COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

SENATE

STANDING COMMITTEE ON RURAL AND REGIONAL AFFAIRS AND TRANSPORT

Reference: Climate change and the Australian agricultural sector

TUESDAY, 1 JULY 2008

CANBERRA

BY AUTHORITY OF THE SENATE

INTERNET

Hansard transcripts of public hearings are made available on the internet when authorised by the committee.

The internet address is:

http://www.aph.gov.au/hansard

To search the parliamentary database, go to:
http://parlinfoweb.aph.gov.au

SENATE STANDING COMMITTEE ON

RURAL AND REGIONAL AFFAIRS AND TRANSPORT

Tuesday, 1 July 2008

Members: Senator Sterle *(Chair)*, Senator Siewert *(Deputy Chair)*, Senators Heffernan, Hutchins, Hurley, McGauran, Nash and O'Brien

Participating members: Senators Abetz, Adams, Arbib, Allison, Barnett, Bernardi, Bilyk, Birmingham, Mark Bishop, Boswell, Boyce, Brandis, Bob Brown, Carol Brown, Bushby, Cameron, Cash, Colbeck, Collins, Coonan, Cormann, Crossin, Eggleston, Ellison, Farrell, Feeney, Fielding, Fierravanti-Wells, Fifield, Fisher, Forshaw, Furner, Hanson-Young, Hogg, Humphries, Johnston, Joyce, Kroger, Ludlam, Lundy, Ian Macdonald, Marshall, Mason, McEwen, McLucas, Milne, Minchin, Moore, Parry, Payne, Polley, Pratt, Ronaldson, Ryan, Scullion, Stephens, Troeth, Trood, Williams, Wortley and Xenophon

Senators in attendance: Senators Fisher, Heffernan, Hutchins, McGauran, Nash, O'Brien, Siewert and Sterle

Terms of reference for the inquiry:

To inquire into and report on:

i. the scientific evidence available on the likely future climate of Australia's key agricultural production zones, and its implications for current farm enterprises and possible future industries;

ii. the need for a national strategy to assist Australian agricultural industries to adapt to climate change; and

iii. the adequacy of existing drought assistance and exceptional circumstances programs to cope with long-term climatic changes.

WITNESSES

Committee met at 9.03 am

CHAIR (Senator Sterle)—I declare open this meeting of the Senate Standing Committee on Rural and Regional Affairs and Transport. The committee is hearing evidence on the committee's inquiry into climate change and the Australian agricultural sector. I welcome you all here today. This is a public hearing, and a Hansard transcript of the proceedings is being made. Before the committee starts taking evidence, I remind all witnesses that, in giving evidence to the committee, they are protected by parliamentary privilege. It is unlawful for anyone to threaten or disadvantage a witness on account of evidence given to a committee, and such action may be treated by the Senate as a contempt. It is also a contempt to give false or misleading evidence to a committee. The committee prefers all evidence to be given in public but, under the Senate's resolutions, witnesses have the right to request to be heard in private session. It is important that witnesses give the committee notice if they intend to ask to give evidence in camera. If a witness objects to answering a question, the witness should state the ground upon which the objection is taken, and the committee will determine whether it will insist on an answer, having regard to the ground which is claimed. If the committee determines to insist on an answer, a witness may request that the answer be given in camera. Such a request may, of course, also be made at any other time.

Finally, on behalf of the committee I would like to thank all those who have made submissions and sent representatives here today for their cooperation in this inquiry. We will turn to our first witnesses.

[9.05 am]

BROWN, Mr Greg, Acting President, Cattle Council of Australia

INALL, Mr David, Executive Director, Cattle Council of Australia

MATZ, Mr Jed, Policy Director, Cattle Council of Australia

MUNRO, Mr Hamish, Councillor (NSW), Cattle Council of Australia

HENRY, Dr Beverley, Manager Environment, Sustainability and Climate Change, Meat and Livestock Australia

JOHNSSON, Dr Ian Douglas, General Manager, Livestock Production Innovation, Meat and Livestock Australia

CHAIR—Meat and Livestock Australia and the Cattle Council of Australia have lodged a joint submission, submission No. 36, with the committee. Do you wish to make any amendments or alterations to that submission?

Mr Brown—No.

CHAIR—I invite you to make a brief opening statement and then the committee will ask questions.

Mr Brown—Thank you. As you know, we are here representing the Cattle Council of Australia, which is our peak council. It is made up of state farm organisations from every state in Australia and it represents all beef producers in Australia. Of course, we are also a member of NFF, the National Farmers Federation. The beef industry is worth $13 billion per annum. We export to over 100 markets and we generate a weekly income of $120 million. There are 200,000 beef properties on the livestock production assurance database, and cattle are grazed on 48 per cent of Australia's land mass.

I am personally seriously involved in the beef industry. I live in Far North Queensland. I am an operating cattle producer. I run 4,000-odd head on 50,000-odd acres and I am very committed to the beef industry. On my extreme right here, Hamish Munro is a mixed farmer from Cumnock in central western New South Wales. He also represents the New South Wales Farmers Association. David Inall is our executive director. Our policy director, Jed Matz, is on my right and Ian Johnsson and Beverley Henry represent MLA at this hearing.

I would like to expand on a few little issues here, and the first one is the competition between food producers and people growing trees in particular who have been given tax breaks by not only this government but the previous government. That is putting serious pressure on land values and it is of grave concern for agriculture—grave concern. We are in a situation where the world population is increasing and we are taking our food country out of production. It is a great

concern to our industry. We believe this is probably going to have far bigger impacts on how things are done than climate change.

Soil sequestration is a serious issue for producers and needs to be addressed. There is very little science around this issue and it is of concern that it is not considered to be acceptable. We need to address this. There is great concern out there in the industry. We support a national strategy, and CCRSPI is the strategy we support—Land and Water Australia. In regard to EC, we are contributing to the review announced by the minister through the NFF, looking to ensure long-term sustainability—and 'sustainability' is a very key word.

CHAIR—Thank you. Does anyone else wish to make a brief opening statement? Not at all. Before we go to questions, Mr Brown, on your concerns with land use, there are other inquiries going on, and if you stay behind at the morning tea break we may be able to point you in that direction. You may wish to make a submission to another inquiry.

Mr Brown—Yes.

CHAIR—On soil sequestration, yesterday there was a very interesting submission put by Dr Jones and Mr Wiley. I encourage you to get a copy of the *Hansard* and have a look into that.

Mr Brown—We definitely will.

Senator NASH—You were just talking about soil sequestration and the concerns about that in the industry. Can you expand on that a little more?

Mr Brown—We believe that a well-managed pasture system is a great carbon sink and that is just not acknowledged. We are very concerned about that.

Senator NASH—One of the things you refer to in your submission is the uncertainty of the predictions for climate change and the potential impact on the agricultural sector. We had a couple of witnesses yesterday talking about movement towards better certainty in predictions and better modelling. Do you see that coming soon? Are you in any kinds of discussions with any of the agencies about what they are doing to improve that prediction, given how important it is to the agricultural sector for those predictions to be correct?

Dr Henry—We deal very closely with the Bureau of Meteorology and CSIRO, who have the capacity to run large-scale dynamic models that are needed to do the climate change projections. The issues for us, though, are how we get downscaled projections from those models at a scale that we can give to farmers to make decisions. We have to get the regional scale outlooks on the same time frame that farmers make decisions on, but then link them also to the biophysical-type models that will tell us what the impacts will be on pasture growth and on animal production. So there are two steps to do with getting better projections: the regional scale models and then the linking to the impacts at farm level.

Senator NASH—What sorts of communication channels have you got at the moment for disseminating that information to farmers so they can then make decisions accordingly?

Dr Henry—We collaborate through CCRSPI and through the Managing Climate Variability Program to get the best information that is available. We also undertake communication programs, as well. Both are fairly vague projections through the website but, at the moment, one of the projects we are doing is called Communicating Climate Change and it is a collaborative project that deals directly with farmer groups.

Mr Brown—We do suffer from not all that much money being invested in R&D in this country, and we certainly need recognition of that fact. It is of critical importance. I think, generally, as a country, we do not take it seriously enough. Certainly in agriculture we are not taking it that seriously at all.

Senator NASH—I could not agree more. One of the things that has come up—certainly yesterday—is the importance of the research and getting it right. There are, I guess, two things: one is that there has not been enough funding available in the various areas to do as good a job as could possibly be done. There also, perhaps, might be a little bit of overlapping and hotchpotch in terms of the research effort to date. Do you have any comments to make on either of those things?

Mr Munro—Some of the climate models that you can readily access on the internet at the moment are quite good for one or two days, but I think we need more research into longer term models because, for websites, anything that is seven to 10 days is merely speculative for them. They are not close to what actually happens within that short time frame. I think we need to be able to progress having these short-term models and work through to longer-term models so that we can actually predict some of these impacts on pastures, animal production and also what ramifications climate change is going to have for consumers as well as producers.

Senator NASH—Absolutely.

Dr Johnsson—In terms of coordination of effort, I think we have seen a rush of redirection of funds, particularly away from production research and into climate change issues, from a lot of the research agencies responsible for agricultural R&D. There is a danger that everyone will go off and do their own thing.

I think the CCRSPI process, which I understand you heard about yesterday, is very important. We are a strong advocate of that, along with all the research and development corporations and all the DPIs. That is a way of documenting what we currently know and what everyone is doing and then, in future, directing each of the agencies to make sure we do things in collaboration or at least acknowledge what everyone else is doing.

Senator NASH—Whether they believe in climate change or not, what is the mood of farmers at the moment in terms of being prepared to embrace adaptation for climate change? What is their ability and will to put in place adaptation measures? Are the majority of farmers prepared to look at doing that? Have we still got any recalcitrance? What is the general feel toward this and toward change on the ground in the community?

Mr Brown—I think they are obliged to look at it. It is something we have been managing for a long time—some of us not necessarily so well, some extremely well—so I think it is something we just have to cope with, but we need a few tools to do it.

Senator NASH—Absolutely. In terms of drought policy, it seems that, over quite a number of years, while we have a drought people talk about drought preparedness but as soon as it rains that tends to go off the boil. It has been incredibly frustrating for years and years, but I think this time the focus will stay on because of the climate change debate and everything else. Do you have a view of what would be appropriate tools for farmers to use for drought preparedness? Have you communicated that to government?

Mr Munro—As our submission states, future-building is probably one of our main areas of concern. I believe we should be able to progress farmers in certain terms to enable them to build for the future. It is not necessarily to prop them up but to make sure that all the groundwork is laid so that that will enable stock rotation, rotational grazing and better management practices that will minimise the effects of drought and lead toward better ground cover and those areas of environmental concern that enable better mineral cycles and water cycles, as well as reduce emissions and those sorts of things.

Mr Inall—In drought policy, we work closely with the NFF. We are a very significant member of the National Farmers Federation, so we do not develop drought policy in toto; we work through them. We are conscious of the recent announcement by Minister Burke of the three-tiered review of drought policy. When it comes to discussion on EC provisions, we would like to see the building of long-term sustainability for this industry, which is where you were coming from with your question, I think. We are committed and tightly engaged in that process from here on.

Senator NASH—It would seem that, if we are going to move to a better drought preparedness situation, you would imagine that there might have to be government financial assistance to do so, given the fact that so many farmers are not in a financial position to be able to do it themselves at this point in time. Is the government partnering or contributing toward drought preparedness for on-farm activities something that you think would be fair?

Mr Brown—I think there is a part for government to play but, generally speaking, it has to be a partnership. Some people may have to recognise that they are on a non-viable piece of land, that it is too small or something of that nature, but it should be a decision made between industry and it certainly needs some government involvement. It needs some assistance, in some cases, to help those people out of the industry.

Senator SIEWERT—Yesterday, as you are aware, we heard a lot about soil carbon. There is not a lot of research going on out of the projects I asked about yesterday. I asked Land and Water and I think they said there were 27 projects. How have Meat and Livestock and the Cattle Council been engaging with any research? Has it been discussed with you? Are you partners in any projects? What is your involvement in that area?

Dr Henry—We are currently going through a process of looking at the programs that we are going to undertake in research and development, and part of that is looking at what CCRSPI is already doing and identifying what has been done, where the gaps are and how we can link with those projects. But we do recognise that there is a lot of uncertainty out there amongst producers and that we have an obligation to provide them with some real science to support decision making or taking a position on where the industry should be on that. So we are looking at what we can do in partnership with CCRSPI and with the producers.

Dr Johnsson—The grazing industries have some unique systems in terms of potential for carbon sequestration in relation to deep rooted perennial species, not only pasture plants but also things like tagasaste, which is tree lucerne in the south and leucaena in the north. One of the things we are planning to do is have a look at those systems. We can find properties that have a history of these systems in place over up to 20 years, so we will be able to look and see what the profile is for storing carbon under those systems and if there is, in fact, the potential for accumulating carbon over the long term. Of course, if we start from a greenfield site, it takes years to actually see effects. I think we can use existing sites. That is one of our priority projects for this coming year.

Senator SIEWERT—Are you working with Dr Jones? She has been doing a lot of research on this issue, and we had people from the north-eastern wheat belt in my home state of Western Australia here yesterday who have been doing a lot, as well, particularly cropping into pasture. Are you engaging with those systems? I am a bit concerned to make sure that things are not going back to square one and you are not engaging with work that has already been done.

Dr Johnsson—We are aware of some of the work going on—certainly the monitoring that has been going on with some of the scientists in Western Australia. What we will be doing—again, through the CCRSPI process—is trying to work out what the gaps are in our knowledge. If there is work already going on, there is no point in us duplicating that work.

Senator SIEWERT—One of my take-home messages from the discussion we had yesterday with CCRSPI is that they do not know. They very tantalisingly had a big file of research on the desk which they are not releasing for another couple of weeks, but one of the take-home messages that you will see in their report—Senator Nash referred to it—is that up-to-date research has been uncoordinated. The other issue that come out yesterday was that they do not think that they have picked up all the research. I hate to use a famous quote from America, but you don't now what you don't know. The point is it sounds like there is still research out there that we do not know about.

Dr Johnsson—In MLA, we do not do our own research. We contract people to do it, so we talk to all the agencies that are doing this sort of work. In Western Australia, we would not be doing anything without talking to the department of agriculture and the universities over there.

Senator SIEWERT—To what extent have you engaged to date? You mentioned the issue of sequestration, and I am wondering how you have engaged with that to date—or is the engagement relatively new?

Dr Henry—Through the connections we have and the people we deal with, we are aware of the research that was undertaken by the CRC for Greenhouse Accounting when that was in existence and the subsequent work that has been undertaken by a variety of universities and research organisations. As you say, we know of the groups that we are aware of, and we are hoping that, through the CCRSPI process, we will be able to understand a bit more about what other people are doing. In Meat and Livestock, we will commission people who do have experience and we will aim at the systems that are specific to grazing.

Dr Johnsson—In anything to do with measurement and accounting, we tend to try to work through the Department of Climate Change—the Australian Greenhouse Office—because they

have commissioned research in that area in the past, they tend to have a good knowledge of what is going on and, if we are trying to influence the way the inventory and the calculations are going to work, then it is important that they are engaged, as well.

Senator SIEWERT—Have you been doing any lobbying or discussing with government about the inclusion this in the accounting process? At the moment, Australia is not accounting for it.

Dr Henry—That is right. MLA is represented on the consultative group that is dealing with the agriculture and emissions-trading system with the Department of Climate Change. We are working through that avenue and with NFF, looking at a unified approach across agriculture.

Senator SIEWERT—So would it be safe for me to assume you support soil carbon being included in the accounting process?

Mr Brown—Definitely.

Senator SIEWERT—Sorry, I just needed to get that on record.

Mr Munro—We also made a submission to Dr Ross Garnaut and had a lot of input concerned with soil carbon and trying to make sure that it was raised. Certainly, coming from our grassroots producers, the environmental aspects of management as well as emissions reduction are going to be a win-win, particularly for farmers and, therefore, particularly for Australia as a whole. I think it is an extremely important point.

We do understand that permanency is an issue and we do understand that carbon sequestration does take a long time. But some of the management aspects over the past 40 to 50 years have really depleted a lot of carbon, so we do have a big bank to catch back up on, which will probably help Australia out in its emissions reductions very early on. The sooner we can get R&D, the sooner we can get the ball rolling and, hopefully, help everyone.

Mr Brown—The better management of a pasture system leads to greater productivity. In a world where the population is increasing and food supplies are not increasing at the same rate, it is a pretty critical issue. We certainly need more science applied to this issue.

Senator SIEWERT—Would you, therefore, support moving to a full carbon accounting system like UNFCCC? Just what are you saying to government?

Mr Matz—We have not formed a position on what system we would support at this stage. Until the release of the green paper later on this month, I do not think we would make a statement on that.

Senator SIEWERT—So the position at this stage is that you want whatever system is adopted for accounting included. Is that a fair summary?

Mr Inall—As Mr Brown has pointed out, there is a very strong feeling among the production sector that they would like the full carbon cycle accounted for. As Mr Matz has just said, as soon

as we see the details of the green paper through the NFF, we will be looking at an all-of-agriculture position on where—

Senator HEFFERNAN—You realise there will be some casualties in primary industry when you go to full accounting? There will be some people who will become unviable and insolvent. You understand that?

Mr Inall—We understand that.

Mr Munro—I think what we would like to try to achieve is net emissions so that everything is included in the calculations, not just methane or nitrous oxide emissions from soil.

Senator HEFFERNAN—The obvious casualties are intensive irrigation dairy farms and things like that.

Mr Munro—Yes.

Senator HEFFERNAN—They would be insolvent the day you include $17 a tonne.

Mr Munro—Yes.

Senator HEFFERNAN—As long as you understand that.

Mr Brown—I cannot argue those figures and I would have to research that a bit more, but I would not have thought that would necessarily be the case.

Senator HEFFERNAN—Well, so the science advises us. Has MLA given any consideration to how we may have to reconfigure the way we do business in rural and regional Australia due to climate change?

Mr Brown—We, as an industry, have considered that, yes. I do not know whether that has been addressed fully by MLA.

Senator HEFFERNAN—That is a really good example. We have just been given 'Queensland Land Use 1999', which really has no future plan. Obviously, we have to do a lot better than that. It is quite patently clear there is going to be a reconfiguration not only of the way we have settled rural and regional Australia but also the way we do business in rural and regional Australia. For instance, Cobar, in the western division of New South Wales, used to be cattle country. It used to be an open grass plain. It is now a woody weeds jungle. You would be familiar with all the land that has been infested with spiny acacia in the lower gulf.

Mr Brown—I am.

Senator HEFFERNAN—You will also be aware of some of the potential of places like the Gilbert River et cetera.

Mr Brown—I certainly am.

Senator HEFFERNAN—So I am disappointed that, to this point this year, we have not really progressed any of the northern thinking which is part of the reconfiguration due to climate change. Yesterday CSIRO frightened the hell out of me because there is absolutely no plan for what will be if there is a dry winter this year and a dry autumn next year—a doomsday scenario for a lot of the southern productive areas. I know they will not shift Adelaide—I said five years ago that, if we continued to use some of the same agricultural practices, we would have to shift Adelaide over 50 years. They thought I was mad, but it is coming true. We could bring water around through the Murrumbidgee.

The wild rivers legislation, for instance, was a very politically convenient arrangement between the Wilderness Society, Peter Beattie and a few political priorities in inner Brisbane. It is an absolute disgrace that they would lock up the productive capacity of all that country up there. There are 17 million hectares in Cape York and they have locked the first kilometre of all those rivers from future production. Even the Australian Conservation Foundation says that was a mistake. Is the MLA going to prosecute the case? There are about 800,000 to one million feral pigs in the cape, and there will be a great challenge in the future if a foot and mouth outbreak occurs after someone comes with a canoe across from Papua New Guinea or somewhere with a bit of tucker. And there are an estimated 20,000 or 30,000 feral cattle. A lot of this country is unfenced, unregulated and unsupervised, and it needs to be brought into production in a meaningful, maintained, restrained and managed system. Has the MLA put much thought into the potential—

Mr Brown—I do not think that this is an MLA issue; it is certainly an industry issue. There is only a political solution to this. The physical solution is available at a minute's notice, but the political decision is not available, and that is the big tragedy. I agree wholeheartedly with you, but not all those productive rivers are under the wild rivers legislation yet. We certainly need to be active and make sure that they do not come under that legislation.

Senator HEFFERNAN—I am not allowed to talk about another inquiry that we have coming up, so I will not, but—

Mr Brown—It is a shame to miss the opportunity, though, isn't it!

Senator NASH—Do not encourage him!

Mr Brown—I agree with him. It is music to my ears!

Senator HEFFERNAN—I got a smack yesterday for it, but we really need to look at how Australia is going to retain its global status as a food producer.

Mr Brown—We do.

Senator HEFFERNAN—I have to say that it defies logic—and I think there is a role for the MLA. Even maintaining our herd status is challenged by the lack of supervision in all that northern country. I went from Yuendumu out to a place—I had better not give too much detail—and I said to these fellows, 'Jeez, there are not too many fences out here.' They said, 'Oh, no, we want to go out into that other bush there.' It was 100,000 acres or something. 'We don't want any fences, mate.' I said, 'What about tags?' They said, 'Oh, no, mate.' There is a lot of country up

there that is not supervised, and I think the MLA, to protect Australia's herd, has a role to play in all of that. I think we need to focus the nation on the potential need to reconfigure. A lot of that area around Cobar is now one-to-20 sheep country. There is going to have to be a reconfiguration of where the herd is and how we manage it.

Mr Brown—I was up at Cape York last week. The herd is virtually unmanaged in probably 80 to 90 per cent of that country. It presents a huge biosecurity risk to agriculture in Australia.

Senator HEFFERNAN—You are singing my song, son!

Mr Brown—Absolutely. We are continuing to take people out of that particular part of Australia. That in itself is an absolute crime. We will pay for it one of these days.

Senator HEFFERNAN—We certainly will.

Mr Brown—And maybe it is not far away.

CHAIR—Senator Heffernan, there are other questions.

Senator HEFFERNAN—I just wanted to make that point, thank you, Mr Chairman.

CHAIR—I have no doubt. I have probably heard that about 12 times in the last two hearings, but I acknowledge that.

Senator NASH—And we will hear it again, Chair!

CHAIR—Now that Senator Heffernan and Mr Brown can swap Chrissy cards, we might move on to Senator O'Brien.

Senator O'BRIEN—I was a bit disappointed that Mr Brown did not know how many cattle he had!

Senator HEFFERNAN—He is strong enough to pull a bull out.

Senator O'BRIEN—I am sure he is. I want to follow the path of investment in research and development for your industry, which you describe as a $13 billion per annum industry. How much money does the industry put into research and development?

Dr Johnsson—Do you mean generally or in this particular area?

Senator O'BRIEN—Generally.

Dr Johnsson—Our R&D budget each year, across all areas, is about $36 million of levy income. In the area of NRM—national resource management—it is about $5 to $6 million a year. In particular, we are looking to shift some of that money into our climate change response in the coming year.

Senator O'BRIEN—So some of that money would be research into pasturage?

Dr Johnsson—That covers research into all areas on-farm and off-farm. Our on-farm research budget is about $27 million a year.

Senator O'BRIEN—We have had some evidence about alternative pastures and consequences for carbon sequestration. To the knowledge of MLA, what work is being done on that issue—that is, productive issues with pasture—and, aligned with that, issues of increased soil carbon?

Dr Johnsson—In relation to pasture development work, we work across the relevant research and development corporations. We co-invest in a group called Pastures Australia, which is looking to coordinate all the industry investments in those areas. Both the private sector and the public sector through the state departments have investments in various pasture breeding programs. Our particular interest is in perennial pastures. We believe that is a more sustainable system for us.

In the area of very new technology, we are looking at trying to increase drought tolerance in a number of species, seeing whether we can find gene markers to help select and increase the rate of genetic progress in that area. All of the pasture breeding programs and forage breeding programs in Australia these days have water use efficiency as one of their major selection criteria.

Senator HEFFERNAN—Who have you outsourced that research to?

Dr Johnsson—The gene marker work is done in collaboration with Dairy Australia.

Senator HEFFERNAN—And who have they outsourced it to?

Dr Johnsson—I believe it is the group at Latrobe University and the Victorian department of agriculture.

Senator O'BRIEN—I am asking these questions because we had some evidence yesterday about perennial pastures and mixing grazing and cropping over perennial pastures. Many cattle producers, I suspect, would be on mixed farms and would be engaged in those types of activities. Is MLA aware of work that is being done to enhance productivity and make farms more sustainable, as well as building the state of the soils and carbon content of the soils?

Dr Johnsson—Regarding the latter point, working out what is actually happening with soil carbon has not been an issue for most of the research that has been done in the past.

Senator O'BRIEN—So you are not aware of trials that are being conducted in New South Wales in that regard?

Dr Johnsson—I am not aware of any specific trials.

Dr Henry—We are aware of the work of Dr Jones. We are aware of the work that was done about 10 years ago looking at soil carbon under cropping systems, comparing it under grazing or

forest systems and looking at the differences that fed into the National Carbon Accounting System—some of the basic work that was done for looking at soil carbon fed into the national accounts.

The work that MLA is looking to support will look at long-term grazing trials so that, where you have had exclosures of animals, for instance, you can compare the soil carbon in those systems and systems that have been grazed to see the impact of grazing, or you can look at the impact of planting perennials or crops like tagasaste that have a browse component in them. We are about to undertake that work, but to date we have not invested heavily in soil carbon.

Senator O'BRIEN—We received evidence yesterday from Dr Jones, Mr Wiley and Mr Wilson about trials in Western Australia—or perhaps experiences rather than trials—and trials in New South Wales using perennial pasture species, overplantings with grains, evidence about cell grazing methods, and cost and outcome. I was interested given this $13 billion industry and the interests of your industry what sort of contribution was being made by the industry to those sorts of trials. On the evidence we received yesterday, there seems to be great potential for your industry. Mr Munro?

Mr Munro—MLA also runs programs such as More Beef from Pasture, and similar programs that worked off some of this other R&D, which are encouraging beef producers to revisit their grazing management styles and also trying to educate them in the finer details of grazing rotations rather than set stocking and so on. So, besides pure R&D, there is other extension work.

Senator O'BRIEN—Like field work or field trials?

