscape, you might actually see more diversification come through.

**David Pembroke:**

Richard, thank you very much for that answer. To the next question, and perhaps Fiona, if you might start us off on this. There is a need for producing increased quantities of fruits and vegetables, excuse me, which are not consumed in the quantities needed, what incentives can be used to stimulate horticultural production?

**Fiona Simson:**

Well, in actual fact that just might refer to the previous question too that uses the word monocrop. I find is a word that as a broadacre farmer myself, I don't use very often at all, but I think diversification is the key, and if we're looking at plant proteins that are made from chickpeas and faba beans or lentils and things, then diversification, rotations, planning perennials, and that sort of an approach is what farmers, as Richard said, are now pursuing in most cases anyway. Fruit and veg and horticulture are actually one of our, I think, fastest growing industries in Australia at the moment and has seen unbelievable growth in the last decade particularly.

**Fiona Simson:**

And I think that's focusing on a couple of things. One is the ability to value add. So, people now, consumers who are time poor, we were talking earlier about consumers and what they like and what they don't like. They do like to be able to go into a shop and buy a pre-planned packing portion size. So, the bag leaves, people are eating more and more of those bags ready to eat meals and lettuce leaves and things, and so I think that that's happening and we're actually also in Australia, we export 70% roughly of what we produce anyway. And so, the shortening of some of those food supply chains and the ability to actually grow some of that fruits and veggies too, in modern locations in modern growing conditions means that we can actually deliver that fruit and veggies to some of our markets overseas who are in close proximity to us.

**Fiona Simson:**

And I think that's what the value adding and being able to deliver the fruit and veggies overseas is what's actually driving some of the growth that we see in horticulture at the moment. Historically we've only been able to really utilise what we've grown, it's a better domestic use. So, I think we've seen a huge change in that currently. And really the opportunities when we're looking at being able to supply alternate sorts of foods and particularly in some of our neighbouring countries that may or may not have access to some of those nutritional needs. I think that's really quite an exciting opportunity for us, and we should be looking at exploring those.

**David Pembroke:**

All right. Okay. Panellists, I don't see anyone got their hand up at the moment. So, we'll move on to the next question and to you Andrew Macintosh, perhaps. How can policymakers best incentivize the uptake of market-based sustainability schemes? How can policy makers best incentivize the uptake of market-based sustainability schemes?

**Prof. Andrew Macintosh:**

Three simple responses. Make them simpler, improve the information available to farmers and lower the transaction costs. You do those three things you're certainly on your way.

**David Pembroke:**

All right, sorry. Give me those three things again. If you might.

**Prof. Andrew Macintosh:**

Make them simpler, improve the information available to farmers and lower transaction costs. Lowering transaction costs, raise up a whole bunch of things. So, for example, providing fully automated end to end participation for farmers in for example, the carbon market or the biodiversity schemes. And so that it involves online application forms, automated reporting systems and automated verification systems. Those sorts of things strip out costs and ensure that farmers are able to realise a lot more of the value that's associated with participation, and it makes it far easier to farmers to understand what they need to do in order to apply in these markets.

**David Pembroke:**

Mm-hmm. And just to that issue around simplicity, your first point, how can they be made simpler?

**Prof. Andrew Macintosh:**

Again, I could rub it on for hours about this one. These markets are fraught with complexity and it's all the way through to the rules, the eligibility, the rules for what you actually need to do to provide these services through to the rules surrounding measurement reporting and verification. All of them, we have to make sure that when we impose any rule, that it is balanced towards the risk we're trying to manage. And again, it's one of those you've got to get in the weeds, because this differs between markets and it differs between the submarkets within those higher-level systems.

**David Pembroke:**

Fiona, I can see you're keen to jump in.

**Fiona Simson:**

I agree with Andrew, there is just a couple of extra things I'd add there. Probably one is I think the returns and the exposure to the international markets implies that we have to have proper commercial returns. And I think that's what we're hoping to achieve through the correct market being built. The second thing is exposure to risk and how we manage that risk for the farmers. So, if I look at some of the markets that are available now, in terms of the trading markets for carbon, the farmers generally have to use an aggregator at the scale we are here in Australia.

