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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES

Reference: Assisting Australian farmers to adapt to climate change

WEDNESDAY, 17 JUNE 2009

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES

Wednesday, 17 June 2009

Members: Mr Adams *(Chair)*, Mr Schultz *(Deputy Chair)*, Mr Bidgood, Mr Champion, Mr Forrest, Mr Haase, Ms Livermore, Mr Perrett, Mr Sidebottom and Mr Windsor

Members in attendance: Mr Adams, Mr Bidgood, Mr Forrest, Mr Haase, Ms Livermore, Mr Schultz, Mr Sidebottom and Mr Windsor

Terms of reference for the inquiry:

To inquire into and report on:

- Current and prospective adaptations to the impacts of climate change on agriculture and the potential impacts on downstream processing.
- The role of government in:

  - augmenting the shift towards farming practices which promote resilience in the farm sector in the face of climate change;

  - promoting research, extension and training which assists the farm sector to better adapt to climate change.
- The role of rural research and development in assisting farmers to adapt to the impacts of climate change.

WITNESSES

Committee met at 5.20 pm

FISCHER, Dr Joern, Research Fellow, Fenner School of Environment and Society, Australian National University

SHERREN, Dr Katherine Dove (Kate), Research Fellow, Fenner School of Environment and Society, Australian National University

CHAIR (Mr Adams)—I declare open this meeting of the House of Representatives Standing Committee on Primary Industries and Resources. The committee is inquiring into climate change and the impacts on Australian farmers. I welcome you both to this public hearing. I would like to acknowledge Bruce Ward, who I understand is here and who has had a lot to do with this process. Although the committee does not require you to give evidence under oath, I should advise that these hearings are legal proceedings of the parliament and warrant the same respect as proceedings of the House itself. Giving false or misleading evidence is a serious matter and may be regarded as a contempt of the parliament. I do not want to be too heavy on you, but we do take it pretty seriously. You might like to make an opening statement.

Dr Fischer—Basically, we have been briefed to just speak for a few minutes at the beginning so that you are then able to discuss things with us. We will keep that pretty brief so that we have discussion rather than just us talking. Essentially, what we want to bring to your attention with respect to how farming in Australia can adapt to climate change is a practice called holistic grazing management. Holistic grazing management differs from conventional grazing management in a number of different ways. It is different in a fundamental way because it is a different sort of underlying philosophy and a different framework for decision making that underlies how farmers make decisions about their grazing systems, and then there are a number of technical level differences as well.

The most important of the technical level differences, probably, is that conventional management typically involves continuous grazing, where livestock are present on the land all year round, whereas in holistic management farmers tend to employ rotational grazing. Basically, you take all the livestock from the whole farm and put them into one paddock and then move them every few days to a new, different paddock, which means that the paddocks have long periods of rest between intensive grazing events. That is basically the most important technical level difference. There are a number of other technical level differences, and as we continue the conversation I am sure we can expand on some of these things more.

Before we do that, I want to briefly introduce myself and give you a little bit of background about who I am, and Kate will do the same. I consider myself an ecologist with a particular interest in the ecology of human modified landscapes, in particular agricultural landscapes. I have published 50 or so papers in a whole range of international journals, plus a major textbook on habitat fragmentation and landscape change. We stumbled into holistic management more or less by chance and found it interesting, and that is why we want to share with you what we found out about it.

Mr FORREST—Can I just ask: did you do your original undergraduate studies in South Africa?

CHAIR—Just a minute—we will go to Katherine first.

Dr Sherren—I go by Kate, Chair. I come from Canada, and I have a bit of a history in contentious natural resource management planning settings involving stakeholders, primarily in British Columbia, in the forest sector, and in New Orleans, related to water management. As you can imagine, that is extremely contentious. I also taught spatial science at Charles Sturt University and at the University of New Orleans for seven years all up, and I consider myself an interdisciplinary researcher. I started out in spatial science but did a PhD in social science, and now I do a lot of work with those together, integrating those two. I have published in areas like sustainability education and interdisciplinary research—as in how to do it as opposed to just generically—as well as stakeholder engagement. That is one of my big interests.