Mr Munro—Yes, field trials. And then there is Grain and Graze. I am not actually sure of the background of Grain and Graze, but it is trying to make the most of perenniality as well as trying to crop, I think.

Mr Brown—One of the main issues with regard to exotic pasture species is that they are now looked upon as an environmental hazard.

Senator O'BRIEN—Some are.

Mr Brown—We have seen great planting productions over the years and now it has declined to practically nothing because of the fear of the environmental issue. We have had a thing called gamba grass banned in Queensland only recently because it is allegedly an environmental threat. Actually, it was banned on the grounds that it was a threat to human life because of the intense heat that it generates in a fire. You can fall in your campfire and get burnt to death. We have developed the skills in the bush to stay out of the way of fires, so it is really no grounds for banning any pasture species when we need more.

Senator O'BRIEN—I am not going to get into a debate about gamba grass. I know that issues have been raised.

Mr Brown—No, but it serves as an example.

Senator O'BRIEN—In terms of the nature of the debate at the moment, where there is talk of areas being unproductive through conventional farming methods and the need to experiment with alternatives—and some of these production systems, on the surface at least, give the appearance of providing those alternatives; that is why I am asking this—do you think more work can be done by your industry to develop the mixed pasture and cropping alternatives to make more of the 200,000-plus properties that you talked about sustainable in the long term?

Mr Brown—There is no doubt about that. We discussed it this morning. Central Queensland is the home of buffel grass, and unfortunately it is a monoculture, practically, and that is of concern. So we cannot take our eye off the game.

Senator O'BRIEN—Do you think more money needs to be invested in research and development by the industry?

Mr Brown—I do not have any doubt about that. It is pretty hard to extract, though.

Senator O'BRIEN—How would we go about extracting it?

Mr Brown—I guess the only means we have now is the 90c which is incorporated in our transaction levy. That is something we probably need to re-address.

Senator HEFFERNAN—Hopefully you will do a better job than Australian Wool Innovation.

Senator SIEWERT—You had better not go there!

Senator O'BRIEN—Let us not divert to another subject.

CHAIR—Senator O'Brien has the call.

Senator O'BRIEN—I know that there is debate within the industry, and the Australian Beef Association has a very strong view—perhaps a number of strong views—on the issue of levies, whether they are well spent and all those sorts of issues. The point of my questioning is: do you think, if there were a strong focus on long-term sustainability issues and research on practical outcomes for the sustainability of the 200,000-odd properties that you represent, there would be strong support for a larger levy or a levy allocated for specific purposes?

Mr Inall—We have not formed a view yet, in the lead-up to a review of the levy, as to how that may or may not be distributed or whether it should be the same or higher or lower. But I think what is important in this discussion is how we develop R&D priorities. In the cattle industry we have a northern Australian beef research council and a southern Australian beef research council. They are members of the Cattle Council and their job is to work closely with those two quite separate production systems in Australia and put forward priorities that we see short, medium and long term. We have a concept now—we saw a similar concept earlier this year with the 2020 Summit—for a 2020 beef industry group, where we have a committee within the Cattle Council looking at what we might see as the longer term R&D priorities. Falling out of that debate and that analysis will come a position on where we see R&D in the future.

CHAIR—Mr Brown has a handle on it. Is there anything more, Senator O'Brien?

Senator O'BRIEN—That will do me, thanks.

CHAIR—Thank you, senators. We do have to run spot on time today. Our next witness has a plane to catch, and we are mindful of that.

Mr Brown—Could I just clarify one point.

CHAIR—Yes.

Mr Brown—I suggested before that pasture carbon sequestration should be included—and it is a significant issue for the bush. We need to better understand this and we need more funding for that issue to be addressed more fully than it is at present. Beverley might like to follow up on that.

Dr Henry—I would just say that there are good trials going on around the country, in New South Wales and Western Australia, but we have to be very careful with soil carbon because soil is a very variable substance. The amount of soil carbon that can be sequestered varies with soil type and with the way it is managed. We do not understand how we can extrapolate from those trials that are going on to the wide area, and we have to be careful that we manage the expectations of farmers about what they might get out of particular systems.

CHAIR—Thank you, Dr Henry. The submission we heard and the witnesses who spoke to us yesterday certainly put forward a very, very strong case. What we can take from this hearing is that there seem to be a lot of walls put up by the rest of scientific Australia. I think it could do no harm to Meat and Livestock Australia and the Cattle Council of Australia to, when we are finished, introduce yourselves to previous witnesses, sitting behind you, and maybe tee up a briefing for your members. On that, I thank you very much.

Mr Brown—Thanks for having us.

[9.49 am]

BOELE, Ms Nicolette, Director, Strategic Projects, Agricultural Alliance on Climate Change

CHAIR—Welcome. Would you please state the capacity in which you appear.

Ms Boele—I am representing the Agricultural Alliance on Climate Change, which is an unincorporated organisation including members such as the state farming organisations—West Australian Farmers Federation, South Australian Farmers Federation and Agforce in Queensland—the Country Women's Association, companies such as Westpac and Visy, and the Australian Conservation Foundation.

I would also like to note that I am employed by the Climate Institute, which is an independent, non-partisan, philanthropically funded research and advocacy group. So, when I answer questions, I might need to answer them on behalf of the Climate Institute because the agricultural alliance has not got a very sophisticated decision on making policy on the run. I will do my presentation on behalf of the agricultural alliance and then I will probably answer on behalf of the Climate Institute as a member of the alliance.

CHAIR—Thank you.

Senator SIEWERT—Just tell us when you are swapping hats.

Ms Boele—I probably should also declare that I am a councillor in the Australian Conservation Foundation, but that will not come into this particular hearing.

CHAIR—Thank you. The Agricultural Alliance on Climate Change has lodged submission No. 37 with the committee. Do you wish to make any amendments or alterations to that submission?

Ms Boele—No, I do not.

CHAIR—I invite you to make a brief opening statement, and then we will go to questions.

Ms Boele—In the submission, there are eight recommendations: A to H. I will just talk quickly about three main themes which summarise those recommendations. The first is that agriculture is a poor cousin to energy in the debate on climate change, the second is the significance of farmers in managing our continent and the third is that perfect is the enemy of the good.

On the first issue, the climate change budget overview talks quite well about different energy projects, funding, regulation and various initiatives the Commonwealth is embracing to reduce greenhouse pollution, but agriculture is not mentioned until the second last chapter, 'Adapting to climate change that we cannot avoid'. I raise this because one of the main barriers to action on climate change I see in the agriculture sector has to do with the silos with which the

Commonwealth deals with the issue. It is very easy to criticise from where I am sitting but it is a very clear thing. There is a move towards fixing it, but you have DAFF, DCC and other subagencies like BRS and ABARE—groups that do not communicate well or have not been told to—who have a focus and boundaries to the work and research that they do.

I am a bit disappointed because the beautiful, magical thing about adapting to climate change or finding opportunities for mitigating emissions from the agricultural sector, as you heard from the previous witnesses, the MLA and the Cattle Council, is that, when you have farmers mitigating climate change through means such as soil carbon, you also get a productivity gain and, of course, you have all those non-financial benefits such as moisture retention, reduced salinity and erosion and basically good land management. I do not really think the Commonwealth yet gets the opportunities presented by the agricultural sector in being part of the solution to climate change. That is the first theme.

The second is the significance of farmers managing the land. The Bureau of Rural Sciences yesterday had a summary based on 2001-2002 land uses. That is probably a quite indicative time delay in producing data. Senator Heffernan previously made the comment that some industries will go to the wall if we look at some of the solutions to climate change. When we talk about that, we are looking at a very, very small percentage. The opportunity is significantly larger.

Grazing land represents some 57.5 per cent of the Australian landmass, while cropping and horticulture is 3.5 per cent and forestry is 1.95 per cent. Cropping and forestry occupies less than 10 per cent of the area that is used for grazing. In reality it is even more stark than that because, if you look at the BRS figures, there is nature conservation and other protected areas including Indigenous use. These are places where essentially changing land management to improve soil carbon, as an example, is a longer shot or really not available to farmers and those managing the land.

If you take that out of the figures, about 37 per cent of that land is out of bounds. On the basis of that, grazing land represents more than 91 per cent of the landmass that could be impacted by change management. Grazing land is 16 times that of cropping and horticulture and 29 times that of forestry. I want to keep an eye on the prize of a lot of country in central Australia that can only improve from improving soil carbon, as an example.

Very quickly, the third point is that perfect is the enemy of the good. As an example, the agricultural alliance convened a soil summit on 18 June in Canberra. We had the opportunity to brief some MPs and senators on 25 June about the outcomes of that. We brought together farmers, researchers, policymakers and industry people. What we found was that yes, there are still barriers to understanding the science—and I would welcome any questions so I can give you more information about that—but equally what is missing is market confidence that there will in fact be a market for soil carbon. I am not getting any signals yet from the Commonwealth or from the elected officials that soil carbon can be part of Australia's international response on climate change. Without that statement—and hopefully we will get it in the green paper this month—it is little wonder that MLA is not investing extra money in it and that the private sector, like Macquarie Bank, has not leapt on doing deals with farmers for soil carbon improvements. Without that certainty you will not get farmers paid to improve the land. We do not actually have to have huge amounts in the government coffers to do it. The private sector can probably do quite a bit of that.

Senator HEFFERNAN—Do you have in your knowledge base the appropriate life span of a tree that is planted in a carbon sink?

Ms Boele—That is out of my knowledge base. I do understand that there is a cycle of night and daytime in terms of producing and absorbing and what have you.

Senator HEFFERNAN—You cannot answer that?

Ms Boele—No.

Senator HEFFERNAN—Given the carbon market that will develop, has the alliance thought through the distortion that that may cause to agricultural land use? My proposition is that the higher the market, the better the land you will use.

Ms Boele—Do you mean the higher the carbon value—

Senator HEFFERNAN—The more the return on the investment in the carbon offset from whatever power station, the more likely the farmer is to change the use of his land.

Ms Boele—I do agree. There are a number of conditions that would first have to be met. First, we would have to have recognition that improving the carbon stock on a farm will mean eligibility for offsets under an emissions-trading scheme, or that there will be a voluntary market into which they can be sold, or perhaps—and probably as a hybrid of the first one—that articles 3.3 and 3.4 of the Kyoto protocol will be adopted by Australia in the next commitment period so that our farmers can trade those internationally as potentially joint implementation projects.

Senator HEFFERNAN—Given that there are millions of hectares in the north that are suitable for that exact purpose, a carbon sink, does the alliance think that we should have some protocols that protect future food production against the background of the potential lucrative investment in carbon sinks? I am sure that Macquarie Bank, with all its mighty brains, and others will eventually turn carbon trading into a river of gold, not for farmers but for investment instruments.

Ms Boele—Are you asking whether improving the carbon content of land is about locking it up so it cannot be farmed?

Senator HEFFERNAN—No. I am talking about setting up a carbon offset market which is specified as trees. We have heard evidence of the good work that farmers do now—with, for instance, a lucerne paddock or some sort of deep-rooted perennial grass—which does not get taken into account. I am worried that, unless we highlight the problem, it would be an easy task for a banker to lock up a whole lot of prime agricultural land, if the market is lucrative enough, in lieu of taking on the spiny acacia of the lower gulf.

Ms Boele—From my understanding from talking with the forestry industry, there are limited—purely by geography and water availability—opportunities for land use change from agricultural production to forestry. They happen in those high-rainfall areas in and around—

Senator HEFFERNAN—But that is rubbish. The high-rainfall area is a mistake. It suits the industry but it is bad for the landscape. We have proven that planting trees allegedly to do all the things that are wonderful about trees including salinity credits does not work if you put them in the wrong parts. Where you can put them to get a salinity credit, in the lower reaches down the slopes, the trees will still grow; they just grow slower. That is why my first question was: what is the life of a tree as a carbon sink? Is it 80 years, five years or three minutes?

Ms Boele—I do not have the answer to that.

Senator HEFFERNAN—It is the key to what is going to happen to land use.

Ms Boele—Yes, possibly. What I am putting to you is that, currently, under accounting protocols our commitments under the first Kyoto period are that we count the bad stuff. We count the methane emissions out the front end of the cows and we count the nitrous oxides that oxidise through urea et cetera and the relationship with the soils and other things like soil conditioners. We do not count the good stuff. We do not give farmers the opportunity to actually get paid to improve and better adapt to the changing climatic patterns. That, to me, is a complete opportunity lost.

Senator HEFFERNAN—This is why we need to understand the science of that before we go robustly into the tree thing, which could completely distort the landscape and the economics of farming.

Ms Boele—I am not talking on behalf of the Climate Institute now. The forestry industry is the forestry industry. I am really looking at grazing land, and I mean really dodgy, worn-out land that has gotten worse. I am looking for opportunities for those people who manage that land, with one head of cattle for every 34 hectares onwards, who are really whom we are talking about when we talk about drought assistance and exceptional circumstances. What can we do, what marketplace, what instruments can we put in place to assist those farmers in improving their land, having a better income and being able to wear out the changing climatic conditions that will happen under climate change.

Senator HEFFERNAN—I presume things like saltbush would retain—

Ms Boele—Possibly. We absolutely need more research in that. But we do not just need more research and more money for it; we also need nationally coordinated research into it. CCRSPI has been talked about. It is a great start but is only a part of everything that is going on. We need consistent methodologies across the nation so we can go into discussions in Copenhagen and say, 'This is in our national interests to do it.' We do not have those answers.

Senator HEFFERNAN—The typical plains saltbush country would probably have from one to four, or one to seven carrying capacity. You could decrease your carrying capacity and pick up the extra benefit by protecting the carbon setting capacity of the saltbush rather than eating it.

Ms Boele—The other side of that, and it is not peer reviewed yet, is that there are some interesting early results coming out of studies, that a resource company in Southeast Queensland is paying for, around the methane reduction in sheep by eating saltbush. I am talking an over 25 per cent reduction in methane output. It is very exciting.

Senator HEFFERNAN—Besides, it produces the best meat.

Ms Boele—Of course—less methane means more meat protein.

Senator NASH—That is very interesting.

Senator SIEWERT—They have been doing work in WA on saltbush and the taste of meat for quite a significant period of time. I want to go into this issue of the accounting. You were down the back when I was asking earlier about the accounting process. You support full carbon accounting, I presume.

Ms Boele—We do not know yet. Intuitively, yes, but I would like to know whether or not the Department of Climate Change or its previous incarnation has done the regulatory impact assessment on Australia's farmlands if we were to include articles 3.3 and 3.4 in our Kyoto accounts.

Senator SIEWERT—We do not know if they have done that yet.

Ms Boele—Let us say, I really hope they have because we go into international negotiating every six months—of course, it is ongoing—and if they have not done that it is a huge oversight. If they have done it, it would be very helpful if it were public.

Senator NASH—Is that something that is difficult to find out? They have either done it or they have not.

Senator SIEWERT—The department is appearing this afternoon, so I suggest we ask them then.

Ms Boele—I can say that, of course, articles 3.3 and 3.4, which relate to full carbon accounting, almost—the soil counting on rangelands—were inserted in the years 1997 to 2000, so three years of negotiating. When Senator Robert Hill put forward the 3.7 clause on land clearing, the Americans put forward 3.3 and 3.4. So it is in their best interests. Of course, they have been trading soil carbon on the Chicago Climate Exchange since 2003. They have traded 11 million tonnes of soil carbon out of a 26 million tonne market in trade so far, and they have found a way around the imperfect science of soil carbon by providing credits, I suppose, for changed management practices such as minimum till or cell grazing and what have you. So it can be done, but we just do not know yet what the impact of that would be. But, yes, intuitively, when we have all the bad stuff in terms of methane and nitrous oxides, why wouldn't we have a look at the good stuff?

Senator SIEWERT—The department are appearing this afternoon, so we will obviously ask them what they have been doing with it.

Ms Boele—Thank you.

Senator SIEWERT—I remember when you were briefing people last week—and I will report that you did brief me in my office—you were going through the American system. It

might be worth going into a little more detail there because I want to ask you a question around that. My understanding is that it is basically geographically based, if I remember correctly.

Ms Boele—That is right. They divide the continent of North America into two rainfall zones. Essentially, there is desert, which they give a 0.4 value to, and then there are regular rainfall areas, which get a value of one. Then there are approximately seven or eight different soil types. Australia can be broadly put into five, I understand. They have done the tests on the ground about changing practice A to practice B with a fence line in the middle, and done the science on approximately how much extra carbon they get in the soil. Then they have just done these proxies—just like NCAS has done for forestry, mind you, in Australia—where they have just said that a certain strand of eucalyptus planted in this geographical region is going to have a proxy value of X. It is the same thing they have done in the United States: if you change your management from A to B, you get a credit of whatever it might be. That credit then becomes, at the end, a function of which rainfall pattern you are in—high or low—and then which soil type as well. Then they discount it even further to provide enough market confidence. Of course, some farmers decide not to do it because they are sequestering a lot more carbon than the credit they get for it. But, as I have mentioned, 11 million trades have happened.

It is a voluntary but legally binding program, so the people who go into it—big names like Microsoft, General Motors and companies like that—agree to voluntarily reduce their greenhouse pollution. But it is legally binding. Farmers take a five-year contract to change their management on the land. They may want to buy out. If, say, they are in peri-urban areas and there is some housing pressure—and, of course, their land is worth a hell of a lot more than the credits they are getting for soil and their agriculture—they can buy out, but they buy out of the five-year contract at the value, which, of course, goes up generally as the trades go up too, for those five years. So there is a sort of permanence built into the system because more people are then coming into the market and buying credits, and it goes on. There are an increasing number of members with a limited amount of trades, but those trades are growing.

It might be worth mentioning as well the growth from 2003 to 2008 in the market. It was quite small, if you like, for a few years and then toward the end of last year the trade started going up, and the price did too, from around $1 and $2 per tonne to around $6 or $7.

There was a massive blip. The blip was no real breakthrough in measurement or estimation of science on carbon in the soils. It was Mitt Romney pulling out of the US presidential election. He was the only candidate of the four remaining who was against bringing in an emissions-trading scheme. So we had McCain, Obama and Clinton, all with an 80 per cent cut by 2050 commitment, bringing in an emissions-trading scheme. That was enough confidence—not perfect science—that the market made a massive blip. The price and the volume in trades basically trebled overnight.

No question, there would be more money and more focus on the science. But the political will and the political statements around the role that science can play is just as important as getting farmers paid to change their land management.

Senator SIEWERT—Would you be advocating a system similar to that used in America or would you be going for a more sophisticated accounting process in Australia?

Ms Boele—I think that, if we were 10 years off coming into an emissions-trading scheme, probably yes. But we are not. I think it is going to be a little challenging finding those companies that would want to legally bind themselves to a voluntary market. There are some, particularly those that have rural constituencies and for whom it is in their brand interest to do so; however, I would really like to see farmers opting into a voluntary soil market ahead of coverage under emissions trading. This gives farmers a choice if they want to do it or not.

The soil task force, which is one of the outcomes of the soil summit which is still loosely being put together but hopefully includes the key interests in the area, would like to examine the full range of options that would be available here. Absolutely, there has to be some credit for early action and the offsets under that scheme would have to count for something in a future emissions-trading scheme. But it is kind of crazy to wait until 2013 or onwards to give farmers a signal to start improving their land management and getting paid for it. We could start doing that now on a voluntary basis and learn by doing so that we are in a stronger position when we want to have our farmers covered. I think that can only be win-win.

Senator SIEWERT—If we are moving to a full accounting system, everybody is in our out, surely. If we are talking about a voluntary system, we then need to be looking at emissions. If farmers are participating on a voluntary basis, surely we then need to be looking at emissions from the whole of the sector, though. Eventually, it is either everybody in or everybody out.

Ms Boele—Correct. The only thing that the voluntary market would do, which we are examining—it does not take over from the need to continue quite vigilant research and a massive step-up in monitoring and verification—is that, as any market does, for those who wish to take a higher risk for possible reward—early movers—it puts in an opportunity to learn by doing and to get moving.

Senator SIEWERT—So we have this being voluntary as a forerunner to then making it a full part of the system.

Ms Boele—Yes, but let's see how it goes before we commit to making it part of the system. I think, internationally, there would be a lot of pressure on Australia, in the long run, to cover emissions from the agricultural sector. It is certainly the view of the members of the alliance that agriculture should have its fair and reasonable burden of being part of a solution.

Senator NASH—Can I ask how you came about? You represent a very interesting collection.

Ms Boele—I remember, when I was doing a regional tour in Sale back in 2006, Peter Costello saying on the front page of the *Age* that it was the worst drought in a thousand years. The Climate Institute were out meeting and talking to farmers and seeing what was going on around western New South Wales and Victoria. There was a lot of scepticism shortly after we had *An Inconvenient Truth*; I am saying there was no less scepticism in the bush after that, but certainly it became an issue of currency at a political level.

At the same time the water plan and the Murray-Darling Basin were also very topical. The traditional advocacy groups in the space basically were very busy working on water, and so the Climate Institute decided to find some naturally progressive alliance members to maybe take this forward. We wanted to see how we could breathe a breath of hope and opportunity—words of

the Country Women's Association of Australia—into rural and regional communities and we wanted to focus on solutions and not just on the problems. That is not to say there are not a load of problems that need to be sorted out—and I am sure if Senator Heffernan were in the room he would probably hit me with the woody weeds thing, too. But that is the genesis of it: we wanted to be solutions focused.

Senator NASH—In your submission I was very pleased to see that you referred straight out—which not a lot of the others did—to the fact that this is an issue for communities that support the farm enterprises as well, that there are flow-on effects in those other industries and that people and businesses in communities are going to be affected by this. We talk about the agricultural sector but we really have to recognise and deal with the potential social impacts of all this change as well. Have you done much work around the flow-on effect of the social impact on those rural and regional communities as a result of all these changes and adaptations?

Ms Boele—We have not, but we are involved in a bid, if I can say that, for a particular consortium of people to focus just on that under the Griffith University climate change adaptation coordinated settlement side of things. On our board at the Climate Institute we have Tony McMichael, professor in epidemiology and population studies at ANU, and it is something very close to his heart. Our philanthropic funder is also a wool grower and now a tree offset-planting person in honey and wool around Hamilton, and so we are very committed to better understanding those impacts, particularly around the mental health side of things. And the Country Women's Association of Australia of course need the support mechanisms, because there is essentially a problem—it is almost a cancer in the men—due to the pressure of ongoing drought, and that will only be exacerbated by climate change. If we can have the information to prepare them and financial mechanisms to assist them, it can only be positive.

Senator NASH—That is right. One of the big questions certainly must be the level of government intervention in change and restructure—how much will just be left to the sector and how much government will be expected to play a part in that. I notice in your submission you even talk about some of the processing industries. Obviously that work running off the agricultural industries might require structural adjustment. You did not refer to the agricultural industries themselves as potentially requiring structural adjustment assistance, though. Do you think that would be necessary along with the processing industries?

Ms Boele—That is a very good question. Of course—

Senator NASH—I am happy if you want to take that on notice.

Ms Boele—Maybe. That is just not in my character; I have to have a crack at it.

Senator NASH—Have a crack and then take it on notice, if you like.

CHAIR—It's like a letter to a bureaucrat.

Ms Boele—Yes. This is a personal observation. I am a believer in welfare, where those who cannot self-determine really do need a leg-up to exist within these communities in society. But I really do think that the agricultural sector—and I can point to wool and wheat and all sorts of other things that have been recently done over, where—

Senator NASH—Thank you. Yes, we thought so too!

Ms Boele—government has not necessarily—

CHAIR—What do you mean 'done over'?

Ms Boele—I am not going to elaborate on that.

CHAIR—Good.

Senator NASH—I think that is a very good comment, Chair.

CHAIR—Assisted.

Ms Boele—I am not just talking about—

CHAIR—Ignore my interjections.

Ms Boele—I am not actually talking about recently.

CHAIR—Good.

Ms Boele—I mean that government is not necessarily the best. It would be better if it came from within communities and it belonged to them and they found their own solutions. At the moment they do not have the full information set. They do not have the networks to find out about the extension programs about the changing climate.

To give one example, the Bureau of Meteorology is a fabulous organisation that is permanently funded to provide data about weather—and now they have the carriage of some water issues. What we do not have is a bureau of environmental observation and forecasting or something which looks at permanent, ongoing methodologically consistent soil sampling, as an example, across the jurisdictions—a central data repository, something which could even assist in the delivery of drought assistance. It could help farmers with information about the commodities or their sectors, how the soils are changing over time and how the ecosystems are working in their areas. We do not have that. We would actually come in line with most OECD countries in having something like that. I have looked at the system in the Netherlands; it could be something we could use here in Australia. That sort of body would be invaluable to helping those agricultural industries that you refer to to understand what is happening on their land and how they should be changing what they do and over what time period.

Senator NASH—That is a very good suggestion.

Senator FISHER—Have you taken that proposition to government?

Ms Boele—As I mentioned, only two weeks ago we had the soil summit, where this idea came out. I have a feeling that the idea is not original, that it has been knocking around for a while. Certainly the agricultural alliance is very clear that it will help advocate on behalf of it once we have a bit more in the way of numbers and design of how it might work.

Senator NASH—It is a very sensible suggestion. Thank you.

Senator SIEWERT—We are not reporting now; we are extending our reporting date, so, if you do some more work on it, it would be really useful to put it in as a supplementary submission.

Senator O'Brien interjecting—

Senator SIEWERT—I should say we are going to seek an extension of our reporting date.

Senator NASH—We are always appreciative of Senator O'Brien sticking to detail!

Senator O'BRIEN—Someone might come back and throw that in your face.

Senator NASH—Someone has to keep us on the straight and narrow.

Senator FISHER—My question is about the scientific evidence and the farmers' views of the scientific evidence about climate change and what we need to do about it. There is clearly an acceptance that we need to get over it and get on with it, but what in your view are farmers' views of the scientific evidence that is available? What do they think of it and what do they think it means?

Ms Boele—My mother-in-law is a farmer, but I am not very well equipped, being a Sydney girl, to answer that. I can say that it is not homogenous, just like any business sector. We have done a little bit of research on how to communicate climate science to the agricultural sector and the regional and rural communities that support it. We did find that generally farm sizes are getting larger and that the population is ageing, which raises a whole lot of questions about which medium you can reach the sector with. I think that the community generally, and rightfully so, is quite, I suppose, conservative. Given that they really do manage the land day in and day out, they have a very strong relationship with and knowledge about the cycles and these sorts of things.