**Fiona Simson:**

There are some outstanding examples that they're not, and this mark and this is of course, changing quite rapidly as we're going through that. It's all very well to be increasing your carbon, but if your current levels drop, then you're hugely exposed on your own. And the aggregator has nothing to do with the levels of your... when your carbon drops. So, I think we have to look at the exposure to risk for the farmer and also make sure that we can actually build those markets so that they can offer really good competitive returns.

**David Pembroke:**

Fiona, thank you for that answer. Melinee, I might just throw the next question to you to get us started. Land clearing is the biggest single most important action for achieving carbon neutrality in the red meat industry. What is being done to fully stop it rather than focused on all other less proven measures of improvement?

**Melinee Leather:**

I don't know that fully stopping land clearing is the solution, and particularly in Queensland, that would be a very controversial topic to bring up. But look, I think management of woody vegetation is really important. And for producers to be able to understand the best management practises. And I think things like that, CBOLABS, digital mapping is a useful tool for us to use, but it's also important for the broader community to understand the difference in land clearing of remnant vegetation versus regrowth. And certainly, on speaking on behalf of Queensland, there's areas where regrowth vegetation certainly is destructive to our environmental outcomes. So, I think it's everyone really understanding what that means and how best to manage it in certain regional areas.

**David Pembroke:**

Andrew?

**Prof. Andrew Macintosh:**

Yeah, I'll just jump in there. I couldn't agree more with what Melinee just said. The land clearing in Australia averages widely around 400,000 hectares a year of which 360,000 of it is re-clearing of previously cleared areas. So, I think there's a perception out there amongst many people that it's still remnant clearing, is the primary thing we're talking about. And it's not, it's re-clearing now. And the problem with people saying, "Oh, it's this bans on re-clearing." that provides an incentive for farmers to clear on shorter rotations, which puts pressure on their businesses. And it doesn't necessarily get you the natural resource management outcomes that you may want. So, it's not a simple thing about, let's all ban all land clearing. I think we need to think deeper and harder about what we're trying to achieve and where we want some certain outcomes.

**David Pembroke:**

Fiona.

**Fiona Simson:**

Yeah, the oils and oils, trees, and trees. And as the two previous speakers have said, sometimes we are managing the regrowth which are woody weeds, which provide really diverse environmental outcomes. You can look at really dense areas of woody weeds in Australia and where there is really degraded soil, where the water at the soil is leached, where it's really not a great habitat at all. And I think this is probably, this whole emotive term land clearing is one of the most misunderstood terminologies and things that are bandied about in Australia a lot.

**Fiona Simson:**

We can and do manage our landscapes for really great environmental outcomes. We've got the stats, we've got the statistics, we've got the data you can hit. You've heard from Melinee how that works in practise for an average range lands type of producer. And so, I think now we really have to focus and be aware that we can and do manage landscapes for good environmental outcomes, as well as productivity profitability. And sometimes people are thinking, I think of Tasmanian old forests when they're thinking trees, not what is actually the vegetation of a lot of Western New South Wales and Queensland,

**David Pembroke:**

Fiona, thank you for that answer. We are about eight minutes away from the conclusion of today's dialogue, Growing Greener food production and a healthy environment. But Andrew, were you going to add something there?

**Prof. Andrew Macintosh:**

Yeah, I'd probably just chuck it in at the fear of upsetting some of my other panellists. I think one of the hardest things for the ag sector at the moment is that clearing of remnant vegetation. Again, a lot of people talk about those high-level statistics, but in many cases, it's the loss of paddock trees and small concert vegetation, which can really have adverse biodiversity impacts. And I can fully understand why landholders do that. In many cases, it's driven by a desire to increase their land values, or because they're trying to implement precision agriculture systems, which can actually themselves have other beneficial impacts for sustainability and for financial performance, but they do have adverse biodiversity impacts.

**Prof. Andrew Macintosh:**

And again, it's one of those cases where we need to design policy instruments that can accommodate agricultural interests and in doing so probably the best way to do that is to try and pay farmers to retain some of that vegetation where it performs important biodiversity services and thereby counteract the thing that they're giving up. They're giving up value, and so the consequence of incentivizing these positive incentives, in many cases. It can change behaviour in ways that we need to do if we want to conserve our biodiversity.

