



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND
FORESTRY

Reference: Future water supplies for Australia's rural industries and communities

WEDNESDAY, 25 JUNE 2003

CANBERRA

BY AUTHORITY OF THE HOUSE OF REPRESENTATIVES

INTERNET

The Proof and Official Hansard transcripts of Senate committee hearings, some House of Representatives committee hearings and some joint committee hearings are available on the Internet. Some House of Representatives committees and some joint committees make available only Official Hansard transcripts.

The Internet address is: **<http://www.aph.gov.au/hansard>**

To search the parliamentary database, go to: **<http://search.aph.gov.au>**

HOUSE OF REPRESENTATIVES
STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY
Wednesday, 25 June 2003

Members: Mrs Elson (*Chair*), Mr Adams (*Deputy Chair*), Mr Forrest, Mrs Gash, Mrs Ley, Mr Schultz, Mr Secker, Mr Sidebottom, Mr Windsor and Mr Zahra

Members in attendance: Mr Adams, Mrs Elson, Mr Forrest, Mrs Ley, Mr Schultz, Mr Sidebottom

Terms of reference for the inquiry:

To inquire into and report on:

The provision of future water supplies for Australia's rural industries and communities, particularly:

- The role of the Commonwealth in ensuring adequate and sustainable supply of water in rural and regional Australia.
- Commonwealth policies and programs in rural and regional Australia that could underpin stability of storage and supply of water for domestic consumption and other purposes.
- The effect of Commonwealth policies and programs on current and future water use in rural Australia.
- Commonwealth policies and programs that could address and balance the competing demands on water resources.
- The adequacy of scientific research on the approaches required for adaptation to climate variability and better weather prediction, including the reliability of forecasting systems and capacity to provide specialist forecasts.

WITNESSES

MEYER, Dr Wayne Stewart, Business Director, Land and Water Division, Commonwealth Scientific and Industrial Research Organisation457

RYAN, Dr Brian Frank, Leader, Earth Systems Modelling Program, Atmospheric Research Division, Commonwealth Scientific and Industrial Research Organisation457

YOUNG, Mr Michael Denis, Director, Policy Economic Research Unit, Land and Water Division, Commonwealth Scientific and Industrial Research Organisation457

Committee met at 5.12 p.m.

MEYER, Dr Wayne Stewart, Business Director, Land and Water Division, Commonwealth Scientific and Industrial Research Organisation

RYAN, Dr Brian Frank, Leader, Earth Systems Modelling Program, Atmospheric Research Division, Commonwealth Scientific and Industrial Research Organisation

YOUNG, Mr Michael Denis, Director, Policy Economic Research Unit, Land and Water Division, Commonwealth Scientific and Industrial Research Organisation

CHAIR—Welcome. I declare open the public hearing of the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry. Our inquiry is into future water supplies for Australians, rural industries and communities. Today's hearing is the 16th of the inquiry. We have previously held public hearings in Queensland, Victoria, South Australia, as well as in Canberra. Do you have anything to add to the capacity in which you are appearing?

Dr Meyer—My division of CSIRO is in Adelaide.

Mr Young—I am an economist.

CHAIR—I also acknowledge the fact that we have had a very extensive briefing from the CSIRO—and I believe, Brian Ryan, you were part of that briefing, so I appreciate that.

Dr Ryan—We all were.

CHAIR—I appreciate the fact that you have come such a long way today to appear before us. Although the committee does not require you to give evidence under oath, I should advise you that these hearings are formal proceedings of the parliament and warrant the same respect as proceedings of the House itself. I remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as a contempt of parliament. Would you like to make a brief statement and then the committee would like to ask you some questions on your submission.

Dr Meyer—I would like to summarise the submission that we made and to indicate what we believe are the important parts of it. With respect to this committee, we believe that the Commonwealth has a pivotal and increasing role in setting the values, direction and the vision for water use in terms of its development and conservation within Australia. We have put in our submission that we think that the vision for that water management really revolves around some essential values, namely those of efficiency, fairness, sustainability and reward for effort within the obligation to others.

Within that, we think that the fundamental principles of water use need to be asserted. These are: the primary rights to water for basic human needs which is of sufficient quality and quantity for drinking and hygiene; the right of the environment to have adequate water to maintain the integrity of dependent ecosystems; and the commercial use of water for productive use. We would like to emphasise, when we are thinking about water, its importance as part of the natural resource system. We would like to emphasise the importance of making the linkage between the

availability of atmospheric water, surface water and ground water, and particularly the linkage between surface and ground water.

In relation to the first term of reference, obviously the important part is associated with section 100 of the Constitution, relating to the reasonable use and conservation or irrigation of water. We note that, at the time of the framing of that particular part of the Constitution, a couple of the biophysical components—those being the link between surface water and ground water—were probably not well understood. There was also a lack of appreciation at that time of the lag between land use change and the effect on water availability. Subsequently, there is a third element that certainly was not envisaged at the time that that section of the Constitution was framed. That is that water was not part of a trading system and that it now has become part of a trading system and, in that sense, falls under the influence of the Commonwealth with respect to the regulation of trade.