Senator FISHER—I would have thought necessarily implicit in your suggestion about another body to collect evidence and data for the future is a questioning of the adequacy of the existing mechanisms to do that. Therefore, if you are questioning the adequacy of the existing mechanisms to achieve that at the moment, I would have thought, at least impliedly, you are also questioning the basis of the data that is available at the moment, both in terms of the past and then how to progress into the future. Would you like to comment on that?

Ms Boele—Probably not. It would be a second-hand observation, I suppose, that I would give you as opposed to a personal, working-the-land one. I can say—in an almost non-partisan way—that farmers have not been allowed to believe in climate change until recently. The message has not been communicated, even through the media, that it is something real—it is natural cycles. And it is not just the data. These people are very busy; they are running businesses. It is only really the big end of town that has the time, resources and intentions to go and actively find more data about climate change and what it might do for their businesses.

Certainly when I go and spend some time with my mother-in-law in Forbes, at the end of the day she is off her feet. She does not have time to get on the net and have a look for more climate data. So I think, yes, it is probably the content and quality of the data but also how that extension happens, how you actually make climate information not an added thing but included in existing paths of communication for those people.

Senator SIEWERT—I do not know if you have had a chance to read some of the other submissions, but CSIRO in particular were talking about the need for regional delivery of this information. They were strongly advocating for Landcare regional type bodies to be involved in the delivery and extension of this information. Would that be a mechanism that you would see as useful?

Ms Boele—No question. But again—and it is all very dreamy of me to say it—this is a particular community that really listens to its peers. Instead of having CSIRO type science communicators talking at, down and across to farmers, if you can actually somehow have champions within communities that are esteemed by their peers, that is going to go a hell of a lot faster.

Senator SIEWERT—That is my understanding of where they were coming from.

Ms Boele—That would be an absolute breakthrough.

Senator SIEWERT—It is a pity the NRM groups are getting attacked at the moment, isn't it?

Ms Boele—Right, and even the Catchment Management Authority. CMA is, of course, not homogenous in terms of its quality. It is worth having a crack at some existing mechanisms like CMAs for that delivery, because you also get cross-commodity, riparian zone, biodiversity and all sorts of people talking to each other at a community level, and that is incredibly valuable, just because agriculture is a system that is geographically relevant as opposed to how it appears in the tax office's sheets.

CHAIR—Ms Boele, we thank you very much and hope you make your taxi and your flight!

Proceedings suspended from 10.27 am to 10.48 am

FARGHER, Mr Ben, Chief Executive Officer, National Farmers Federation

KERR, Mrs Deborah, Manager, Natural Resource Management, National Farmers Federation

McELHONE, Mr Charles, Manager, Economics, National Farmers Federation

ACTING CHAIR (Senator Siewert)—I welcome representatives from the National Farmers Federation. You have lodged a submission with the committee which we have numbered 24. Do you wish to make any amendments or alterations to the submission?

Mr McElhone—No.

ACTING CHAIR—I invite you to make a brief opening statement and then we will go to questions.

Mr Fargher—Thanks for the opportunity of talking to you this morning about this important issue for us. It has been very important to us for some time. Our point of view on this is that, for us, there is really no point in continuing the debate about whether climate change is happening or not. What we are trying to work out is what it means to us and to our members, to farmers, and what we can do about it. We see it as a risk management issue, but we see that while there are obviously a lot of challenges there could be opportunities as well. There may be drier areas of the country, of course, but there may be wetter areas too. There may be more extreme weather events, but there may be less in some areas as well. So we are very focused on the climatic research and on-farm tools to give farmers the ability to make decisions about climate change and its impact.

We do hear in the community sometimes criticism of the farming sector for not embracing the debate. We would advocate to those people we speak to that no-one is more exposed to the risk of climate variability than people who actually live and work with the climate every day—farmers. We are aware of the risk because we live and work with the climate, and obviously we want to maximise the opportunities from change and manage and minimise the risks.

As well as the fact that some people think we have not engaged enough in the debate, people also think that perhaps we have not adapted enough. We would advocate there as well that we do adapt to change all the time. We have been adapting and we have put in new technology. We have looked at crop rotation, minimum till, increased irrigation, water use efficiency, diversification, new crop varieties, new genetics and nutrition—and we accept that we are going to have to do more in the future. We have changed; we are going to have to do more. To do more we need more information and on-farm tools to make those decisions. Therefore, our big advocacy is around research and development, and not only the coordination of it, which is where CCRSPI comes in—and I know there has been a lot of discussion; we want to talk to you about that if you so wish—but also the quantum of money involved. So it is not just about

coordination; it is about the quantum of funds as well. We are very focused on that and to adaptation to change.

The other thing we are very focused on is the issue of mitigation and to make sure, if I could be frank, that any policy response to climate change does not mean that the medicine is in fact worse than the disease itself. In that regard we are particularly interested in an emissions-trading scheme and making sure that we are not disproportionately impacted by such a scheme. We are focused on the debate. We want to manage the risk. We realise we need to do more to adapt—we want to engage in that—but we do not want to see ourselves disproportionately impacted as farmers through policy instruments to respond to climate change like an emissions-trading scheme. We will leave it to the committee as to how much we will discuss that today.

The last thing is drought policy and short-term climatic risk, variability, shift, change and that quantum. We face it every day. We are still in the grip of a drought in many parts of the country. We want our drought policy to support our productive base but not impede our structural adjustment in the sector, and we are very interested in the government policy settings around that. With that, we are happy to take questions. Charlie is our economist and is also managing our emissions-trading work. Deb is our natural resource management manager, with particular expertise, not surprisingly, in water given the importance of the issue at the moment.

Senator HUTCHINS—I wonder, Mr Fargher, if you could expand on your comment about the medicine being worse than the disease, in particular in relation to the ETS. What have you got in mind that might be under consideration that you think will be worse than the disease?

Mr Fargher—We are concerned because, at the moment, for agriculture to engage in the emissions-trading debate there are a lot of challenges or restrictions that do not enable us to do that. For example, we are faced with an international accounting rule through the current Kyoto protocol that does not let us take account of sequestration from agriculture well enough. We are counted for our emissions—and we know we are an emitter. We know we need to do more to try to adapt and to reduce our emissions over time. However, we are also a sequester of carbon in our industry, not just through plantations and forestry but in agriculture through soil carbon and all those other pasture management issues. But we cannot adequately take account of that under the current Kyoto accounting rules, so we are concerned that we get exposed to the liability but we are not able to offset that well enough. Therefore, if that continues in Kyoto mark 2, we are in effect disproportionately impacted.

Also, if we as a trade exposed sector—because we are exporting 60 per cent of what we produce; in some industries it is over 90 per cent of what we produce—are disproportionately impacted like that through the rules and our international competitors do not face restrictions then we are concerned about this concept of leakage offshore where we are put at a comparative disadvantage immediately with our overseas competitors.

Senator HUTCHINS—Could you explain what you mean by ‘leakage’, please.

Mr Fargher—What I mean—and I will ask Charlie to help me with a more technical explanation—is that if we have our cost base going up, if we have a restraint put on us through an emissions-trading scheme in Australia, if we cannot express our sequestration and get the advantages from that while our cost base is going up and our overseas competitors do not face

those restraints then that immediately puts us at a disadvantage. The concept of leakage is where you see agricultural production move to other countries. The challenge with that—as Professor Garnaut has said—is that Australian agriculture is quite an emissions-efficient sector because of our pasture and broadacre farming compared to, say, agricultural industries in Europe where they use a lot of heating for animals. So you could get the perverse outcome where production moves from an emissions-efficient country like Australia to other countries that do not face those restraints which may be less efficient. So you would not be getting a better global climate outcome; all you would be doing is putting Australian farmers at a disadvantage. We do not want to see that. We are not turning our backs on the debate or trying to exclude ourselves from our responsibilities, but we do not want to be disproportionately impacted—and the current rules, such as Kyoto, are leading to that. That is a real problem. Charlie, is there anything you want to add?

Mr McElhone—Yes, I will just expand on that. That is exactly right. I have been particularly focused on the perverse outcome potential in the economic field, but there is also potential for perverse outcomes in the environmental area. What are the water run-off and biodiversity issues of replacing agricultural land with mass plantation forestry in order to meet our Kyoto obligations? And what are the social implications of ETS as well? We have to get those policy settings right. As Ben correctly says, the potential economic impact, the leakage potential, the international competitiveness issue, is a key issue that we face or are concerned about facing. We are particularly conscious that if we get the settings wrong, the only way we will be able to meet our liabilities is to reduce production, and that is what we have to avoid because that is not in the interests of the solution for the global carbon problem, bearing in mind that, in the global scheme of things, we are low-intensity emitters from agricultural production.

Senator HUTCHINS—In relation to us having just signed the Kyoto protocol, what you are advising us is that there is a significant amount of intrusion that is expected to potentially keep these benchmarks. Have countries that have previously signed it been able to argue in their own markets the sequestration argument or the leakage argument that we are confronting here?

Mr McElhone—The problem with the Kyoto rules as we see them, particularly when you are talking about Australia, which has variable climatic conditions such as variable rainfall, is that the opportunities for agriculture and for farmers to engage through sequestration management options on farms are also linked with factors that cannot be controlled such as drought and bushfire. Therefore, their potential to engage within those sequestration activities such as building up soil carbon—which there has been a lot of discussion about over the last couple of days, I understand—is restrained because it is also linked with those natural variability issues. That therefore makes the risks of us electing those elective options through the Kyoto protocol restrictive. That is going to be a problem for us in our domestic policy settings, which we understand are also designed to help the Australian economy meet its Kyoto targets.

Senator HUTCHINS—You mentioned the issue of litigation in your verbal submission, Mr Fargher. Do you want to expand on what you meant by that?

Mr Fargher—On mitigation.

Senator HUTCHINS—Oh, 'mitigation'! I am sorry.

Mr Fargher—Yes, I meant mitigation. We probably have litigation issues somewhere, but I am referring to the adaptation issues and the mitigation issue and, on the mitigation side with ETS, to the fact that, because of the way international rules are set up now, if those rules are taken for our domestic ETS rules then we have that challenge of not being able to sequester. We know that there will be a new Kyoto agreement negotiated. We are saying to the Australian government: 'Please, in a new agreement, can we try to take better account of agriculture?' not because we are trying to exclude ourselves from our responsibilities but because we want to get recognition for the things that farmers do do to sequester carbon as well as emit it.

Senator HUTCHINS—In the supply chain, do you include rail and road transport in what the government needs to take into account?

Mr Fargher—In terms of the rules?

Senator HUTCHINS—Yes. Or is it just at the farm gate?

Mr Fargher—We are interested in the whole supply chain, but the rules we are particularly interested in—and Charlie will correct me if I am wrong—are the specific clauses that link agriculture sequestration to bushfires and other things like that, the particular agriculture rules as distinct from further transport issues.

Mr McElhone—But I would say, on the issue of transport, we are very aware that if there is a cost impost through the supply chain then, in most cases, the farmer actually wears those additional costs. It does reinforce the need for efficiencies through the supply chain and through the transport infrastructure to make sure that we are maximising efficiencies through those elements as well.

Senator NASH—I was interested in the part of your submission where you talk about there being considerable scope to better position agriculture with regard to national and international markets. Could you expand on that for the committee? I think that is probably very interesting.

Mr McElhone—From that perspective, we are very aware of the consumer consciousness around carbon footprints and carbon emissions. We are very concerned that, particularly in some sectors of the international community, pushing things like food miles, which is a very misrepresentative acknowledgement of the real impact—

Senator NASH—Could you explain food miles?

Mr McElhone—It is basically acknowledging the distance travelled to get food to market as being the carbon footprint of that food. But there are some studies out of Lincoln University in New Zealand which demonstrate that food from production systems in New Zealand shipped to Europe has a lower carbon footprint than the same food produced in a UK heated greenhouse and delivered to those same consumers. So to just look at the transportation element within the carbon footprint is very misleading.

We are saying that it is widely acknowledged that Australian agriculture production systems are low intensity in terms of their emissions per unit of production output and therefore there

may be an opportunity from a global marketplace perspective if we get the science right in understanding the life cycle of agriculture emissions in our production systems more effectively.

Senator NASH—We have had a fair bit of discussion about research over the last couple of days. What is the NFF's view on where the research task is at the moment? Is it as streamlined as necessary? Is it a bit hotchpotch? Could it be improved? Is it doing a good job? Do you have a view?

Mr Fargher—I will make some opening comments, then ask Charlie and Deb to give more technical detail. One thing our farmers do not like is duplication within the systems. They do not like to see that every agency or every R&D corporation has their own climate change project and that they are not talking to each other. What our farmers think then is that their levy dollars may not be maximised.

We have been very interested to see and supportive of this CCRSPI process where the state governments, CSIRO, the Commonwealth government, the RDCs and all these groups that seem to have climate change projects are talking to each other and, as I understand it, effectively doing a gap analysis of who is doing what and what needs to be done. We have been very supportive of that.

We are not an R&D corporation, obviously, but what we do get involved with is advocating and lobbying to government about where we might need more funding or more focus. If we knew where the gaps were and we knew that there was not duplication because all those agencies were talking to each other, we could then go to government with confidence and say: 'Our industry is organised in this R&D task. We do face gaps and we need new money to fill those gaps.' In the past it has not been as coordinated as it could have been. The CCRSPI process has been a good one, from what I understand, to start getting those people talking together—and long may that continue. If the CCRSPI process not only identifies the gaps but identifies where new money is needed, we will with confidence go to the government and make the case for that new money.

Senator NASH—Have you noticed any change over the last five years in the attitude of farmers towards climate change and adaptation and the very big issue that it is? I know it is a generalisation, but where are we at now in terms of farmers looking at a change in climate—even if they do not believe in climate change—and how they are going to deal with that? Are they responsive and receptive to the potential changes that may be necessary?

Mr Fargher—My judgement—the basis is anecdotal, I guess—would be that we did go through a period of scepticism but we came to a realisation that we were dealing with risk and we needed to manage the risk. We also came to the understandings that the community as a whole and our customers were very focused on this issue; that we were exposed to the risk and our customers were exposed to the risk and interested, so we needed to be focused.

There are three concepts I have written down in response to your question. One is the management of risk. Then there is the desire to get access to information and tools on farm—not global modelling predictions that say, 'X number of degrees change,' which are interesting in their own way, but: 'What is happening in my region or on my farm? What tools do I have to make decisions as a result?' So it is the risk. It is the longing to get access to regional on-farm

information and tools. And the third thing I have written down in answer to your question is the word 'uncertainty'. I think there is a lot of uncertainty about this issue out there. People just are not sure what it means for them and what it is going to mean for their farm or their region in the future. Overlay that with the impact of drought, which is creating so much stress and tension on our systems around the country, and people are uncertain.

So, yes, they are receptive. They are uncertain. What they need are information and decision-making tools to assist them to adapt, because they are, as you know, innovative and adaptive people if they have that information.

Senator NASH—Absolutely. That was my next question. You spoke in your opening statement about the tools needed on farm for the management of this. Are farmers getting good enough information and tools at the moment to be able to do this? On one hand they need the tools and the information to make the changes and adapt the way they need to, yet there is still all this uncertainty about exactly where it is that we are going. It is the combination of those two things: the lack of tools and mechanisms for them to make decisions about making changes for the future when that future is actually still quite uncertain. Do you think they are getting enough information and tools provided to help? Is that uncertainty creating any baulking at making any adaptive changes?

Mr Fargher—People are recognising the issue, and we do have a lot of good research and development corporations around the country trying to provide farmers with that information and those tools. We do have a lot of our industry associations around the country—Deb has just come from the Ricegrowers Association of Australia, for example—actually trying to do things on farm and with groups of farmers to give them decision-making tools and other things.

I think the industry recognises we always need more, as I said, because there is so much uncertainty. Policy instruments that are being developed—which need to be developed and which we are supportive of—like the new water plan and the ETS, by their very nature, create uncertainty in their development. We are not exactly sure how we are going to fit in with some of these policy instruments. I do have farmers saying to me, 'There are things we could do but we are not entirely sure whether they are appropriate or whether they can be done or not, and then, when the ETS comes in, what is that going to mean for us?' People do ask those questions. They are uncertain about those things, and the RDCs and the industry associations are doing what they can to assist.

Senator NASH—Yes, I think that is true. Can I just take you to this issue of drought preparedness. I have raised it before. For years and years it has been a great frustration that, as I mentioned earlier, we have a period of drought and everybody says, 'Gee, we need to do more on drought preparation, but we can't do anything at the moment because we are in drought.' But then it rains and they forget all about it. I think that that may have changed. Hopefully now we will maintain a focus on drought preparation, which I know the NFF has done a lot of very good work towards. One of the things that you did which you list in your submission is the mutual obligation grant—one of the eligibility criteria being that you have to demonstrate implementation of drought mitigation activities over the past five years. Can you just clarify for me that, if there was going to be some kind of funding arrangement, you already have to have been doing things for five years before you qualify to get any of that funding.

Mr Fargher—Our concept there is really around the issue of mutual obligation and the fact that we really do want to work in partnership with the community and the government to better manage and prepare for future drought. We are not sitting here saying, 'We expect something for nothing.' We are not that type of group and I do not believe we are that type of sector. If that is not recognised, it is easy to say: 'You have just been sitting on your hands while climate change and climate variability has been happening all around you. You are going in and out of drought and you've been sitting on your hands and now you expect the community to support you in doing something.' What we are saying is: 'No, no, no. That is not the case. We have not been sitting on our hands. Farmers are adapting. They are putting in new technology. They are putting in new irrigation efficiencies. They are putting in new fodder storage. There is more that we can do but this is expensive and we are under financial pressure, so we want to work in partnership with the community to do this work. Why? Because it is good for the farm sector but also because, if you are better managing preparing for droughts, it is good for the community as well.'

So a lot of farmers do have drought management plans in place. A lot of farmers have already tried to better manage drought. For those people who have done that, we want to know what more we can do to assist them to strengthen their business even further. That is the concept we are getting at. It is not a matter of people who have done nothing saying, 'We expect something from the community.' It is a matter of saying, 'Farmers are trying to adapt and they are trying to better manage drought, so how can we support them even more?' There is a mutual obligation component for them in partnership with the community. That is what the community expects and we recognise that.

Senator NASH—Absolutely. Are you assuming that farmers are already doing most of these drought mitigation activities and so they will qualify?

Mr Fargher—We are not being specific about the guidelines. It is a concept. We want to talk to the government about the guidelines.

Senator NASH—Yes, I understand.

Mr Fargher—That is where we get to the mutual obligation part—is it just cash or is it in-kind and what have farmers or regions of farms already been doing? If you start to get too prescriptive about that at this stage, given the inquiry is just underway, I think that will be dangerous. We want to talk to government about the guidelines, but the concept is recognising that we want to work in partnership and not get something for nothing.

Senator NASH—Exactly. I am happy for you to take on notice—this is quite important—the example of, say, a young couple who have just bought a farm and do not have a previous history on that farm. Is that going to preclude them when they might be very forward-thinking people?

Mr Fargher—Of course, that would be a perverse outcome that we would not want to see.

Senator NASH—So that sort of thing will be taken into account in discussions?

Mr Fargher—We would absolutely want to take that into account.

Senator NASH—Great. Thanks.

Senator O'BRIEN—Following down the path of your submission on that issue, you say that 'more drought resistant practices today and over time reduce the need for drought relief'. How is that going to work?

Mr Fargher—We are obviously seeing two forms of drought support now: the household support, which I know you are very familiar with, and the interest rate business support. We are saying to the community that, hopefully over time, when we have not just the preparedness tools but also a suite of tools, which I have listed—I hope we can talk about them—we can better manage and prepare for drought and rely on relief payments less. We hope, but there is—

Senator O'BRIEN—You said in your earlier submission that you also need the appropriate market signals so that you will actually encourage the necessary restructure for this response to find its way through the system. I will not quote you, but there are plenty of other people who privately complained about those who sit back and take exceptional circumstances assistance but make no preparation for the future. On the other hand, those who have equipped their properties, spent money, invested and borrowed, and diversified risk find themselves ineligible for the assistance when they need it most.

Mr Fargher—Yes.

Senator O'BRIEN—What I am interested in is a little bit of progress towards resolving that very difficult issue about how you deal with the deserving versus those that, it is argued by some in your sector, are not as deserving. How do you balance that up so that there are financial incentives to invest in drought proofing and the systems which will equip these properties to better survive droughts, while at the same time not pulling the rug out from under everybody and keeping the financial commitments of government?

Mr Fargher—Your question is: how do you do that? My response is: with difficulty. In my personal view, you have hit the nail exactly on the head. If you asked us what our ultimate drought policy would be, it would be that you protect the productive base of the nation through an exceptional event that threatens to wipe out the entire productive capacity of regions—

Senator O'BRIEN—Given that exceptional events are probably much worse than they were thought to be 25 or 30 years ago.

Mr Fargher—And it is right, we believe, for the government and the community to protect that productive base. We are not talking about handouts, despite what may think. Let's remember we are the second least subsidised agricultural country in the OECD and we are producing food to feed our population and the world. So let's protect that productive base but, as you rightly say, do it in a way that does not impede the normal structural adjustment process in agriculture.

Senator O'BRIEN—So you are saying maybe we have a limitation—you can go to the well so many times and that is it?

Mr Fargher—I am not saying that we would support or oppose that, because there is an inquiry underway. I am saying that we need to protect our productive base. We need to have a

safety net in place, just like everyone in the community gets. We do not want to impede the structural adjustment process and we want to move to better manage and prepare for future events given the climate risk. How you do that—I will be frank—is very difficult. We have been trying to do that—have we not?—for at least a decade, that I can recall, if not longer. It may be 15 years. I do not know—maybe more.

Senator O'BRIEN—I thought it started back in the early eighties.

Mr Fargher—It is difficult. That is why we have been trying to show leadership and actually talk about it. Some people say interest rate subsidies are not a perfect tool. We know they are not a perfect tool, but what about the young people out there that will only get through this current drought because of that instrument and go on to be good farmers for years and years?

Senator O'BRIEN—I agree it is difficult and I agree it is difficult to get the farm leadership to talk about it because you must tread on toes to do it. Most are not very happy to do it, because there are those within their membership who think that you should not actually be talking about taking anything away from the farm sector.

Mr Fargher—Yes.

Senator O'BRIEN—But, ultimately, you have to have a sustainable system. You say that you are talking about, in part, mutual obligation. In the employment area, there are pressures on people to improve themselves to be able to work, to fit into the system, to try. How does that work with a farm operation that does not equip itself? You talk about the young people buying into the system and moving onto a property that has not been set up. It might be affordable, but that should be reflected in the price, shouldn't it, that that young couple has to pay for the property? In other words, shouldn't there be an economic imperative for someone who wants to sell their property to equip it so that it will pass certain tests to make those new operators fit in with the system and satisfy the mutual obligation? I am proposing a theory about how you might progress the mutual obligation of farms being equipped to deal with, as far as is practical, the challenges of drought.

Senator HEFFERNAN—I can answer that.

Senator O'BRIEN—I do not want your answer; I want their answer.

ACTING CHAIR—Let the witness answer.

Mr Fargher—I need to think about your proposal a little bit more. Of course, as you are well aware, it is not just young families now buying properties because in the financial climate it is very expensive to do so for a range of reasons. So people might be share-farming or contracting. It is a very diverse sector. The challenge we have—and I am not saying it is easy; that is why we have been dealing with it for 20-odd years—is that if you try to protect your productive base but not impede adjustment then you have to draw a line somewhere and, as soon as you draw a line, such as around maps, assets tests, farm income tests or regions, you will have people in and people out and that is a problem. We are willing to show leadership and talk about how we do it better. Is it simple? No. We know we need to better manage and prepare. We recognise that. We want to do that in partnership with the community. We want to protect our productive base. As I

say, we think it is right that the government does so and has done so, and we recognise that. But the line between protecting the productive base and providing the safety net and not impeding the structural adjustment process is extremely difficult and we will try as part of this review, again, to—

Senator O'BRIEN—Farm managed deposits have been there for some time and we have regularly seen that, although they are there, they are not drawn against as much in drought. Although, more recently, that may have changed slightly. They have become a tool to manage tax rather than a tool to manage drought, if you know what I mean. There have been proposals which have varied over time for accelerated depreciation on fodder storages and water storages. Those issues have been in existence for some time. Some would argue, despite that, we have not taken the steps we needed to take. That is why I am going down this path of mutual obligation in an exploratory way. We are not saying, 'This is the proposal.' I want to discuss with you in this inquiry the range of issues that may need to be considered. I know that there is another inquiry of the Productivity Commission dealing with it, but you raised the issue in your submission and I think it is very valid for you to do that here because it is absolutely pertinent to this inquiry. How accepting is rural Australia of the idea that there needs to be an extension of mutual obligation to the issue of drought relief and funding for drought preparedness?

Mr Fargher—I think a lot of what we are seeing at the moment in government programs is a recognition that one of the best ways to get an outcome is to actually work with the people who are out there doing the work. Farmers are actually out there doing the work. They are exposed to climatic risk. They are dealing with the land and the water resource, so one of the best ways you can get, say, an environmental outcome is to work with those people and not regulate them out of existence.

With NRM programs, you are seeing the concept of partnership. With the stewardship program which we have proposed, which the previous government initiated and the current government supports, you are seeing the issue of partnerships, drought management preparedness and mutual obligation. I think the community would like to see that and the farm sector is willing to engage in it. It is not just about producing food; it is also about providing environmental outcomes on behalf of the community and, rather than regulating, recognising and supporting farmers for doing so. The concept of working together is talked about and recognised. Farmers are not and do not want to be seen as people who are getting something for nothing—they are not.

Senator HEFFERNAN—Farmers are their own greatest critics.

Mr Fargher—They are out there working with the land. They do not want to be seen to be getting something for nothing. They are the second least subsidised farm sector in the world, despite what some people in the community think. Therefore, work with them. We are saying that. Governments are recognising that. Long may it continue. When you are proposing new policies, like management of preparedness for drought, put it around a mutual obligation component where you are trying to do something for the country. Farmers want to be a part of that. That is my judgement from what people are telling us.