In this project what we are working on is using the same landholders as Joern has been working with for the biodiversity study where he has discovered the holistic grazing management. I am working with them using photography and information visualisation to explore some of the social values related to their grazing choices and how they decide to operate.

CHAIR—Thank you.

Dr Fischer—Are you willing to hear another couple of minutes of background, and then we can move on to discussion?

CHAIR—Yes, please.

Dr Fischer—I want to just briefly summarise some of the biophysical benefits that we see in the practice of holistic grazing management, and Kate will briefly summarise some of the socioeconomic benefits that she has identified so far from her work. Just to keep this really brief: some of the key benefits that we see are a focus on the health of the resource base rather than just on the health of the livestock, which changes the perception in how farmers operate on the land. It tends to mean more conservative management of the land and coming through droughts better, for example. There is a very heavy focus on maintaining ground cover all year round, which means that soil erosion is less, and, when it rains, water infiltration into the ground is demonstrably higher on holistically managed properties a lot of the time. There is consistency between managing for perennial pastures and managing holistically, so often perennial pastures are encouraged in holistic management systems. Those are pastures where the grasses live multiple years as opposed to dying off once a year. There is also a tendency amongst holistic farmers to use less fertiliser, which has major positive benefits for biodiversity and of course also is becoming increasingly attractive to farmers because input prices have gone up. In fact, if you can do with less fertiliser and still make money, that is starting to be attractive to farmers. Those are just some of the main benefits.

Dr Sherren—From a socioeconomic standpoint, I guess the benefits can come down to financial and quality-of-life benefits for the landholders themselves. From a financial standpoint, it would appear that more even profits are gained by doing holistic grazing management, as opposed to the boom-and-bust cycles that occur often in more conventional grazing. A grazier I spoke to said, 'We do have lower highs, but we have higher lows.' So, instead of making a million one year and losing a million the next year, they are able to be much more consistent—there is less risk in that. There are also lower input costs, because there is typically less fertiliser

being employed. There is also less risk often, or less need for remediation, of things like erosion. Because there is cover on the ground year round, it is not eroding as much, and you do not have to bring people in to fix those problems. And then, after the initial setup, which does involve some costs, the maintenance of the system is actually less than in conventional grazing. Also, you are not required to feed your stock during drought, which can be extremely expensive.

On the quality-of-life side of things, I can only really speak from an anecdotal point because we are still in the middle of the social research and the research was not designed to test whether or not holistic management was better, but these are the things that we see in the literature and that I hear from some of my respondents. One of them is that there is more family time. I have noticed that those who are doing holistic management tend to be in partnerships between husband and wife, with a lot less need for the wife to go and get work off farm to supplement the farm income, because, I guess, the women can move stock just as easily as the men can. There is actually less labour there. And, because the women are not working off the farm, there is actually more time from the family standpoint. That is what it seems to be.

And then there is the benefit of improved mental health, which has also been in the media quite a lot. There is less risk year to year because of that lack of boom and bust that we see. And it has to be said that there is a huge pride and satisfaction amongst the landholders doing this kind of work from the stewardship role that they are taking on by focusing on the land base as opposed to focusing on the livestock and assuming that everything else will go all right.

We would like to sum up by saying that this is one of those win-win situations; it may well be one of those rare occasions in life. It is not a fringe movement anymore. We do not have good numbers on how many landholders are doing this. One study estimated it at 0.5 per cent, but other people we have spoken to estimate it at five to 10 per cent. So we are not actually sure what it is. But it is not a fringe movement anymore. The people who are doing this are on the boards of catchment management authorities and they have won awards. Some of our landholders have won things like ‘Carbon Cocky of the Year’ for their carbon sequestration and other awards for their environmental remediation. Tim Flannery, former Australian of the Year, is also a great advocate of the system and believes we should be encouraging it in a big way.

But of course there are things that government can do and these are the sorts of things I assume you want to hear about. There are initial start-up costs. The adoption literature tells us that, even if farmers can perceive a relative benefit from a new practice, they are unlikely to take it on unless it can be readily trialled. This is a system-wide change; it cannot readily be trialled. It is not something you can do in one paddock, as you can imagine. There are risks in putting in all the new fencing and the new watering network. That is somewhere government can help to defray those costs a bit so it is perceived as less of an initial risk. Once that is set up, I think the benefits are quite evident.

