



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, 14 MAY 2003

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**HOUSE OF REPRESENTATIVES**  
**STANDING COMMITTEE ON AGRICULTURE, FISHERIES AND FORESTRY**

**Wednesday, 14 May 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 (*Acting Chair*), Mr Forrest, Mrs Ley, Mr Secker, Mr Schultz and Mr Windsor

**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.

**WITNESS**

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**Committee met at 5.15 p.m.****BEARE, Dr Stephen, Research Director, Australian Bureau of Agricultural and Resource Economics**

**ACTING CHAIR (Mr ADAMS)**—Welcome. Apologies for our chair's absence. She is away, and I am sitting in for her. I declare open this public hearing of the House of Representatives Standing Committee on Agriculture, Fisheries and Forestry inquiring into future water supplies for Australia's rural industries and communities. Today's hearing is the ninth hearing of the inquiry.

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; consequently they warrant the same respect as proceedings of the House itself. It is customary to remind witnesses that the giving of false or misleading evidence is a serious matter and may be regarded as contempt of parliament. Do you wish to make a statement in relation to your submission or would you care to make some introductory remarks?

**Dr Beare**—I would like to make a couple of introductory remarks.

**ACTING CHAIR**—We will keep this reasonably informal, so please do.

**Dr Beare**—I would like to make my time here as productive to the committee as possible and will take some direction from the committee as to what they are interested in. I have been working with water policy in Australia for almost 15 years, so I have a reasonably broad background.

**ACTING CHAIR**—You have a fair bit of knowledge then. Please give us your introduction. At its conclusion, I am sure there will be questions from the panel.

**Dr Beare**—To start with, water has always been a very difficult policy issue. One of the biggest problems in dealing with water is making a fundamental separation between issues which have to do with ownership and equity and those which have to do with the actual efficiency of water use. The comments that ABARE has put forward in this paper—and they are what I would put forward—deal with the latter and the fact that water reform really is about two things. First, it is about improving when, where and how water is used by essentially facilitating where the water gets at the lowest cost; and, second, it is about ensuring that the full costs or full environmental implications of water use are met by the users—and principally at the moment that at least seems to be the primary public concern. I believe that the role of government in this regard is to establish appropriate institutional arrangements to facilitate both of these aspects. An awful lot of progress still needs to be made to have the sorts of institutional arrangements in Australia that promote the effective use of water in agriculture and other uses. The paper that we have put forward details what I think are some of the absolutely key issues that need to be resolved.

A lot of times people say, 'We don't have well defined property rights for water,' but that is not necessarily so. A lot of times we have very well defined rights in terms of riparian access and other things like that. But these are rights that actually do not facilitate the best use of water. The

key is to think about our institutions and how they are working to effectively get water to the right places at the right times and to ensure that, in establishing those institutional arrangements, we do not lose sight of the fact that there are environmental implications.

An example is that, when we established the concept of making water trading a reality, we disassociated the right to the water from the land, making them separate so we could trade them. But, in doing that, we failed to acknowledge that where and when you use water is important. In fact we know that, for example, when we are using water in parts of the lower Mallee and in the river lands of South Australia, we are eventually using water over highly saline ground water conditions, as opposed to when we are using water in the Murrumbidgee—where we might have much cleaner water, in terms of its saline content, although we still have problems with rising watertables. We know that where we use it has to be taken into account, and we are going to need to think about not only the right to the water itself as an asset but also the right to use the water in a particular place. We need to think about how we are going to define those use rights so that they allow adaptation and promotion of good activities and are not so draconian and rigid that they stop investment and development. In doing so, we also have to think about use rights that essentially are potentially themselves tradeable—so that we can establish things like exchange rates between us. For example, one unit of water used in the Murrumbidgee would be half a unit of water, in terms of implications for the environment, used in the river lands. We need to allow these transactions to take place to ensure that investments take place—the flexibility—and that we get value out of the water. I think those are the more progressive sorts of institutional arrangements that we can make.