Senator O'BRIEN—Your risk is the loud voice of the agripolitician who wants to play a political game to attack farm leadership when they step into these areas, isn't it?

Senator HEFFERNAN—You have to have a thick enough hide to wear that. Australia's farmers—

ACTING CHAIR—There are five minutes left in this session. You work out who wants to take that five minutes.

Senator FISHER—Can you have another go at answering Senator O'Brien's question about how receptive the farming community is to some sort of increased mutual obligation, in light of the earlier evidence you have given about the lack of certainty that farmers have about where we and they are going in dealing with climate change? Also, what is the lack of certainty about where we are today in the context of the scientific and empirical evidence, if we know not with precision where we are today and what we are attempting to plan for tomorrow? There is a lot of faith in this. You are saying that the farming community is over it now and ready to get on with it. That is all well and good, but are your members going to be calling upon you to call upon the government for empirical evidence to show where we are today and the measurement tools to show the forecast for the future, so that you can build your tools, your risk management strategy and your access to information? My question around Senator O'Brien's question is: how can there be increased receptiveness without an increased call from organisations with formal scientific information about where we are today and the basis for planning where we go tomorrow?

Mr Fargher—Perhaps I have not explained myself well enough. In answer to Senator O'Brien's question about a new policy instrument—which is what we have proposed and Senator Nash talked about—and the concept of mutual obligation grants, I have not said that there should not be the protection of the productive base or a safety net in our drought policy regime to protect farmers from exceptional events. And we are moving to throw that safety net and that protection away for a stringent mutual obligation component. I am saying, with new policy measures going forward to better manage and prepare for drought, farmers realise that they are working in partnership with the community. That is what I am saying.

I am not saying that we know exactly where we are now and that we are looking for some broadscale change so we do not protect our farm base. That is my first point. My second point is that we are asking for more R&D money because it is uncertain. I recognise the uncertainty. We are asking for an ETS design not to impact disproportionately on our emissions-efficient farmers. We are asking, as part of the new National Water Initiative, for on-farm investment in water reticulation. We are asking for access to new technology like GM. We are asking for better seasonal forecasting tools on-farm. We are asking for better transport efficiency. We are asking for better training schemes. We ask not because we want a handout but because we want to strengthen our sector. I am not saying that it is certain and we are looking to move to mutual obligation and somehow take the safety net out from under our people. That is not what I am saying.

Senator FISHER—Would not the same thirst for data and the assessment of where we are at today and where we may want to go tomorrow apply in terms of your argument, for example, for the maintenance of a safety net? Whether it be mutual obligation, a safety net in terms of exceptional circumstances, a community climate management grants policy or whatever, and for whatever measures you are seeking, I would have thought you would need empirical evidence about where we are today and the basis for planning where we go tomorrow.

Mr Fargher—Absolutely, where we are today. As I understand it, one of the three planks of the new drought review is the Bureau of Meteorology climatic study. We do want to know where we are today, because in the National Water Initiative, for example, farmers are looking at carrying the risk of climate change. If you do not know where the baseline is for an ETS then you can always be above it and be disproportionately impacted. So we do look for that knowledge.

Perhaps I am just not explaining myself well enough in regard to how where we are now relates to our drought policy settings. We are not looking to remove the safety net. In fact, the minister is saying—and we have supported him saying this—that, for those people currently in the grip of drought, those support arrangements will be maintained. So they should be, given the nature of the drought around the country at the moment. We are looking for that maintenance. We are looking to see if we can do things better in the future and we want to engage in a discussion about it. That is all we are saying at the moment.

Senator HEFFERNAN—Cockies are their own greatest critics. Cockies do not like to see some bloke who spends too much time in the pub getting rewarded when the bloke who is out on the tractor does not get rewarded. That is just a given. We are our greatest critics. Freight subsidies for fodder just increased costs; the hay costs more. The questions that farmers want answered are: 'Should we reconfigure Australia, and the way we have settled and do business in rural Australia, due to climate change? Is what we are experiencing now not an exceptional circumstance but the way it might be going to be?' That is the bottom line, wouldn't you agree?

Mr Fargher—Yes, I agree; farmers are their greatest critics. The farm sector does not want to be seen—as some people in the community think, though not all and I hope it is changing—as somehow having this handout mentality, which I completely disagree with. They are critical and they do want to know where they are now. That is exactly right and that is why I said at the start that, whether it is drought, climate variability, a change in climate, climate shift or climate change, as you well know, they are dealing with it daily and so they want to manage the risk. To do that, they want information and decision-making tools.

Senator HEFFERNAN—If you go to some of the major bank forums, banks will tell you that the future of farming is not about the return on your capital; it is about capital gain. That is based on the fact that all costs get passed back to the farmer instead of forward to the consumer. That is the bloody issue: how do we farm affordably?

Senator McGAURAN—I am not sure, unless I missed it, that you quite answered Bill's question, which was going to be mine. From your position, is the drought that we have been under for a decade now abnormal to the normal rain patterns or is it a product of fundamental changes in rain patterns—that is, climate change?

Mr Fargher—My answer is that I do not know the answer to that question, but I do know that whether it is a shift or variability or a drought that has been and will come again or climate change, the climate is variable, farmers are exposed to variable climate and they want to manage it. They want to know what it means for them. At the moment they do not have enough information about that and they need better tools to manage it. I do not know whether it is eight or 10 years, or 11 or 12 years; all I know is that we are exposed. We want information and tools to manage it.

Senator McGAURAN—Do you know anyone who does know? We have been sitting here for two days and no-one knows.

Mr Fargher—I do not know.

Senator HEFFERNAN—No-one knows the answer. I have a final question. Yesterday we received evidence from CSIRO and the Bureau of Meteorology. CSIRO is having its focus changed, as you would be aware, to research on climate change and away from productive research. Would you like to put on the record that it is necessary to have both? If CSIRO is not going to do it and its budget is going to be cut, someone else has to pick up the tag, if we want to feed ourselves, on the productive research.

Mr Fargher—Both that incremental productivity farm based research and climatic research—and the fact that we have seen productivity improvement as much as any sector apart from IT, I think, in the last 20 years—are important. We cannot lose the productivity research and, in our view, it will require not just coordination but new money. We are hoping that CCRSPI will identify where the money needs to be spent so that we—where we add value, because we are not researchers—can go to government with confidence and say, 'It's not being duplicated; there is a gap; please, let's invest.'

Senator McGAURAN—Could you, on notice, submit the list that you have there of drought policy changes you were looking for?

Mr Fargher—Yes. I have drawn a diagram.

ACTING CHAIR—Maybe you could type it up for us.

Mr Fargher—Sure.

ACTING CHAIR—Any more questions?

Senator O'BRIEN—Could I ask the NFF to submit a piece on why they think GM is relevant for the farm sector in terms of the climate debate? We have not had much in this inquiry about that, and I think this inquiry needs to have something before it about that issue. You just mentioned it, but we have not touched on your submission.

Mr Fargher—Yes, we are happy to do so because it is not just about climatic management grants or on-farm works, it is not just about GM and it is not just about on-farm water efficiency savings; it is about the whole lot and how you give farmers those tools, and FMDs. Give them a suite of tools and seasonal forecasting that they can manage. I think, and we believe, that GM is part of that debate, so we are happy to give you something there.

ACTING CHAIR—Thank you very much. If you could get those answers back to the secretariat, that would be appreciated.

[11.38 am]

YOUNG, Professor Michael Denis, Wentworth Group of Concerned Scientists

ACTING CHAIR—Welcome. Would you please state the capacity in which you appear.

Prof. Young—I am from the University of Adelaide and am a member of the Wentworth Group of Concerned Scientists.

Senator HEFFERNAN—Before we go further, on the behalf of the committee I would like to express our heartfelt condolences on the passing of Peter Cullen and mention the fantastic work that he did, which also included the work of the Wentworth group. I just think it would be nice for the committee to recognise the late Peter Cullen.

ACTING CHAIR—Thank you, Senator Heffernan.

Prof. Young—Thank you very much.

ACTING CHAIR—The Wentworth group has lodged submission No. 17. Do you wish to make any amendments or alterations?

Prof. Young—No.

ACTING CHAIR—I invite you to make an opening statement and then we will ask you some questions.

Prof. Young—I want to make four points, but, before I do that, given the previous discussion, I think it is useful as we run up to COAG—we are actually meeting on 3 July—to recognise that, when the first draft of the MOU on the Murray-Darling Basin was signed, Australia thought it had stepped back into a La Nina and it looked like we had a lot of time to get water management right. This autumn and, more particularly, the May and June we have just had have been very low inflow years. It is starting to look like adverse climate change, and I always put 'adverse' in front of 'climate change' when I talk about the issues that we are addressing. The report that we have submitted, which was prepared by Jim McColl and me, focuses on future proofing Australia, preparing Australia's water managers for dry and also for wet futures, and the regimes we have at the moment do not do that. The report sets out a template for how you might think about managing and sharing water resources in times of adversity and in times of abundance.

The first concept is what we call 'maintenance' water, which is very important. It has been the practice in the past to call all water that is not used for consumption 'environmental' water, but there is a component of that which we have identified and called 'maintenance' water, which is the water that is needed to just cover the evaporative losses from the system and to convey the water to those people who want to use it. It is very different from environmental water. If we do not commit to having a river and maintaining a river, we are in strife. That has some very, very important implications which I will come back to, but it is, essentially, a fixed cost to the system that has to be managed and, if we do not recognise that, we end up essentially doing what, in the

corporate world, is equivalent to trading when the system we are managing is bankrupt. You have to cover the fixed costs in any system first. In a world of climate change, particularly adverse climate change, that has massive ramifications.

The second thing I want to draw the committee's attention to is the difficulties of dealing with the impact of climate change on water supplies and water inflows. The best data around that is frequently quoted is the inflow data from Perth. Rainfall behind the dams which supply Perth dropped in 1974 to a new mean—rainfall was about 14 per cent less. That meant that inflows into the dam became 48 per cent less. More recently, rainfall has dropped and the mean is now 20 per cent lower. Twenty per cent lower meant that inflows into the dam dropped by 66 per cent. The reality is—and this is a rule of thumb; there is much more sophisticated science—that for every one per cent reduction in mean rainfall, inflows into dams dropped by about three per cent. As you get to really dry steps, it becomes more like four per cent and even five per cent. That really matters and it happens because you have to wet a landscape before you get run-off. It is simple, but the very, very difficult bit when you put together the reality of a 10 per cent decline in mean rainfall—meaning that inflows drop by 66 per cent—is, if you have a commitment to maintaining the system, then even a 10 per cent reduction in rainfall, if we commit to looking after the environment and all those other fixed costs, means that use has to drop by as much as two-thirds. In the back of the envelope sums that I have done for the river Murray, if we were experiencing a 20 per cent or more reduction in mean rainfall then, when you recognise the evaporative costs and the commitments governments have made, there is actually no water left for use, unless we reconfigure the system, downsize it and give up on some of the environmental aspirations that we hold. That is the reality. It is a very, very difficult message to convey to Australia and it is why we wrote the report and offered it as a template to put up a regime that would facilitate change.

Coupled with that is another very important thing that Australia is still finding it greatly difficult to face up to. That is the issue of the interception of rainfall by forests—particularly in plantation forests. Your discussions and the evidence you have received have talked about the plans to set up an emissions-trading system from 2010. It will give people credits for planting forests. Forests tend to get planted in high rainfall areas and areas where roots can access water free of charge. It is high security water; it is the water that is taken first. When you plant a tree, it intercepts all the water it needs before it lets any run off. If you plant a tree close to a river and it gets its roots into the river or into the aquifer, it takes all the water it needs. It grows on hydroponics. If Australia goes into an emissions-trading system that gives people carbon credits for planting trees and does not bring water accounting into that regime then this nation could be in very serious strife as we dry up our rivers.

The obvious rule to put in place is an offset arrangement which says, 'If you plant trees then you have to acquire the water from a water user.' If we bring carbon into the economy then we have to bring water into the carbon economy as well. If you use an offset rule rather than a full accounting rule—and I have written some papers which I would be happy to forward to the committee on how to do this in more detail—there is an argument that you should in fact ask people to set aside a bit more water than is needed because, essentially, once you go into an offset arrangement and the water is surrendered, the forest is then actually insured against climate change. There is an argument for having a climate change insurance premium because the reality is, once you have planted the trees, they will keep on growing. If the well gets dry, those people will not be part of the ongoing economy. I think there is a need to openly discuss

whether or not we are going to insure foresters and those who plant forests against climate change. If so, are we going to impose a climate change insurance premium on them for the water that that they get, which is of the highest of high security. It is higher than urban water security.

The last issue that I want to raise in my opening comments is about storage management. The report that we wrote called *Future proofing the MDB* draws attention to a serious flaw which operates in some of our water management systems. That is that we allow trading of water within a year but not between years. In a regime that is getting dryer, it is obvious that people have to be able to conserve water for the next year. The rules on the amount of water you can store will change from year to year depending on circumstances. It has been the practice in southern Australia in the past, with the partial exception of New South Wales, not to allow farmers to carry water forward from year to year. We have had a rule in recent times that says, 'You use the water or you sell it, because you cannot save it.' In the very worst drought which we are now in, which could be adverse climate change, governments have finally recognised that there is a need to allow farmers to carry water forward from year to year.

When that was introduced very recently in South Australia, the price of water doubled because farmers knew the smart thing to do was to let more orange trees and more grapevines die this year so that they could keep more alive next year. For a long time in the southern part of Australia we have denied them that opportunity. I think it is critically important that Australia moves to water sharing regimes that are built around a concept of recognising maintenance or conveyance or whatever you want to call it—there are different words being used to identify that—as a separate function and responsibility for the nation to get right.

We have to understand that we have to have a share for the environment and a share for all users that is fixed as a percentage and we have to move away from water sharing plans, because the water sharing plans that we have written have been unable to put in place rules and regimes to cope with the circumstances we now find ourselves in. The most recent reports to the National Water Commission underscore that we are not good at planning for adversity. What we need are regimes that do facilitate and force us to adapt quickly. That means we have to give the environment a share, all users shares and let them separately decide how much water they carry forward. On top of that, there is the separate issue of how you design systems for flood management. I would love to see floods returning to Australia, but all of the warnings are that they are going to be much rarer than they have been in the past.

Senator HEFFERNAN—Yesterday, we had CSIRO and the bureau in, and somewhere in the discussion I raised the question of the disproportionate return to the system of what you call 'making the system work water'. They did not seem to recognise that. In the plan that they put to us—the reduction scenario of 30 per cent to the environment, as they call it—there would only be a six per cent reduction in the production water. That cannot be right, can it?

Prof. Young—That is the way we have tended to plan for water use in the past. We have had a regime that has not allowed carry forward from year to year. It has been assumed that, when it gets wet, the land will get a drink; when it gets dry, irrigators will get to use most of the water. That is fine if we operate around a fixed mean and we do not have long dry periods.

When you go back through history, you can understand that, in periods in the past, particularly the first half of last century, we had long droughts. If you take the drought that started in 1938,

take that rainfall sequence and lift it forward to this current drought that started essentially in 2002, then inflows into the river Murray would have remained low until 2014. The bad news is we would only be halfway through this drought and we are not in a regime which enables us to manage for such circumstances. If we put adverse climate change on top of that, then it could be even more serious.

Senator HEFFERNAN—And what about the extraction levels of both ground water and run-off?

Prof. Young—Yes. We have capped diversions rather than sharing inflows. The right thing to do is to share inflows and to put in place a regime that forces everybody to revise plans as circumstances change.

Senator HEFFERNAN—It is a shame we did not have you here yesterday to talk about the interception because the forest people here yesterday had a view on forest interception that is graphically different from yours and mine. Is it a possibility that you not only would have a premium for the insurance for the forest in the high rainfall area but you could also offer an incentive in the system if you wanted to put the trees down in a less vigorous tree environment where you would get a salinity credit. That would be another way to manage it, wouldn't it? You could tender out an area for growth that would give you an active salinity credit.

Prof. Young—It is certainly possible to set up a salinity credit regime. Trees tend to grow very slowly in those areas.

Senator HEFFERNAN—They do.

Prof. Young—If you are after carbon credits, the obvious place to go is into the very steep areas which produce most of the water. It is not very valuable for any other type of production and it is ideally suited for trees. The other place is right next to rivers, where there is a lot of water. Trees also do not like saline water, which is part of the reality. But, yes, that can be part of the challenge of getting all of this right. It is a multifaceted problem, and we tend to address one issue at a time rather than realising all the problems we face.

Senator HEFFERNAN—Do you think that, in the longer term—like in the next 50 years—we may have to reconfigure rural and regional Australia and look more at other opportunities in other areas to the north et cetera?

Prof. Young—I think rural and regional Australia is continuously reconfiguring itself. The debate you have just had with the National Farmers Federation is about the difference between impeding change, facilitating change and expediting change. On the other side, it is not just what farmers do; it is also what government does. The problems I have highlighted to you are all problems of governments which have tended to put in regimes that have denied the prospect of change and the need for change.

For example, in the case of interception, the Murray-Darling Basin Commission still bundles these up in what are called six 'risks'. The reality and the truth is that interception by forests is occurring and has been occurring, and farmers are not being told how much is occurring. Similarly, every time we put more farm dams in the top of the system—small ones, but they all

add up—we reduce the amount of water that flows into the river. And I can go on listing these. But until we stop calling these processes 'risks' and start managing them, we keep on going backwards. The Murray-Darling Basin Ministerial Council was informed in May this year that by 2023 the reduction of inflows was expected to be more than 2,500—I think it was 2,570—gigalitres a year. Nobody has yet talked about returning that much water back into the river, yet we are talking about losing it. The talk about making progress is being drowned out by plans to walk backwards.

Senator HEFFERNAN—I entirely agree with you.

Senator O'BRIEN—You talk about interception by trees. The forestry industry say pasture intercepts as well, it is just a different rate; why shouldn't they be subject to the same regime?

Prof. Young—All processes intercept rainfall. What matters is change in land use. When you change from an annual pasture to a perennial pasture or to plantations, you increase interception. What matters is the rate of change.

Senator O'BRIEN—It is the rate of interception—is that right?

Prof. Young—Yes.

Senator O'BRIEN—So if you are going to have an equitable system, everyone has to pay for their level of interception. Is that what you are saying?

Prof. Young—No. Everybody has to pay for change in the level of interception. The reality is that these processes are unmeterable and therefore we can only approximate and derive estimates of the impact of these processes.

Senator HEFFERNAN—So it would be fair to say that with an under 22-inch rainfall the difference between a forest interception, a lucerne paddock and a pasture is bugger all.

Senator O'BRIEN—Can I continue? You have just had half a dozen questions without interruption. Can I continue without interruption, please?

Senator HEFFERNAN—It is an important point.

Senator O'BRIEN—Professor Young, you talk about the rate of flow. If the rainfall drops, then a certain amount of the rainfall has to saturate the land before it will run off. It does not matter what you are growing, a certain amount of rainfall has to saturate the land before you get run-off. That is the case, whatever the system, isn't it?

Prof. Young—No. It depends on what crops are grown there. A lot of moisture actually goes into the soil and goes through the soil for a bit before it emerges in small streams and creeks. So if there is a network of roots that are permanently alive, then those roots trap the moisture and stop it moving out. The difference between a perennial plant and an annual plant is that for half the year the annual plant is dead, so summer rainfall and all those processes go straight through.

Senator O'BRIEN—So perennial pastures will intercept more rainfall than annual pastures—is that what you are saying?

Prof. Young—Yes. What also matters is where these plants are actually planted. It is once you get above about a thousand millimetres per year of rainfall that the gap between the two starts to become really significant. Once you get a little bit higher than that—I have not got the numbers in my head—the rate of interception of water rises to about two megalitres of water per year. If you had to buy back that water as a permanent water entitlement in places like the Murrumbidgee, it would cost you about $6,000 to purchase back that water right per hectare.

Senator O'BRIEN—It is a very small part of the country where you would have a thousand millimetres of rain per year—in the south, anyway. In some of the tropical areas you would get it, but in the south it is a very small part of the country where you would exceed a metre of rainfall per year.

Prof. Young—But I would recommend to the committee that you obtain access to the evidence on the coincidence between high-rainfall areas and where trees are being planted. You will find that there is close to a one-to-one correlation between the two.

Senator O'BRIEN—What you were saying about the alternative—the way that you would encourage the trees somewhere else—actually sounded like a comment made by the head of Gunns some time ago: 'We're happy to plant trees somewhere else, but the economics of it are such that, unless there is another incentive, we cannot grow the trees economically in those areas.' So your solution to their quandary and the need to continue in industry is to have some other economic incentive to move the plantation. Is that what you are saying?

Prof. Young—Not quite. My recommendation is to bring water into the carbon economy and leave the market to work out whether it grows rice or oranges or grapes for wine, or trees for carbon or trees for carbon and wood.

ACTING CHAIR—And it is not being accounted for at the moment.

Prof. Young—Yes. The role of a government is to get the accounting right and to send clear signals confidently to industry so that they can then make long-term investment decisions.

Senator O'BRIEN—We have seen in the Murray-Darling Basin, probably more than at any time in the past, the impact of the price of water on efficient versus inefficient agricultural and horticultural industries, where rice growers with some water were better off selling their water to a grape grower rather than trying to grow some rice. Is that how you see the future?

Prof. Young—I think the market is the best place to sort out what crops are grown.

Senator O'BRIEN—That is exactly what was happening, wasn't it.

Prof. Young—I would add a caution around increases in water use efficiency. At the moment we allocate water to water supply systems and to farmers in gross terms. We do not require them to account for the amount they return to a system. I can probably show you this using these glasses of water here. Understand water flows back into a system. When you increase water use

efficiency then people use more water. Imagine an irrigator who is entitled to a glass of water and another who is entitled to half a glass. If the first irrigator uses it inefficiently, then half of the water drains back into the river and the second irrigator gets a full glass and is happy. If you think of this as the environment, which started off without any water, the environment is quite relaxed because it knows that this irrigator is inefficient. So it gets half a glass. Everybody says, 'That's great; we've all got our share of the system.' If governments now turn around under the allocation regime and ask this first irrigator to get very efficient, they will then say, 'Okay, then I have to convert to drips,' and use all of it. Nothing goes back into the system. Or, if it is an irrigation water supply system that stops all the leaks and the seepage, they use the full glass. This second irrigator gets angry because they only got half a glass of water and they want to know who stole their water. In response they then get efficient and use their little bit really efficiently—and the environment does not get anything.

That is one of the reasons why before this drought we put a dredge in the mouth of the river Murray. The national crisis we face is deeper than this current long, dry period we are in. The river ran out of water before this drought.

Senator O'BRIEN—Because of the rate of interception?

Prof. Young—Because we did not get our water accounting right and we did not put in systems that were designed for managing under a water-trading regime. Essentially this nation traded into trouble because it took its existing water right regimes, like the ones I have just showed you, and we all said, 'We have to be more efficient,' but we did not understand that getting more efficient actually meant more water use.

Senator McGAURAN—If you are maintaining the same production then there is a leftover.

Prof. Young—But the rule—

Senator McGAURAN—If you grow the crops—

Prof. Young—Yes, you are growing more crops, but you are using more water as you are doing it. So there is a great increase in productivity because we expand—

Senator McGAURAN—So you expand your tonnage, don't you?

Senator O'BRIEN—If there were 100,000 irrigators who all had 1,000 megalitres and they all used it inefficiently, half of that would go into the river system—

Prof. Young—Yes.

Senator O'BRIEN—but if the same number use all of their water efficiently, none of it goes into the river. Is that the proposition you are putting?

Prof. Young—You have got it, yes.

Senator O'BRIEN—What you are saying is that, because of the allocations which occurred before this drought, the overallocation of the system and efficiencies that started to emerge meant that less water was actually getting back to the river system.

Prof. Young—That is right.

ACTING CHAIR—So for the government's water irrigation efficiency, for example, we are saying the community is getting half back for the river, but in fact all we are getting back is what we used to get back through inefficiency?

Prof. Young—It depends. All of this is context specific, so we have to be very careful. There are some areas where you can upgrade and where there is no return back to the system. There are other areas where there are. Areas where there is a 100 per cent return of the leakage and seepage, the leakage and seepage water goes somewhere.

Senator McGAURAN—Where?

Prof. Young—I am not a hydrologist. It is not my role—

Senator McGAURAN—Then you are just theorising.

Senator HEFFERNAN—You are wrong.

Prof. Young—No. My role is to explain concepts—

Senator McGAURAN—Bill, I am allowed to ask questions. You interrupt everyone and you have been swearing during the whole two days and making a big idiot of yourself.

ACTING CHAIR—That does not mean that you should interrupt.

Senator McGAURAN—I happen to want to ask a few questions of the Wentworth Group. I know what they think of farmers. They want half of them off the Murray, and that is the bottom line for that group.

ACTING CHAIR—Senator McGauran, just hold on, please. Just because other people interrupt does not mean that you should. Professor Young was in the middle of an answer.

Prof. Young—Can I just clarify that the Wentworth Group does not want half the farmers off the land. We have not said that.

Senator HEFFERNAN—Can I give you an example—

ACTING CHAIR—Hang on.

Senator McGAURAN—Talk to me later, Bill. Madam Acting Chair, I am not interested in what Bill has to say to me.

ACTING CHAIR—Professor Young, could you continue with your answer and then we will move on.

Prof. Young—The answer to which question?

ACTING CHAIR—We were talking about what is actually returned through inefficiency and what the net outcome is of the efficiency process.

Prof. Young—In systems that are located close to a river where the groundwater system is closely connected to the river, leakage and seepage will move very quickly back into the river. As you go further away from the river, the time delays become greater. Accounting for that becomes very complex and is technically difficult and is probably closer to an art than a traditional science. Groundwater is very hard to measure. As a general rule, it is prudent to assume that the water that leaks and seeps through to groundwater will return back to a river system or drain directly to the sea. The important thing is which way the bedrock essentially drains that groundwater.

ACTING CHAIR—Am I to understand, from what you said previously, that we do not have a good understanding of that at the moment?

Prof. Young—I think we have a much better understanding than people are prepared to talk about. It has been the tradition in Australia to manage groundwater separately from surface water. The plan under the new Commonwealth water act is to bring management planning for ground and surface water together, which will force us to face up to these realities. If you give only half back to the river through leakage and seepage, in many cases it would short-change the river by half.