Secondly, I suppose the support of the regulatory environment is appropriate. This may not be so much about encouraging holistic grazing management as it is about stopping encouraging practices that may be less sustainable—the more conventional practices. It is about not making those who are operating sustainably feel like dupes for not doing something where they would get more handouts when they simply do not need them. Maybe there is a place for that.

Finally, good reliable information is important. I think farmers need to hear the training information from more than one place—not just from the people who are selling training courses but from government and from academics. This is also where there is a role government can play. One of the things we summed up with in our submission was that a study tour to the region would probably be extremely informative for you. The area we have been studying is very close by. We encourage you to take a trip and see some of those places for yourself.

CHAIR—About eight years ago I went to the Lachlan River for an inquiry on desertification. It was the first time I had seen a salt monitor and salt build-up on cuttings and things. I visited a property the name of which I cannot remember. There was a young farmer who had come back to the farm. His father had turned the farm over to him. He had picked up on this philosophy and was practising it. He had thrown the gates open and wired them open. I do not know how he has gone, but he told us that he thought he had to do something new because they were in pretty dry times. Most of us would have heard of whole-farm planning, and I think a lot of people are moving in that direction. Our committee has received some pretty practical questions. One question that came to me was about how you control grasses et cetera when there is no grazing for a couple of months and you have a fair bit of grass or something on different areas. The other question was about how turning off stock over a whole region would create some gluts and some issues with the way abattoirs deal with that—the price and those sorts of things. I guess those questions cannot be readily answered, but they are concerns that we have heard.

Dr Fischer—Do you mean that there would be too much grass, or very long grass, and that could create hazards of all kinds?

CHAIR—Yes. Some animals only eat grass of a certain length.

Dr Fischer—That is to the advantage of the management; that is exactly the story. Holistic managers tend to have grazing charts, whereby they map the length of the grass in all of the different paddocks that they have. It is quite common for them to have 50 or 100 paddocks. They know at any given time how much grass is in each paddock. Every time it rains they update these charts. That means they can predict into the future how many days of feed they have ahead for their cattle, sheep or whatever they are running if it does not rain. That means they have a very effective monitoring system. Because they know the length of the grass, they know how far into the future they can carry their livestock even if it does not rain. That means they have an early warning system when they are running low on feed. When they know they have only, say, 30 days of feed ahead of them they start to de-stock. They de-stock before everyone else de-stocks and before the resource base is really affected. So knowing the length of the grass is quite a good thing. There are not real any problems with there being too much grass.

Dr Sherren—Except for fire. That comes up in some of the interviews. It is certainly perceived by some people who are not doing holistic management that the fire risk increases.

Dr Fischer—That is a key point. One important thing is that everyone we have spoken to who has switched over is very happy with what they have done. That is quite a critical insight: people seem not to really want to go back.

CHAIR—How about if everyone in a region started to turn off stock?

Dr Sherren—You may have noticed that we mentioned that in the submission. I try to have thought experiments: what actually happens? Is it one of those things that only works if only some people are doing it? We do have an economic side to this project. We have a third colleague who is working on the dynamics of what happens at the farm level and at the industry level if these transitions made. I am afraid we do not have a very easy answer to that, but it is unlikely that entire regions are going to be in the same condition of having drought conditions. It is likely that there will be a shift.

CHAIR—It happens now. Alby and I are both old meatworkers, so we have experienced a glut of stock coming into the works because there is a drought on and all of a sudden stock are being pulled out.

Dr Sherren—I do think research is still needed to see how to scale things up.

CHAIR—I am sure it is.

Mr SCHULTZ—I have heard of this type of grazing. In fact, I think a few people in my electorate are utilising this concept. Where in the upper Lachlan did you start this investigation? I notice in your submission that you began it in 2007.

Dr Fischer—We have sites around Boorowa and Cowra. Those are the two main bits. And we go a bit further east, into Dalton. The furthest west we are going is just short of Young.

