



National Drought Forum 2023

Decision Time session transcript

(Duration 92 mins 31 secs)

26 September 2023

Introduction

This is the transcript of one of the Department of Agriculture, Fisheries and Forestry's National Drought Forum sessions. This transcript is for the Decision Time session, held at the Forum, 26 September 2023.

This session features Josh Gilbert, session Chair, and speakers Kristie Lisle, Elizabeth Johnston, Dr Yiheyis Maru and Neal Hughes.

The panel features Josh Gilbert, panel Chair, and panellists Courtney Bryant, Scott Hansen, Natalie Hughes and John Walters.

Learn more about the [National Drought Forum](#).

Transcript

[Recording begins]

Kristie Lisle [00:00:07]:

But also I didn't have the required data to make that decision. In August 2020, we made the decision to reintroduce cattle back onto Moonkan, which were heifers we purchased as our first trade cattle. This also allowed us to track their daily average weight gain and capture the data we required. It also safeguarded us that if the weight gain didn't work, we could use these heifers in our breeding operation. We then used the daily average weight gain, cashflows, livestock schedules, finance backing and Mark's knowledge of trading cattle to compare our two operations. This gave us the confidence that we could make the right decision to change our business strategy and sell our breeding herd and transition into a beef trading background operation on actual figures that we collected. This has also given us the flexibility to adjust our stocking rate to carrying capacity when required through the dry seasons.

On farm management decisions. We cannot control the climate change or weather cycles. However, we can control the management practices within our tools and data. To improve and prepare for the dry seasons, over the past four years, we have focused on the infrastructure, soil and pastures on Moonkan with the assistance of tools, data and financial literacy to make our farm management decisions.

Improving Infrastructure with technology. A key tool for operating any property is water, especially throughout the dry seasons. While we slowly introduce livestock back onto Moonkan, we realised the water infrastructure was beyond repairable and unreliable, which forced us to replace the entire water infrastructure. We were fortunate enough to have a friend, Isaac Hartz, who had the knowledge and experience to help design and implement the new water infrastructure. The first step, Isaac suggested, was downloading Phoenix Mapping. Utilising the Phoenix Mapping program allowed the three month process much more sufficient with designing planning stages a visual outlook and maintain the tools and data to ensure the decision making was the right fit for Moonkan. After three years, we have now achieved our water infrastructure goals with an easy access map. As you can see on the screen, the dark blue line is 55 kilometres of poly we laid, the light blue dots is 58 troughs we have installed and we also have a million litres of water storage.

Throughout designing the water infrastructure, we wanted to focus on the 500 meters walk to water, which would assist with our weight gain herd mentality and grazing pressures. This all, this is what is displayed on your screen now. The Phoenix Mapping program had a tool that we could put a 500 metre radius circle over each trough to see our walk to water and make the decision if we needed to relocate a trough or put a new trough in. We then used the mapping program to decide how to split out the original paddocks into smaller paddocks to allow for our rotational grazing system. As you can see on the slide, the original fencing was 25 four barbed wired paddocks. And the new fencing is now 55 single white electric fence paddocks with the boundary and laneways continued at four barbed.

Improving soil and pasture. We believe that our soil and posture are another key tool within our beef business. If we do not have the pasture for our livestock, how are our livestock meant to gain weight? Over the past four years we have taken an incredible journey on focusing on learning, renovating and nurturing soils and pasture. This journey has included ploughing in multi species of pasture via the traditional disc and plough method. This was until Ross Newman, agronomist, recommended a Great Plains zero till drill, which we purchased last year. And it has been a great addition to our business. Which, I have a bit of a video to show you. As you can see, the first is cuts into the soil. Then the second disc has two blades, which opens the soil up and plants the seed. The third disc is a press wheel covering the soil back over. This allows the seed to drill straight into moisture with limited disturbance to the ground cover and soil.

Improving Financial and Administration Literacy. In February 2022, we completed the QRIDA Drought Preparedness Grant, which included completing the Farm Business Resilience Plan funded by the Future Drought Fund and Queensland Government. Throughout the application, we had to provide our drought preparedness strategies and projects that would improve the drought preparedness on our property. Which we were approved, as you can see on the screen, a fodder storage shed and exclusion fencing. In the farm Business Resilience plan, we had to outlay our actions and approved projects and develop a plan which helped with completing the projects easier. Matt and I were already active in setting goals, but the resilience plan facilitated further developed written in depth goals that assisted with the risk within our business and property. We were already familiar with QRIDA's processes due to utilising the sustainability loan to start our improvements at Moonkan. With QRIDA's processes, you are required to complete a three year cash flow, which to this day I still use our cash flow for forecasting and actuals with completing major improvements and projects on Moonkan it has been essential to take control and understand our business inside out. This has

started with our cash flow. It provided us with control, confidence and support to help ensure that we had enough funding to support the business decisions, planning and improvements. This transition of Moonkan from the 2019 drought affected no pasture property to today makes us very proud of our achievements. It is definitely not been an easy road. It's been a lot of commitment, sweat and tears and it also has involved a lot of time to learn, plan, trial and implement that what works for our property. However, our journey of improving Moonkan still continues. Our next step is starting to focus on capturing our weight gain data with an Optiweigh. We have previously captured our weight records by yarding and manually weighing cattle every two months. Where an Optiweigh is a system with satellite connectivity for tracking live paddock weight records. We are hoping to be able to detect that livestock weight gain changes due to the pasture degrading.

I really appreciate the opportunity to be a part of the 2023 National Drought Forum and present to you today. I hope you have enjoyed listening to Matt and I story. Thank you.

Josh Gilbert [00:07:07]:

Yeah, a big thank you to Kristy for sharing that story. For me, that yarn around resilience and the way in which you know your family and working together as a team and also the outside support there really helped pull everything together. It was really beneficial and the change of business practice around data was also very helpful.

Kristy also spoke at the Science to Practice Forum earlier this year. So, if you want to continue seeing a bit more about her story, make sure you check that out. I particularly love the yarn about changing one of your bedrooms into a boardroom to help make good strategic decisions. So, certainly check that out.