ACTING CHAIR—Okay. I am aware that I interrupted Senator O'Brien, but my final question is: if I have correctly interpreted what you said earlier, does that mean that once we start accounting for groundwater as well we may then end up officially seeing that we are in a worse position than we thought we were?

Prof. Young—Yes, in a much worse position. It is interesting. This is called 'return flows' in America, and the Americans developed a whole law around this over a century ago that has been part of water management in the United States for a century. Australia has not yet started to talk about this issue; we are a century behind.

Senator HEFFERNAN—The Murrumbidgee River is a really good example. Eighty-six per cent of the water that comes out of the bore at Wagga—

Senator McGAURAN—We are not here to get information from you, Bill; we are here to ask questions.

ACTING CHAIR—He is going to ask a question, and then we will move to Senator Fisher.

Senator McGAURAN—Bill, are you asking a question or making another pointless, biased statement?

ACTING CHAIR—Senator McGauran, leave him alone.

Senator HEFFERNAN—To illustrate that, Professor Young, you would be aware that the bores between Narrandera and Wagga are seriously intercepting Murrumbidgee River water and, for the bore that takes out the water at Wagga for Junee, Temora and West Wyalong, it is estimated that 86 per cent of the bore water is actually river water that was about to get to the river.

Prof. Young—I am not aware of that example, but it is interesting.

Senator HEFFERNAN—Of inefficiencies that are traditionally returned to the river system, the best example that I know is at Leeton, with the inefficient channel system there that absolutely goes back to the aquifer.

Senator FISHER—State Labor governments have over time laid great store in domestic or backyard water restrictions. I think in recent times even you yourself, as we are tracking backward in terms of the status of the Murray-Darling Basin, have included in the suite of options backyard water restrictions. I want to ask you about that. Can you confirm that you hold that position? Why do you see backyard water restrictions as an option? You are a South Australian. I am, as you know, a senator for South Australia. I wondered if you could focus on Adelaide in your answer; it is, after all, the capital city that is drawing the most on the Murray-Darling.

Prof. Young—We are talking here about the issue of urban water restrictions and how we manage with a river system that is failing. The approach that has been taken in South Australia, as in all of eastern Australia and also around Perth, has been to go to restrictions on watering. That is a very crude option and it crowds out a lot of innovation. The other options on the table are to start—

Senator FISHER—So does it make it look like something is happening when it really is not?

Prof. Young—It is actually freezing and hoping that the problem will go away. The challenge for your committee, I think, is to design mechanisms that encourage the nation as a whole to plan for change and to continually open up opportunities for people to develop new solutions and be very innovative. That requires looking very carefully at the institutional rules around who has access to both surface and groundwater, as well as the incentives that face developers and users of water. In the case of Adelaide, there are tremendous opportunities to make much better use of stormwater by capturing it, recharging aquifers, putting water in and then allowing people to access it.

There are important issues around sharing access to groundwater, particularly in urban areas, like how you do that in a fair way and, once again, facilitate change. There are important opportunities around recycling sewage for potable use in cities and also back into rural areas. There are also important opportunities around taking water from the sea and desalinating it. There is a whole spectrum.

Senator FISHER—Clearly there are actions that we need to be taking regarding better collection, storage, use and re-use, but, in terms of urban water restrictions, have they achieved anything in Adelaide's case?

Prof. Young—They have reduced some use at great cost to a large number of people.

Senator FISHER—Can you prove that?

Prof. Young—Certainly, SA Water has produced data that has shown that the volume of water which is used by people in Adelaide has gone down.

Senator FISHER—Yes, but can you prove that the reduced consumption is not in fact due to, for example, people becoming waterwise? Can you prove that the reduced consumption is due to water restrictions? I would suggest you cannot.

Prof. Young—I think there is a difference between whether I can and whether I have. I have not done the detailed analysis—others have.

Senator FISHER—Who?

Prof. Young—Particularly SA Water—or they claim to have done it. I have—

Senator FISHER—Is it publicly available? I cannot find it. The minister does not produce it; the state minister does not produce it.

Prof. Young—I have seen summary data. I think you have seen the summary data too.

Senator FISHER—It does not show causation, though—the causative link between the urban water restrictions in the backyard and reduced consumption. Indeed, Minister Wong has said that Melburnians reduced their water consumption by some 22 per cent some years ago, before water restrictions, meaning that people are becoming smarter and more economical, as we need to be, in our use of water. Moving to the next step, I think you are acknowledging that, if Adelaide did not draw from the Murray at all, that would not solve the scenario that is currently facing the Murray-Darling Basin. If Adelaide's allocation, Adelaide's take, from the Murray went to nil, would that make any difference?

Prof. Young—To the river Murray?

Senator FISHER—Yes.

Prof. Young—It would make a very small difference. I think that is the point you are after and you are really asking: does this matter or not?

Senator FISHER—How small a difference?

Prof. Young—I have not worked out the sums. I could certainly try and find some of this information if it would help you. I have not looked at the questions you are now raising and I have not taken the time to go and examine the claims made by SA Water.

Senator FISHER—I think it is important that an expert like you who has credibility across the political spectrum does take these arguments forward because, from my perspective—biased as it may seem—refuge is being taken in mechanisms that are unnecessary and do not work. Far more important is to find out: what do you think of mechanisms to take Adelaide off the Murray, even though it will make only a small difference, and leave the Murray for those whose livelihoods have depended upon it for some time? Have you advised governments as to the options for weaning Adelaide off the Murray? Have you been asked to?

Prof. Young—Many years ago, when I was working with CSIRO, CSIRO put up a proposal to the South Australian government to undertake a study that would carefully work through the options for doing that. The government in its wisdom chose instead to prepare the *Waterproofing Adelaide* document, which was prepared by government officers without my involvement. I have made public comment about options and ways to do this and reduce dependence on the river Murray, but that is as far as I have gone. Unfortunately, there is only one of me. The demands on my time are much greater than the resources that I have physically available.

Senator FISHER—I do sympathise and empathise, but, unfortunately, you are somewhat a captive of your own skilful and experienced advocacy on these really important issues. You may want to take this on notice, but I would appreciate your advice as to what in your view are the options for weaning Adelaide off the Murray and how you would prioritise those options.

Prof. Young—I will take that on notice and think about it carefully. The right way to answer that is to do a very detailed study, as we offered to do for the South Australian government, and do it properly—

Senator FISHER—What was the response to your offer to assess the options for weaning Adelaide off the Murray, to prioritise those options and to do it properly? What was the response to that offer?

Prof. Young—That was when Adelaide was under a Liberal government and the minister was Mark Brindle. There has been a change in government and, with that change, it was decided it would be wiser to resource it in house.

Senator FISHER—So who made that decision and how do you know that decision was made?

Prof. Young—I know that decision was made because our offer was not taken up; instead—

Senator FISHER—By the current state Labor government.

Prof. Young—Yes, but they did set up the Waterproofing Adelaide study.

Senator FISHER—That did not seek your advice or input, you said.

Prof. Young—I actually spoke to some of the officers involved in it, but there is a big difference between coming and consulting with people quickly and actually commissioning a large amount of work to be done. We were not commissioned to do work. There is a very big difference between people offering ideas and opinions and doing detailed analysis. Questions

like decoupling Adelaide from the river Murray require very careful, detailed analysis and it should not be done lightly.

Senator FISHER—Indeed. One cannot achieve evidence-based policy outcomes without that sort of analysis, I would have thought. Thank you.

Senator SIEWERT—Professor Young, I want to go back to the comment that you made at the beginning of your statement on the MOU. The MOU was signed when we still thought we were in La Nina. Obviously, the situation is worse than we thought it was going to be. You did not continue on from that. Do I read into that statement that you think there are issues around the MOU because it was signed when we thought things were actually go to get a little bit better, or am I misinterpreting what you said?

Prof. Young—There is significant difference between the template that we have offered in our future proofing document for Australia and the MOU. The MOU focuses on developing a basin plan and moving quite slowly and on leaving the existing structure of the Murray-Darling Basin Agreement in plan, with a qualification that it is possible to interpret the commitment to develop a sustainable cap, but that will end up being actually determined as a need for a sustainable sharing regime. If it is a sustainable sharing regime, then we are on the same page. The March version of the MOU is silent also on interception, the issue we have already talked about. We have been recommending very strongly that we deal with all these issues and quickly move to a new regime. That needs to be done, ideally, in two steps. We need to agree on what the property right regimes and the sharing rules are going to be between each of the states and between users and the environment. Having got the foundations right, we can then move on to getting the detail right. Now, I have not been closely involved in the negotiations between March and where we are now, and I think it is best that we wait until we see what is released on 3 July, but my checklist would involve a commitment to moving rapidly to a sustainable sharing regime and preparing the nation for adverse climate change; to giving the environment a share and setting aside maintenance water; and to dealing with interception well before 2010.

Senator SIEWERT—In terms of maintenance water, what are the recommended figures that we need to ensure are available for maintenance as opposed to environmental flows?

Prof. Young—If you take the maintenance definition that we have used—and there are some caveats to that and some debate about whether or not maintenance water should include water for critical human needs, and you can decide whether that is in or out and also whether or not stock and domestic water is in or out of that definition—the evaporative losses in the river Murray system, as I understand them, are of the order of 2,000 gigalitres a year, going up and down a bit depending upon how hot it is and also how the river is managed. In recent times we have downsized it a lot. Some 33 wetlands, I understand, in South Australia have been closed off and are now being allowed to dry out. That significantly reduces the evaporative losses from the system.

Senator SIEWERT—As an environmental cost potentially?

Prof. Young—Potentially an environmental cost particularly in some areas—less so in other areas. If they rewet those areas again in the near future it could lead to an environmental improvement. There are good reasons for wetting and drying wetlands rather than holding them

at a fixed level. That is one of the big opportunities available—to start managing the river much more cleverly—and, hopefully, as part of the regime that will emerge in the years to come that will be an opportunity for Australia to become much smarter about how it manages its river.

Senator SIEWERT—Okay, so we are looking at over 2,000 gigalitres because that is outside where you factor critical human need into that.

Prof. Young—Unless we decide to downsize the system and actually dry out some of the lakes or reconfigure some of the system. There is an option which we have put on the table very nervously pointing to the fact that there are opportunities to dry out wetlands and to close off lakes and to change them from the top of the system to the bottom. It is not just in the lower lakes of South Australia.

Senator SIEWERT—By doing that though you would have to be assured that you had the proper management plan in place first to ensure that water is going back into the lakes at the appropriate time.

Prof. Young—Yes. There is an important issue about who does that management and whether it is done state by state or by the environmental managers. The current plan, as I interpret it, is for the Commonwealth to start purchasing water for the environment. That will ultimately result in a situation which is close to the template we have put up, which is that the environment will have a share of all water entitlements and so will all users and we will end up in a regime where the cake is fully specified—there is a share for the environment and a share for consumptive users. What is not clear at the moment is whether or not the maintenance of water is going to be protected or whether we are going to erode the maintenance water and then have to buy that back. That is the reason we have recommended that maintenance water be dealt with separately and that an authority be appointed to determine the amount that is needed for system maintenance and take that as the first priority for the river.

Senator SIEWERT—As I understand it, the IGA is being dealt with at COAG on Thursday, and I presume that is why you said wait until after Thursday to find out. Have you been involved in IGA development?

Prof. Young—Yes, I have been involved but I am not central to the process. My advice has been sought by many people and I have provided that willingly. I have been particularly active and am particularly willing to explain to communities the significance of the challenges before us and the importance of getting the foundations for the Murray-Darling Basin right.

Peter Cullen, in almost the last thing he ever wrote, said:

> We don't have all the answers—nobody does—but before we start laying bricks and mortar, we have got to get the foundations right, otherwise the cathedral will tumble with the smallest of tremors.

I think it is important that we understand that the foundations on which we have built the Murray-Darling Basin agreement have not planned for adverse climate change, and it is now incumbent upon governments to quickly move to putting down a set of foundations which will support the cathedral.

Senator HEFFERNAN—The answer to the efficiency returns to the system surely is that if we are going to go to efficient irrigation systems—Carnarvon type route zone stuff—part of the deal has to be to return some of the efficiency gains back to the system.

Prof. Young—Yes.

Senator HEFFERNAN—The late Professor Cullen was seriously misquoted in his analysis of the lower Balonne, which is a unique system which gets water out of the river for huge overland water harvesting and it eventually finishes back in the system. Would you be able to provide this committee on notice with any analysis on that?

Prof. Young—I could see if I can find some of the information he assembled. I have not spent enough time up there to advise the committee on anything in detail.

CHAIR—Thank you, Professor Young.

[12.30 pm]

RUPRECHT, Mr John, Director, Water Resource Management, Department of Water, Western Australia

Evidence was taken via teleconference—

CHAIR—I welcome the next witness. I remind senators that the Senate has resolved that an officer of a department of the Commonwealth or of a state shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of the officer to superior officers or to a minister. This resolution prohibits only questions asking for opinions on matters of policy and does not preclude questions asking for explanations of policies or factual questions about when and how policies were adopted. Officers of the department are also reminded that any claim that it would be contrary to the public interest to answer a question must be made by a minister and should be accompanied by a statement setting out the basis for the claim.

The Western Australian Department of Water has lodged submission No. 26 with the committee. Do you wish to make any amendments or alterations to that submission?

Mr Ruprecht—No amendments are required.

CHAIR—I invite you to make a brief opening statement before we go to questions.

Mr Ruprecht—I will perhaps just elaborate on some initiatives the Department of Water are undertaking that meet with your terms of reference. The Department of Water, with a number of other state agencies, back in 1997 established an Indian Ocean climate initiative, which was looking at both climate variability and climate change in its initial phase, where the state agencies, including departments of agriculture and commerce and trade, and the environment agencies as well, were looking at seasonal forecasting and understanding the climate that we have observed in the south-west in particular, which has indicated a stepped decline in rainfall since the mid-seventies. We have slowly been transitioning that to perhaps have more of a focus on climate change. It is now in its third phase, where it now has a greater focus on climate change and some of the climate change scenarios.

What the Department of Water have taken from that is this: we are looking at regional scenarios for climate change as to its impact on water resources, so we are now looking at what impacts some of the climate change scenarios will have not just on Perth's water supply but also on a range of regions. We are looking at a range of regional scenarios that include a lot of our agricultural areas. The other aspect is that within the department we have a significant farm water planning role covering the transition from drought and looking at some of the climate change aspects, in particular some of the long-term scenarios for rainfall such as those for our south-west agricultural zone. Those scenarios are dominated by rainfall, as it is the main avenue for agricultural production, rather than by irrigation through groundwater or surface water dams. I will leave it at that and open the discussion for questions.

CHAIR—Thank you, Mr Ruprecht. I know that Senator Siewert, who is from that fantastic state of yours, does want to ask a couple of questions before she has to move to somewhere else.

Senator SIEWERT—Mr Ruprecht, I was quoting figures yesterday but we have also just had Professor Mike Young here quoting figures as to the decline in the rainfall that we have had in some of our catchments, which has resulted in a significant reduction in run-off. He said there has been a 21 per cent decrease in rainfall, which has resulted in a 66 per cent—I thought it was 64 per cent; he quoted 66 per cent—decrease in run-off. Is that continuing or is that getting slightly better now?

Mr Ruprecht—It does depend on where you are within Western Australia. I think it is not a constant across the south-west—and that is probably the first point. Taking particularly those eastern areas that are more summer dominated, those in the Kalgoorlie area, we have not observed that decline. But for the water supply catchments we have seen that there has been a greater decline since 1997 and even since about 2001 in particular. The records are for quite short periods, so it is difficult to say whether it is another stepped change or just part of climate variability. What we are now looking at is this: you have climate change scenarios for median rainfall, but on top of those you might have a seven- to 10-year period of a very dry sequence. That is when they both occur at the same time. We are starting to look at some of those scenarios. To answer your question, I think that for the south-west that 60 per cent decline prior to 1975 is about right, but it has tended to decline further in more recent years.

Senator SIEWERT—The other issue that we have been discussing over the last couple of days is interception by plantations. That has been a quite significant point of discussion and contention. One of the issues that has been raised is that trees tend to be planted in the higher rainfall areas and are therefore intercepting water at the point where you would get the most run-off. Is that happening in Western Australia as well?

Mr Ruprecht—In some parts it is. It is quite complicated. A lot of our high-rainfall areas are preserved in state forests and in national parks, so a lot of our high-rainfall areas are not subject to plantations but are in native forests. But there are some areas where there are increasing plantations, and we are starting to look at that issue. We have done a lot of good research on a small scale. But what we have not done is do that while looking at a regional scale and while looking at what the impacts might be on water users within a larger catchment, rather than looking at the initial response within a small research catchment.

Senator SIEWERT—Sorry, but did you say you are starting to do that?

Mr Ruprecht—We are starting to look at regional scale impacts rather than research on a local scale. We have just released the South West Regional Water Plan. It starts to try to give some information about what is going to happen on a regional scale with some scenarios about what might perhaps happen on a regional scale.

Senator SIEWERT—We had here yesterday Kevin Goss from the CRC. One of the points that we were also talking about was salinity and the fact that some of the scenarios for WA have in fact improved given what they were previously. But he did indicate that the outlook for biodiversity was still pretty drastic. I am wondering whether the scenarios have improved and about what the situation is for a lot of the wetlands that have been threatened by salinity, in

particular those in the south-west. And then, when you overlay the issues around climate change and a drying environment across that, are those scenarios still similar to what they were or has the situation for those wetlands improved?

Mr Ruprecht—With respect to salinity in the broader sense, I think we are certainly seeing a slowing of the increase in areas that are salt affected and, in some areas, particularly higher ground areas, a decline in groundwater because of the lower rainfall. We are not sure whether that means that the total area of salt affected land is going to be less ultimately or whether it is just going to take a longer for that to be determined. Again, some of that very large regional scale assessment has not been done on climate change and we are looking at how we can continue that work. With regard to wetlands, there is a complex interaction. In some cases, where we have declining rainfall and groundwater levels, we start to get some acidification of wetlands. It is natural in that it is not a land use change or a human induced change but has just happened indirectly through the climate, whether through climate variability or climate change. We have observed some increase in pH, in acidity, in some of our wetlands. So, although the salinity impact may be declining, there are other impacts from declining rainfall. This acidification was observed in previous records back in, I think, the mid-seventies, and then we had a new equilibrium. These episodes have been observed before but, with climate change, they may be exacerbated.

Senator SIEWERT—This is my last question. You made what seemed like a side comment on when you were doing the regional assessment. I understand that you are doing that. Do I understand that you are not sure where you are going to get funding from to do that?

Mr Ruprecht—You mean with regard to the broader scale land monitor work?

Senator SIEWERT—You made some comment that you have done it on the small scale and that you need to do the larger regional scale. I am sorry; I cannot remember the exact comment that you made, but it sounded like you had not ascertained how you are going to be doing that.

Mr Ruprecht—You are correct. We do need to do some more work on the impact of climate change on the salinity issue within the south-west. There is more work that is needed, and we are currently looking at how we can fund that work.

Senator SIEWERT—So at the moment you are not being funded by the state or federally?

Mr Ruprecht—Not as far as I am aware. The Department of Agriculture and Food have just recently established a Climate Adaptation Program with Agricultural Research WA. I think they are focusing to begin with on the northern agricultural region in Western Australia. I am not sure. I am happy to take that question on notice to clarify what is happening through that agricultural research program.

Senator SIEWERT—Thank you.

Senator HEFFERNAN—In the west, given the science predictions and the fact that you blokes were actually first cab off the rank 20 years ago in recognising climate change, does your department have a plan for some of the northern waters? Have you looked at the possibility of

Mosaic development on the Fitzroy et cetera? Have you learnt from the water efficiencies that have been gained in places like Carnarvon?

Mr Ruprecht—We certainly see Carnarvon as a very good example of how you can be very water efficient. With regard to water efficiency, I know that the initial plans for Ord stage 2 were looking at very good water efficiency. With regard to the broader aspects of the north, as you are very aware, the Northern Australia Water Futures Assessment and also CSIRO are doing some significant new work on water availability in Northern Australia. We will be looking at that work. As far as I am aware, they are also looking at climate change scenarios for the north. So we will get a much better picture of what water availability is like in Northern Australia from those two studies.

Senator HEFFERNAN—From your department's point of view, given climate predictions, has there been much research or thought put into the possibility of reconfiguring some of the pastoral lease arrangements up in the north?

Mr Ruprecht—Not as far as I am aware, but I am happy to take that question on notice. It is a little bit outside my area of responsibility.

Senator HEFFERNAN—But are you directly responsible for, for instance, the water plan for Kununurra?

Mr Ruprecht—No, not directly. The Department of Water have done a lot of work on measuring water flows in the north and they also did some work a number of years ago on water availability in the north. That does need to be updated. We have a lot of that baseline information.

Senator HEFFERNAN—As efficient as Carnarvon is, Kununurra is inefficient. I presume it still returns its tailwater to the system in Ord stage 1, and it has focused not on the tradability and price mechanisms in water but on the gross availability of water; therefore, it has not put a value on it. We have found there is the potential for about 80,000 hectares there all up if you go into some of the lighter soils and root zone fertigation, as well as the black soil plain there. That was obviously one of the fundamental flaws in the tender document for the expressions of interest for Ord stage 2. Is your department involved in that or is that flicked off somewhere else?

Mr Ruprecht—The Ord stage 2 is being run through the central agency with the state government in a coordinating role. I am not able to comment much further. We did a lot of work in looking at crop water use with the department of agriculture, but that had a greater focus on sugarcane and the like, and it was a few years ago. I know more work has recently been done on aspects of efficient water use, crop water use and use of effective rainfall, but we have not been directly involved in that.

Senator HEFFERNAN—It has been lazy planning in my view to allow a lot of the country in what was an unviable sugar industry at half a million tonnes—it needed about a million—to just transfer across to bloody sandalwood. I have to say it seems to me a gross waste of good agricultural land in terms of the future global food task. I think the Western Australian government should revisit that and also the inefficiencies and deficiencies in the science arguments, rather than the political imperatives of GM farming for the north, which obviously

will greatly enhance its viability and even allow some new ventures in places like the Fitzroy, where you can get very small mosaic developments. I cannot think of a better example anywhere on the planet than Carnarvon of what you can do with a little bit of water and suitable land types if you put your mind to it. I guess we have a long way to go and some political hurdles to jump in the west to absolutely enhance the potential of the changing forecast that Mother Nature is sending us for the north.

Mr Ruprecht—One aspect of what the Department of Water are doing is interpreting the regional climate predictions or scenarios. We are about to produce a report which will include some information about the likely climate change scenarios and the impact on water resources in the Kimberley region. We are trying to reduce the uncertainty with regard to some aspects of climate change around the state.

Senator HEFFERNAN—I think Lagoon Station is in the Territory. Are you familiar with Lagoon Station?

Mr Ruprecht—No, but it sounds like it might be in the NT.

Senator HEFFERNAN—If people that are following these proceedings were to look at the prediction charts for climate change and some of the inundation that is to occur under the top of the predictions in the vagary of the science on climate change over 50 or 80 years, there are some surprises in store in inundation in some of those areas of the north as well. I guess we need to be conscious of that. You probably would not want to buy a place on some of the canal developments on the Gold Coast either. Thanks very much for your trouble.

CHAIR—I would like to thank you, Mr Ruprecht, for that submission. Thank you very much.

Senator HEFFERNAN—We will be coming back to visit you on another committee, by the way.

CHAIR—Which we are not allowed to talk about. Thank you, Mr Ruprecht; see you in the west.

Proceedings suspended from 12.50 pm to 1.52 pm

GROVES, Mr Jim, General Manager, Climate and Resource Policy, Department of Primary Industries and Fisheries, Queensland

MURPHY, Ms Marion, Senior Policy Officer, Climate and Resource Policy, Department of Primary Industries and Fisheries, Queensland

CHAIR—Welcome. The Queensland Department of Primary Industries and Fisheries has lodged submission No. 30 with the committee. Do you wish to make any amendments or alterations to the submission?

Mr Groves—No.

CHAIR—I invite you to make a brief opening statement and then the committee will ask questions.

Mr Groves—Thank you, Chair. I welcome the committee's inquiry, not only because climate change adaptation is a vitally important issue but also because there is a danger that adaptation issues will get lost this year as we focus heavily on mitigation through the emissions-trading proposals. We know that in agriculture we are dealing with one of the most dynamic sectors of the Australian economy, hence much adaptation will be autonomous as individuals take their own decisions. The question for us, as governments, is: what can governments do to support that process?

Climate change will bring a lot of changes. We have a good idea what some of these will be but major gaps in knowledge remain, particularly about the implications for individual regions and industries. One of the information gaps which governments will need to fill is in relation to the implications of mitigation policies. Mitigation arrangements will involve significant risks and opportunities for the primary industry sector in both economic and greenhouse gas reduction terms. The sooner those policies can become clear, the sooner they can be communicated, the sooner there can be investment certainty, the better.

ABARE suggests that possibly as much as one-fifth of the normal productivity growth in primary industries will be diverted to the adaptation challenge. Therefore, the challenge for the sector is to accelerate productivity growth so that it can meet the climate change challenge as well as the challenges and opportunities emerging in the global marketplace.

Another point is that climate change adaptation is not only about challenges; it is also about opportunities. One of the opportunities in our state in particular is the possibility of greater water availability in the north and what that might mean for development of the north.

Another role for government is to reduce impediments to adaptation. This is where drought policies come in. Queensland is on record as welcoming the Australian government's reviews of drought policy and will participate in that review process. Finally, I should mention Queensland's response to climate change issues. The Queensland government has created the Queensland Climate Change Centre of Excellence. We have a climate smart adaptation plan,

which is being reviewed as part of the broader Climate Smart 2050 climate change commitments of the Queensland government.

In my own Department of Primary Industries and Fisheries we have a significant climate change effort, mostly devoted to the adaptation challenge. Much of our understanding of climate change must, of necessity, be based on modelling. In our collaboration with CSIRO and the University of Queensland in the Agricultural Production Systems Research Unit we have a world-leading modelling capability. With that, I am more than happy to discuss issues with the committee.