I certainly think there are progressive things that we can do in terms of public expenditure and promoting good activities in terms of what we do with water. Some cases in point would be in areas such as the river lands—or in some place like Mildura where we are pumping pressurised water and we have got water that is basically as saline as seawater in the system but we are on a system that, if we could move agriculture back from the river by 30, 20 or 10 kilometres, we could buy 100 years of cleaner water for the downstream areas, into South Australia. Is there a role for government in setting up institutions, and maybe subsidies or charges, in such a way that we would promote water being used in sites that have less impact on quality water in the river? I do not see us as quite moving yet to those sorts of progressive things.

**Mr WINDSOR**—Could you give an example of where that is happening?

**Dr Beare**—These sorts of things are not happening yet. We are not creating the incentives to see investment in irrigation take place in the right places. We also have to remember that it is going to take time for that to happen even if we do it.

**Mr WINDSOR**—Are there any examples of where you can buy 100 years of cleaner water?

**Dr Beare**—I think it has been pretty well established from the hydrogeological work that has been done in South Australia that moving water from 1½ kilometres within that sort of boundary right on the river back to about five kilometres will buy you about that 100 years, maybe—before the leakage from that particular system starts actually pushing water into the ground water system. But, of course, that is going to incur increased pumping costs. The question is whether we have a system that says it costs more to pump the water not as far as to pump it further. I think we have a lot more knowledge. When the irrigation systems were established we did not

understand the ground water systems, so we did not realise how important location was for what we were doing. For example, in the Mallee you have irrigation areas that are lined, with the water drifting right into the river, and then you have a bend in the river and the ground water system is flowing away. Had we located the irrigation system—by chance, at that time—in the right spot, we would not have the same intensity of problems. Now we have a chance to start thinking about the incentives to start getting that to move, but we also have to remember that we have got to be a bit patient about that, because somebody starting a new greenfields investment faces the full costs of putting up the vineyards, whereas somebody who has a 10-year-old valencia orchard, even though it is not returning a lot, is still better off than if they were starting it from scratch. So we have to realise that these investments either have to be helped out or moved out, or we have to be willing to wait for these sorts of activities to take place.

**ACTING CHAIR**—Are there any models? I have seen something in South Australia where what you are talking about has been done—to use water where it is, in a better way. Has any modelling been done?

**Dr Beare**—We have done extensive modelling with our SALSA model, which is a land use simulation model that looks specifically at those issues across the entire Murray-Darling Basin. The South Australian government, in cooperation with CSIRO, is also developing more refined models to look at the same sorts of issues.

I do not want to be overly South Australia-centric about it. If you look at what is happening on the Murray River, you know where most of the salt starts. We look at the audit and say, 'This is going to increase.' Most of our irrigation areas are fairly mature, so they are not necessarily going to be a new contributor to salt, yet they are probably the area where we can take the action to address the problems. Even though the salt might be mobilised from other places in the landscape due to land clearing—which is very difficult to manage because large-scale reforestation and revegetation exercises have significant implications for agriculture and the levels of water that are available—we could take some significant action in irrigation areas and do interception works. Some of the modelling work that we did suggests that, if you could simply increase water use efficiency by five per cent in the Riverina, you could arrest the salinity trend at Morgan. The irrigation scientists down there do not see that as a problem. It is mostly on-farm practices. It is not huge irrigation investments, but rather better technology on-farm, such as using a moisture probe stop in the deep penetration of water with overwetting the soil profile. A lot of action can be taken.

We should recognise that the farmers themselves do not reap the full benefits of that. They are generating flow-on benefits downstream, and there is a good argument that you can either assist the farmers to do it or you can penalise them for doing it. To be honest, South Australia seems to be taking a penalisation approach in terms of requiring people to reach certain standards. An alternative—and we have put out a paper on this that I am happy to provide to the committee—might even be to hold an auction and let farmers volunteer what they would require and what sorts of funds they would require to achieve certain targets and water use efficiency. We do not have to be prescriptive with them. We can let them decide, and they can enter into the contracts, agree to improve efficiency and receive, I guess we would say, cost-effective money from government to get that. It would be a competitive system. We should be trialling some of these ideas to see where we can move forward. We should not go into these things and say that we should just do them across the board. They need to be trialled, because there are a lot of things

that you should probably have thought about, but you forgot when you did not quite get there in the design phase.