And next presenter is Elizabeth Johnston, Major Programs Director of Water and Agriculture at the Bureau of Meteorology. She leads projects providing climate, weather and weather information to inform decision making for the water and agricultural sectors. Please welcome Elizabeth.

Elizabeth Johnston [00:08:22]:

Hi, everyone, and thanks for the opportunity to chat today about Climate Services for Agriculture in particular. I also want to acknowledge the traditional owners and pay my respects to the elders, past, present and any elders in the room today and potential future elders as well.

So, Climate Services for Agriculture is a Future Drought Fund program that and I have to acknowledge as well our colleagues in the room today who are partnering with us to deliver the Climate Services for Agriculture project. The intention behind this is to contribute climate information to support a stronger, more resilient Australian agriculture sector and inform some of those decisions based on climate information. So, outputs that have been delivered so far through the program and My Climate View, access to API information and Map Explorer, which is still under development. I'll focus now on My Climate View and where we're up to with that.

I just wanted to also talk to the key strength and the uniqueness of this program. It really is user design led program that brings together sort of multi-disciplinary groups to actually create a product that is intended to be user friendly, that that can actually inform those decisions that farmers then make in that sort of more strategic space when thinking about climate and thinking about those

decisions in that climate space around what they might do strategically with their businesses. So, as well as the development that occurs in supporting this digital tool, we also have a strong focus on user experience and making sure that that tool is accessible to the users. Importantly, as well, it is underpinned by agricultural and climate scientists that kind of ensure the rigorous presentation and the robustness of the data that is presented to the users.

The Customer Engagement Team and the Social Sciences Team are actually quite critical as well in ensuring that those user needs are reflected in the tool and to again support that that development and that social science team provide the theory and practice around the analysis.

So, what is the tool? Let me just see if we can get this one to play. Great.

Video audio plays [00:11:00]:

Your location, your commodity, your climate. No matter where you are across Australia, preparing for the future of your farming enterprise is critical. That's why we've developed My Climate View. It's a free digital product designed to help Australian farmers understand what the future climate might mean for their location. My Climate View provides farmers and their advisors with past climate data, seasonal forecasts and future climate projections at a five square kilometre resolution right across Australia.

Climate information is tailored to meet the needs of a range of agricultural commodities, from meat to grains to horticulture and many more. This means that farmers can easily assess how climate factors that matter to their business could change into the future. For example, a wheat producer can see how the timing and intensity of seasonal rainfall in their region might change over time and how that might impact the way they farm.

We've built this tool by talking with Australian farmers. Their valuable feedback has helped improve my climate view, which will help Australian farmers and communities prepare for the future. Start using My Climate View for your farm planning. My Climate View is developed by the Bureau of Meteorology and CSIRO as part of the Climate Services for Agriculture Program, which is funded by the Australian Government's Future Drought Fund.

For more information about My Climate View and the Climate Services for Agriculture Program Search Climate Services to Agriculture on the Department of Agriculture, Fisheries and Forestry website.

Elizabeth Johnston [00:12:56]:

Great. So that's effectively the tool itself. And I guess I just wanted to then and you can go and explore that yourself to understand the tool a little bit more. But I wanted to talk to where we are now. So, the program is funded, as I mentioned, under the Future Drought Fund. And so encouragingly, and my quick scan after the Treasury mentions the Productivity Commission report has been released, there is support for continuing climate information services from the Productivity Commission. So, subject to government consideration, I guess, you know, we will be looking to kind of work through how we continue to support increasing adoption. We now have the tool itself and the real focus from here is to actually kind of drive now that impact and actually inform those decisions that are happening on ground and for farmers being better informed by climate.

And so, the Social Science Team in this space understands that farmers have a really established practice in utilising weather and seasonal forecasting information. They've got multiple tools, short term awareness, knowledge and in some cases formal training. There's still work to do in that space to inform decision making. But I guess just reflecting on that, what does that mean then in the climate space where, you know, we're still emerging, we've got the tool now, but there's still a capability uplift that needs to occur. There's some digital tools that are still under development and formal training and education in that climate space isn't as widespread and so really our focus from here is to kind of take that product and output and to kind of drive some adoption and capability uplift.

This slide just highlights some of those key work that the team has been undertaking and what we're hearing in the context of that kind of adoption and increasing awareness space. And you can see there that people are keen to kind of get more into playing with that and actually looking at trying to make some decisions. So, we're starting to really hit towards that kind of outcomes and the impact space that we're looking for the tool to be able to establish. Also in the Productivity Commission's report, there was a commitment to supporting First Nations and bridging to see the working group recommendation that's coming through that Productivity Commission report and we as part of the Climate Services for Agriculture program are starting to hear some really positive feedback from the Indigenous engagement that the team has been doing in the climate space.

Also too I guess, one of the things that we're looking at and in terms of that adoption is, is that we are actually looking at those sort of more strategic decisions. So, where we've sort of seen people think about this is that top left hand kind of comment where people are sort of checking in with industry consultants to understand what the possibility of growing avocados in Tasmania will be and having those conversations in Queensland. So again, there's lots of decisions that we would be keen to kind of inform through this kind of tool.

This is actually just building on that, that comment that I made around the engagement with First Nations people I think we've seen some great successes as a result of the engagement that's been happening through the Climate Services for Agriculture program. The engagement plan was developed in 2022 and since then you can see there are a huge number of Indigenous organisations that have been engaged and some active engagement that's happening in the planning space. Really positive feedback and we're hearing that we were engaging through that, that sort of Bush Foods Alliance. But the missing link for the bush foods industries is a tool like this and having more information to climate, more access to climate information.

The other key thing to note here is that one of the really exciting things that has come out of those consultations is the potential consideration of bush foods industries as a commodity within the Climate Services for Agriculture program, including potentially Kakadu Plum. And what we're finding in that space, and I mentioned that science team that sort of sits behind this is that actually we do need to change our thinking in this space where we might not have access to the sort of traditional science that might exist for other commodities. How do we access First Nations information, but how do we also treat that with respect and cultural significance that that it provides and create that intellectual property associated with that indigenous cultural knowledge. And so that's one of the areas for us where we see us kind of building our competency and capability as we're thinking about those bush foods commodities in the Climate Services for Agriculture program.