Senator HEFFERNAN—Obviously, in your paper you have a crack at defining some of the predicted changes from some of the science predictions of climate change, including an 80 per cent possibility of an increase in yields on the Darling Downs for wheat farmers, which sounds like good news, as well as an 18 per cent opportunity of a 42 per cent decline in yields.

Mr Groves—Just up the road, yes.

Senator HEFFERNAN—One of the political imperatives in recent times under a previous Premier was the lockup of the cape in the wild rivers legislation—and the first kilometre, as you know, Mr Groves, from some of those rivers is pretty useful country. As you would further know, a lot of the Indigenous people up there have been seriously offended by the closure of their economic opportunities on that country. You would also know that the Australian Conservation Foundation, which is fairly careful in the way it puts out statements, supports the view that the premature wild rivers legislation lockup should have been preceded by some science. Do you think that, given the sovereignty issues surrounding food security, there is a chance you may revisit that?

Mr Groves—I am not sure whether I am in a position to comment on the wild rivers legislation and the commitment the Queensland government clearly has to that legislation.

Senator HEFFERNAN—I understand that.

Mr Groves—Concerning the one you described as a 'lockup', I am not sure that that would be an entirely accurate description. My own department has just taken on responsibilities as assessment manager for development proposals involving grazing within the wild rivers areas. There have not been many such proposals but the opportunity is certainly there. At the risk of speaking out of school, I understand there are some negotiations with Indigenous communities about what sorts of options might be available to them.

Senator HEFFERNAN—Obviously, you would be familiar with that big slab of country below the gulf where there is spiny acacia—there are about 2½ million hectares of country. Spiny acacia is a weed. It seems to me it would be eminently sensible to model what would happen if we sowed that out for carbon offsets. There would be a huge carbon credit there if we planted it all out to a useful species and put a covenant on it for 80 years or whatever. Do you think that there is a political mood as well as an electoral mood of recognition in the community in Queensland that we have a lot of work to do? Do you think people have finally woken up to the fact that tucker is not necessarily going to be on the shelf when you go to the supermarket if we keep doing what we are doing?

Mr Groves—You refer to that as a fact. I am not sure that Australia's food security situation is in quite that level of danger.

Senator HEFFERNAN—That is for another time. I am not suggesting it is at the present time. I am suggesting that under the climate change science and the reviews of that science—and there are some productivity implications for Queensland.

Mr Groves—Potentially absolutely.

Senator HEFFERNAN—There may be some serious reconfiguration of the way we are doing business. I presume your department would have input into the resource operating plans for rivers.

Mr Groves—Yes, we have input. They are under the operation of the Department of Natural Resources and Water of course, and we do have input.

Senator HEFFERNAN—To go to one of my less familiar areas of knowledge, the Lower Balonne, where are we up to with the draft plan for the resource operating plan for the Lower Balonne?

Mr Groves—I am sorry but I would have to take that on notice. It is the responsibility of my colleagues in the Department of Natural Resources and Water.

Senator HEFFERNAN—In that plan, as you would be aware, there is a proposal to issue a whole lot of overland flow water licences, the biggest of which is 420 gigalitres. That would be the biggest water licence ever issued in Australia for an individual set-up. That has serious implications for the Murray-Darling Basin if that is the standard that we are going to set—the vagaries between the sovereign considerations of borders of rivers. You might like to inform this committee—because I think it is on notice—as to where we are up to with all that, because obviously there has been a lot of science misquoted. You would be aware that there was no environmental planning as to all the earthworks for the Balonne upon which the licences proposed are going to be based and that that river system is unique. Unlike a lot of our more prominent terminal rivers, when it goes overland in the Lower Balonne it actually comes back into the river and becomes someone else's river water further down, so if you intercept it further up you absolutely bugger up downstream. I would be interested to know who is winning the thought war on the outrageous proposition that was put in the draft plan by the independent chair, who is absolutely a beneficiary of the largest water licence under her own guidelines.

Mr Groves—There is a series of allegations there, Senator, that I will not be commenting on.

Senator HEFFERNAN—There are. If we are going to be serious about climate change, we have to recognise that we need to put the science ahead of political convenience.

Mr Groves—Clearly, there will be implications for the water resource planning arrangements. Clearly, the area you mention is also part of the broader Murray-Darling Basin initiatives of successive governments. I will take on notice the question about the specifics of the Lower Balonne plan and where it is at.

Senator HEFFERNAN—Take the Gilbert River, which was pegged out in 1957. Where are we up to with that stuff? Has there been any planning done? Obviously, the base questions are these. Do you use the water where it is in the Gilbert River or do you store it in the sand bed? Do you build a dam or do you build weirs? Is anyone doing that sort of planning? Has any approach been made to the Commonwealth, under what they propose will be the northern development office to be run out of Townsville, for it to allocate some funds for more science on those such systems? Obviously, there are a lot of unknowns with all of those river systems. Is there a plan to put more metering stations in?

Mr Groves—I will have to take on notice the specifics as to Gilbert River resource operation planning for that district.

Senator HEFFERNAN—I know you need a very firm assistant to be able to take all this down for you. She has got a pretty important role.

Mr Groves—Marion is enjoying it intensely, Senator.

Senator HEFFERNAN—Mr Chairman, I think that Australia generally has to recognise, through the denial phase of what is going on with the planet, that there are mosaic opportunities in Queensland for further development in what I would term frontier areas where we really have not been. Obviously, there needs to be a reprioritisation of government research from being on what I would call mature agricultural areas, some of which in the south-east are going to go into serious decline, according to the science. Some work needs to be put into what would be the opportunities, rather than dealing with the adversities.

Mr Groves—That is our view too. My own minister announced just last week a major set of initiatives for our department which centre on the north and centre on a much enhanced collaboration with James Cook University to establish major centres of excellence in tropical research, with a major rationalisation of our own research facilities in the Atherton district, where we have three outdated, underutilised research facilities. We will be combining those into a much more modern, world-class facility, including in partnership with James Cook University. It is all about identifying and taking advantage of the opportunities that you are referring to.

Senator HEFFERNAN—Getting the science right early. The best example I can think of was the move by the peanut company to Douglas Daly and their expectation when they got there that they could just walk in to a 40,000 or 50,000 megalitre water licence at no cost. Thank God the Northern Territory government decided to do the science on the water there and not just issue a whole lot of water licences which may have been unsustainable.

Mr Groves—There is a widespread view that in developing the north we have to avoid the mistakes that have been made elsewhere.

Senator HEFFERNAN—Most definitely.

Mr Groves—I think that is a fair enough proposition. There is a corollary of course and that is we should also try to avoid making a whole lot of new mistakes.

Senator HEFFERNAN—We are quite happy to assist you in that process, Mr Groves.

Senator O'BRIEN—Could you further describe, Mr Groves, what is going to take place at the Atherton facility and the timetable?

Mr Groves—Our minister announced last week an in principle decision that will rationalise the three research stations there into a new facility. The location of the new facility has not yet been decided. It may be on a new greenfield site or it may be on one of the existing sites. That site selection process has now started within the organisation. I am not sure exactly what the timetable is. At the moment there is not a public commitment on when that will be finalised, because there are a series of collaborations to be undertaken not only with James Cook University but also with the industry stakeholders. The whole process announced by the minister is based on very detailed collaborations with industry stakeholders. That takes time but, hopefully, it will deliver the results that benefit both the industries and the state more generally.

Senator O'BRIEN—So there are three facilities there at the moment. What are they doing?

Mr Groves—In some cases, as I said, they are underutilised. There are a range of research projects undertaken mostly, as I understand, on tropical horticulture type activities. We are looking for a major expansion of that. Two of them were originally established to undertake tobacco research. The tobacco industry no longer exists.

Senator O'BRIEN—There is not a lot of use for that now, no. Presumably, they have branched out into the alternative crops for the tobacco growers; have they?

Mr Groves—As I said, tropical horticulture and crops particularly suitable for the environment of the Atherton Tableland. That is a relatively unique environment of its own with quite substantial opportunities for horticulture.

Senator O'BRIEN—I asked a series of questions of the National Farmers Federation witnesses earlier today about drought exceptional circumstances and the need for reform. Their submission talks about mutual obligation aspects of drought exceptional circumstances policy and also proposals for some form of public subsidisation of drought preparedness as part of their approach. What is the Queensland government's view, if any, on changes that may be necessary to drought exceptional circumstances policy, given that we are probably in climatic circumstances well beyond those contemplated when the exceptional circumstances arrangements were arrived at in the previous Labor government in—I am trying to think of the exact year—

Mr Groves—1992.

Senator O'BRIEN—1992 with Minister Crean?

Mr Groves—In our submission, we have set out the public position of the Queensland government, which is:

The focus of national drought policy is on self reliance and drought preparedness ...

and, in support of the development, as has been happening, of proposals. We are supporting the development of proposals as distinct from what the actual options might be at this stage. We are

supportive of looking at options to move away from business assistance during exceptional drought events towards financial incentives to ensure producers are better prepared for future drought events. That is as far as the formal decision making of the Queensland government has got. We do not have a decision on exactly what arrangements we would like to see. There are a range of options for how that might be achieved, and we are supportive of exploring those options.

The federal minister has now announced three drought reviews, one explicitly on climate change. Our minister is on record as welcoming those announcements, indicating that Queensland will participate in reviews to the extent we can. The outcome of those reviews gives us an opportunity to look at our own drought policies. The exceptional circumstance arrangements are partly co-funded by the state and Australian governments. In addition to that, we have our own drought assistance arrangements. Those reviews are looking at state arrangements as well, and they give us an opportunity to look at those arrangements.

Exactly what will come out of that is a matter for the reviews. They are genuine reviews and not predetermined outcomes, as we understand it. Like any good review process, some brainpower will be applied to developing some options for government to consider and we look forward to seeing those. But, in terms of the directions of policy, I think it is pretty clear what the desirable direction is. There has been a succession of reviews of drought policy that have all come to the same conclusion about the desirability of moving towards drought preparedness. It has been a bit difficult in the last five years when there was actually a drought on. It is hard to shift assistance from drought assistance to preparedness assistance during a drought. Hopefully, there will also be opportunities in the future to move in that direction.

Senator O'BRIEN—One of the propositions which I canvassed with the NFF, in part in response to their view that these measures should not get in the way of the ongoing restructuring and evolution of farm enterprises and the farming community, was about the problem that some in the sector say exists—that is, that there are those people who have taken the benefits of exceptional circumstances business and family support components without making the investments necessary to at least attempt to put themselves beyond the need, if not the eligibility for those payments.

Mr Groves—There is no formal connection under the current arrangements, that is true; therefore, it is quite possible for people to do that. One of the options that ought to be explored in this area is that those two elements can be formally linked so that there is a link in the manner. I am not sure if 'mutual obligation', which is a phrase that carries some baggage with it, is exactly the phrase we would use in that context.

Senator O'BRIEN—It was the phrase that the NFF used, so I am comfortable using it in that context.

Mr Groves—That is something we find quite attractive. One of our major approaches to a whole range of issues is a property management systems approach. We have been looking, in collaboration with a number of our state colleagues, at developing a national framework for property management systems. There has been fairly limited progress in that regard. That could change overnight if the drought policy could be linked to that agenda, and that is something we would be keen on seeing explored.

Senator O'BRIEN—One concept that has been spoken about—I think, fairly quietly because there is a great sensitivity within the sector in talking about this issue—is the concept of there being a limited number of times you can go to the well, as it were, for this support. Given that, as Senator Heffernan said, a lot of businesses are depending upon capital appreciation, the number of times you go to the well may affect ultimately the value of the property and that might be another element of persuasion for the sector to approach.

Mr Groves—Yes. In Queensland, we have implemented something that would be regarded as analogous to that. I am not talking about drought; I am talking about our State Rural Leasehold Land Strategy, which is currently called the Delbessie agreement after the property on which the agreement was reached, whereby good management is rewarded through longer leasehold periods. There is a range of options and potential benefits available to people through that mechanism, so that would be a comparable, analogous measure that the state government has taken.

Senator O'BRIEN—So what has been the outcome of that measure? Has there been any review of that measure or is it too new?

Mr Groves—It is too new. Again, our colleagues in the Department of Natural Resources and Water are the administrators of that arrangement, so I do not know the details in that regard. There has not been a review yet, but that is something that will certainly be happening at the appropriate time.

Senator O'BRIEN—It is quite a different measure in the sense that its consequences are at the end of the lease rather than during an ongoing struggle with time.

Mr Groves—Yes. The point is just analogous in that the broader agenda we have on property management systems is about looking at the drivers for good farm management, with farm management being defined in economic, social and environmental terms. There is a range of potential drivers for that, some of which are regulatory requirements in government and some of which are access to government assistance type arrangements, whereby the more that those can be linked, the more that we will be able to not only encourage better property management but also demonstrate to the community about improved property management and improved outcomes therefore.

Senator O'BRIEN—We have had some evidence about soil improvement and increased carbon retention in pastures which are planted with perennial grasses and other plants—some native, some non-native. We have also had some evidence from the Cattle Council about the undesirability of getting rid of gamba grass, but that is another question. What is the general approach of the Queensland government on this issue, and has the Queensland government been part of funding any studies into the impact of these perennial pastures on carbon retention or soil improvement?

Mr Groves—Certainly, there have been a couple of studies undertaken by some people in our department, and more from the Department of Natural Resources and Water. I do not have the studies at my fingertips. I can easily take the question on notice and provide information on the details of what studies are underway and what results might be available to date. You mentioned gamba grass. I know there has been some criticism of the decision on gamba grass, but it was a

cost-benefit analysis of the options done. Clearly, the original expectation on gamba grass, that it would be managed in a way that would prevent it becoming a weed, was not completely fulfilled, and action needed to be taken. But, on the broader issue of carbon from various pasture choices and various pasture versus forestry operations, agroforestry operations and vegetation management arrangements and what have you, there are a number of research projects underway. I am not aware of any definitive answer as yet. I think the science in that area is probably roughly where the science on soil carbon is—that is, it has a long way to go before it can provide us with a definitive answer that might help, particularly in the context of emissions trading. There is a long way to go before Australia would be in a position to start including those sorts of opportunities that might exist into its emissions trading scheme, quite aside from international rules and regulations governing those arrangements. So there is a need for—

Senator O'BRIEN—There is a bit of a catch-22 there. When you are going to a world forum and talking about the rules that should apply, saying, 'We have established that these pasture systems lead to hundreds, thousands, millions of tonnes of carbon sequestration, and it is unfair that it should be excluded from the system' it is quite a different argument to say, 'We think we should be able to test to see if it works and then we might be able to include it in the system.'

Mr Groves—Absolutely. Australia does not have to follow the world rules and certainly should consider its options in that respect. But, that said, there is a cost involved in not. In that area, the science is not there yet. As you know, the world rules on those sorts of things require one in, all in. If you want to identify one particular buyer sequestration opportunity you have to look at all the net gains and losses from your natural systems management. So there are some substantial issues. It is important that the science be undertaken; we are doing a bit. I assume some of the other submitters would have mentioned the Climate Change Research Strategy for Primary Industries, with the wonderful acronym of CCRSPI, is being developed under the leadership of Land and Water Australia. We are enthusiastic supporters of that as a mechanism for identifying and prioritising the major research directions and then coordinating the major research efforts that need to be made in these directions. Clearly, soil carbon is very high on the list and became more so when the Prime Minister announced his initiative at the ABARE outlook conference in that respect. So yes, Senator, the potential in that sort of area is enormous, but we have a long way to go before the science can tell us what the policy structures can be before we can actually start tapping those.

Senator HEFFERNAN—Queensland is a long way from there.

Mr Groves—In terms of?

Senator HEFFERNAN—In terms of the carbon market.

Mr Groves—There is some private carbon market now, including in Queensland, but we are talking about what a national emissions-trading scheme might cover in vegetation management, for which a whole range of options will need to be considered down the track.

Senator HEFFERNAN—In the private carbon market, now that you have mentioned it, what is carbon worth?

Mr Groves—I am sorry, I do not know. I do not have the dollars in my head, Senator.

Ms Murphy—Can I make a comment through the chair on this carbon sequestration issue. Even though we do not actually know what the dollars and the volumes are, it would seem quite reasonable that the profitability of agricultural land use is going to be driven by the demand for food and fibre on the world markets and that the revenue that might be achieved from carbon sequestration, be it in the rangelands, in the Gulf, in the soil, is probably going to be the icing on the cake, but not the actual cake, for much of Queensland's country.

Senator HEFFERNAN—We hope you are right. It is logical, given the food task.

Ms Murphy—Carbon sequestration can also be a driver for additional productivity by improving the soil.

Senator HEFFERNAN—Yes. There is no doubt about that.

Ms Murphy—And our preparedness can be a driver. They fit well together, but I do not know that that is going to reap the potential that perhaps some of the speculators and the market—

Senator HEFFERNAN—That is the task that we, the Queensland government and everyone else all face: how do you keep it from being a carpetbagger operation where everyone, including the environment, is the loser?

Senator O'BRIEN—Presumably you set the rules so that it is not able to be captured.

Senator HEFFERNAN—Yes, but that—

Senator O'BRIEN—In any system where this trade is enabled there will be people who will seek to trade and make a profit out of trade.

Senator HEFFERNAN—That makes the point about legislating to give a tax deduction for a carbon sink when we have not got any rules.

Senator O'BRIEN—You are still talking about another inquiry?

Senator HEFFERNAN—No, it was just a throwaway. How are you, Mr Chairman?

CHAIR—Very good, thank you, Senator Heffernan. Thank you, Mr Groves and Ms Murphy.

Mr Groves—Thank you, Mr Chairman and committee.

[2.25 pm]

DOLLING, Mr Andrew James, Director, Climate Change in Agriculture, Agriculture and Natural Resources Policy Branch, Department of Primary Industries, Victoria

CHAIR—Welcome. The Victorian Department of Primary Industries has lodged submission No. 27 with the committee. Do you wish to make any amendments or alterations to that submission?

Mr Dolling—No, thank you.

CHAIR—I invite you to make a brief opening statement, and then the committee will ask questions.

Mr Dolling—My only real introductory remark, beyond saying thank you for the invitation to attend, is to draw the committee's attention to the key points in our submission. They summarise the main points, which may help the discussion as well.

Senator NASH—We have had a lot of discussion over the last couple of days about the research task, if you like, into the broad question of climate change and what is being done at the moment. From your perspective, do you think that that research effort is good enough for where we are headed? Can you see any area where it needs to be improved? What is your involvement? I am assuming that the department has some involvement with providing information to Land and Water under the CCRSPI arrangement?

Mr Dolling—Yes, we do.

Senator NASH—Could you give us an outline of that?

Mr Dolling—I guess there is lots of information we need to gather regarding the climate change challenge. Some of that is the biophysical information that we need around climate predictions, and that might well be the nature of your question. But there is information elsewhere, I would suggest, that we need around the policy impacts and the trade and market impacts that relate to the whole dynamic of climate change, governments around the world and their responses. Do I think that we could benefit from more information in all three of those areas? I am happy to say yes. I would not want to make too much comment on the extent to which we have biophysical information and climatology data, for example. It is probably for others to comment more on that side of it.

Senator NASH—Have you been asked by Land and Water to provide any information on the climate change projects you might be undertaking?

Mr Dolling—Yes, we have. The department as a whole has provided several inputs at various points of time into the CCRSPI—Climate Change Research Strategy for Primary Industries—process. As part of that, too, I think we have provided—it is certainly on our website—examples of the types of programs that Victoria is running.

Senator NASH—I think that was one of the key points about trying to get a definitive list together, if you like, of the climate change projects that are happening. It is all a bit hotchpotch at the moment. Are you satisfied that Victoria and your department have done enough to make absolutely sure that you have put that information forward to Land and Water?

Mr Dolling—Various parties within the department have gone to considerable effort to make sure that the information—particularly on the research side—is available. Most of my sphere of work is at the policy end, but I work quite closely with our research and practice change managers. I am familiar with the fact that they have definitely made efforts to provide information to CCRSPI. Certainly on the issue of national coordination, we are making efforts to encourage that.

Senator NASH—On another issue: I am trying to determine the level of communication and contact that the department is having with people working and living in the agricultural sector to determine their response to where they feel they are at at the moment with potential changing climate issues and the need for adaptation. Do you have a lot of communication with the farmers themselves, and are you getting any sense of direction or acceptance from them about where they might have to go?

Mr Dolling—That is a good question. Yes, we do. The Victorian government is undertaking a number of initiatives to engage with stakeholders. The Victorian government in particular is developing a green paper on climate change which will help form the Victorian government's response to the climate change challenges. That will ultimately lead to a white paper. As part of that, there is stakeholder engagement. This is a whole-of-government process so it will include agricultural and forestry producers but also manufacturing and all the other sectors.

Senator HEFFERNAN—Does it make sense to do the Goulburn interception back to Melbourne—the 75 gigs—ahead of that plan? We have heard evidence today—which you can dispute—that if rainfall declines by one per cent, run-off declines by three per cent. Just say it is two per cent and we lose only 3,000 gigs of the run-off. Do you really think it is fair dinkum to make those sorts of decisions to take high security water out of the system when we are trying to return 500 gigs to the system and Mother Nature is telling us, through the research which you have not completed yet, that we might be going to take 2,000 or 3,000 gigalitres out of the system? How can you make those sorts of long-term plans and commit those sorts of dollars into an infrastructure that might turn out in 30 years to be a white elephant? This is against the background of desalinisation, recycling and all the rest of it.

Mr Dolling—That is a fair question. It is probably worth making a distinction there between some of the water policies that the Victorian government has and those that are working in the national sphere. As with climate change policies, there are a number of water policies being made along the way. Some of them were made last year or the year before, and some will be made next year. Although there is a green paper regarding climate change, there is still a need for policy development in other spheres.

Senator HEFFERNAN—Is there a disconnect between one and the other? Is everyone talking to everyone else? The scientists are telling the Commonwealth there is almost a doomsday scenario for the Murray-Darling. Surely that should feed into the decision making of the Victorian government.

Mr Dolling—Yes, and I think it will. There clearly will be links between the climate change green paper that gets developed and other policies that the government is running with, including its water policies. There will no doubt be interface between those policies moving forward.

Senator HEFFERNAN—Are you a policy person?

Mr Dolling—Correct; that is right, Senator.

Senator HEFFERNAN—Have you acquainted yourself with the various and the variations in the variability of climate predictions for run-off and the impact of further forestry interception and the wildfires et cetera? Are you familiar with the decline figures?

Mr Dolling—I have seen some of those decline figures; I could not recall them now. Again, we have various responsibilities. To be quite honest, water is not my area of expertise. Climate change is more my area.

Senator HEFFERNAN—If you were interested and you saw the figures you would never forget them. They are pretty scary.

Mr Dolling—I understand they are large, yes.

Senator NASH—I want to raise the issue of the social impact from potential climate change adaptation. Does your department do any work on potential effects in rural communities of changes to farming practices that may be a result of changing climate?

Mr Dolling—We are cognisant of that and we do take into consideration the social impacts of the various climate change and policy scenarios. We do have an area which is specifically undertaking social research related to a number of challenges that farming communities face, of which climate change is one. There are, of course, others. Some of that work is going on but, again, I probably would not be the person to speak about those social research programs.

Senator NASH—Would you mind taking on notice—to get another state's perspective—any work that is being done within the department that is particular to social impact as the result of potential climate change.

Mr Dolling—Absolutely; very happy to do so.

Senator O'BRIEN—What is your department's scenario-painting process for the dairy industry—Victoria being by far the biggest of the dairying states, producing 60 or 70 per cent of national production. I would be interested to know how you see the dairy industry fitting in with the various scenarios.

Mr Dolling—I can answer that on two levels. One, we do have some industry analysis looking at the dairy sector itself and the challenges and opportunities it faces. Again, that is not specifically my area of expertise. In relation to climate change, we are very conscious of the impacts that may have, for example, through heat stress, effects on the productivity of milk production, pasture growth and the potential increase in prices of additional feed in some dairy businesses where supplementary feed is used. As well we are looking at what might occur if

agriculture is included in an emissions-trading scheme. Livestock is obviously a reasonably significant emitter and if it were captured there might be some implications for the sector which would depend a lot—I should emphasise—on the ETS design, the nature of any transitional assistance to trade exposed emissions intensive industries and other aspects that relate to the size of those impacts. It is important. We have contracted a study by Allen Consulting to look at agriculture and an emissions-trading scheme in particular. That provides some useful background information on some of the topics that we are talking about here.

Senator O'BRIEN—Is that available?

Mr Dolling—It will be available shortly. We are getting it referee checked so it is not that far away from being available.

Senator O'BRIEN—Is that to be published?

Mr Dolling—I have to get it cleared internally before it is published. I will have to take that on notice and find out.

Senator O'BRIEN—Obviously, all sorts of figures are bandied around, about the impact on intense dairying operations, by a certain member of this committee who is not at the table at the moment. I am interested in the nature of the work that has been done by your department or within the Victorian government. Are you aware of any?

Mr Dolling—One thing I can mention, and you may be aware of this, Senator, is that the Primary Industries Ministerial Council has agreed to undertake a national study on the emissions-trading scheme and agriculture, forestry and fisheries. That came out of an April meeting. It was decided at the time that Victoria would lead that study, and we are doing so. We had a teleconference hook-up with all jurisdictions—Commonwealth, states and territories—yesterday. As part of that we have had several email exchanges and other communications about developing that study. That is due to report to PIMC in November.

Senator O'BRIEN—So you have the Allen Consulting study which is imminent—

Mr Dolling—Yes, imminent and more qualitative, and it is a smaller study. And then there is the PMIC study. We are working on that now. Basically, it will involve some general equilibrium modelling and also looking at some of the transaction costs, point of obligation issues, verifiability around agricultural emissions and sink opportunities.

Senator O'BRIEN—Who is going to do that?

Mr Dolling—The work will end up going out for a tender process, so I guess it will wait for the outcome of the tender process. A working group has been set up, the officials working group, to run with that program. Obviously, we will need to work out more precisely the terms of reference for that study and also how we actually run the process.

Senator O'BRIEN—Thank you for that.

Senator McGAURAN—Mr Dolling, do you expect the rural sector to be included in that process?

Mr Dolling—There are pros and cons for its inclusion.

Senator McGAURAN—What is your expectation?