We would like to draw to your attention, under the condition of what is ‘reasonable’, some of the issues which have caused us to be in the current position with respect to water resources—that is, that there is a very strong pressure on our water resources. The really important issues are to do with the management of water across state and local government boundaries. We recognise the important role that state governments have, but the issue of the overallocation of water resources is fundamental. At the time that those water resources were thought about and responsibilities allocated—and subsequently in the allocation policies of state governments—they were largely influenced by the reality that all the allocation which was put out was not used; the allocations at the time they were assigned were not tradable. There was no linkage between the allocation of surface water and ground water. In fact, some ground water allocations exceeded bore yields, and there has never been any redress of that.

The expectation when allocations were made was that full use would not occur, except in exceptional circumstances. So we now have a situation, particularly in the south-eastern part of Australia, where allocation of water exceeds the ability of the systems to supply it. We therefore submit that the primary role of the Commonwealth is to set the policy framework, supply the high level signals and assemble data and analyses at a national level that transcend state and local government borders, because of the importance of the management of water as an entity that goes across these various jurisdictions.

With respect to the second term of reference, we submit that there is no single action that will markedly improve the stability of storage and supply in rural and regional Australia. We submit that a number of connected actions will need to be looked at with respect to water resource management. As we indicated previously, we think that the establishment of a water management framework with a statement of principles is important, as is the re-establishment of that hierarchy of needs—the right of the environment and the need for commercial use.

In our submission, we divide up the business of water resource management into two major categories. One is the management of the demand, whereby we submit that the ability to come up with improved climate and weather forecasting will assist in the management of that demand. Also, as has been indicated in urban environments, water demand management can not only achieve significant reductions but also the maintenance of water supply—particularly during critical periods. It has a lot to do with how people perceive water availability and how they use it

themselves, and it is not always necessary to have regulations influencing how people use water and how they see that demand.

The other category is the issue of supply, which we divide into three components. Firstly, there is the amount of supply which is available through atmospheric processes and in that case we have indicated that weather modification through cloud seeding may provide more rainfall depending on the cloud suitability and regional climatic and geographic conditions. The second component relates to water coming into and the amount of water available coming out of the catchments in terms of run-off. The importance of the management of the catchments cannot be overemphasised. Land use change which occurs within those catchments can certainly have a major impact on the amount of run-off which occurs and the condition of the run-off.

Thirdly, the business of how much water we take out of our surface and groundwater systems as the demand for water increases is a complex business. We submit that there are no quick fixes with respect to how that management can be achieved. As the demand for quality water for a number of uses increases, the complexity of the rules and management arrangements that need to be put in place will increase. We have suggested a number of places where it is possible to intervene and how they might influence the amount of supply that is available to satisfy those different demands.

On the third of the terms of reference, we suggest that the current policies and programs do not yet sufficiently emphasise the need to reduce extraction from overallocated rivers and ground waters and nor do they provide a clear direction on the availability of water for irrigation and the conditions needed to achieve sustainable irrigated areas. We have seen the imposition of a cap, bearing in mind that that imposition is only partial in the sense that Queensland has not signed on within the Murray Darling Basin.

Mr FORREST—Chair, all of what Dr Meyer is saying to us is already in the submission. We do not have a lot of time and we would like the opportunity to ask questions. How much longer do you think this will take?

Dr Meyer—Just a few more minutes in order to highlight a couple of points.

CHAIR—You may continue.

Dr Meyer—We have indicated the components that we think are very important in terms of the elements that will be needed for better management. I would like to draw attention under terms of reference No. 4 to the number of elements that we suggest are needed to address this balance between demand and supply, and in particular draw your attention to the need to measure and monitor both the supply and how it changes over time.

Finally, under terms of reference No. 5, we have said that while the research component or the number of agencies within the Australian context is world-class in content, we certainly do not think that, given the complexity of the system that we are dealing with—the size of the system and the variability of water and its management within Australia—our research effort is commensurate with that need. We draw your attention to a number of activities and programs that the CSIRO are currently involved in through flagship programs and social and economic initiatives that are very much directed at concentrating our efforts on some of those issues.

Ms LEY—I would like to know your views on the Living Murray process, which is being conducted in a large part of my electorate at the moment.

Dr Meyer—It is an important process with respect to looking at what the options are and what impact those options might have on the retention of additional water in the Murray, or more than is currently there. We believe there are impacts that are likely to occur as a result of changes; say, in land use management in the upper catchment. For example, there is compensation going on as surface water restrictions are increasing, with many irrigators and water users increasing their amount of ground water use. Given that surface water and ground water are connected, the chances are—and I will ask Mike Young to comment on this—that, if you do an analysis on that, some of the proposals being put in place will not result in an increase in the amount of water coming back into the river. I would like to make one other comment with respect to the Living Murray document. I think the social involvement of people within the affected areas probably needs some more work.

Mr Young—I would like to expand on that a little. I have been very closely involved in the process from when it was first started—before it was called the Living Murray process, when it was an environmental flows process. It has been a very frustrating process on all sides. One of the most difficult parts has been the stop-start nature of the process. It has been very difficult for people on all sides to plan a long stream of analysis and, very carefully and importantly, engagement. A lot of information has been trapped by the continuing traps and constraints put on the process through changing administrative arrangements. It has been very difficult.