Dr Sherren—Carcoar, just south of Blayney, is the furthest north we are going.

Mr SCHULTZ—What size blocks and carrying what type and number of livestock?

Dr Sherren—It is a mix.

Dr Fischer—I do not have the average property size in my head, but we are dealing with typical farms in the area—for example, 800 hectare farms. They are running stocking rates as low as 2 DSE and as high as 12 DSE on average across the farm. We have a range of things. In fact, the experiment is designed from a biophysical perspective around capturing the whole range of grazing regimes that are practised in the region. So we do not have just the most environmentally aware farmers; we try as much as possible to cover the whole range—those who stock heavily, those who stock heavily lightly, those who rotate and those who do not. We cover the whole range.

Mr SCHULTZ—How many farmers did you approach to participate in the trial, and what was the initial reaction to it? What you are asking farmers to do is move away from the traditional farming method that they use.

Dr Fischer—We need to understand the experiment. We have not asked any farmer to change anything they do. The way these kinds of studies work is that they substitute space and time. Basically, we cannot make farmers change and adopt the practice and see results over the funding cycle of a three-year research project. But what we can do is pick 10 or so farms that do it a certain way, 10 other farms that do something else and 10 other farms that do something else. That is a so-called cross-sectional study. We are basically using the fact that these people have

done things in a certain way for a number of years already, and we are there to witness the results. By doing that in a number of different places at the same time, it is like doing a comparison between how boys and girls perform at school. You cannot turn a boy into a girl, but you can compare all the girls with all the boys. That is the same kind of thing.

Ms LIVERMORE—I want to get an idea of whether you have been able to form a view as to the applicability of this kind of management regime across different regions. Are there particular characteristics of a region or a population that seem to foster the uptake of this kind of practice?

CHAIR—Kirsten comes from Rockhampton, which is a pretty big region for beef.

Ms LIVERMORE—Yes, I am in Queensland.

Dr Sherren—The south-eastern wheat-sheep belt has a lot of similarities. We are really only looking at those who are doing grazing. Obviously there is a huge amount of cropping, particularly throughout the west of our region, that we are not dealing with at all; we are eliminating that from the experiment. From a social perspective, my work is still very much in the early days. If I had to generalise, I would say it is probably the younger landholders who are more likely to take this up at this stage, but I would say it is still in train.

Dr Fischer—There was a study published this year, I think it was two months ago, by people at the University of Queensland, looking at adoption and what the characteristics of adoption were. I am not entirely sure what the various factors were, but there are a range of social factors that play into it; it is a complex thing when it comes to individuals. When it comes to the geographic range, in our submission we are basically sticking to the area we know most about, which is the temperate grazing area. Having said that, we are also aware that this is practised beyond the temperate grazing areas. It is practised in the rangelands of Queensland. But we did not want to extrapolate beyond our knowledge and tell you about how wonderful it works up there because essentially we do not know.

Mr SCHULTZ—It is very pleasing for people who are concerned about the suggestion from Professor Garnaut that we should totally do away with livestock grazing. Your method cuts down flatulence, doesn't it?

Dr Fischer—If you encourage perennial pastures, there is a lot of talk about the carbon level in the soil: how the hell do we account for it? Whoever gets it will, I guess, publish it somewhere very prestigious. Basically we do not know how we do that. But it is pretty obvious that the perennial pastures are going to have benefits as carbon sinks, as opposed to annual pastures.

Dr Sherren—They are not tilling the other pastures either, so they are not using as much mechanised equipment.

CHAIR—I think there will be a lot of work going on as we go to Copenhagen. There will be a lot of outcome from that in the world that will take us further into the future.

Mr WINDSOR—I am very supportive of what is being said. A lot of proactive graziers in the New England area are operating these sorts of systems. There are some variations in the systems, but the ground-cover initiative is really having an impact. One of the people who will give

evidence is Dr Christine Jones. She is doing some carbon analysis work with, in particular, ground-cover technologies and sequestration of carbon from humus. Have you done any work on that? Do you have any feedback on the carbon effect at depth?