**David Pembroke:**

Andrew, thank you very much for that answer. The question, I might throw this one to Richard, I'll throw it to you, you've been quiet for a while. Are lands used to generate renewable energy example, solar farms compatible with diversifying retaining agriculture usage.

**Prof. Richard Eckard:**

Look, I think that there's no doubt that the agricultural lands in Australia have a lot of sun as mentioned earlier, a lot of wind. I think we've got to think that it's not an either or in all cases, that you can actually generate renewable energy through solar farms. We're starting to look at design options for grazing underneath solar panels or within solar panels. That might actually be a far better solution if we can get a bit of shade and heat stress amelioration from grazing within a solar panel farm.

**Prof. Richard Eckard:**

So maybe it's not an either-or solution. I do think renewable energy on farm could be an important diversification of income, because it is a more consistent income stream, and in a variable climate sometimes stabilising some of the income stream could be a good idea. So, I think agriculture can play a distinct role and we are seeing some of these large solar farms emerging now. I just don't think we have to think about them as either or.

**David Pembroke:**

Richard, thank you. Fellow panellists that may have been our last question. So, any views on that particular question? As the poll makes its way up onto your screen, the people at home looking forward to you being able to answer those polling questions over the last couple of minutes. Andrew Macintosh?

**Prof. Andrew Macintosh:**

Oh yeah. I'll just say that I totally agree with Richard. I think already there's a lot of cases where both solar and wind farms are complimentary to your agricultural production and providing very drought free income sources for farmers to support their businesses, you can have livestock operations going in and around smaller farms. I was only a few days ago at a solar farm, that's been built on a cat landfill site where the land is moving. Now we can build a solar farm on a site where the ground is moving quite considerably, building solar panels and solar panel systems that allow for livestock to graze underneath them to underneath them is hardly a great technical challenge.

**Prof. Andrew Macintosh:**

And so, I personally see it as an opportunity in many areas. Having said that, I will note that there are a lot of people who don't like the sight of both solar panels and wind farms, but apart from that, I see for many agricultural producers that the renewable energy sector is probably one of their partners going forward in many areas.

**David Pembroke:**

All right. And Fiona?

**Fiona Simson:**

Yeah, totally agree with both Richard and Andrew. I think renewable energy on farm really is an exciting opportunity. So many people, I think so often in Australia, we have polarised debates where you have to be for something or anti something. I think we can walk and chew gum at the same time. I think it's quite possible that we can achieve both and that's what we should be striving for.

**David Pembroke:**

I'm sure you will join me in thanking our panellists today Fiona Simson, Professor Richard Eckard, Professor Andrew Macintosh, and Melinee Leather. So, a very big thank you to our panellists today for the contribution they've made to what's been a fascinating conversation and really given us a number of different perspectives and insights around your questions, which I think has really been a great feature of today is that this has been a conversation driven by your interest.

**David Pembroke:**

And for the people, who we haven't been able to get to today. There are a couple of questions that we didn't get to, certainly we will look to in further opportunities, answer those questions into the future. But although today's dialogue is coming to a close, it doesn't mean that the Food Systems Summit dialogues are over, in fact far from it. And I'd like now to get Fleur Downard, to come back to the microphone, to let you know, what are the other ways that people can engage in preparations for the summit. Fleur.

Fleur Downard:

Thank you, David. We encourage you to visit the department's Have Your Say page, where you can still provide us with your views and ideas for the Food Systems Summit. We will also publish a recording of this webinar. We hope you'll also register for the next webinar in the series, future-proofing our food systems boosting resilience. This will be held on Thursday, the 20th of May, 2:00 to 3:30 PM, Australian Eastern Standard Time. You can find this registration link for this and future webinars on the Department of Agriculture Water and Environments, UN Food Systems Summit 2021 webpage.

**David Pembroke:**

Thank you very much, Fleur, and remember that these dialogues are also happening elsewhere, both in Australia and around the world. And if you would like to engage further, please use the links that are now up on your screen. So, as we head to 3:30 PM, Australian Eastern Standard Time, on behalf of the Department of Agriculture Water and the Environment, thank you so much for your attendance today and for your questions and for the contributions of each of our panellists. And until next week's dialogue, it's bye for now.