**Mr SECKER**—You have spoken a few times about the best use of water. There is the argument that goes on among farmers, irrigators and scientists about where you stop or start charging for water. Do you charge for the water that naturally falls upon the ground? Do you charge for the rainfall that runs off into dams on the property? Do you charge for the water that farmers pump from underground? Or are you basically talking about pumping water out of the river system?

**Dr Beare**—First of all, we have to accept that we are never going to get a system of property rights to deal with water completely. An example of how complicated it is is that farmers in northern New South Wales have been encouraged to put in minimum till and increase the carbon content of the soil. That has increased potential water retention by 20 to 30 per cent on-farm. It is excellent for that particular farm.

**ACTING CHAIR**—He is an expert on that.

**Dr Beare**—But people's dams downstream are not filling, because the water is not running off and penetrating the ground water system. In some places that is good and in some places that is detrimental, so we cannot expect to have a full system. Fundamentally, from a purely economic perspective, we do not charge for water. We charge for the services that we provide through water, so we charge for the infrastructure we require to store and deliver water. There is no real need to charge for water unless the government decides it wants a return beyond that.

**Mr SECKER**—That is not quite true, because in Queensland—and I am sure it happens all over the place—they auction off water licences from dams that they have built, and you really do have more than a delivery cost or infrastructure cost; you have the cost of water as well.

**ACTING CHAIR**—I pay for the water in my own house.

**Mr WINDSOR**—Not much.

**Dr Beare**—Yes. This is a question about separating the issue of ownership of the right to harvest from the allocation. That is a right, and it is worth something. In some cases it is worth a tremendous amount. That is an equity issue: 'If I own it, I'll charge you for it.' But underpinning that is the way the water is going to be used and where it is going to be sent. It is an issue of charging for the cost of getting the water there and any adverse impacts that that might have on environmental assets or downstream users.

So there are two distinct issues. This is one of the things that people do not recognise. Let us say that water is worth \$50 a megalitre on a short-term basis and we have a \$20 delivery charge. That is a cost of \$70. If we double that charge to \$40, we will have no impact on water use. It will simply rate down the asset value. Instead of being worth \$50, it will be worth \$30, and water will be used exactly as it was. All you have done is take the assets away. But if you change the delivery charges and that sort of thing to the point where they have to exceed the value of the asset in order to get some sort of distributional—



**Mr SECKER**—You talk about tradeable rights, and that theory has been around for quite a while—and I suppose with some of those auction systems they would be tradeable; you can sell them off to someone. We have a certain amount of tradeable rights now along the Murray-Darling system. We do not have a full system, I agree with you, but how do we actually work out whether it is going to achieve what we are looking at? I am probably being a bit clumsy in how I am describing this, but we have seen data that says water for growing flowers or vegetables might be worth \$1,000 a megalitre, but for growing dairy might only be worth \$50 a megalitre. The trouble is that you can only grow so many flowers and so many vegetables in a market. How do you get across this problem of saying you are going to pay more to grow vegetables than if you are going to grow pasture for dairies or vineyards or whatever?

**Dr Beare**—A tremendous amount of water in Australia is used on very low valued activities. It is generally recognised that Australia is the only continent on the globe that actually still uses water to produce meat, which is an interesting phenomenon. We have a lot of water, actually. We do not have it during a drought but, generally speaking, an abundance of water relative to the activities and returns we have is not the issue. The issue, I think, is that up until 1995 before the cap was in place, there were no limits on diversions and there were no restrictions, so the only value was in the infrastructure. When they put the cap in place, you capped it virtually where it already was so you would not really expect there to be a great need for a marketplace to readjust water, because there really are not any constraints on it. But now, as time has passed, things have started to change and we think about the introduction of something like environmental flows and demands from the environment. That will mean increased pressure to have a marketplace. But, in order to move to higher value uses, people have to make investments. In a period where water is going through significant reform, it is very difficult to make long-term investments in irrigation infrastructure with any degree of security, and they are substantially big investments. We know that horticulture is a high-return activity relative to use in something like producing fat lambs or dairy.