Dr Fischer—No. I am aware of a published paper, which I do not think I have on me, which looked at a case study in the US which compared dairy farms that are operated holistically and dairy farms that are operated conventionally. They did a full carbon budget and found that the carbon balance was much more favourable in the holistic setting. That is the only published case study I am aware of that has looked at that. But that does not mean there are not other studies. We have not really worked on carbon ourselves.

Mr WINDSOR—Logically, these sorts of systems have to be better.

Dr Fischer—I agree, but getting the hard numbers on the table is quite difficult.

Mr WINDSOR—The other issue here is drought policy.

Dr Fischer—I would like to make one key point that perhaps I did not make in our short introduction. The key difference between this method of adapting to climate change and the various other options is that this is not technology command/control oriented, which is what the vast majority of natural resource management has been. This is not about getting bigger silos, better forecasts and better technology in place; this is simply about living with variability. Australia has the most variable climate on the planet, and we just have to face that. The system itself has a nice monitoring cycle built into it. Even if you do not believe in any of the philosophy underlying holistic management, anyone who is not a fool would agree that good monitoring of the resource base of any business operation is important for doing it better in the future. The system comes with a built-in monitoring tool, unlike a lot of other things. Some of the people I know who are sceptics of holistic management, such as farmers, still acknowledge that the monitoring side of it is really neat. When it comes to dealing with droughts and having that sort of feedback from the environment and living with it, it is absolutely critical—rather than controlling your way through it and saying, 'We're just going to feed and pretend nothing has happened,' which is the more conventional approach.

Dr Sherren—Or setting up more infrastructure, more silos, and getting more silage and constantly spending more to try to buttress yourself against that.

CHAIR—You also make an argument about being ready to go again. We know that, with climate change, rainfall could vary drastically and these approaches could work very well. John, do you have a question? John is from the Mallee.

Mr FORREST—I have been very impressed by the rehabilitation that has occurred in South Africa—they are at a similar latitude to us—after some pretty terrible colonial mistakes and so forth. That is why I was inquiring about your South African credentials.

Dr Fischer—I do not have any South African credentials.

Mr FORREST—Okay. As to those examples you gave to Mr Windsor's question, would it be convenient, Chair, for the committee to inspect them on a Friday? We could speak to the

landholders themselves and pick up on some of the support you have described to us and ask them how they feel about this.

Dr Sherren—You would like to meet some of these people?

CHAIR—John is suggesting that we could have a visit. We can talk about that later on.

Dr Sherren—Absolutely.

Dr Fischer—There is a person near Boorowa who is an absolute leader in the field.

CHAIR—How far from Canberra is that?

Dr Fischer—It is a two-hour drive.

CHAIR—Is there anything closer?

Dr Sherren—Yes.

CHAIR—Okay. We will talk about that later.

Mr FORREST—Give it some thought and give us some advice. I think that would be worth while.

CHAIR—It would be very good. We like to visit and talk and get that sort of evidence as well.

Dr Fischer—What is the best way to get in touch with you?

CHAIR—We will talk to you when we have finished.

Mr FORREST—I asked that question because we have today received the Department of Agriculture, Fisheries and Forestry submission to our inquiry and it does not mention this level of livestock management at all. I imagine that is why you have made your submission: to create greater awareness. Have you tried to talk to the department about the benefits of this management technique?

Dr Fischer—No, not yet. Our research findings are coming out as we speak. You might have read about it in the *Sydney Morning Herald* today. We have not engaged heavily in dialogue with policy people because obviously we want to have something to say before we talk to people. This is early days for us in terms of communication. We are in touch with DEWHA and we have spoken to them about various things. They are rolling out the stewardship scheme trial over our study area, so our insights are very relevant there. We have not spoken to Agriculture yet, but we will take that on board. That is an important point.

Mr SCHULTZ—I am interested in the section headed 'Synergies with other societal priorities'. In paragraph 2 you say HM grazing tends to use less fertiliser. I take the point and I

take the reasons as to why you make that comment. It is very obvious. What about the issue of weed control? How does that affect it?