Nevertheless, I think tremendous progress has been made and a lot of analysis has come forward. Today in the *Australian Economic Review* I published a paper about how you would go about actually solving the process forever by putting in place a framework which is robust—and the title of the paper is ‘Robust Reform: The Case for a New Water Entitlement System for Australia’. One of the things that draws attention to is the size of the flaws in all the allocation and entitlement systems in place. I would like to table that article for the committee. Where do we go from here? I think it is quite clear that we do need to restore water back into the river. How we go about that is the big challenge in terms of the next step forward.

Ms LEY—You have been closely involved with the process. Do you have an idea of the benchmark Murray River that the process is aiming at maintaining or restoring? Could you describe it? I am not saying that you need to do that now, but do you have an idea of what benchmarks have been set for the Murray, because I do not believe that is made clear in the Living Murray paperwork?

Mr Young—I think the science that underpins the work that has been done so far is very sound, but it has not been shared with the community. I guess that is the frustration that you are reflecting.

Ms LEY—It is not so much the science—and, as you may know, I have been critical of the science—but science for what? Is it science for a heritage river, as they heritage list rivers in South Africa? I know the document talks about a healthy, working river, but we need actual benchmarks that describe what parameters that sort of river has so we know what we are trying to achieve.

Mr Young—I have had them communicated to me. I am the wrong person to articulate them in detail. My role in the process is as an economist trying to understand the impacts and costs of doing the processes you are talking about. So my skill and expertise is more in terms of taking the benchmarks that are being put in place and guiding people in trying to model and estimate the consequences of what is being talked about.

Ms LEY—When you say ‘benchmarks’, do you mean those additional flows—those reference points?

Mr Young—That is right, yes.

Ms LEY—So as an economist you have made a statement that you are quite convinced that those additional flows are necessary?

Mr Young—I have looked and in the preliminary assessment—I led the team which did that—the surprising and very stunning conclusion was that even if there were no environmental improvement and if the only thing you recovered was increased revenue from hydro-power generation and increased profit from irrigation as a result of reduction in salinity, and if you also got savings from Adelaide and other urban centres in terms of salinity impacts, at a nationwide level you would increase GDP. However, the social costs of that are very frightening. But if you just look at it ruthlessly as an economist and look at what is best for the nation trying to grow economically and not caring which people suffer—

Mr ADAMS—The Treasury does that all the time.

Mr Young—Yes. If you do the hard economic analysis of putting water back into the river and diluting the salinity—with some adjustments taking place and an increase in agricultural production in some areas—the result is that there is an increase in economic activity across the entire basin. That is scary; it is very unpalatable.

Ms LEY—Increase in what sort of economic activity?

Mr Young—There is an increase in profit from Australian agriculture.

Ms LEY—But the transfer obviously goes from one area to another.

Mr Young—That is right, there are very big transfers.

Ms LEY—Where does it go to?

Mr Young—Most of the declines in productivity occur in New South Wales and Victoria and most of the gains come in South Australia.

Ms LEY—I know that my colleagues have questions on that and I will hand over to the member for Mallee, but I wonder if we could see some of that economic analysis? It would be every useful.

Mr Young—I am happy to supply that and I know that there is further work under way at the moment. I am happy to make a copy of that report available.

Mr FORREST—Is there a formal process by which you provide that input into the debate and discussions? Is there a formal process by which the CSIRO's research effort gets utilised?

Mr Young—The process at the moment goes through a number of pathways. The Murray-Darling Basin Commission is contracting a lot of work and other people are commenting in lots of different ways and feeding information forward. CSIRO is involved in quite a few of the processes as parts of teams putting the biophysical, economic and social work together.

Mr FORREST—I am going to bore my colleagues; I am interested in the issue of stabilising the weather for the future. I know that I am on a hobbyhorse but I want to advance the debate in Australia. There was a recent conference in Africa run by the World Meteorological Organisation which confirmed that there are 40 countries around the world where there have been considerable achievements in respect of weather modification. Yet, apart from Tasmania, we are not investing in any way in this research in Australia. I cannot understand why we are not. So my question is: why has weather modification become so badly discredited in Australia that we will not touch it?

Dr Ryan—I got the summary, just the other day, of the actions that came out of the Morocco meeting. You might be interested in that.

Mr FORREST—The committee has already got it.

Dr Ryan—I did not know that you had that. As you know, it has always been extremely difficult to establish whether cloud seeding works. Certainly in the seventies and the eighties in Australia there was a great deal of effort put into proving that techniques worked in various areas. New techniques such as hydrosopic seeding have been tried in recent times.

Mr FORREST—Tried where? Not here?

Dr Ryan—Not here, no.

Mr FORREST—There has been no research effort in Australia?

Dr Ryan—No, there has been no research effort in Australia and that is because of two things. Certainly, within CSIRO the priorities have been in developing weather applications and climate in a particular area. That is where our priorities have been—they have been determined in terms of partnerships with our stakeholders and that has determined the direction we are going. We have kept a watching brief on the state of weather modification. If we were to re-establish it in Australia, it would be a massive effort—I have certainly advised on it, at least several times. There is currently a major study in the US that is a whole review of weather modification. A committee has spent something like two years on it. I had an email from one of the authors. I think I promised you I would try to get you that report. Its current state is that it has come back from the reviewers and it is now expected in about August.