Mr Dolling—It is hard for me to say because it falls into the political realm as to what sorts of decisions are made. We are certainly working on the basis that it may well be included in terms of our planning and thinking, because I think it is important and prudent to do so. We are interested in looking at both the challenges and the opportunities that inclusion in an ETS would provide for that sector and farming communities, so that may well be the case. I think anything beyond that probably would be speculating as to when or whether it might be included.

Senator McGAURAN—The whole state of Victoria, like most of the rest of Australia, has been drought declared. For perhaps close to a decade it has been in drought. Are you solely attributing the climate effect to greenhouse gas emissions? Otherwise, is it just abnormal, being from the norm?

Mr Dolling—We would not be attributing it to being solely and purely explained by climate change activities. Drought is a particular phenomenon. It gets defined in a particular way. We are familiar with droughts, as they have been going on for a very long period of time. The evidence is such that there is a sense that climate change may contribute to exacerbating droughts. It is hard to provide direct and irrefutable proof of the link between the two, but certainly the evidence looks as if there is a likely possibility of more droughts. But obviously that is information that CSIRO and the IPCC have come out with, so I will not—

Senator Heffernan interjecting—

Senator McGAURAN—There has not been one witness who has been able to give it to us, so you do wonder. There is still a huge question mark over the whole thing. Mr Dolling, you explained to Senator O'Brien the work that you have been doing particularly on the dairy industry and most effectively on Victoria. In that study or its modelling, as climate change affects the north of Victoria and the dairy industry up there and water shortages become even more acute than they are now, what then becomes the state government's priority or recommendation with regard to that industry's water requirements? What I am trying to say is this. Sooner or later there has to be a priority. For the dairy farmers to stay on the land they will require greater access to water, but there is that gigantic pipe that is going down to Melbourne and they are sharing the same water.

Mr Dolling—In answering that, if I can, the place where I would start is that the Victorian government has released a future farming statement. I can leave a copy of that behind for you if you are interested. That outlines Victoria's vision for the future of farming. Basically, it emphasises the need to build innovative, competitive and dynamic farming businesses. In that sense farming businesses are predominantly left to make optimising decisions—obviously as to maximising profits et cetera. It also identifies some important roles for government in addressing some areas where markets may fail—a good example of that is in the research and development area, through some of the practice change activities that the government already undertakes—

and in reviewing and looking and ensuring that regulatory regimes are as efficient as possible to minimise the holding back of adjustment processes. So there is that question. Obviously, as things change over time if there is a major structural adjustment issue then no doubt that will get the Victorian government's attention, and then we will have to think about the particular adjustment that will be required at the time, bearing in mind what are appropriate roles for government in that space.

Senator HEFFERNAN—That was a grand motherhood statement. Thank you very much for that.

Senator McGAURAN—It was worthy of Modelling the Future public service classes.

Senator HEFFERNAN—Can I just put that into context. You say what the various government attitudes would have to be. Could I just point out to the committee that in another context we are looking at input cost of fertiliser. We are paying around $1,300 a tonne for MAP and DAP, which was $420 three years ago. This season, in India, the Indian farmers are paying $250 a tonne, and it is the same global market. Do you know what the difference is? The government pays the rest. If you want an example of how our farmers—and your Victorian farmers, in which you are so interested, Senator McGauran—are up against it, as well as climate change, that is a very good example.

Mr Dolling—It is a challenge.

Senator HEFFERNAN—So it does not matter how strong and long your motherhood statement is, if there is not the capacity and the political will and, shall I say, return on dividend for the government, then we will not be able to compete—which is very sad.

Mr Dolling—It is certainly fair to say there are a number of drivers of competitiveness. It is certainly true that Australian governments have a role in making sure that we provide the right environment for that competitiveness to occur. I do not know about the detail of that example, Senator, but I am certainly aware of a number of situations where various foreign governments provide different levels of assistance, or otherwise, and that is case in many sectors of the economy, of course.

CHAIR—Are there any other questions? If not, to the Victorian Department of Primary Industries and Mr Dolling: thank you very much.

Senator HEFFERNAN—Could I just ask one—

CHAIR—We have another question.

Senator HEFFERNAN—In terms of the Victorian government's plan for a carbon market, we have evidence earlier of the various forms of carbon sinks, including perennial grasses and a whole lot of things that have not been accounted—and, as we have heard from Professor Mike Young, if you get the accounting wrong you bugger up the whole thing. Have you given consideration to what ought to be considered a reasonable easement arrangement for a carbon sink planting?

Mr Dolling—Specifically on easements—

Senator HEFFERNAN—If someone puts a gas pipeline through a property—I have got one through my property—or a water line, you give them an easement to protect the line. If we are going to go to all the trouble of introducing carbon sinks on farms for offsets to emitters—which begs the argument about why we don't do something about the emissions as well as having an offset—how are you going to protect the integrity of the carbon sink without an easement?

Mr Dolling—It is a good question. Indeed, similar questions about arrangements come up in terms of forestry sequesting too, which is the idea of maintaining the integrity of the asset that we are creating, if you like, through a new property right regime linked to the regulated emissions-trading scheme. If it is not through the regulated emissions-trading scheme, of course, we can observe carbon markets in a voluntary capacity as well, which we are already observing some activity in. In the case of the regulatory one, I guess it is important that we do have the appropriate design elements within the emissions-trading scheme to maintain that integrity whilst also minimising the transaction costs.

Senator HEFFERNAN—Is this in your area of expertise? Is this query of mine in your area of responsibility?

Mr Dolling—Looking at emissions-trading design issues is something that we do look at.

Senator HEFFERNAN—Could I invite you to have a think about that in the next week or two because this exact committee is going to come back in a few weeks time—aren't we, Mr Chairman?—with an inquiry into carbon sinks, following on the carbon sink tax deductibility legislation in this parliament where we classically put the horse before the cart, and we really need to get some answers from state governments about the individual state regimes, regulations and rules on carbon sinks.

Mr Dolling—I am happy to do that. I think it is fair to say that because the emissions-trading scheme will be led through the Commonwealth government, the Victorian government is unlikely to have—

Senator HEFFERNAN—That is the scary bit, because in the Senate chamber the Commonwealth government said, 'It's got a lot to do with the states.' So we have got a bit of work to do.

Mr Dolling—Yes, sure.

Senator HEFFERNAN—Are you listening, Queensland?

CHAIR—As there are no further questions, thank you very much, Mr Dolling and the Victorian Department of Primary Industries.

Mr Dolling—Thank you.

Proceedings suspended from 2.50 pm to 3.30 pm

GUNASEKERA, Dr Don, Chief Economist, Australian Bureau of Agricultural and Resource Economics

GRANT, Dr Colin James, Executive Director, Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry

SIMS, Dr John, Program Leader, Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry

DARBY, Ms Desley, Acting Manager, Drought and Exceptional Circumstances, Department of Agriculture, Fisheries and Forestry

GIBBS, Mr Mark Allan, General Manager, Climate Change Policy, Department of Agriculture, Fisheries and Forestry

MORTIMER, Mr David Kenneth, Executive Manager, Climate Change Division, Department of Agriculture, Fisheries and Forestry

CARRUTHERS, Mr Ian, First Assistant Secretary, Adaptation and Land Management Division, Department of Climate Change

ACTING CHAIR (Senator O'Brien)—Welcome. The Department of Agriculture, Fisheries and Forestry and the Department of Climate Change have lodged joint submission No. 34 with the committee. Do you wish to make any amendments of alterations to that submission.

Mr Mortimer—No, but we might take the opportunity to make a few opening comments, if you like.

ACTING CHAIR—Before we do that, I remind senators that the Senate has resolved that an officer of a department of the Commonwealth or of a state shall not be asked to give opinions on matters of policy and shall be given reasonable opportunity to refer questions asked of the officer to superior officers or to a minister. This resolution prohibits only questions asking for opinions on matters of policy and does not preclude questions asking for explanations of policies or factual questions about when and how policies were adopted. Officers of the departments are also reminded that any claim that it would be contrary to public interest to answer a question must be made by a minister and should be accompanied by a statement setting out the basis for the claim. Please proceed.

Mr Mortimer—The Australian government places high priority on developing responses to climate change and is moving ahead to implement actions that help the adaptation to those changes that cannot be avoided, reduction of greenhouse gas emissions and promotion of an effective international climate framework.

The Department of Agriculture, Fisheries and Forestry is responsible for providing policy advice and administering programs aimed at the development of internationally competitive and

sustainable primary industries. DAFF is also responsible for preparing the primary industries sectors to respond to the opportunities and challenges of climate change.

The Department of Climate Change, within the Prime Minister's portfolio, leads the development of Australia's climate change policy and is represented here by Mr Carruthers. DCC advises on emissions reduction policy—for example, the national emission-trading scheme and measurement of emissions. It also advises on international climate change negotiations and policies and programs on adaptation to the impacts of climate change.

DAFF, in consultation with the agriculture sector, works closely with DCC, other Commonwealth agencies and the states and territories to align policy and program objectives and bring about a coordinated and comprehensive approach to helping the sector prepare for the challenges of climate change. DAFF works with state and territory governments through the Natural Resources Management Ministerial Council and the Primary Industries Ministerial Council to facilitate cooperative program arrangements across Australia. The department consults with peak industry bodies to ensure the development of practical options and policy measures relevant to agricultural industries, particularly as they relate to sector-specific adaptation and mitigation options.

The Australian Bureau of Agricultural and Resource Economics, ABARE, and the Bureau of Rural Sciences, BRS, are the specialist agencies within DAFF providing ongoing advice on economic and scientific issues, and they are represented here by Dr Don Gunasekera, from ABARE, and by Dr Colin Grant and Dr John Sims, from BRS.

ABARE undertakes rigorous and independent economic research analysis and forecasting, which contributes to the competitiveness of Australia's agricultural, fisheries, forestry, energy and minerals industries and the quality of the Australian environment. BRS provides scientific assessments, tools and advice to decision-makers in the areas of agriculture, fisheries, forestry, natural resource management and social sciences. We are happy to take any questions on the submission which we have provided and which you have referenced. Thanks very much.

Senator NASH—How many people in the department are currently working on climate change issues?

Mr Mortimer—I will probably have to take that notice.

Senator NASH—I thought you might.

Mr Mortimer—I could not give you an exact answer. There are a number and, as you can see from the way we are represented here, they are spread across different parts of the department. They encompass ABARE and BRS, obviously, staff in the Climate Change Division and others. If you like, we will take that on notice.

Senator NASH—That would be great, thank you. What is the department's view of the research task on climate change at the moment? Do you think it is honed enough? Do you think it is good enough? Is it too hodgepodge? Could there be improvements? Is it okay as it is? What is the department's view of where it is at the moment?

Mr Mortimer—There is a distinctive range of research activities happening in a range of areas. It might be best, if ABARE and BRS are happy to give—

Senator NASH—I understand a lot of the research that is being undertaken. As the department, have you seen or do you have a view of any way in which that research task could be improved, even perhaps just within your own department? Are there things that you would like to see happening in your department that are not yet happening, perhaps for lack of funding or coordination?

Mr Gibbs—From DAFF's point of view, there is currently the Australia's Farming Future program, which was announced by the government and which is part of the policy process at this stage. There are three components of that program which were announced in the budget. The first is a priority research program involving $15 million over three years. The second is the Climate Change Adaptation Partnerships program, which is $60 million over four years. We are in the process at this stage of looking at research priorities. Research priorities would cover mitigation of emissions. They also include adaptation, adjusting to climate change over the short-term and long-term. So there has been no formal announcement about the priorities which will be on the program at this stage, but there is work going on with primary industry ministers through the council, looking at priorities which they can work collaboratively, and the states have a number of programs as well.

Mr Carruthers—As Mr Mortimer indicated in his opening remarks, the role of the Department of Climate Change is directed at ensuring a whole of government response on climate change and so that does include matters to do with research as they relate to the reference before this committee. In terms of the integrated picture, I would say that you can look at it in three domains. The first is in relation to the fundamentals of climate change science, where the national coordination is led by the Department of Climate Change through the Australian Climate Change Science program, and that is a program that has been running for several years. We did undertake an independent review last year done by two internationally eminent scientists. It came to the conclusion that the integration across Australia in relation to the fundamentals of climate change science, in other words, understanding the broad implications of changing atmospheric composition upon the atmosphere, oceans and land is very well integrated across our prime institutions and we are really now developing for government a new national climate change science framework for consideration.

The second domain has to do with adaptation to the impacts of climate change. Through the Council of Australian Governments there has been close attention to how to organise Australian science to best effect in relation to delivering the requirements of Australia for the future in terms of adaptation knowledge. On the basis of the COAG agreement in April 2007 there has been established, led by the Australian government, an adaptation research facility, which in the first instance will be hosted by Griffith University—

Senator NASH—I am sorry, when was that established?

Mr Carruthers—It was agreed at the April 2007 COAG framework. The announcement of Griffith University to host that was made in November 2007. The new director will take up the appointment on 1 August. The new director is an internationally eminent scientist, Dr Jean Palutikof, who led the coordination of the work for the IPCC fourth assessment report completed

last year, so she will be migrating to Australia. Also, there is being established a network of all the key institutions in the primary industries area to work on the adaptation task and we will be commissioning a national adaptation research plan in that area. So there is a very strong focus on integration in the adaptation area.

In the case of emissions mitigation, as Mr Gibbs has mentioned there is the new Australia's Farming Future initiative, which will be focusing in that area. That will build on preceding work over the last few years that is being integrated across Australia.

Senator NASH—Are there any target dates you are heading towards to have some results in terms of adaptation?

Mr Carruthers—In terms of the, if you like, institutional infrastructure—

Senator NASH—What does 'institutional infrastructure' mean?

Mr Carruthers—In terms of the point of your question, I think there are two parts to it. One is: how do you ensure that whatever effort is invested in adaptation research achieves the best result and is not fragmented, scattergun and failing to meet a strategic applications outcome? That is the role of the adaptation research facility. We already have the core unit established, as I have mentioned—

Senator NASH—I am sorry but that is a bit too bureaucratic.

Mr Carruthers—That is the Griffith University role. It is responsible for strategic planning and integration through the director and a support group. The next step will be a set of adaptation research networks, each of which will be led by a premier national institute.

Senator NASH—I think we are going round in circles here. What I was trying to get at is that, by and large, for farmers the most important thing, once we actually realise where we are heading in terms of change, will be what practices we have to put in place for adaptation. Obviously with this particular adaptation section this is being very well covered and underway at the moment, but my question was: do you have a target by which you would like to see some results showing from this research into adaptation?

Mr Carruthers—Not at the present time because this is a quite new venture, but that is being worked on. I think you can say that by, say, the end of this calendar year we will have that.

Senator NASH—Great. With all of the programs that are underway, what consultation is there, or is there going to be, with the grassroots rural community on developing those adaptation processes?

Mr Carruthers—There will be a national adaptation research plan on primary industries. There will be another one on water resources, which is in fact already underway and being led by Dr Bryson Bates from CSIRO and Professor Stuart Bunn from Griffith University, both well-renowned scientists in the field. They are working with the research community and the stakeholder groups to prepare these national adaptation research plans, which will set the priorities for—

Senator NASH—If you can just back up one second, that was my question: what are the communication channels going to be between this body and the others involved and grassroots farmers?

Mr Carruthers—Basically, the key researchers and the prime stakeholder groups will develop the draft research plans. They will then be advertised as drafts and open for comment, and that will all be fed back through Griffith University in formulating the final versions of the National Adaptation Research Plans for ministerial approval.

Senator NASH—So the body itself will come up with the draft—I might have this wrong—

Mr Carruthers—That is correct.

Senator NASH—and then take it out to community groups.

Mr Carruthers—They will go out publicly for comment.

Senator NASH—What scope have they then got for change? Would it not be more sensible, perhaps, to communicate with the stakeholder groups as they are preparing the draft? I would have thought their responses to potential adaptation would be incredibly important to have at the building stage, not once the draft has been thrown out for comment.

Mr Carruthers—It is a matter for judgement, Senator. I think it was our view that it is probably helpful in supporting general engagement to have, at least as a starting basis, a rationale on proposals for the research. Otherwise, if you go out with a blank sheet of paper at the beginning, you will perhaps tend not to get the same focus, and the process will perhaps not be as effective.

Senator NASH—Why would it not be as effective? I am just asking, given that at the end of the day you can have many bureaucrats looking at this stuff from a scientific point of view—and I say that with the greatest respect.

Senator FISHER—Dwarfed by numbers, as we are!

Senator NASH—That is all very well, but at the end of the day this is going to impact particularly on people on farms who are going to change their practices.

Mr Carruthers—Based on my observations of the process so far, it is very easy to identify 1,001 things about which we need better knowledge in some particular field of climate change adaptation—in this case, shall we say, primary industries.

Senator NASH—Can we have a list of those on notice? I am serious.

Mr Carruthers—Yes. I am sure you are. This is exactly the point: given that there are—

Senator NASH—Just a second, Mr Carruthers. I was actually quite serious. Even though you used the term '1,001', for the committee I would like to know what those areas are.

Senator FISHER—So that is a question of you, Mr Carruthers, on notice.

Senator NASH—Rather than make you go through 1,001 now—

Mr Carruthers—No. I said I can imagine that you would see 1,001 different ideas being raised. The task is—

Senator NASH—I am asking you if you would not mind providing to the committee, in the interests of time, your view on what those might be.

Mr Carruthers—I would be very happy to give you some suggestions from the department on what those might be. But the real task is to decide: yes, they are all valid proposals, but what areas of knowledge development are needed over the next, say, 5, 7, 10 years versus those that might be needed in 20, 30, 50 years time and to try to focus on where you begin in this young field of adaptation research. I think people probably need some assistance with putting that into a framework.

Senator NASH—This is a general question that you will probably not be able to answer: how can you be sure that what you end up with as your projections for change in the future will be spot-on the money, so that the processes we put in place in terms of adaptation will be correct? How are you going to be certain—I do not mean you as the department; this is a question, really, for the general climate change community—that all this research, where we end up with a reasonably clear picture of where we are going, is absolutely right given the ramifications that there are going to be for the farming community as a result of the advice to them from that knowledge?

Mr Carruthers—We can certainly advance the knowledge base in the adaptation field, including in the area of primary industries. But that knowledge base will only grow over time, so over, say, the next five to 10 years considerable uncertainties will remain in the knowledge base. The question becomes: how do you focus the research strategies so that you build the resilience of, in this case, primary industry systems—and DAFF might like to speak more about this—so they can manage in a situation where uncertainties remain about what the future holds?

Senator NASH—And that really is the fact that it is risk management.

Mr Carruthers—Yes.

Senator NASH—Regardless of what the research comes up with and how definitive it is, it is widely perceived and understood that there will be a risk, and the question is how best to manage it for farmers.

Mr Carruthers—That is correct.

Mr Mortimer—That is appreciated, Senator. There are no absolutes in terms of certainties in this area, and that is why the research is continuing and the work is going on with adaptation. It is suspected that, depending on the size of the research effort and the length of time over which it continues, the outcomes of the research will come to greater clarity and there will be a coalescing of likely outcomes in some area or another.

Senator NASH—As part of all this research, is the department planning on doing, or have you done, work on the social impact in the broader regional community?

Mr Mortimer—Of climate change?

Senator NASH—Sorry—the whole thing is on climate change.

Mr Mortimer—That is fine. I will answer one part of that and Mr Gibbs might be able to help me on the rest of it. You would be aware that the government has initiated a review of drought policy, which has three elements to it. One part of that is a social assessment panel. That panel has now been established and is going to be consulting widely on the consequences of drought. That will give one dimension of the issue facing farmers. In some regards, as people see and experience climatic events—drought and weather change around them—that is going to pick up on what the consequences are for them in a broader social sense. That report will come to government at the end of September.

Senator NASH—I completely understand the drought perspective just as a stand-alone, but does that include potential climate change adaptation, which might change the nature of a farming community and by association the farming town—businesses et cetera that rely on that farming community? Will that study that you are talking about take that angle and not just drought itself into account?

Mr Mortimer—No. It will focus on drought. But, as I said, there are two key dimensions here. One is: what do people know in terms of their experiences to date about how events such as drought and climatic variability change to the extent that people accept that it has happened and how has that impacted upon regions? The other part that you are asking about is more forward-looking. I will ask my colleague here if he can provide—

Senator NASH—That was part of my original question, when I said: are you planning on looking at this? It is probably really a yes or no answer, but have a go, Mr Gibbs.

Mr Gibbs—The answer is yes.

Senator NASH—Excellent.

Mr Gibbs—There are three broad areas: economic, science and social aspects. When you are talking about adaptation and mitigation, especially for primary industries and agriculture, you are looking across those three spectrums of science, if you want to call it that. One element of work which has been happening in DAFF has been undertaken by ABARE, looking at vulnerability assessments in particular regions across Australia. That work has focused on economic assessments, but we are looking at expanding that to look at social considerations over time. That is an example where it feeds into your question about risk. We look at vulnerability, the changes happening in a region—not a community but a region—or certain parts of Australia and the ability of that region to adapt to those changes over time.

Senator NASH—Mr Mortimer, I will ask you to take that question on notice about the staff. Could we have who they are and what they do as well as the numbers? Also, we had Land and Water in here talking about the CCRSPI, which has been great. I assume you have all been asked

to put forward any research projects you might be involved with so that register of projects can be attained. I assume you are all very happy that you have given all that information to the absolute best of your ability.

Mr Gibbs—DAFF were involved in the first stage of the CCRSPI. I understand you had Land and Water Australia here talking about it. They are coming to the conclusion of that draft report. DAFF were involved in that; we were on the steering committee. The second stage of that is being discussed now. We have been participants in it and it has been a quite worthwhile exercise in pulling RDCs together and collaborating across RDCs on the issue of climate change. It is one of those issues which cut across a number of different RDCs.

Senator NASH—It would indeed.

Senator HEFFERNAN—Sorry I was not here for the earlier questions. In planning for climate change and changed land use and water availability et cetera, has the department accepted some givens in the science? Do you accept some of the science predictions, such as decreased run-off, as part of forward planning?

Mr Mortimer—I might pass to our colleagues from the research agencies.

Dr Grant—Certainly we have accepted the science that is coming out of the IPCC and the projections for Australia—the projections of temperature rise. There is a great deal less certainty with regard to rainfall of course. To the extent that that science is laid out in the IPCC and to the extent work has been done in Australia by CSIRO and others, as best it is possible to do, to regionalise it down to Australia, yes, of course.

Senator HEFFERNAN—Yesterday we had before us CSIRO and the Murray-Darling Basin Commission water coordinator, who did not know a lot about water. There is obviously a need for long-term planning, and that is what this inquiry is about, but there is also a need for some short-term decision making in view of what we are facing this year as a result of last year and the likely consequences of a similar year next year. Have you in your wisdom been doing some what I would call 'doomsday' planning for a dry winter and no run-off in the Murray-Darling Basin? Can we get someone to own up to the fact that this could happen? There are the vagaries of science and the vagaries of weather forecasting, but there are some science predictions that we are not going to have above-average rainfall and run-off. The declines to run-off last year went back to 1900 and whatever it was. This year is shaping to be no better. We had some hope earlier when it started to rain in the north.

Mr Mortimer—Planning and water management do not lie with the DAFF portfolio at this stage; they lie with the Department of the Environment, Water, Heritage and the Arts.

Senator HEFFERNAN—I appreciate that.

Mr Mortimer—There is lot of work going on there in terms of working out how to manage water supplies, particularly irrigated water supplies down the Murray-Darling system. I am really not in a situation to brief you on that here and now.

Senator HEFFERNAN—No, but I wondered whether you have advised yourselves as a department of that research and the implications that that research has for land use, which would certainly be in your portfolio area. What do we do about it? The great vagary for farmers in the southern parts of Australia in the last couple of years has been: 'Is this the way it is going to be forever? Is this the new format for farming?'—which, I have to say, is pretty much a worry. I just wondered what input your department would have had. I can remember this time last year talking on these sorts of occasions about the need for a plan because it might not rain.

Mr Mortimer—You are right, Senator. We are contributing to those processes, but essentially the oversighting body, I think it is fair to say, is COAG itself in terms of getting Commonwealth-state cooperation, which is fundamental, and then there are different issues below that. It is very difficult, because no-one quite knows what is going to come out. The longer we go without sustained rain and the longer we go with storage through the Murray-Darling system falling away, the more obviously there is going to have to be change, in a very immediate short-term sense, by farmers. We are dealing with that as it happens, but it is very hard to put something in place to rearrange that (a) in the absence of a whole lot more knowledge and (b) in the sort of economy we have where farmers have to make their own best choices—

Senator HEFFERNAN—The difficulty is that the advice coming out of, for instance, earlier submissions to this inquiry is that, under this scenario—as run-off declines in view of the lowest rainfall, with the smallest rice crop, with most of last year's snow evaporating and not melting and all those sorts of things—there is a disproportionate amount of water required to be returned to the system rather than to the farming work. Yet we have evidence that state governments—which is why COAG is a worry—are still blindly saying that there will only be a loss of six per cent of water for irrigated work versus a 30 per cent loss to the system and to the carriage of the system, which is not separated in the definition in the water planners' minds between running the system and looking after the environment. There is a certain amount of load in the system just so you do not have to cart the bloody water in buckets down to Mildura; the system will run it down there for you. And in that planning, which I think is seriously misleading for our farmers, they are saying there is only going to be a six per cent loss of water when in fact it probably should be a return of 30 per cent to the work and six per cent to the environment to make the system work—a disproportionate return of water to make the system work. Do you blokes have any input into that or have you just got to let that go by?

Mr Carruthers—I might make a comment on behalf of the Department of Climate Change. I am Ian Carruthers, Senator Heffernan; you were not here when I introduced myself.

Senator HEFFERNAN—Are you any relation of Jimmy's?

Mr Carruthers—No. We really have two issues here, as you are pointing out. The first is the immediate problem of management of the resources, particularly the Murray-Darling Basin, with this increasingly protracted and serious drought of today. Now, the management of water resources is essentially the responsibility of Senator Wong as the water resources minister, and, as Mr Mortimer has indicated, it is the environment and water department that has the principal responsibility in that area in advising Senator Wong, and that whole issue is being addressed under the Australian government's water plan and being taken up through COAG, as has been mentioned.