**Mr SECKER**—We do not call them that any more; they are prime lambs now.

**Dr Beare**—I am showing my age! The point being that, if you look at what you would pay for some mallee or riverland with nothing on it compared with what you would pay for an established vineyard or orchard, you are talking about tying up a massive amount of money. Yes, that farmer will be willing to pay an arm and a leg to keep his water, but all that is doing is lowering his return on the investment that he originally made in the first instance under certain expectations about his access rights and his charges and the less certain that is. So you are really getting into a situation where you do not have rights and you do not have a market, which almost prevents people from making investments which are going to generate what you need.

**Mr SECKER**—If you charged \$100 a megalitre, you would basically stop rice growing and cotton growing and probably most dairying in Australia overnight.

**Dr Beare**—Yes, you would stop almost all your pasture because you would lose most of your crop.

**Mr SECKER**—That might be okay, but there is going to be a hell of a reduction in the wealth creation in Australia if you do that.

**Dr Beare**—I do not want to say on the *Hansard* that that is going to be okay—but the point is taken. You can easily price out an awful lot of activity. I would like to diverge a little bit and talk about the context of environmental flows. With regard to environmental flows—although the last ministerial council suggested that they are less than the reference points that we were talking about—if we take a significant amount of water away and put it into the environment, we have a marker. That will redirect the water to its highest level and we will see that most of the horticulture there will be running at the same levels they were. They will be running at reduced profit margins, but we will see a lot move out. We could compensate those individuals, but they will move to the coast and the structural adjustment problem will still be there because you will have a situation where—

**Mr SECKER**—And you will not have people living in inland Australia.

**Dr Beare**—Instead of 50-hectare properties, we will need to have 1,500-, 2,000- or 2,500-hectare properties. So, to see beneath the issues between equity and structure, we always need to look at what will physically happen in these places as well as what will happen in terms of the equity.

**Mr SECKER**—I will come back to my original question then. You are really only talking about promoting tradeable rights for river water. Are you also saying that it should be for underground water as well? It is pretty hard to trade underground water because some places do not have it. If you go that far, do you start charging for water for people's rainwater tanks? Where do you stop charging for water?

**Dr Beare**—We probably do not understand our ground water systems well enough to trade effectively across them, because they are connected or not connected. So what I do might influence you and, if what I am doing influences you, then there is a reason, potentially, to introduce a set of charges to address that problem. For example, if I sell my water to you and that causes your aquifer to drop and that influences—

**Mr SECKER**—Charges or restrictions?

**Dr Beare**—Restrictions or charges, yes. As to whether that extends to rainwater tanks, it depends on the external flow-on effects.

**Mr SECKER**—I think there is a pretty fair and strong argument to say that the rainfall that lands on your land you can use for growing wheat crops or filling up a dam—provided it is only on your property or the water is coming from your property—or to fill up your rainwater tanks. In fact, what they use for irrigation equivalents is the basis of how much the underground aquifer is being replenished.

**Dr Beare**—I think I can give you an answer to your question. You stop charging or restricting water use when the costs of doing it are too high to give you a more beneficial reallocation of the water to better uses. With trying to restrict people in households and rainwater taps, how is that water going to be reallocated? Is it really going to go more efficient uses? Are you going to be able to put in a system that is going to make that work better? How much is it going to cost? Is it worth it? The answer is probably no. Are you going to put in 40,000 hectares of trees above Burrinjuck Dam that are probably going to reduce run-off from about 1½ megs per hectare? I

would think carefully about that one and make sure the forestry industry is prepared to pay for the water rights for that. So the questions go to whether it is significant enough to intervene in and whether the intervention is going to happen.

**Mr SECKER**—On the same basis you could say, ‘Well, you shouldn’t grow a wheat crop.’

**ACTING CHAIR**—Of course.

**Mr SECKER**—That would do the same thing.

**ACTING CHAIR**—It is then a decision for the country as to whether it restructures its pastoral industries or whatever.

**Dr Beare**—We are looking at the question of system level water use efficiency. We are actually trying to verify whether it is worth acquiring some information from an organisation called WaterWatch in the Netherlands. They can provide evapotranspiration across the landscape from satellite imagery data. From that data we could then look at the agricultural returns we are getting and we could get a feel for how effective we are being overall—because, ultimately, it is transpiration use, as we would understand it—and whether we are getting the maximum return for our transpiration. It is an interesting question. But would we, knowing that, be willing to change the social engineering to try to improve that? I do not know.