Mr FORREST—Who is the author?

Dr Ryan—There is a whole committee. The particular person I have been corresponding with is Roelof Bruintjes. I have a guarantee from Roelof that he will let us know as soon as it is available—and, as I say, I have made a promise that I will let this committee and the minister know. Certainly, the outcomes of that should be clearly reviewed.

If you are asking me to speak honestly in terms of what it would require, CSIRO itself would not actually have the capacity to undertake all the various areas concerned. For example, if you look at what is happening in places like the US, I am sure, if it starts up, there will be a whole lot of technologies—radar and those sorts of things—which currently we would certainly not have the ability to use. It would actually take a wide range of skills to be able to do it. I note that one of the submissions to your committee was from Monash University suggesting that a pathway to this could, in fact, be through a CRC. I think the attraction of that would be that it actually would require hard business sense. To create a CRC, you actually are required to get partners—the whole thing actually has to go through.

Mr FORREST—It is not a bad idea. For example, you have got the Snowy Hydro and the Tasmanian Hydro.

Dr Ryan—That is right, and I am sure that the CSIRO would be prepared to take part in discussions on such a thing. But the other part about it is that it would also have to meet the hard-nosed requirements of making sure there were stakeholders and those sorts of things associated with it. In short, the answer to your question is that there were good reasons at the time—and that was before my time—for reducing CSIRO's effort in cloud seeding.

We have kept a solid watching brief on it—as you know, I am on the WMO committee—and certainly the guidelines we have produced of what needs to be done in this area, of that what we have said in Australia, are entirely consistent with the WMO guidelines. Our advice has consistently been that if someone wishes to undertake cloud seeding and invest in it, CSIRO does not have a problem. But we would always say to them, 'If you want to know down the line whether there has been an answer, whether there has actually been a water increase, you have to actually develop methodologies which are going to show you.' I do not need to go through what we suggested. Does that answer the question?

Mr FORREST—But how can you have that input in terms of an experiment or demonstration when you have no experience in cloud seeding any more?

Dr Ryan—I think we have sufficient physical expertise to be able to have an input.

Mr FORREST—But you have already said that we do not have radar and satellite technology, and that we do not even have the kinds of modern flares that are being used around the world. So how can we offer any kind of critique?

Dr Ryan—I would certainly argue that I would have the expertise to be able to make a judgment on a lot of that from my past experience. There are some technical measures that you would have to clear to get consulting on. In other words, I am quite confident that I would be able to make a critical assessment of the US academy report. When I met with my other colleagues on the WMO committee I sat for a week and listened to the reviews of all the

previous cloud seeding activities. My responsibility to that meeting is to report on the physics and the advances in the physics that may assist with the modification.

Mr FORREST—How can you do that when you do not have any original research of your own on cloud seeding? That is my point. How can you provide a critique? The only way to challenge it is to have some research of your own, and you do not have it.

Dr Ryan—I would disagree with that. I think there are several people who are sufficiently aware of and across what is going on. The basic physics and microphysical understanding of what is happening is resident.

Mr FORREST—I think it would be fair to say that there is no scientific problem in demonstrating that seeding a cloud makes it rain. The argument is a mathematical, statistical one—to show that you get an increased outcome—isn't it?

Dr Ryan—It is easy to show that you have modified the microphysical structure of a cloud.

Mr FORREST—You distribute it, and a cloud develops.

Dr Ryan—You can see the droplets.

Mr FORREST—The argument is about a long-term increase, which is statistical and mathematical.

Dr Ryan—No. Even showing that a single cloud has rained because of you putting the seeding in there is actually quite difficult.

Mr FORREST—I can do that in a refrigerator. I can show the physics of that in a refrigerator.

Dr Ryan—No. What you can show is that you have changed the microphysical structure of the cloud. What you have not shown is that this has actually changed the amount of rain that is going to reach the ground.

Mr FORREST—The outcome at Casablanca was that the Chinese, presenting their work on 300 projects—

Dr Ryan—Absolutely. They put a massive investment in it.

Mr FORREST—It was \$US100 million a year. Do they know something that we do not know?

Dr Ryan—I cannot answer that. All I know is that they have put a massive investment in it.

Mr FORREST—Why don't you know? You said you were following what was happening around the world.

Dr Ryan—Yes. I know that they have put a massive investment in it, but I do not know more than that. I have not visited China.

Mr FORREST—Why not? You are our expert. I have people going without water, Dr Ryan. We are carting water in semitrailers this week. Answer the question: is this a solution or not? The Chinese must be convinced. They must know something that we do not know. You are our expert in Australia. You are on the WMO; you are our representative. Yet you do not know what the Chinese are doing. You cannot tell our committee.

Dr Ryan—No, I cannot tell you that.

Mr FORREST—I think that is disgraceful. We had better send someone else. I am going to Israel next week; I will find out.

Mr SIDEBOTTOM—This is *deja vu*; we have been through this one before. But it is important. I will move to another area. I noticed that, in one of your footnotes, there was an article by Syme, Nancarrow and McCreddin with a very interesting title: ‘If water means wealth—how should we share it?’ I would like to turn to the trading side of it. What do you believe are the social, economic and environmental risks associated with water trading? How do we establish water trading markets that minimise the adverse impacts of water trading?