The other use case that I want you to talk to is the Queensland example, where QDAF have been undertaking Critical Temperature Thresholds Research Project. And as part of that project, they identified the value of the APIs that I mentioned within the Climate Services for Agriculture program to inform the work that they're doing or we're doing in that research project. And the great thing about this example is that it's actually coming full circle back where we've identified a potential new commodity within the tool around tomatoes. And so, what we're hoping to do with QDAF is actually utilise that research information that they've created and put it back into the tool to create that as a kind of key commodity.

And so, I guess that kind of leads me into where to from here. So, what we're hoping for is to think about some additional new commodities. So, in the native food space, thinking about what we might need to do to build our capability to consider Indigenous knowledge in the climate tool around Kakadu Plum and also looking at tomatoes, which is great, and that line up and link to QDAF and part of that the sort of broader interactions and collaborations with states. But also potentially thinking about as we're doing that tomatoes, could we also do a potential native food space, native food commodity around bush, tomatoes and pork? Again, highlighting the importance of the engagement component of Climate Services for Agriculture, where we have heard from stakeholders that pork is a potential area of interest they would like to see a commodity around.

So, this is the link to the tool. If you do want to go and have a look and explore a little bit further based on that video that I showed, you can plug in your own location, identify your own commodity and look for those different climate factors that that might be relevant for your particular stakeholders or your particular location. And I guess I just also wanted to again, finalise these with a bit of an acknowledgment, but you're really encouraging to say... One more thing in terms of the future space is that we actually have heard from farmers that they are, again, in that decision making capacity they have all this great information and then the question is, will, what do I now do with that? And so, developing that future climate summary is intended to kind of again, target and support farmers to be starting to make some of those more strategic decisions. So key next steps for us really in this space is to make sure that we provide that information to start informing decision making. But also to reflect on for those of you that haven't had a chance to see the Productivity Commission report yet, is to actually think about how we might, you know, make sure that we are getting to that that kind of really impact space with the Climate Services for Agriculture Program. I sort of talked to where those early adopters are. But yeah, there's a lot of work for us to do over the next little while to make sure we're continuing to increase that adoption and providing information to build that awareness for people to actually start making some really meaningful decisions and build that transformational adaptation in this space. So exciting place to go from here.

Thanks, everyone for the opportunity to present.

Josh Gilbert [00:21:09]:

Thanks, Elizabeth, for that presentation and sharing your insights and encourage you all to go and check out the MyClimateView.com.au website and follow the link on the QR code. And thanks for the examples to show that practical application as well. I'd like to now welcome our next speaker, Dr. Yiheyis Maru, Principal Systems Research Scientist and Team Leader for Adaptation Pathways and

Social Transition at CSIRO. He has a post graduate Diploma in Rural and Natural Systems Management and the PhD in Integrative Systems, Research, Modelling and Practice from the University of Queensland. His research focuses on understanding social ecological system traps conducive conducting linked resilience vulnerability assessments and developing resilience adaptation and transformation pathways for sustainability in developing and developed countries. Thanks so much Yheyis.

Yiheyis Maru [00:22:10]:

Thank you very much. Josh. I would like to start by acknowledging the Traditional Owners of the land this past and present. I would be making this presentation on behalf of my team and particular Dr. Nikki Creek, who supported putting together this presentation. I also would be making this presentation based on a few projects that we are leading the Drought Resilience Mission, which CSIRO has, and particularly the Future Drought Resilience Plans so there is independent reviews the CSIRO does to Regional Drought Resilience Plans that have been developed by different regions across Australia. We do provide that independent review and feedback to those plans. So, I would be connecting some of their decision making context in making this presentation.

So I've talked about the CSIRO Drought Resilience Mission. It has three work packages building resilience through innovation, innovative farming and regional resilience and also supporting decision making processes and policy around drought. As I said, I lead the team reviewing the Regional Drought Resilience Plans and providing resilience science feedback in making those regional drought resilience plans robust.

So maybe in case I don't have time, I will probably try to summarise the key messages that I am trying to communicate through this process. The first one is we heard quite a lot today the importance of data and prediction and information for decision making but those are not only the ones that we use when we make decisions. So, it's very important to understand what are the other contexts, decision contexts that we need to use when making decisions. So, if we are going to provide an integrated support for decision making, we need to understand other elements are required in decision making.

So, data and predictions, particularly when things are quite complex, drought interacting with other issues there are other areas of elements of decision that we need to be focusing if we are going to provide that support. We have to make decisions sometimes in a context of irreducible uncertainty and the uncertainty is such that even if we develop a lot of information, knowledge, we can't predict it because there are a lot of interacting factors that make that context that we have to make decision on.

So, those are particularly there has been some studies that have been done. Values and the things that we hold dear and words that we assign to a particular thing have tremendous impact in the way we do decision. Even if we have data and knowledge suggesting otherwise, the values could trump some of the information that comes. So, understanding what values we bring to the decision context are very important, and that also translate the rules and norms that we apply or are constrained by when we make decisions.

Plus, plus the capability that we have. What sort of options do we have? What resources do we have? We want to make a decision those are also constraining. So, if we are going to provide support, it's not heavily emphasizing about generating more data and information that is required. We need to be also investigating what values are deciding and how we are making strategic decisions in relation to drought preparedness and resilience.

In fact, the resilience science is that because we cannot predict the future and exactly how it's going to pan out, it's better prepared now to have options to respond as we learn more and the conditions unfold themselves. So, it's really about taking the resources that we might need to put prediction which we cannot attain certainty and putting it be prepared to develop different options.

So now that I have said my key message is if Melissa interrupted me, I'd be okay. Okay. And so there is a framework called VRK. The V is value, R rules and K knowledge. But we now understand it's also the capability or the options that we have, the diverse options that we have to make decisions. What sort of options are emerging also affect our decision making processes. I wouldn't go into details what those are. I mean, values are really the sets of principles by which we make choices or how we assign values or words to a particular thing do affect our emotions. So, decisions are not entirely made by rational thinking. Emotions play significant role, and the emotions are driven by the values that we hold or assign to particular things. So, understanding those would help us in terms of making what sort of decisions we are trying to promote, particularly with building resilience on farm or a community or a policy at a at a national level. And obviously the others are rules and norms. What sort of norms, rules are we operating on and which constrain us sometimes enables us to do different types of decisions.