Dr Fischer—This is a very fascinating area, and I think it is controversial. From a researcher's perspective, the honest thing to say about that is that I think we might need a little bit more work on that. But I can already tell you some things. These things are tendencies. Holistic management does not forbid per se the use of fertiliser or pesticides, but there seems to be a correlation that people who adopt a holistic management tend to stay away from chemicals because they want to use natural processes rather than artificial processes. That tends to mean that they do not control weeds as much, in terms of chemical use, as conventional farmers do. That can create controversy with neighbours on adjacent properties and so on and so forth. One of the interesting things about rotational grazing is that, when you bring a mob onto a patch, they no longer feed in a selective way. If livestock are on the same patch of land for a long time, they basically eat their favourite species of grass over and over, and that leads to overgrazing. With rotational grazing you bring in a big mob and they nibble whatever they can get their mouths on. So some of the things that the livestock do not typically go for will get grazed as well. There are case studies of people who have employed this for a long time and can demonstrate that they have less weed cover than they used to have and instead have more perennial grasses than they used to have. Even though they have not used any chemicals in the process, through time the nutrient balance in the soil changes in such a way that it is no longer favourable to those weeds and becomes more favourable towards the things that are favourable from an economic perspective. So it is not as instant as spraying, but over time, if you give it 10 years or so, you will get changes in the system that are basically self-perpetuating.

Mr SCHULTZ—Are you going to be running your trials on the basis of looking at the areas that are grazing with HM techniques in 10 years time to find out whether that is in fact a reality?

Dr Fischer—I am currently on an ARC fellowship of three years duration. As of this time next year, unless I find something else I will be unemployed.

Mr HAASE—I am quite familiar with the process you are talking about. In pastoral areas it is not appropriate because we are talking about very large paddocks. In the grazing area it is popular, but it is limited to areas where rainfall is distributed through the year. My farmers tell me that it does not suit pure Mediterranean climates, where you have wet winters, a growing season that goes into spring and no rain through summer.

Dr Fischer—May I ask where you are from?

Mr HAASE—I am from Kalgoorlie in Western Australia. It is inland from Geraldton. I have some large agricultural and grazing areas in the midwest. Primarily it is a Mediterranean climate. I have seen this work best under irrigation.

Dr Fischer—In your area?

Mr HAASE—Yes—especially with centre-pivot arrangements, where cattle are moved almost on a three-day cycle from one segment to the next. It has great results, and the monitoring process is perfect. But that is where you have a guaranteed water supply and you are guaranteeing turnoff to a market with a pre-arrangement for a premium price et cetera. Would

you agree that this is simply a good farming/grazing principle that has benefits whether we are experiencing climate change or not?

Dr Fischer—Yes, but it is particularly suited for buffering you against variability in the environment. I am originally from Germany. If you have as much rainfall as I had in Hamburg when I grew up, you would be pretty safe. You do not need to think about de-stocking, because you know it is going to rain. The soils are very deep. That kind of country can handle a lot. The guy who came up with holistic management distinguishes between brittle environments and non-brittle environments. Brittle environments are what South Africa and Australia are like. In places that are inherently variable and more brittle, holistic management is a particularly suitable management style.

Mr HAASE—Is there anything in this holistic management style that would be suited to a Mediterranean climate? I am racking my brain, but could you pick aspects of it that would take you through a dry season as a regular annual occurrence?

Dr Fischer—I do not have the expertise to tell you that. I know that in Queensland, in the wet-dry areas, where they have very much seasonality, they do employ cell grazing under the banner of holistic management in some cases. I do not know how they do it, though.

Mr HAASE—Just as a matter of interest—because you will know the Upper Lachlan—do they have dung beetles there?

Dr Sherren—Yes.

Mr HAASE—In large numbers? Is dung beetle introduction effective? That is the perfect fertiliser, isn't it?

Dr Sherren—Yes. Anecdotally, the landholders' philosophy is to graze one-third, trample one-third and leave one-third of the grass every time. That is what they are looking for. The way that they speak to me about it—and I am not a scientist so they have to speak very simply—is that, because there is always some grass left, when the rains do come something will always grow. There are some little solar panels out there waiting for the sun to come back after the winter, and waiting for the rain to come. There is always a little bit of green there; they are never grazing it all the way down. So when it does rain something will always grow, and then that is what sets them up well for periods when it is a little bit uncertain.