So, yes, we have this drought here and now, but the second part of the problem is that, if we look forward into the future, with the climate system changing—and this is where your questioning started—and what we know about the state of the climate conditions as we look out to 2020, 2030, 2050, 2070, what the science is indicating at the present is that south-east Australia will become drier and so our water resources planning today needs to be focusing on two agendas: (1) what we do about the current desperate situation and (2) how we position ourselves in relation to management of our water resources and our land use in the long term.

So the present water program is dealing with issues around building our capacity in water accounting—a large investment is going in that area—and, going back to Senator Nash's earlier questions, how we focus our work on the research and knowledge development that will equip us to make judgements about the best management of our water resources and our land use for the future.

Senator HEFFERNAN—In the event of the grimmer side of the predictions of the bureau and CSIRO on the weather for the next year or two eventuating in what you would call a terminal failure of the Murray—and there are some vagaries in there; it is worse than bloody bookmaking—would you concede that as a possibility?

Mr Carruthers—I could not answer that question, I am afraid. That does not come within the province of the Department of Climate Change. I think it is for the Department of the Environment—

Senator HEFFERNAN—Is there someone else who would have some knowledge on that?

Mr Mortimer—I would not claim any knowledge—

Senator HEFFERNAN—I will tell you I think what we are doing is flawed. I think you need to know as much about water as they do, and they need to know as much about the land side of it as you do, and you need to combine that in a task force. Take it on as a task force as to what in the hell we are going to do, rather than saying, 'Shit, that is their problem,' and them saying, 'That's their problem.' We really need to form a task force—I am happy to be part of it; it would be easier for you blokes if I was inside the tent rather than outside—to look at what the hell we are going to do, other than shift Adelaide.

Mr Mortimer, you may recall that four or five years ago I said that any 50-year plan for the Murray-Darling Basin would exclude furrow cotton and paddy rice as an annual crop; it would be very much an event based crop—other than the contingency plan of moving Adelaide. The rice growers and cotton growers were not very happy. But it is starting to look that way; it is self-evident. So what comfort can this committee give farmers as opposed to planners on what we will do if it does not rain and there is no run-off? Has someone asked the drop-dead question in your department or Penny Wong's department? I accept that Penny Wong is a pretty smart minister, and her department is a hardworking department, but has your department asked their department: what are we going to tell our mob if it all turns to custard?

Mr Mortimer—We talk between the departments. We communicate and discuss these issues.

Senator HEFFERNAN—What are the options in the event of a catastrophic failure of the Murray system?

Mr Mortimer—I think they are fairly self-evident: there will be a whole lot less agriculture and there will be considerable readjustment of farming activity, and indeed economic activity and populations. Those are the clear consequences.

Senator HEFFERNAN—I think there are several expeditions planned for the winter break to go down and visit Lake Alexandrina and these places, but visiting them is really just an interesting exercise. It is a bit like going to Yuendumu or Wadeye or somewhere—you fly in there and say, 'Oh my God! Don't these people live in dreadful conditions,' and then you fly home in the air-conditioned plane and say, 'That was interesting.' That is about as much benefit as you will get out of a trip to see what is a sadly and badly degrading river system. There are appeals through the media now to please return water to the farmers. Well, if Mother Nature has turned the bloody tap off, there is no good appealing to something that is not there. There seems to be a misunderstanding of the amount of water that is required just to carry the river—the freight component of the river system. I would like to think that the government of the day—and I do not care who the government is—would have the wisdom to have some sort of a plan so we do not have some sort of social catastrophe in the event of the lower end of the forecasts coming true.

Mr Mortimer—It is probably best to direct those questions to the water department, because there is a lot of work going on in mapping out all of those scenarios and thinking about what might need to be done in all those situations. I do not want to be unhelpful, but it would potentially be misleading for me to try to say something when I cannot guarantee the truth of it or when it has no particular standing.

Senator HEFFERNAN—Fair enough. But at the present time—and I do not want to interfere with government policy in any way—is there a reasonable argument to be made that there should be a taskforce formed between the various groups with connection to the land to discuss water and the social implications et cetera? Should there be a contingency in the event of a catastrophic failure? Shouldn't we be planning for that?

Mr Mortimer—Again, I would reserve any comment on that. The other part of—

Senator HEFFERNAN—Right. Anyhow, I am sure someone is writing it down. That is the short-term scenario. In the longer term scenario, we should have greater efficiency. There is no question that farmers are pretty resilient and inventive and, like engineers say, you can do anything if you have enough money—if we can avoid a flight of capital from the rural areas. The latest and greatest threat of capital flight from rural Australia will be if we do not manage our emissions trading process in a way that is not filled up with a whole lot of financial instruments and carpetbaggers. If we can retain wealth in the bush—and there have been several spectacular flights of capital from the bush over the last 50 years—and we go to higher efficiency water use, there needs to be an acceptance by farmers that a lot of the efficiency gains in better water use through, as I keep saying, Carnarvon type thinking are going to have to go back into the system to keep the system in existence. That is a big hurdle for farmers to jump. Farmers need not only assistance but therapy sessions to understand this.

They need to understand, the government needs to understand and the Australian people need to understand that we are up against some spectacular corruptions in the global market. I mentioned one earlier, which was the fertiliser market in India, in which fertiliser that is worth $1,300 a tonne here is being sold for $250 a tonne to the farmer in India at the present time. It is subsidised.

In the longer term plan, we ought to offer hope with regard to climate change with more work in the north. That is heresy for some people, like the Wilderness Society, because it is not driven by need at the present time. The hangman's noose is not there. No-one has woken up to the fact that, for instance, Walmart has rationed rice in their supermarkets in the United States. Most people would think that is pretty incredible. But we produced 18,000 tonnes of rice this year, where we could produce 1.2 million tonnes in other years. The question is: is this the way that it is going to be? There will be other wet years, but what about most years? Is the department working up a scenario in which we may have to reconfigure not only the way that we are using our land but the way we have settled our land and where we are doing our productive work? Have you got a scenario that looks at the capacity of other regions in a frontier sense? Is someone—

Mr Mortimer—I have to say that we have not done something as back to basics as that. That is not something that is currently being done. If you asked me why, I would say that it is for two reasons: one, it is a matter of pursuing the current policies in terms of dealing with water management and other drought and adjustment issues around that; and, two, there is a recognition that we live in a market economy in which farmers have in front of them a whole pile of information about options, including where the better places to go are. Farmers over the years do move between regions. They go to the regions with better prospects and they change their crops and their products depending on what is going to get better prices and greater productivity. Those sorts of things happen all the time. Governments typically do not try to get in there and engineer that unless there is an absolute need to do so.

Senator NASH—But what Senator Heffernan is suggesting is that surely it would be a natural progression to add that kind of geographical adjustment, if you like, to all the other research that is being undertaken. Very simply, if we undertake all this research and it looks like we are farming in the wrong spots, wouldn't it be eminently sensible to be looking at the same time at what other areas could potentially be opened up and farmed for X, Y and Z reasons? You might do that research and come up with absolutely nothing, but it seems odd that that type of open-mindedness is not being considered at the same as all this other research is going on.

Mr Mortimer—I want to say one thing. I do not think that we are lacking open-mindedness.

Senator NASH—If you are not doing it, though, it would kind of indicate that there is a lack of—

Mr Mortimer—No, I would not take that consequence.

Senator NASH—I am sure that you would not, Mr Mortimer.

Mr Mortimer—Thank you. There is a lot of research going on. My colleague on my right is going to be talking about that. What I was trying to say was that there is a lot of information out

there and a lot of research going on, and which will continue to go on, and there is a lot of knowledge. I was responding in part to the sentiment of Senator Heffernan's question about how farmers adjust and move between regions. I will leave it at that.

Mr Carruthers—In terms of the questions from Senator Heffernan and Senator Nash, I made the remark earlier on in this discussion in reply to Senator Nash that we need to recognise that in terms of developing our knowledge base on how to adapt to the future changing climate and to develop adaptation response strategies, we are at present at an early stage. The question in my mind is: how do you build our capacity to do the tasks that you have outlined? The model that I was describing in terms of the role of the adaptation research facility, where we really are harnessing our national institutions to develop this knowledge base, does need to cover all regions and all systems of regions, not isolated bits such as water resources or biodiversity or primary industries. We need to look at the whole capability of regions under a changing climate system. We then need to lay out what some of the options for the future are to allow, as Mr Mortimer says, farmers and regional communities and others with an interest in different regions to make soundly based decisions.

Senator HEFFERNAN—But the difficulty is—and we say this yesterday with the CSIRO and the Murray-Darling Basin people—that you can spend years shuffling reports and integrating this report with that report and coming up with a summary. That map there is pretty telling. We have to get someone to do it, not plan it. Mr Mortimer, you said—correctly—that the market works to a certain point. But the Ord is a really good example of a great idea from the 1960s that did not work because they did not go on with it because it had no political priority. Anyone who had anything to do with the clumsiness and the laziness of the Ord stage 2 tender document should have been taken off and—I will not say 'shot'—counselled.

CHAIR—We have 10 minutes to go, Senator Heffernan, and I am sure there are other questions to be asked. I have a couple of questions of a non-farming background.

Senator HEFFERNAN—Yes, but these fellows will not mind if we go over a bit because it is probably therapeutic to be here.

CHAIR—I was enjoying it, but after so many days of hearing the same stories I am starting to feel—

Senator HEFFERNAN—But can I say this as to the reason that you cannot say that farmers will take the market opportunity and move. They do not have to move. They can still do business in the south despite the gloominess of all those predictions. It is just that they have got to change the way they are doing business and they have got to have the right accounting around it et cetera. Have you been to the Gilbert River?

Mr Carruthers—Not personally.

Senator HEFFERNAN—Has anyone been to the Gilbert River? It seems not. You see that is one of the problems.

Mr Mortimer—We are all happy to take a trip, I see.

Senator HEFFERNAN—That is the nature of the business. You can plan all this stuff in the office.

CHAIR—Is it a question?

Senator HEFFERNAN—Don't panic, Mr Chairman.

CHAIR—It is 20 past and at 4.30 we are winding it up.

Senator HEFFERNAN—But you can hand it over to us. We will keep it going for a while if you have got to go.

CHAIR—No. The timetable said 4.30.

Senator HEFFERNAN—But these are the last witnesses, aren't they?

CHAIR—They are the last witnesses.

Senator HEFFERNAN—Right, just relax.

CHAIR—But we started a quarter of an hour late. You just get to the questions.

Senator HEFFERNAN—Just relax.

CHAIR—Senator Heffernan, there are others that have questions.

Senator HEFFERNAN—So the difficulty is this, and Gilbert River is a really good example, Mr Chairman. It was pegged out in 1957 as an irrigation area. From 1957 until two years ago nothing of any circumstance has happened there. That is because it has been given no priority. Farmers are not going to move up there, Mr Mortimer, unless there is some basic infrastructure. As I keep saying, if it is good enough to build a bloody football stadium at the Melbourne Cricket Ground, then it ought to be good enough to spend the equivalent of that money on a road or two and a bridge or two. Those roads up there are literally 10-feet strips of tar—where there are tar roads—and if a road train is coming you have got to get off the road if you are an old grey nomad in a bloody caravan or you are someone running the kids into school at Georgetown. You know you have got to get off the road because the road trains will not get off the road. There is basic infrastructure in an area with untold potential, and we as a Commonwealth government have sat around for years ignoring the potential of all of that up there because it had no political imperative. Against the background of climate change, which is what this is all about, it is time we did have one.

It is time we told the Queensland government that they have got to rethink the wild rivers legislation, because that was just a political bullshit exercise, with great respect. Peter Beattie, God bless him—he is over there and now he cannot respond—said, 'Bill, we had to do something.' It was like the Traveston Dam. He said, 'Bill, it was a political imperative.' Of course the people that think that food is going to be on the supermarket shelf forever, regardless of how it gets there—like the Wilderness Society, who probably think we should not have cattle, we should not eat meat, we should all smoke pot and we should plait our bloody armpit hair—

are saying, 'No. Leave it locked up because we want to make the 17 million hectares that represent Cape York Peninsula a World Heritage area where you won't be able to go in to even have a look.' That is the plan. We have taken the first step with the wild rivers legislation. The Indigenous people up there, a lot of whom have not even got access to schools, are busting for an economic opportunity. They want to own their own house on their own bit of farm land. Michael Ross, the Chairman of the Cape York Land Council, is a really good example. He came to Cairns and gave evidence to the task force. I said, 'Michael, how big?' He said, 'I can't do a PowerPoint presentation.' I said, 'Neither can I, so come on in.' I said, 'How big is the place that you live on?' It was an active pastoral station. He said, 'I don't know. But it is 80 kilometres from the front gate to the house.'

CHAIR—I know there is a question coming, Senator Heffernan. I know it is on the edge of your lips.

Senator HEFFERNAN—It is, Mr Chairman. Why can't this department influence the water side of the government? Why can't you get together and get busy on developing a plan to give the next generation of Australian farmers the opportunities that Mother Nature is signalling in this map to come out of the adversity that this map is also showing in the red areas of southern Australia? Why the hell are we sitting around here saying, 'We'll summarise everything.' There are a lot of silos of science and information. Most of the water and land planning in the Northern Territory is done to a reasonable level. Why can't we form a response to what could be if it does not rain? Bear in mind, as I know from my own experience, that we have just been through June with no frosts.

Senator NASH—Same—one.

Senator HEFFERNAN—I don't think we have had even one. That is Mother Nature saying something.

Mr Mortimer—If you like, I will just answer that quickly and say that we are engaged in the water issues. We are also engaged with the climate change issues. They will inevitably lead to policies and frameworks for dealing with a whole pile of issues around land and water use. That will all form part of the government's set of policies and programs. Beyond that, in terms of the single task force, I really cannot comment on that. That is essentially a matter for government.

Senator HEFFERNAN—Thank you for that generous answer. In terms of that planning, who in your department has been up there and had a look?

Mr Mortimer—I have not. I will take that on notice.

Senator HEFFERNAN—It is very important that you just simply go and have a look.

CHAIR—He will take it on notice, Senator Heffernan.

Mr Mortimer—I hear what you are saying, Senator Heffernan. No-one from the department has gone up to look at that river as part of this specific exercise—

Senator HEFFERNAN—It is not just that river. There is a whole—

Mr Mortimer—Yes. I hear what you are saying.

CHAIR—We have three minutes left on that, Senator Heffernan. I just wanted to ask the department: have you done any work on soil sequestration?

Dr Grant—Do you mean soil carbon?

CHAIR—Soil carbon, sorry.

Dr Grant—The Bureau of Rural Sciences, in company with CSIRO, are going to be coming out with a report probably in about four or five weeks time on an evaluation of what is being done across the world in terms of soil carbon, with an intent to basically summarise that work and identify the issues that are associated with soil carbon. It is a very complex issue.

CHAIR—Are you aware of what Dr Jones has been doing in New South Wales?

Dr Grant—Not personally, but I am sure that the people working on it will be. As I say, we are working closely with CSIRO.

CHAIR—Then I will bring to the department's attention submissions 41 and 42. Pull a couple of cards out and you can introduce yourselves to them. I suggest that the department may want to have a look at submissions 41 and 42. I would be surprised if you are not aware that we had some very interesting witnesses yesterday who put some very interesting submissions to us. The committee are going to make the effort to head out and have a firsthand look at what Dr Jones has been doing in New South Wales. There are 200 farmers jumping for glee saying that it is the best thing since sliced bread. You will find out for yourselves if you read the submissions. Also, from my home state of Western Australia is Mr Wilson, who is a farmer. I would appreciate it if you could say hello to him before you leave and hear what is going on out there. I bear in mind that you will have to look at what is going on in the world, but it is happening in our backyard now as we speak. Also, has the department done any work on pasture cropping?

Mr Mortimer—Not the department; I expect that will be done in one of the R&D corporations. They do that sort of research these days.

CHAIR—I do not think I will hold my breath on what I have heard, Mr Mortimer. Take that on notice for us, please, and come back to the committee. We will have a closing date for questions on notice of 31 July, if that suits the rest of the committee.

Senator HEFFERNAN—I have another question.

CHAIR—And I am the one taking up the time now! I would like you to do that, but I am mindful that it is 4.30 and Senator Fisher has sat here very patiently and not asked a question, so I am going to give Senator Fisher the call. When you leave, introduce yourselves to the people at the back.

Senator FISHER—The Prime Minister has promised us evidence based policy. The department, as you said in your introduction, Mr Mortimer, is a policy advisory team. Is the

department in a position in respect of climate change and its impact on agriculture to provide the government with advice to enable it to formulate evidence based policy?

Mr Mortimer—The department has two research bureaus within it: the Bureau of Rural Sciences and ABARE, both of which are fully engaged in providing material, advice and research into the policy formulation process. They are very much part of this whole exercise in terms of coming to new policies and programs for climate change.

Senator FISHER—What is the process for developing policy? What are the steps—one, two, three—that you would advise the government to be going through to develop evidence based policy?

Mr Mortimer—Do you mean in general terms or—

Senator FISHER—Yes, in general terms.

Mr Mortimer—In general terms it is a matter of collecting the evidence and the data. That is the starting point. Secondly, we look at the scenario that is around us that is related to that.

Senator FISHER—So you assess the evidence in the context?

Mr Mortimer—Yes, in the context of the operating environment we are in, considering what the issues are and who is being affected. Thirdly, we identify key outcomes in terms of where we need to be.

Senator FISHER—The purpose of the policy.

Mr Mortimer—Yes, the purpose of the policy. And, following on from that, putting in place the key elements of the program or policy—

Senator FISHER—So, you implement?

Mr Mortimer—No, we develop the strategy that will get you the purpose.

Senator FISHER—Okay, strategy, then the next step would be to implement?

Mr Mortimer—Yes, the delivery of the strategy or policy.

Senator FISHER—Which would include presumably monitoring?

Mr Mortimer—That is an important part of any strategy once it is put in place—to know that you are actually achieving the outcomes that you are seeking to get.

Senator FISHER—Thank you. I appreciate that that is in very general terms—in the abstract, a process that might be contemplated to achieve evidence based policy. What does the department say then of the views of the likes of CSIRO that we are not collecting sufficient empirical data to inform the baseline—so it is not sufficient to get us to step one of your process,

which is collecting the evidence? And what do you say of the likes of CSIRO saying that the similar lack of long-term monitoring programs means that we are not in a position to reliably track changes in the environment—and particularly the agricultural environment—caused by climate change? What do you say of those three themes, which are argued by several, but particularly by CSIRO in this context?

Mr Mortimer—Now I understand what you are saying. I will ask Mr Carruthers to respond.

Mr Carruthers—In terms of observation programs, I am sure that those with knowledge in the field would see that there is always the need for building and improving. But on the other hand, we do occupy a continent of 760 million hectares, so we need to be smart about the kinds of observation programs that we do put into place. I think, on the basis of experience, we at the Department of Climate Change view that, for example, in terms of meteorological observations the Bureau of Meteorology is doing an excellent job in terms of the national system there. I am sure the Bureau of Meteorology would readily identify areas that need strengthening and improving, but there is a very good knowledge and information base there for planning and developing strategies. For example, in relation to measuring emissions and carbon sequestration across the landscape, there has been a big investment by Australia over the last 10 years in the measurements and in the analysis of that so that Australia has a high capability in that area today, but one that needs to be advanced. Whilst we can look to the gaps, let's not down-rate the achievements that have been made but also recognise the necessity of planning carefully these kinds of analytical exercises because it is a big task in a big continent.

Senator FISHER—So, if you were to accept that claims of the ilk that I outlined have been made by the likes of CSIRO, would you disagree with those claims?

Mr Carruthers—No, there are certainly gaps and needs in the area.

Senator FISHER—Okay.

Mr Carruthers—I am really making the point that we should understand that, in terms of the capacities we have in place today, there is a good deal that can be done with them on the basis of smart approaches. This gets back to some of Senator Heffernan's comments before: think about these as system solutions, not as fragmented efforts in this or that place, this or that institution.

Senator FISHER—I do not disagree with that. I know this is the time to ask questions of you, but I will leave you with one thought, which is my concern: having done the best that we can to get the buy in from the stakeholders at the moment—clearly I am including farmers in that; it has been a long road, and we appear to have buy in—I am concerned that, as we go down the path without having developed evidence based policy, we risk getting buyout as soon as the rubber starts to hit the road. That will put you guys in the policy gun as soon as you start to get disenchantment with implementation of policy. So it is from that background of concern that my questioning comes, but thank you for your views.

Mr Carruthers—Thank you. I would just say that, as far as my minister and the Prime Minister are concerned, the message is very clear: they want the departments to be delivering the evidence base for policy.

Senator FISHER—I look forward to seeing it.

Senator HEFFERNAN—The week before last, we passed legislation on carbon sinks. Are you familiar with that?

Mr Carruthers—Yes, I am. I am looking forward to engaging with the committee on the specific inquiry on the subject.

Senator HEFFERNAN—The way it is now, there is no definition of a carbon sink other than an international description of a carbon sink. Would you like to describe the parameters of a carbon sink to the committee so we have got something to think about, as well, while we are away? You might be able to provide that to the committee.

Mr Carruthers—I am looking for a copy of the legislation for the definition but, to give you my lay version without drawing on the particular quote: a carbon sink forest, firstly, is defined as being specifically planned and implemented for the purpose of sequestering carbon dioxide from the atmosphere. Secondly, it is a requirement that that forest not be felled—in other words, it is clearly distinguished from commercial forestry plantations which are established for the purpose of cutting down and generating logs, pulp or whatever.

Senator HEFFERNAN—Have you given any thought as to how you would protect the sovereignty of the carbon sink?

Mr Carruthers—I think there are a couple of parts to that. Firstly, the requirement, as I have said, that the forest not be felled provides the integrity of the long-term storage of the carbon.

Senator HEFFERNAN—With great respect, it does not.

Mr Carruthers—Secondly, the trees will be established for the purpose of, for example, selling into carbon offsets markets. Those programs—for example, the Australian government's Greenhouse Friendly program—will have provisions over the security of the carbon offsets.

Senator HEFFERNAN—With great respect, we do not know the extent or the market that is going to be established. The market will establish its own price, which will determine the land use, which will determine what happens to agricultural land, given it is supposed to be cleared land.

You say that the guidelines will address a situation where I lease my farm to Mr Mortimer, he leases it to Origin Energy or someone who wants to put 10 million carbon-sink trees on that land, and someone else comes along in 10 or 15 years time and removes the trees, or a fire burns the trees down. Have you in your deliberations or the bureau's deliberations established the varieties of trees and the length of the sequestration cycle? Is there going to be a set of guidelines: 'If you plant this tree, it has to be in the ground for 80 years; if you plant that one, it has to be in the ground for 30 years, because it has to run its course'? Have you done any of that work?

Mr Carruthers—Certainly—

Senator HEFFERNAN—Just a simple yes or no answer.

Mr Carruthers—The answer is yes.

Senator HEFFERNAN—Give us an idea of what the vagaries are. Are there trees that complete their sequestration in 20 years? Are there some that do it in 50? Are there some that do it in 80? Are there some that do it in 10? What is the range?

Mr Carruthers—It depends on the type of tree. We can give you some information on that.

Senator HEFFERNAN—If you know the answer—you said yes—

Mr Carruthers—The kinds of trees that would be generally considered for the establishment of carbon-sink forests have a very long growing cycle—perhaps typically out over, say, 40, 50 or more years.

Senator HEFFERNAN—But there would be trees that complete their growth cycle, rather than the maturing cycle, in 20 years.

Mr Carruthers—That is certainly the case.

Senator HEFFERNAN—And some in 15 years.

Mr Carruthers—They are likely to be the ones on the more productive lands for commercial harvesting.

Senator HEFFERNAN—Would they be banned by description from sinks?

Mr Carruthers—When we come to the other inquiry, we would be very happy to lay out the economic analyses done.

Senator HEFFERNAN—No, this is not economic. This is about what a sink is. If a tree completes its cycle—and there are plenty around that do—in 15 years, and then you can knock it down for timber—

Mr Carruthers—That would not meet the definition under that particular taxation legislation. They are not for felling.

Senator HEFFERNAN—All right. So we go through the exercise. Mr Mortimer has leased it to Billy Bloggs, the emitter. He then carks it and leaves it in his will to someone who wants to improve the kitchen, so they sell the place. The next bloke comes along and just bulldozes it. What are you going to do about it?

Mr Carruthers—I think you will find that the kinds of programs that are established around carbon offsets deal with those kinds of contingencies.

Senator HEFFERNAN—But what would be the scenario? Would you put him in jail? Would there be legal—

Mr Carruthers—There are contractual arrangements.

Senator HEFFERNAN—Hang on. But he forgot to tell me when Senator Nash bought it from the person who wants to do the kitchen up, and it is not registered on the title. I would have thought that there is a legal case—and bear in mind, the courts are about the law and not the truth; I would shoot two out of three lawyers if I were in charge. How do you protect the buyer if the easement on the sink is not registered on the title?

Mr Carruthers—Through the contractual relationships between the different parties.

Senator HEFFERNAN—With great respect, if it is not a legal, registered document, what protection has she got when she buys it?

Mr Carruthers—The states have legislation on carbon rights which have application.

Senator HEFFERNAN—With great respect, if it is not registered on the title—

Mr Carruthers—The states' carbon rights legislation establishes separate titles over the land and the carbon commodities.

Senator HEFFERNAN—You are saying that it is going to be Commonwealth oversight; it is going to be the individual thinking of all the individual governments as to how they protect the integrity of the sink?

Mr Carruthers—I am describing what is in place today.

Senator HEFFERNAN—There is nothing in place today.

Mr Carruthers—Yes, there is. There is carbon rights legislation in virtually every state and territory.

Senator HEFFERNAN—There is in New South Wales, but not in Queensland.

Mr Carruthers—No, in virtually every state and territory.

Senator HEFFERNAN—So is there an easement in those arrangements to protect—

Mr Carruthers—I am not in a position to go into the detail here, Senator. I would be very happy to do that in the future inquiry. I have not come along with details this afternoon of the states' legislation but, given your interest in that area, we will make sure that you have information about what the states do have in place.

Senator HEFFERNAN—All right, there you go.

ACTING CHAIR (Senator O'Brien)—I think that is all. As there are no further questions, I declare this meeting closed. Thank you very much for your attendance. If any questions arise on notice, we will forward them to you.

Committee adjourned at 4.45 pm