Mr Young—The paper I have just tabled is all about that very subject. But let me take the opportunity to say that markets are excellent servants and lousy masters. If you specify trading arrangements and entitlements in a flawed way, the market will deliver you a flawed outcome. That is guaranteed. Markets reveal what you have specified, rather than your intention. If you look at the way we have designed water entitlements, you see that we just bolted on trading arrangements without going back and designing a system that had a thorough understanding of several key things. This includes the way water flows through a system and what determines water yield; the connections between ground water and surface water; and the fact that, when people irrigate inefficiently, a large proportion of the water flows back into the river and is available downstream. If you do not build all of these things in, you can trade into trouble.

The paper I have had published in the *Australian Economic Review* today has a crack at estimating the size of those flaws in the River Murray system in the southern connected system, just piecing together the evidence that is available. If you add all of those up, the rough indicative numbers are that, from the 1993 baseline—which has been used for the Living Murray exercise—going forward about 20 years, you would expect the River Murray to lose about 2,000 gigitalitres of water. So, just because of the flaws in the system, flows will be less by about 2,000 gigitalitres. That is because of the nature of the flaws. What we clearly need is an entitlement system that steps out of all of that mess we have got ourselves into—one that is designed for trading and also includes water quality in the whole process. Setting up a market that does that could ease the costs of adjustment. But, if we trade with what we have and expand trade with what we have, we could trade into trouble.

Mr SIDEBOTTOM—I look forward to reading your paper in more depth. I like that term ‘trading into trouble’. We have all those issues with speculators, water barons and whatever else evolving with this.

Mr Young—I think we should also clarify that there is a lot of misunderstanding around even the nature of the markets that are there at the moment. There are three markets operating in the basin and in each of the sub-basins and components of it to various degrees. There are what are currently called temporary trading markets, which trade in allocations of water that are available for use in a year. It is just like trading buckets of water. There is also a market emerging for permanent trades, which is trading of licences—moving a licence from one location to another. That is a very different market. Most of the discussion in the media confuses those two markets and fails to understand the difference.

There is also a very small—although some people say it is very big—market for salinity impacts, which are arrangements designed to encourage trades of water away from areas where there is salinity and its use in areas where it has less impact on the river. There is a very formal arrangement between the states of Victoria, South Australia and New South Wales that trades obligations in terms of offsets against targets that are set at a state level. That is a very sophisticated market. It is very difficult at the moment for individual landholders, who in some cases have formal salinity prevention obligations, to engage in those markets. So we really need to see a much greater understanding of the nature of the markets and the processes that are occurring, rather than just a very emotive debate that does not understand the different natures of the markets and the different things that are occurring.

CHAIR—During our travels around Australia and at our public hearings, the same problem comes up all the time—that is, data: getting access to data, the collection of it and the sharing of it. It seems to be very ad hoc. What is the CSIRO's responsibility as far as sharing the data that they have with groups around Australia that require it? Do people have to pay for it, or is it the case that if they request it from the CSIRO they can actually get it? Is your database broad enough to be able service different groups around Australia?

Dr Meyer—We do not have a primary responsibility—there is a data storage warehouse, if you like—but there are various pieces of data associated with particular research projects that we have. Primarily, what data we have used in relation to water, particularly in recent years, has been accumulated through the National Land and Water Resources Audit. If somebody wanted general figures with respect to water resources—supply and/or demand—we would certainly refer them to the National Land and Water Resources Audit office. The only other data sets that are really available are those associated with particular research projects, and they may very well have some local relevance. But again, CSIRO, in terms of accumulating data, is often reliant on state agencies and the Commonwealth agencies ABARE and ABS to aggregate that data.

Sorry, I did not quite answer your question. We certainly welcome inquiries if people want data, and we have no restrictions with respect to the availability of that. If it required us to undertake extensive accessing and rearranging of data then we would certainly be concerned about the cost of that and we may ask for some cost recovery.

Mr ADAMS—I am trying to guess where we are going. I guess it is getting more water to flow into the Murray-Darling system—this is what we are dealing with. So it is about using the soils better and getting people off marginal soils. We accept that there has been an increase of 76 per cent in water use since the eighties. Isn't it about coming up with a process of how we get that water into the river and how we restructure the people off the marginal lands? We would use a marketable system of water to do that. We spoke earlier about all the inadequacies that are

within the systems that are there. It really is about restructuring some of the rural industries that use this water. Then it comes down to a debate about who pays for that restructuring, how we get people to withdraw from some of that land onto other lands to use the water more productively and getting your economics to work in that regard. Is that the direction?

Mr Young—It is certainly the direction. We cannot emphasise too strongly the importance of fixing up the entitlement system as well so that we do not end up having to do it again—that is, having thought we fixed it, having the problem re-emerge. We have been floating the idea that there is the need for a small group of people to be asked to actually put together a framework which will work properly rather than running it through lots of committee and compromise processes. Yes, markets are very much part of easing the pain and particularly part of finding those people who are most able to be part of the solution by giving up some water, rather than having somebody going in in some autocratic style and actually picking the winners and losers. To do that, you need to go through a market or a market-like process.