**ACTING CHAIR**—So that is an acceptance that there is only so much moisture in the system?

**Dr Beare**—Yes.

**ACTING CHAIR**—But we have not reached that conclusion in our minds. I do not think many people have.

**Ms LEY**—Dr Beare, I represent the New South Wales Murray and we are very involved with the environmental flows process. Is your background as an economist or as an environmental scientist—or a bit of both?

**Dr Beare**—My background is in genetics and statistics and economics, but I have spent a large part of my career working with scientists in attempts to do integrated assessment and integrated modelling. So I have had a fair bit of exposure to a fairly wide range, but I would say that my experience on ecology is relatively limited.

**Ms LEY**—But ABARE provides advice on economic issues, doesn’t it?

**Dr Beare**—Yes, indeed.

**Ms LEY**—And you would be aware of the Living Murray process.

**Dr Beare**—Yes.

**Ms LEY**—There is under way at the moment a socioeconomic study, looking to report in about August, of the economic effects of adding certain amounts of environmental flows. Do you know anything about how that economic study is going to be carried out or what methodology it is using?

**Dr Beare**—We were involved in the study as a supplier of information at one stage. I have also participated in meetings and discussions. The work that we have been doing has principally been about trying to say what the cost is to agriculture of providing the flows. That is the principal work that we have been doing. I have comments about some of the other aspects, but I would have to say that my personal comment is not necessarily reflective of my agency.

**Ms LEY**—Broadly, how are you calculating those costs?

**Dr Beare**—In the case of most broadacre activities, including rice production, we use ABARE's farm survey estimates of the returns. If you survey farms you principally get tax based accounts and you notice that there is probably no point in farming. But, if you look at land values, you realise that there are returns to farming and there are good commercial returns to good farming. So we use the land values to try to ascertain the fully capitalised margins of these activities. We also use, for example, valuer information for the industries that are not surveyed—principally the horticultural industries. We then statistically fit what we think is the distribution of those returns within the region and then, as we remove the water, we take the water away from the lowest returning activities until we get the water supplies. We then look at the gross changes in the returns to the land and management after we have done that, and that is how we do the calculation—not that that is that clear. It is a consistent approach that we can apply across the entire lower Murray. I think it is reasonably robust in terms of its overall orders of magnitude; however, I would not suggest that it is a means for calculating compensation. It is not that good.

**Ms LEY**—No, I was not suggesting it was. But obviously there has to be some benefit cost analysis produced for the next ministerial council meeting.

**Dr Beare**—Yes.

**Ms LEY**—If you work out the lost agricultural production—maybe even in gross terms; obviously not in net terms—what calculation do you do that represents the flow-on of that primary industry in an area that has towns, secondary industries, trade and obviously all those supporting activities? Broadly, it is a multiplier, isn't it? But rather than just provide a blanket one, how do you do that?

**Dr Beare**—We do a net calculation on-farm rather than a gross calculation. We have recognised the increasing need for information about the flow-on effects to towns and communities. As part of our work program we have put forward a project to use some regional general equilibrium models to start making those assessments on a more complete basis, because we really have not been able to do that. Generally speaking, the multipliers tend to be a little too big, and by the time you finish multiplying them they tend to be more valuable than the continent itself! We want to put some care into and some closure on it, so we are planning to spend the next year addressing that kind of issue, to the point where we think that, if we do a good job of essentially getting the economy of the region right, we will be able to tie that back to the key

regional centres. When you get out of the ag and the mining direct the balance of the economy should look pretty much like its regional centres, so we can start getting some ideas about employment effects and demand for services effects. But it is not just for water: it is for drought and a whole range of activities where we want to be able to look at these effects. To date we have not done anything central.

**Ms LEY**—If you are using general equilibrium models—and it sounds a little new and exploratory in some respects—what is your understanding of what will be presented in August to the communities along the Murray as far as the economic loss in their area? They have been told that this calculation will be done and will be presented by the end of the year, but you have said it will take 12 months and you are still talking about models.