A capability is about options. So, what options do we have on hand? What options are emerging that we can scan that would help us? So again, emphasizing that it's not entirely data and information that helps us making decisions. Those aspects are also useful if we're going to make a very integrated and systemic decisions that support us to build resilience. And so, I'm just going to go through... decision context, change those values, change the rules change, particularly when we are in drought or pre-drought and in drought and post drought, those things change. So for instance, the values that we hold during drought might change. The emotions that we have when we see dry land change and thus prompt us to do other things to value some things more than others. So, understanding how those changes happen also helps us in terms of making important decisions and if we are affected by the decisions that have been made previously, it's a cumulative effect of decisions previously made. Make a system or a particular context that we have for making a decision forward. So in the resilience plans that we currently reviewing, a myriad of decisions and people have made a lot of decisions, what sort of interventions are useful for a particular region to build resilience. And they are also about creating decision contexts that would enable us to make further decisions in the future.

So, I'm just going to take you through sort of a visual that we have developed to working with in fact, in Queensland, the Reconstruction Authority in developing how we perceive values into interact with rules, knowledge and capability and trying to make a decision. So, people coming for a reason for planning process, regional resilience planning process would have different values reflected because of their bringing the way that they hold a lot of things dear and how they assign to values to different things and thus are put together in terms of those have to be negotiated in a planning process.

And, and sometimes there are tensions. For instance, some of us might prefer to get in quite the short term, others might want to see a long term. Some of us might prefer to have significant efficiencies in the way that things that we're doing. But efficiencies sometimes do reduce the redundancies and spare capacity that we have in the system, which are the very nature of building resilience. Resilience has a cost. So, the efficiency and resilience would have tensions and we have to negotiate to resolve the issues. And it is in this context that we make decisions and we have to apply rules. For instance, the original Drought Resilience Planning Program has certain rules and how we make regional drought resilience plans. There are norms that we need to follow within the context that would help us to put together. So, all of us have to interact. Obviously that our data and knowledge generated by the from a local experience and also the data for example from My Climate View and, and the hubs and other sources are we have to integrate into making the regional drought resilience plans. All those have to be put together to affect that. So emphasising again, it's not just only the data and knowledge that it's making it helping us make the decisions, but there are lots of other aspects of values groups and norms and capabilities that we have. For instance, how much money do we have to implement those plans would have enormous implications what sort of interventions we're going to be designing.

So, those cumulative decisions that we make, make a system. A region is really a reflection of the decisions that have been made several times by individuals, by communities, by other different organisations. So, that gets reflected in the system. And the system has a nested sort of structure. There is an environment which is affected by decisions under the environment. That is a society that operates different services and connections and community. And community also provides sort of a nest in the economy and how the economy works. During the stable times when there is not drought for instance, we had a very good run for the last two or three years. And the decisions that we make tend to optimise stability and they tend to optimize for efficiency. And sometimes we forget to prepare for what might come because we don't have the sort of feedback that we receive quite quickly. So it's very important to optimise what this was, but it also maintains some systemic vulnerability that we have when we enter into crisis moments and thus would manifest. So for instance, the economy would be affected and the society like we have been hearing today, the significant impacts of drought affecting not just only farmers but the entire community, mental health issues and others.

So, we have options to then before the drought happening or during the drought or after the drought, we have choices to make. And those choices could be we make just use we just make decisions that are just going to take us back where we were and it's just doing the same and therefore increasing the vulnerability that we have already in the system. So, doing just the same or maintaining what we had. Or we could make decisions that will modify the system so that it enables us to give us different options to respond when another drought or another crisis comes. So, that's a modification. So as an example, these are the free, for instance, forbid if we go through a drought soon, what sort of decisions do we need to make trying to change the system. If we, for instance, relief programs are not going to reinforce the resilience building exercise that we have been working on for the last three years and then the system would go back to the same again and we would be facing similar challenges. We modify some of those things. For instance, the first speaker was talking about some of the systems that had been put in terms of water storage capacity. There are modifications to the system that helps enormously in terms of preparing ourselves for drought conditions. We can also think to do things differently if we assess that the system is not going to

work and supporting us going forward in preparing and having the resilience system to do during crisis, we could do things differently or transform. Prior to the crisis happening, there are certain actions that we could take to in doing that, or even after a drought or another crisis happening. And that involves making really decisions that change the decision context so that you would have a lot of options for us to work on trying to build our resilience. And so, I'm just emphasising this the plans, the regional drought we have reviewed around now around 18, 19 plans. One of the things that is emerging currently is that an assessment regional drought resilience plans, are making an assessment of the system that the regions and trying to see what do we need to maintain in the current system that is working and is likely to work even when we are facing drought? What are the things that we need to modify because they are struggling currently and will be struggling if we are going to have a long drought season? Or what other portions of the system that we need to seriously think transition or transform them because they are not going to work during that context. So, modify, maintain, modify and transform are not we're not entirely going to change the whole system that we have. There's no advocacy for making, transforming the entire system. You have to make an assessment of the system, in this case regions, to try to see what to maintain, what to modify and transform. And that that way we could then work actions out to help us with that.

Just about to finish. So summary is that again, data and knowledge are not the only ones that we need to be thinking of when we are making decisions that are other and decision context elements that we need to be focusing on. What sort of values or bringing into the decision? What are the roles of norms that are affecting us or enabling us to do the decision? What sort of capabilities, resources and options do we have to make a decision? So, if we are going to support farmers, communities and policy makers, we need to be thinking the other aspects and not just only data and information. And like I said, resilience building is really about being prepared so that you would have options to respond to the different stresses of shocks in the future. And regions are making the sort of based on some decision making and resilience assessment processes, regions are currently working towards making decisions, what to maintain, what to modify and transform, which is very useful. And they have to be supported to doing that. Thank you very much.

Josh Gilbert [00:39:46]:

Thanks Yiheyis for your presentation. So many of the things you spoke about really resonated for me and I was just thinking about the decisions that we make on our farm and everything, our community and just the environmental factors that we go through and some of the limitations about what we think about when we consider that. So thank you for that.