CHAIR—At this stage, we are still dealing with philosophy versus some hard stuff to move on. Government support is usually geared to getting a cabinet submission through on some pretty tough figures so there are going to be some decent outcomes. I would just ask another question. The philosophy goes back to grazing as generally animals did roving around all over the world for thousands of years. Are there differences between domesticated animals and the other animals that this philosophy basically grew from?

Dr Fischer—I asked this question of people who adopted it in Australia because I thought, 'Come on; there were no cows here, right? So how can you say you are mimicking the natural system when there were no cows here?'

CHAIR—Sure. That is why I am asking.

Dr Fischer—I totally agree with you. The analogy works quite well in areas like South Africa. In Australia, it is not the same.

CHAIR—Northern Canada, maybe.

Dr Fischer—It is not exactly the same. So the question is: even though that little parallel breaks down, are the outcomes still beneficial? I would say, 'Yes, there are differences.' And who knows how exactly kangaroos grazed the environment prior to European arrival?

CHAIR—Well, they graze a lot better now because there are a lot of other grasses and things. I think there are probably a lot more kangaroos here now than there were before Captain Cook hit the shore. Getting away from too much purity and getting down to reality is where we would be looking at making recommendations in the future.

Dr Fischer—I fundamentally agree with you. Some people call it 'the holy church of holistic management'. That is when you have over-fired—if it becomes a belief system. I am a scientist so I am naturally critical of things, and the hypothesis is always, 'There is no effect.' So a traditional hypothesis test in science is: 'Demonstrate to me that there is an effect. Until then, I will believe there is no effect,' which is very conservative.

So, for example, with respect to tree regeneration, which we have published on, we find that there is a four-in-1,000 chance that tree regeneration is not higher under holistic management. All right, there might be a chance, but not a very big chance. Similarly, I think there is now very tangible evidence for some of the basics, like better ground cover, better water infiltration and some of those kinds of things. There is very tangible evidence. So, in terms of getting it through cabinet and what not, there is firm evidence on some of those things already; some of the other things are still works in progress.

CHAIR—If you fence off where the trees are, you have got to stop the grazing of the ones coming up, to get them started.

Dr Fischer—Well, this is the point: with holistic management, potentially, you do not. That is precisely the point.

CHAIR—Sure. I take your point.

Mr BIDGOOD—In the light of what you just said about the impacts and the actual effect, I really welcome what you are presenting and I think it is the way to go, but at the end of the day you have got to see the evidence to prove that it works and to really sell its benefits for climate change solutions. How well prepared do you think Australian farmers are for the impacts of climate change on grazing and agriculture?

Dr Fischer—A really good publication that summarises how some Australian farmers deal with this was produced by Land and Water a few years ago—I have got a copy here if you would like to see it—called *Masters of the Climate*. It has 30 case studies of how different farmers cope with climate change. It shows that different people adapt in different ways, and there are all

kinds of strategies out there. What is so interesting about holistic management, in particular—and what I think would be a good sales pitch—is that it is not a command-and-control solution that is heavy on infrastructure and heavy on technology. It just involves thinking a little bit smarter about where we actually live and using that. Essentially, that is what makes it quite saleable.

There is one case study in *Masters of Climate*, I think, of a couple that practises holistic management but most of the others are more technology driven—they talk about how they get better ENSO forecasts and how they have better groundwater modelling for their own property and so on. I think that those things will buffer them a little bit, but they are not fundamental changes that adapt to variability in the environment. That is the critical difference.

Mr BIDGOOD—I also take up on your point that, for example, cattle were not indigenous to the land before Captain Cook, whereas kangaroos, obviously, were. We all know that kangaroo meat is much greener, leaner and more efficient. What's your view of kangaroo farming?

Dr Fischer—Again, I feel like I completely lack the expertise to answer that. It is a different—

Mr BIDGOOD—I ask simply because they are indigenous to the land.