The lowest cost system in the world that is known is a system that is used in the United States for sulfur trading, where there is a pollution problem with sulfur dioxide that comes out of power stations. The mechanism that is used there is that every year people are required to put a proportion of their allocation through into a tender pool. They can set any reserve price they like. They can set a price which is worth millions and millions of dollars if they want to, or they can set it at 1c. When everybody's offers are in, there is an inspection process whereby the government will work out what it is prepared to buy and take out of the system.

That would work just as well with water. You could run a process whereby every person is required to put a proportion of their licence in as an offer at a price that they determine. So if somebody says, 'I will let my water go for \$500,000'—or \$1 million, or whatever price they put on it—it does not matter. Experience with those processes is that there are a large number of people who are prepared to give a small amount at a reasonable price. If you have a willing buyer and a willing seller, you have people who are willing to help solve the problem. There is community understanding that we have a problem and that Australia needs to work to solve it. By going through those processes, you have a very powerful mechanism of doing it. You also need to be aware that there are problems associated with income tax. There is a big difference between a compulsory acquisition and a voluntary sale. The income tax implications of that are big. I urge the committee to explore the taxation implications of dealing differently with the acquisition of water in the market.

Mr ADAMS—Is that touched on in your paper?

Mr Young—In about as many sentences as I have just summarised for you, because it requires a lot of work to be done. The paper I have tabled was limited to 5,000 words. We need to set up an entitlement system that works, that is better than our railway system, that is designed to work forever, and that would place Australia as a leading nation in water management. To have something that we could export because it is world class is the first part, to work out strategies for securing water in a way that is fair and equitable is the second part and to set up the market so that we trade out of the problem, not into another problem, is the third part. Then things like income tax are the fine detail, but they are vital and as part of your terms of reference I would consider them.

Mr ADAMS—I certainly do not mind if we look at that. Just coming back to the trading situation of people setting a price for their water, I take it then that people—say, on the marginal land that I talked about—might say, ‘The future here on this piece of land doing what we are doing may not be the future for us or the family, and if we can get \$X for the water, we could move somewhere else.’ Then they would withdraw. Do we then need to take that land out of production? If the water comes off it, we will not have to worry, I suppose. Is that how the system would work?

Mr Young—There are two Xs that they can take, not one, and a number of different scenarios. There are options to sell the water permanently, as it is called, and then they could remain as a dryland farmer. So you remove irrigation from that land. Some of them would stay, and it would be amalgamated and managed differently. They might, as part of that, though, decide to keep their water holding and trade it ever year. This is one of the tensions that surround the debate at the moment. Do you have to be an irrigator to own water? The irrigator who says, ‘I am prepared to stop irrigating but I now want to profit from the value of water where it is most appropriately used’ is one model.

The other—and what is currently being talked about—is the arrangement where water has to be owned only by irrigators. Where people are forced to be irrigators if they hold an entitlement, the pain will be greater for the people who are part of the solution because there is an option to remain as a person who holds water but sells it every year to people who use it in a place where it is used most productively in the economy and causes the least environmental impact in terms of salinity and other damage. That is the discussion which we need to have, rather than one which is at a higher level saying, ‘Markets are bad, markets are bad.’ We need to understand the role of markets in the adjustment process, in helping people to adjust and cope with the changes that have to happen.

Mr ADAMS—Some people are also trying to say that land and water have a connection, but there is no legal status to that, as I understand it, in Australia—there is no constitutional head or anything to establish that. So it is quite possible to do what you were saying—for people to sell their water on a regular basis, sell it as one lump, I guess. Is that what you mean? Somebody could sell their right to the water that they have now, under a state licence or whatever.

Mr Young—That is right. They could sell their entitlement—their access entitlement, as people are now starting to call it—and I think there is a broad recognition now that in fact COAG made a serious mistake in 1993-94 in talking about rights, rather than learning from a lot of the legal history and experience that parliaments have had the world around and saying, ‘You do not actually legislate rights to land and so forth; you define entitlements and interests.’ There has been a commitment now at the highest level in Australia to shift towards talking about access entitlements, allocations and use licences and arrangements, obligations and responsibilities. But, conceptually, there is no reason why you cannot do that provided that the rules are right and you understand what markets will do.

I was talking earlier today and also yesterday about what the very smartest people are doing—or trying to do—at the moment, with the flaws in our system as we have it. If you have land in New South Wales, Victoria and South Australia, and you are very smart, you would have woken up to the fact that the water-sharing plans in some parts of New South Wales are proposing to reduce allocations by as much as 10 per cent, so you would have traded your water through into

South Australia so that the cuts would be made on someone else's water licence, rather than yours. You would have woken up about a month ago in South Australia and heard that your licence was going to have to be cut—first of all it was by 20 per cent, but it was cutting use by 20 per cent. It was then explained that, in fact, to cut use by 20 per cent you would have to cut allocations by 35 per cent. You need to think through why. So the smart person would then trade their water through into Victoria, so that they are not part of the 35 per cent cut, and then they can temporarily trade the water back. That is the sort of stuff smart people in smart markets do.