Our final presentation is from Neal Hughes, a Senior Economist Farm Data and Analysis at the Australian Bureau of Agricultural and Resource Economics or ABARES. Neal has over 15 years of experience as a research economist at ABARES with a focus on water policy in the Murray-Darling Basin and the effects of drought and climate change policy on Australian farms. Please welcome Neal.

Neal Hughes [00:40:40]:

Thank you Josh. Hello everybody. So here today I'm about to talk about the Drought Early Warning System Project, which is a collaboration between ABARES and the CSIRO to develop a drought and warning system for the Australian Government. Okay, there we go. So, following the last set of

drought events, 2019 2020, there was a clear need demonstrating for better information on the impacts of drought. So, there were a number of government reviews and a fairly consistent theme amongst all of them was the need for better drought information at the Commonwealth level, nationally consistent drought indicators and also forecasting capability and to look ahead at the potential for drought using the BOM forecasts. So, in 2022 the Department of Agriculture started the DEWS Project and essentially that project involves linking a range of agricultural models with historical weather data and forecasts coming from the Bureau of Meteorology.

So, the focus of this tool is very much on agricultural drought impacts. So a lot of traditional drought metrics are based on meteorological information like rainfall percentiles, but we know they can sometimes be an inaccurate description of agricultural drought and so that's what this focus, this tool is all about, translating the weather data into agricultural outcomes. Doing it on a high resolution and with a national scale and establishing an automated operational product that can produce regular updates, drawing in the latest weather data and forecasts, and pushing that out to a user interface as part of the Climate Services for Agriculture platform that we heard a little bit more about earlier. As I said, it's led by ABARES and CSIRO and it's kind of leveraging off a lot of the data and tools that ABARES already have around farm businesses drawing on our farm survey programs, all that kind of economic information, and then the scientific biophysical information on crops and pasture and their responses to weather conditions from CSIRO, as well as some colleagues in the Queensland Government who are also collaborating with us on this project. And of course all of this builds on the Bureau of Meteorology's historical data and the seasonal forecasts.

So why the DEWS? So, the DEWS has been built primarily to inform government. So this is a system that will provide a national overview on the impacts of drought on agriculture, and it will allow people in Commonwealth Government agencies to get that national overview and a lot of detailed regional information. Now it's important to point out when we've been talking about a drought information system that is not about drought declarations or triggers. This is an information system. It's about providing government with detailed information about what's happening on the ground, what's been the impact of weather conditions to date, and what's the likely impact coming down the road and that's useful information to inform the Government's response to drought in a variety of ways. So for example, the government run a number of programs like Farm House on Allowance, Rural Financial Counselling Service that could benefit from having a good understanding of where and when drought might be happening because it tends to affect demand for those programs.

As I mentioned, it's about measuring agricultural drought. So, we know that rainfall is an inaccurate measure in some cases of actual on farm outcomes. So, we're trying to capture the link from weather data through to the biophysical response of the plants and the pasture and the crops. And then through to the economic responses of the farm businesses and what's happening to the bottom line. And as I've mentioned we're trying to do something slightly different, which is not just looking back but looking forward.

So here's an overview of the Drought Early Warning System prototypes. Over the last 12 months, a bunch of us in CSIRO and events have been busy away building an operational system, getting all these different components together, talking to each other so that we can produce these results. So on the left hand side, you're taking in historical way the data and forecasts. You're also taking in a range of agricultural information, telling you things like the types of soil and pasture that exist at

different locations and the characteristics of the farm businesses, the mix of cropping and livestock activity, etc., all available on these high resolution five-kilometre grid across Australia. And then we're feeding that through a range of agricultural models, so that includes pasture growth models, crop growth models, and also that the farm predictor model at ABARES that generates estimates of farm profits. That allows us to produce agricultural income, agricultural impact indicators on the same five-kilometre grid across Australia, including forecasts out for the for the coming season and the plan is to put all that into a nice user interface.

So as you can imagine, a lot of IT technical issues that we've been dealing with primarily at the moment, just getting all of those tools, talking to each other and at the same time that that's happening, there's also a user interface that's being developed and it's being developed as part of the Climate Services for Agriculture platform. So in future it may be another app that would sit on that platform side by side with things like My Climate View that I've heard about today. And so that that is a demonstration of the user interface is still under development, but it gives you an idea of what it might look like. It has a national overview on the on the first page, gives you estimates of each of the indicators at a state level, and you can kind of dive in and get more detailed information. It provides national, state, region and LGA region and individual locations based on the five k grid of data.

So, this is probably the more interesting part of my talk. So, we actually have some live numbers from this system now being generated, and it's a really interesting time to be producing drought indicators given what we've heard in the opening about the way the outlook, the drying conditions as well as a difficult operating environment for farmers with commodity prices. So, that is a map coming out of our prototype system that's showing you the effect of climate conditions on farm business profit across Australia. And that's for the current financial year in progress. So for 2023-24 financial year, take into account weather to date and the forecasts from the BOM from year out which we've heard are for fairly dry and hot conditions, certainly for the next couple of months. So with presenting these indicators relative to a fairly short reference period the last 33 years, and that's specifically because of climate change and to avoid the kind of problems that we saw in the opening talk about those temperature maps which were just all red. You know, so comparing to long reference periods is becoming problematic because of climate change. And that's the motivation there. And you can see with the forecast, the BOM give you a probabilistic forecast, gives you a wide range of potential outcomes, we show you the upper and lower range and the average.

So yeah, obviously conditions have been drying. We've got some below average conditions for farming, northern and eastern parts of the Western Australian cropping zone, northern New South Wales into southern Queensland. But very mixed.

So we can kind of flick through and just give you some examples of some of the early years. So as we work back into some of the wetter years and seeing some better conditions for farm businesses and then starting to head back into the previous drought. And so I can't quite make that out, that might be 2019 no that was 2020, that would be 2019 looking rather bad. And so I just thought it would be useful here to provide provided me the comparisons. I that's the rainfall map for 2018-19 for the same period.