Mr SIDEBOTTOM—This is more of an observation. I was fascinated listening to what you were saying there, and it just struck me that you would need a lot of fencing for this. Then I read on, and you mention that, so I am sorry; I did not read it all. Then it struck me that, of course, if you were creating units of fencing inside larger units, that would affect your water infrastructure et cetera. I would be interested to see how the cost benefits work on that compared to the other system.

This is more of an observation—and maybe someone here can help me with this—but I do not know how fencing and some of the water infrastructure fits into the current 50 per cent investment allowance that is available on plant and equipment. You wrote in here about how you can be assisted. I would have thought that that is really important. I do not mean to politicise it; I am just saying that that would be an incredible incentive, if it meets the guidelines, to get into extra fencing and water management stuff. Are there any farmers here? Does it meet the guidelines or not?

CHAIR—I do not know.

Interjector—Not fencing.

Mr SIDEBOTTOM—Not fencing?

CHAIR—No.

Mr SIDEBOTTOM—But machines to—

Interjector—A tractor.

Mr SIDEBOTTOM—Yes, tractors. Of course, then there is your water. Sorry, Chair, but it is related to what we are talking about, because there is the crisis and everything else.

CHAIR—I understand what you are saying. I think that it is more plant, computers, utes—

Mr WINDSOR—The point is valid, Chair—

CHAIR—It is a very good point.

Mr WINDSOR—that maybe, if we are trying to encourage these sorts of things, that is part of the way to do it.

CHAIR—Well, we will certainly be making recommendations. You say in your submission that there is a need to get over the initial hurdles, and that is what we are looking for.

Dr Sherren—Most of the sponsored fencing that I have heard farmers talk about is to do with Landcare groups fencing off to do some plantings inside rather than infrastructure for the—

Dr Fischer—I will just point you towards one more document that I am aware of: a trial of the Green Graze program in the Goulburn Broken catchment in Victoria. There is a published report by Jim Moll et al—one of the other co-authors is Josh Dorrough, from the Arthur Rylah Institute for Environmental Research. They ran a stewardship trial with a total budget of—I am not sure exactly how much—a few hundred thousand dollars, so not very big money. There was a tender scheme, where farmers could put in for whatever. The point is that part of what they funded was additional fencing for this stuff, and there is something written up about how landholders responded to it, with the additional fencing required and so on. So there is a trial out there already.

CHAIR—The other one I wanted to touch on was the water run-off. Is there any hard data on increases? This is pretty important.

Dr Fischer—Do you mean hard data on infiltration?

CHAIR—Yes, infiltration and that sort of thing. This is a pretty significant claim, I think.

Dr Sherren—I do not have the data. I have the anecdotes.

Dr Fischer—There are overwhelming anecdotes, which Dr Sherren can tell you, and stuff has been written up—I think I cite it in here. There would be at least two different studies demonstrating enhanced water infiltration.

CHAIR—I am sure that that is going to come forward in other submissions that we have received about changing what is being grown—perennials other than yearly grasses, English rye grasses and other things that we have introduced over the years. Thank you very much for your submission. It is exciting to get new direction, and I think we are looking forward to these things coming forward to the committee.

Dr Fischer—We are very interested in hearing where the committee goes, so if there is a way that you can add us to some magic list of updates on what you end up doing with the various things that you are hearing, that would be of interest to us.

CHAIR—There is a website for the committee, so you can follow its progress there. All submissions are published on the website, so—

Dr Fischer—When do you anticipate wrapping up this whole process?

CHAIR—We are not sure about that—in a couple more months, hopefully.

Mr SCHULTZ—It will be interesting to read the website and see the evidence that is coming in to you guys. We have had good feedback on the website and the evidence taken that is sitting on the website, from people who have been running in parallel with the inquiry.

Dr Sherren—We have got you on our mailing list, too. So we will continue to do that.

CHAIR—Well, please keep Mr Schultz up to date.

Resolved (on motion by **Mr Bidgood**):

That this committee authorises publication of the transcript of the evidence given before it at public hearing this day.

Committee adjourned at 6.07 pm