Mr ADAMS—Of course, and that is what happens all the time with markets. That is how people make money, as I understand it. There is an acceptance, I take it, at COAG level, that we have made mistakes in this decision making process from the early 1990s, and that maybe we have to look at redoing some of the things we did before. Is that a fair comment?

Mr Young—I am not a member of COAG.

Mr ADAMS—But you would have read most of the papers.

Mr Young—Across the nation, there is very serious discussion about the need to fix the problem. As I have already indicated, I think the way forward is to set up a process whereby a small group of people, a small team, are assigned the task of defining a framework that will work and will serve us for this century at least, if not for the centuries to come after that. That is not a big ask. The clues to the solution are around in all the states. There is a lot of bickering about which bits of which system are better. We, as a nation, need to rise above that and roll out something which will be a plan for the future.

Mr SCHULTZ—Whilst water covers a wide variety of geographic areas and usages, I want to raise the issue of the effect that the use of water, and the way water is released, is having on our ecosystem. I think each and every one of us over the years has realised that we are taking too much for granted the limited amount of water in this country, and we are using it as if it is coming from a supply that is never going to end. Over the years there has been constant criticism about irrigators and people who use water for their livelihood using too much of it or damaging the ecosystem in one way or another—whether it is salinity problems as an after-effect of flood irrigation or from putting it back into the ecosystem and saturating freshwater streams with salt.

One of the things that I have noticed as a member of parliament over the last 16 years is that all of that goes on—in this region, in particular—downstream from dams, such as Blowering Dam and Burrinjuck Dam. If you have a look at the damage that occurs and continues to occur downstream from both of those dams, you will see that the people who are supposedly managing water storages are doing far more damage to our system than other users downstream. An example of what I am talking about is the Tumut River. The Tumut River is now four times wider and one-eighth of the depth that it used to be. That is totally attributable to the way in which the water resources department in New South Wales have used the release of water over the years. It has created a massive problem for landholders and the community at large in the loss of productive land. That was a long-winded overview.

People say that those storages—depending on who you are talking to—are used for flood mitigation and/or irrigation. Have you given any thought to the issues that we should be addressing to highlight to governments—not only to land users but to governments—their role in

making sure that they use the water that they store more responsibly than they do? That was a long wind-up to a very short question.

Dr Meyer—I will try to capture the question: my understanding is that you are really asking about the impact of high flows associated with dam use, particularly on the river systems, the riverine areas and those land-holders close to them. It is certainly true to say that the high demand for irrigation downstream and for using those streams for high flows in the summer period has dramatically changed the nature of not only the rivers but the supply channels. So, effectively, they have become cold water, high-flow systems in summer, which are great for introduced species like trout—

Mr SCHULTZ—And platypus.

Dr Meyer—but are pretty poor in terms of native species. And, of course, that impacts on other areas. I am familiar with the Mitta Mitta region and the impact that those high flows have on the groundwater systems immediately adjacent to the river, which people use for pasture. There are fluctuating water tables within a few centimetres of the surface, for example. So there is no doubt that it causes major influences on the productive land and the ecosystems that are there. As long as you have a dependent irrigation area further downstream and as long as the capacity of the supply channels is limited effectively—relative to the demand—there is not much alternative but to flow the water as it is. The options that have been looked at are things like increasing the number of off-river storages further down and, of course, the notion of trying to increase the amount of water that you are putting through pipes or constructed supply channels of one sort or another.

Mr SCHULTZ—Which leads me to my next question. In your submission you talk about using water more efficiently, and you also make a very valid point about 70 per cent of initial stored water being lost in seepage and evaporation.

Dr Meyer—That is right.

Mr SCHULTZ—Have you thought very seriously about how to go about stopping that wastage and what that would mean for the concerns of the community at large today about the use of water? What would we do if we were able to obtain 70 per cent or 80 per cent of that water back into the system? In my view, it would just be another pool of water for people to call upon and we would be back to where we were. Have you thought about what needs to be done to save that water and stop it being wasted, and also what we should be doing with the water thereafter?

Dr Meyer—It is certainly true that, if you look at where losses occur within the system now from dam to use on and movement through plants—which is what we are trying to achieve—significant losses occur in the distribution systems and the flow in the river systems from dam release to point of off-take is an important part of that. Then of course there are the losses that occur on-farm with respect to water coming in the farm gate by the time it gets distributed through to the crop.

Going to the kinds of things that need to happen in terms of the distribution system, there would need to be increased emphasis on measurement for a start and better control structures.

Part of the major work of irrigation distribution companies is to improve both the monitoring and the control of their water distribution systems, and they can demonstrate significant savings from that. Piping of those volumes into irrigation areas would certainly be one way of saving water, but the economics of that are very questionable and it would need to be worked through.

Once you enter the irrigation areas, we know, for example, that changing irrigation practice through improved technology and management can result in significant savings. We question the impact that might have back on the ecosystems and managing rivers better, which is highly dependent on what happens with any water that is saved. Currently, part of the issue to do with water entitlement and how that is managed is that the savings, which come as a result of improvements in water use efficiency, actually result in a greater demand for water and an increase, either because of intensification of the current irrigation or because of an increase in the area of irrigation.