So we've done some research and maybe as we publish reports on these previously showing that you can get quite a big difference between what a simple rainfall indicator was showing and what you get

when you actually try to translate that into agricultural impacts. And so more importantly, not only do you get a difference between those two things, that we've shown with our research, that the outcome based indicators like this farm profit indicator are much more closely correlated with on the ground farm outcomes.

Okay, so this is also exciting for me. So, this is a forecast of farm profits for the coming financial year. So, you heard Tony talking this morning about the difficult environment the farmers are facing themselves right now with the low livestock prices. And typically ABARES would present a forecast of farm profit around March towards the end of the financial year. Now that we have this Drought Early Warning System prototype operational, we're able to do that much earlier. So these numbers are not yet public, seeing lots of people taking photos. So there will be a report hopefully... that's fine, that's fine. I won't tell my boss. So, it should be next week hopefully that this will be published. So you can see we're forecasting quite a decline in national farm business profit, this is specifically for the broadacre sector around 50% decline, and that's on the back of low livestock prices and the dry conditions. And you can also put that on a map and see what farm profits look like in different regions. And you can see that map looks a little bit different to the drought map because it's kind of putting a bit more red further South, which is really about the sheep prices and really low profits for a lot of the sheep farms in those areas that are more reliant on lamb and wool.

OK, there are a range of potential uses for the Drought Early Warning System. So, we've been commissioned to build these primarily from government and so that's what we've been busy doing. But there's a lot of other potential uses for these types of indicators. So firstly, farmers themselves and their advisors potentially can draw on this information to get an understanding of their exposure to drought risk, into climate change risk and to potentially benchmark the properties against the averages that are built into the metrics that we producing. And there's also a lot of interest within the finance sector. So, we've had a lot of engagement from banks, insurance companies that are really crying out for this kind of information to be able to understand their and the exposure of their customers to drought and climate change risk and to be able to do that not just by looking at rainfall data, but to do that in terms of say for example, farm profits, that is a bit more meaningful in that context. And the other on the obvious application is agricultural forecasting. So, you've already seen some of those numbers I put up, rolling these products into ABARES farm business forecasts and potentially some of our farm production forecasts as well.

So, we need to from here. We're close to finalising a DEWS prototype. So we have, as you can see, a working system kind of behind the scenes that is generating all of these numbers. We don't yet have a finished user interface, but we are expecting that that will come online soon. Once that is available, we expect to basically transition into a testing phase for around a year where we producing these numbers, running the tool in a non-public way with a select group of test users to get some feedback and refine the tool with the idea of going public next year.

So, if you want some more information on the Drought Early Warning System project, I mentioned the farm forecasts that's coming out next week is a little bit of information in there. Certainly some of those maps and charts in terms of the current season, there's also a much more detailed progress report outlining the Drought Early Warning System in all of its kind of technical detail if you're if you're into that kind of thing and that will be, you know, potentially another month or so away, hopefully soon. We have what we call a community of practice, which we are engaging with lots of

people across the states in state government agencies doing similar work, and we'll be presenting some of that to that group - I think it's next week, if not the week after. And that's it. Hopefully you will hear more from us and we'll be kind of looking for feedback and happy to hear what you think.

Josh Gilbert [00:55:29]:

Many thanks to you, Neal. I think you'll be the person everyone's chasing at the end of this. So if you're in the finance or insurance agencies, I'm sure they'll be very interested in that so thank you for your presentation.

The next part of our session today is a Q&A panel, and I'd like to welcome our panel members up to stage for a yarn. We have Courtney Bryant, who is the Assistant Secretary of the Drought Policy Branch at the Department of Agriculture, Fisheries and Forestry. Please welcome Courtney. We have Pip Job, who is the Director of Industry Engagement at the New South Wales Department of Primary Industries, please welcome Pip. Natalie Hughes is a Rural Financial Counsellor for Townsville, Burdekin and the north west region in Queensland, please welcome Natalie. And last, but certainly not least, please welcome John Warlters, the CEO of Rural Aid, welcome John.

All right, let's check the tech over this side of the room. Thank you. There's been a lot of interesting presentations today, so we're going to just get cracking into it. John, your you drawn the short straw, so you're up first. The not for profit sector is being increasingly recognised as having a clear role to play in supporting drought response. What information supports you to understand areas to target and to coordinate with others in the sector during drought? And is there a gap?

John Warlters [00:57:07]:

Thanks. Great question. And I really like that piece that you prefaced the question with about the clear role of not-for-profits. We think that Rural Aid does have a clear role to play and an important role based on the \$100 million worth of assistance we distributed during the last drought. We want to do a whole lot more. And I sort of also think about that question and turn the question around a little bit about what is it that government can do to help and support organisations like Rural Aid? And I think there's more that can be done. There's a gap there that needs to be closed. And I think it's about government understanding what it is that organisations like Rural Aid are good at, and then helping us to do more of that work. From a Rural Aid perspective that's getting assistance to people rapidly, it's our team of counsellors and that's the work that we do in communities to build resilience. So, by the end of this year, we'll be working with 65 communities right around the countryside. So, having a seat at the table like today is really important to us and having that ongoing seat at the table similarly so right throughout the whole conversation, the before, during and after.

So, coming right back to the what the question was all about. The information that we use is very much community driven information through the engagements that we have right around the country. But it's also very much through regularly asking the seventeen and a half thousand farmers registered with Rural Aid what it is that they need from us and what are the issues that concern them. So typically and a bit of an example of that, what do they need to help their operations be more sustainable for the long term? 60% tell us that they need more information about soil and land management. 30% want more information on from a financial and management literacy perspective. 88% of them have an appetite for carbon farming. 38% don't understand their insurance policy. 62%

don't have a succession plan and 73% tell us that they currently have a bushfire management plan, which could be helpful for the summer ahead. So coming back to also what's the gaps that exist? For me the gap is again just recognising the role that we have to play as not for profits and how we integrate that with the work that government does and how do we do that better. It's about having us at a seat at the table to do that on an ongoing basis. The other gap that I see very much focusing at Rural Aid is if we're going into another serious drought period like that we experienced through 2015 through to 20, where's the \$100 million going to come from that Rural Aid distributed in the last drought, where's that going to come in the next drought? The community might well help us do a lot of that work. Again, I want to acknowledge DPI and New South Wales because we have a fantastic relationship with them right through that previous drought and we continue to work really closely with them and also acknowledge our Federal Minister for the opportunity to be a part of these conversations and his willingness to engage more broadly with organisations like Rural Aid. So long winded answer to your question, but I hope it adds some value.

Josh Gilbert [01:00:26]:

Yeah, that was awesome. Thank you so much. And for me, that data was really influential as well. Like just understanding what farmers on the ground need, what their fears are and what their concerns are and how we can help address that. So thank you for sharing.

Courtney you're up next. The Australian Government has an important role in supporting farmers and regional communities across the drought cycle. What information that you access to understand conditions to make informed decisions?

Courtney Bryant [01:00:58]:

Awesome, thanks for that question. So, I think it's important that we make sure we realise that we look at drought information across the whole drought cycle. So not just when we kind of get into drought. We been involved in the drought process, even when it's been raining the last three years, we've been active and being out there and putting money out and really trying to build resilience and build relationships as well. And days like today is a really important place for us to continue to build those relationships and gather that information together. So, from a government point of view, I was reflecting on some of the earlier presentations. A lot of talk about learning and decision making based on information. That is really what we try to do in government with policy, probably not in some of the nice landscapes we saw before, more just in offices, but it's a really a question we're always asking is what's going on and what information can help us make good decisions. And, you know, we have been working a lot with Neal and ABARES in terms of the DEWS, because we see that as a really important tool for us to understand that better and one of the gaps we had from last drought was to have that clear information that had a real immediacy about it. But we also think that there's also important information to understand kind of the social and community issues that are going on and it's really hard to get data and information about what's happening right here and now. A lot of it's quite time, it's quite a time lag and comes kind of several years after droughts have passed and we can look back and see some of the stats around mental health or other issues that are happening in communities. And that's where some of our partners and stakeholders here today, like John and so forth, are really useful in helping us actually understand what's happening here and now. And the RFCS and those kind of groups. So we've been forming a lot of kind of partnerships and trying to find ways in which to bring that information in and some of the workshops later today will

be really important in us in kind of thinking about what are some of the ways we can keep the momentum of what we've done today going and keep that information between us going out there, but also information back on what's going on.

Another important part for us as well is that we're really keen to kind of make sure we're really clear about how we use the information and what it looks like as well. So, it's all great to have information and there's lots of data information out there, but what does that mean and how does that flow into government decision making? So there is a workshop this afternoon. We were looking at some of that and that's something we're really keen to explore in the Government's Drought Plan and try to give a bit more clarity around what that looks like so that it allows farmers and others to make decisions and also community groups as well.

Josh Gilbert [01:03:20]:

Yeah, excellent. Thanks so much Courtney. Pip, drought impacts vary from region to region, farm operations and also industries. What factors need to be considered to ensure the full situation is understood and decisions are reflective of this?

Pip Job [01:03:36]:

It's a great question because drought is terribly complex. So from a State Government perspective, I think there's five key things that we have to really make sure that we go and collect in order to better make a decision on whether it is a policy decision or an outreach based decision. So those five key areas are firstly, is the on ground intelligence. We as government, we get flooded with that. What's going on the ground. Whether that's coming from farmers, direct media, it might be coming through from NGOs or industry organisations, so that that is rich knowledge to hear. So, we need to collect that. But it's important to look at what patterns come through in that and are they patterns that are local or are they regional? Are they primary producers specific or are they sector specific? So, when you start to look for those patterns, you start to get some really interesting information that comes through from that.

The second part is looking at data, and we are in an era now where we are so data rich, it's almost overwhelming. But in that data, whether it's climate data, commodity data, it might even be banking sector data. And again, we need to be looking for those patterns. And data is really informative and if we can match that with the narrative that we're hearing from on ground intelligence, we start to get a really interesting story that we can look at.

The third important thing is we've got to look back. So, we have to look back at past evaluations, inquiries, surveys, lessons, management processes because that's where we can find out what was effective and efficient last time and what do we need to do differently. But we can also sometimes it's really helpful just to stop and go. Actually, that's right. That that was good. So don't lose it rather than always focusing on what do we always need to do better. Then it's important to look forward. So we've got to look out to the horizon. We've got to do scenario planning. What are the emerging risks that are coming our way? We also need to be non-linear in our thinking. We have to look across what are those other broad reach of impacts that we could be that could be coming our way. So, for New South Wales at the moment, we have got a drought event that is evolving. We also have just had to move to a management position on a pretty significant biosecurity situation with varroa mite,

we have bushfire season, so that's really complex. So we have to think way out into the horizon, scenario plan, what could be the possibilities now? Who doesn't love a bit of black hat thinking?

And then the fifth element to that is to consult, go and be curious, go back out and ask the questions that we need to so that we can fill the gaps, ask about unintended consequences, and we get a really rich picture and that helps us make a decision where we need to go to. So, and whether that is designing how we do our outreach and how can we do that appropriately, or it might be what are we putting in front of the policy decision makers that needs to be diverse? We always need to have a suite of options. It's never really about one. That's the reality of it. But if we use all of that information, hopefully the right decision is made.

Josh Gilbert [01:06:39]:

Yeah, it's definitely a tough job and I don't envy your situation. I think if you think about the 13 RDCs that represent all the grower groups and all the other, you know NGOs and those differences in government and local farmer groups and the whole works. There's a lot of information there and a lot of many different priorities I think that you have to try and weigh up. And, you know, particularly in New South Wales at the moment, you know, we've got varroa mite and, you know, the FMD conversations that we're having, there's quite a lot there. So thank you for sharing your strategy on that and I think it's really important.

Natalie, what impact can drought have on succession matters such as the decision to retire for farmers and how can drought be effectively considered as part of the succession planning process.