Mr SCHULTZ—That is the very point that I was trying to get to. Do we have any idea of what that 70 per cent loss is made up of in terms of gigalitres and the value of that water? Having established that cost, could we use that as a good argument for putting some considerable public and private money into what Richard Pratt has been advocating in terms of putting water into pipes?

Dr Meyer—The short answer is that we do not have a thorough analysis of that and are unable to say categorically where the losses are occurring, what the size of them are and what the trade-offs might be if you start to try and address the issues. We have some figures in general, but we would not be sufficiently confident in any of the numbers to be able to do that kind of rigorous economic analysis.

Mr SCHULTZ—Because of the different values of the different waters that we use.

Dr Meyer—Yes.

Mr SCHULTZ—Could we not realistically come up with some sort of a ballpark safety figure and use that figure as a sweetener to government to say, ‘This is what this water is worth. It’s going down the chute. It’s not benefiting anybody from an economic point of view.’ If you did the other exercise to find out how much it would cost not so much to put all the water system into pipes but to do it in stages over a period of time, you should be able to get some realistic figure that tells you whether or not it is a viable operation to invest in.

Dr Meyer—It is certainly possible to do that. Mike, perhaps you would comment on what has been done so far.

Mr Young—There is a lot of interest in doing this. It is a very simple process. Rather than commissioning lots of consultants to produce more and more reports and plans—

Mr SCHULTZ—We could have built 10 pipelines with what we have paid those people.

Mr Young—Yes. Rather than doing that, all you have to do is to go out and buy the water. The money will then be in the pockets of the irrigators and investors in the area. That money will give them the opportunity to put in those savings where they pay. If you do make savings, you

want to get that water back so that you can use it in flows. The flaw in the entitlement system we have at the moment is that any person who upgrades their water use gets to keep the savings. You actually take more water out of the river, so you make the problem worse, not better. One of the big flaws in the system is that, at the moment, every time somebody increases water use efficiency they actually make the river sicker, not better. That is not part of the solution. The solution is to put the money on the table. Where the cheapest solution is to stop irrigating totally, that is okay. If it pays to put in smart infrastructure then that is also a smart solution.

Australia has built an entire nation on smart investment, smart decisions and people being able to take risks and manage them. We do not need governments paying consultants and everybody else to write plans about what could happen. That work has already been done, and in most cases it does not pay. It is cheaper to buy water out. We need a very smart discovery. It is amazing how many farmers know where they can save 10 or 20 megalitres—small amounts. We need a process which gives them the chance to show that, rather than writing reports that are tabled in parliament.

Can I go back to one of your earlier questions, Mr Schultz? You were talking about the relationship between flows and river health. I think it is fair to say that the systems we have had in the past have been largely designed to supply irrigation water, with hardly any consideration of the environment. Professor Peter Cullen is in the audience tonight. I would urge you to invite him to make a presentation to you, as he is an Australian expert on this and someone who is deeply concerned about the health of our rivers. He would probably make the point that there is smart and there is dumb environmental water. As part of the restructuring that is going on, Australia needs to look for new institutional arrangements which are exciting and smart in the way that they deliver solutions.

There is considerable interest and discussion around setting up models where, at times when water is desperately needed for irrigation, water that is thought of as environmental water could be sold to irrigators. In times when a lot of water is needed for floods, you could then buy it back again. We could set up some trusts or banks or some other models whereby, rather than having a simple reduction in the cap, we can set up strong, smart institutional arrangements whereby we have win-win solutions—a win for the health of the river, wins for the environment and wins for irrigators. That is about thinking through smart solutions rather than naive, simple ones. I think Australia is smart enough to go to that next step where we are clever in the way we manage water: seeking environmental outcomes and economic gain at the same time, and restructuring at low cost without lots of fancy schemes.

CHAIR—Is the CSIRO undertaking any current research into better efficiency in the use of our water supply?

Dr Meyer—I can comment with respect to a number of initiatives on improved water use—everything from irrigation water use efficiency, where we are looking—

CHAIR—Is this currently being researched?

Dr Meyer—Yes, this is current research. I am currently involved, along with a number of people from CSIRO and other state agencies, in the development of a CRC for irrigation futures, which has got a very strong component of looking at water use efficiency, sustainability issues,

involvement with policy option development and so on. So, yes, there are a number of policy options, and then there is—

Mr FORREST—Is that CRC already established?

Dr Meyer—It comes into existence, hopefully, on 1 July.

Mr FORREST—Good.

CHAIR—I am sorry about losing one of our committee members but he has other commitments. I think we will have to wind it up very shortly but there are a couple of other questions.

Mr ADAMS—I just want to say that whenever Dr Ryan has come before me he has given professional and good advice. Whether I agree with that advice or not is another thing. I do not think this committee needs to be rude to the people who come before it.

CHAIR—Thank you for that contribution. Do you have anything to add, John, before we close the meeting?

Mr FORREST—Yes, but it is getting on.

CHAIR—Thank you very much for the time you have given us today. There are heaps of questions that I would have liked to ask. Would you have any objection if I send them in writing to you?

Dr Ryan—No.

CHAIR—I need the answers to them, but time did not permit this afternoon.

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

That this committee notes that the CSIRO document, as exhibited by Mr Young, be received as evidence before it at public hearing this day and authorises publication.

Committee adjourned at 6.21 p.m.