Natalie Hughes [01:07:27]:

So, I think we can all agree that drought is basically a key driver for delayed or even abandoned succession, whether that's through a sale or retaining that asset basically until death. We know that drought results in farmers working in business, but they prefer during drought to work in it rather than on it. And that often means abandoning the paperwork and the data side because they're, you know, they're busy putting in extra waters, pulling cattle out of waters, you know, turning on extra irrigation. So we basically find that whilst we're encouraging people to sell down now or to look at other drought options, but sometimes it results in getting caught. Also I'll speak to cattle in terms of brevity here and say you know, you might get stuck with light and then you're trying to sell them into a depressed, overloaded market. Sometimes it's impossible to truck them off property and that results in people needing to feed their cattle. They get into a worse position and they're lucky they're able to rely on non-profits, such as Rural Aid. They're able to access RFCs like myself. But when drought happens, there's a lot of people in need of assistance and it's really important that we've got in place ready to go.

In terms of succession, we have to look at the financial impact of that drought. Nobody wants to leave their child responsible for a drought and most businesses have some level of debt. So, is the child then going to be responsible for that debt and the amount of money needed to support their parent into old age? One of my soapbox topics, if you'd like to call it that, is aged care access for the parent that's leaving the property. In my area, an aged care deposit is anywhere between \$380,000 and \$580,000. So, for a couple leaving their property, that's basically \$1,000,000. Now if they haven't put money aside because they've been in drought so frequently that they're ploughing all of their

money into keeping their property afloat, where is that million dollars going to come from? Is it going to come from their child who needs to buy them out? Well, okay, that's fine. But does that child also have to take on the preexisting debt? And they say at the moment, it's common saying, that it takes three generations to go broke. But if we're going to see increased droughts more frequent, is that going to take fewer generations to go broke? Something for us to consider. And of course, we've seen our market fluctuations and quite a few people have talked about that today. So I'll talk about it in preparing it instead.

So skills in end on the business paperwork side, using the data side and using all the techniques we've seen here today so far, is there capacity for that business to be viable? And it's really important that when someone is tackling succession, that they're actually taking a good hard look at their business first, should that business continue? Is selling and exiting the issue a more viable option for them? Is a set date or a fluctuating date? You know, will drought push their succession back? But we actually have to remember that succession doesn't mean ownership succession, it can mean management succession. And it's really important that we get those younger people onto the property as early as we can and train them up in all aspects of business so that then the decision might come down to when does a parent want to go, not when do they have to go.

Our current taxation system also means that sometimes people have decided that they actually want to retain the asset until their death. So, management succession becomes more important. Does that farm then continue to pay their living costs as well? It's really important that we're referring people to trained advisors who have drought experience. We find that a lot of rural people might go to the city, and we'll find then you know, does that assessor actually know what that property looks like? Have they had a chance to go out and look at the conditions? So, the succession gets pushed aside essentially until it's urgent and it's the risk of change. I'm often told by clients that they don't want to put a succession on paper because they just have no idea what they'll be handing their child at the time. So I'll conclude by saying I tell my clients all the time, succession starts at birth.

Josh Gilbert [01:12:28]:

Yeah, Thank you. That's a really, really interesting framing to start the conversation. So thank you. We don't have time for questions. Sorry. I'm mindful that we are standing the way between you and lunch, but I do want to just give the opportunity for our panel, given all their experience, just to see if they have any reflections on what we've heard this morning from either of the ministers or the panel, the session that we just had around the conversation starters. So is there any final reflections you want to share before we wrap up today?

John Warlters [01:12:56]:

I'd just chime in on the mental health and wellbeing piece. I think it's absolutely one of the big ongoing issues. At Rural Aid we refer to it as the always on requirement that needs to be met and then the demand for the services that organisations like ours just becomes more heightened during those times of disaster and the stats there is troubling. And as concerning as they are, I don't think they are probably a surprise either. But we'd just love to be a part of the solution there.

Pip Job [01:13:30]:

I'll jump in next. I think that we've heard some presentations this morning that are clearly saying to us in a really loud way, don't approach drought in a linear fashion. And climate change is throwing us some really unusual situations that we have to start managing for. And if we just have a look at New South Wales, Mother Nature's obviously pretty cranky at present. You know, we've had record breaking drought followed by record breaking bushfires, followed by record breaking flood events. Mother Nature needs to go and have a couple of weeks on the beach in Fiji. But you know, we've we just need to be really cognisant that we cannot approach this in a linear way. It's highly systemic, it's complex, it's complicated, and it's going to continue to even be more so as we see climate change exacerbated and we just have to all keep on our toes. I think the way we've done things in the past, we need to be prepared that we might all have to work together in a very different way into the future and continue to do so.

Courtney Bryant [01:14:32]:

And I'll just add to what Pip said. Like, I think what I've enjoyed this morning is already us kind of trying to tackle and think about the complexity of drought. Like if drought was an easy problem, we would have solved it. But it's complex, it's evolving, as people said, it's continually changing and it cuts across so many different areas from a policy person for us, it cuts across so many different areas and so it has to be a really complex solution there as well. It takes many people with different kind of perspectives and different viewpoints. And yeah, I think it's really great to see so many people coming here willing to be part of that and like, as you say, be part of that solution so that that's great. And I think for us as government, I can probably for Pip as well, it's really great for us to hear that that this so many people who are keen to be part of that conversation and work with us.

Natalie Hughes [01:15:16]:

Yeah, mine will be about the longevity of funding and having locally led locally implemented solutions and people on the ground. And I thank Minister Watt for extending the funding for the RFCS service for another two years because we're on the ground and we can support people regardless of whether there's a current drought or not.

Josh Gilbert [01:15:40]:

Excellent. Thanks very much. Please give a round of applause to all of our presenters and panel members today. We really appreciate your insights and your time. So thank you. Thank you again so much. And to all the presenters as well. We're going to break for lunch I'm going to come back at 130 sharp. That's the very strict teacher, mother in me - coming back at 130 sharp. Lunch is going to be served at back. However, please feel free to break out onto the balcony areas like we did at morning tea. If you had the opportunity around to the front foyer area where the registration desk is to stretch your legs as well.

After lunch at 130, the program breaks into the interactive workshop sessions which are in the different rooms again. So please check your programs to say which room your workshop is in that you'd like to attend. The event staff are on hand to direct you to the correct room, so please give yourself enough time to find your room and to be seated before those sessions starting. And thanks everyone. Feel free to reach out to the panel of presenters during lunch to have a bit more of a yarn and we'll see you all back at 130.

[Recording ends]

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

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