**Dr Beare**—I am saying that from ABARE's perspective. ABARE, at this point in time, has been able to do an assessment of the direct costs on-farm. We have not been able to do an assessment of the flow-on and community effects. I think there are two things that need to be thought about here and there is some other work that needs to be done. I have not seen where they are, so I do not want to comment unfairly, but if this happens it depends on how it happens and whether we have an effective water market running underneath this. At the moment, I would be loath to see large-scale changes in something like environmental flows until I saw we had a reasonably good water market to make sure that we did minimise the cost. It makes a huge difference to what happens if we have an effective water market essentially saying that this water for the environment is going to come out of the lowest returning activities. It would be better still if we had a water market that recognised environmental damages and said that it should come not only from the lowest activities but also from areas that are low activity and are returning a lot of salt to the river. I would suggest that areas like Barr Creek are problematic areas with a lot of salt going in. If we can get that kind of outcome, that would be good. We have done some irrigation studies. I think we know where the water will come from. We know roughly the kinds of activities and where it will come from. We ought not focus on the whole thing. We probably should focus on the key areas that are going to lose water and do some small-scale sensitive studies about those particular areas.

**Ms LEY**—We do not know what activities the water is going to come from. Can you enlighten us?

**Dr Beare**—I am happy to provide the committee with a report that provides a pretty good breakdown of the marginal returns to water and what the various activities are.

**Ms LEY**—I think we saw that with our land and water people. I am totally unconvinced about the methodology used. I wonder if you could talk about the way you calculate the benefits or value the benefits of environmental flows.

**Dr Beare**—I will have to diverge a little. We do not value environmental flows; in fact, I do not even know what environmental flows mean. I have seen people going ahead and constructing indices of river health on the basis of things like torpidity, flows and pH. I do not know what that means, and I certainly do not think it means the same thing in every place on the river. Creating those indexes allows people to make value judgments about what is good and what is bad on the river. I think environmental flows ought to be about concrete outcomes—

about real things. When you ask what the real things are, nine times out of 10 they will tell you one thing: that we should flood the Barmah Forest.

**Ms LEY**—We are already doing that, very successfully.

**Dr Beare**—I could flood that forest by raising the entire river to the point where it would flood, or—if I listened to my engineers down in Griffith—I could get a little floating barge and put it in front of there and flood it out for half the price. So maybe we ought to think about what environmental outcomes we want to have and how we can turn our engineers and rocket scientists to doing that sort of stuff at a good cost, rather than simply say, broad brush, ‘We’re going to give a big chunk of water to an environmental manager.’ That is a personal comment.

**Ms LEY**—As you probably know, we are flooding half the river to flood the Barmah Forest at the moment.

**ACTING CHAIR**—What is the outcome of that, Susan? Could you enlighten the rest of us?

**Ms LEY**—The Barmah Forest is a world-class wetland, and I am hoping when the committee comes to my area we can look at it.

**ACTING CHAIR**—Is that a Ramsar site?

**Ms LEY**—Yes. The outcome is that it is just a completely inefficient way of getting the water into the critical wetlands area. So, to get it there, it also is providing minor flooding to huge tracts of the river where it does not need to be flooded. So there is a lot of water with, yes, our outcome with respect to the Barmah Forest—but a lot of additional flooding as well. I have one last question. I do have lots more, but others have questions too. What is your personal view on the environmental flows process in the Murray—if that is not an unfair question?

**Dr Beare**—It is not an unfair question. I think that the process was initially too private. A lot of work was done and a lot of discussions were had that were seen to be within the domain of the commission, the states and the Commonwealth. It probably would have been better had it been opened up earlier in terms of getting a wider spread of consultation and viewpoints. I think it would have been easier had that happened in the first instance.

**ACTING CHAIR**—Could you elaborate on that? When you say ‘commission’, are you talking about the Murray-Darling Basin Commission?

**Dr Beare**—Yes, the Murray-Darling Basin Commission. A number of preliminary studies were done but, because everyone thought they were very sensitive things and people would worry about them a lot—which they will—they were done in that way. It probably should have been open at the very beginning, and they should have said, ‘This is what we are thinking about doing.’ But that is a personal opinion about the process. Beyond the process, I think they are focusing too much on the economics. I think *The living Murray* is a nice, balanced document—it is not a bad document—but there is not enough focus on what you are going to achieve with environmental flows.

**Ms LEY**—You just said that they are focusing too much on the economics.

**Dr Beare**—I think more definition needs to be given in terms of what the benefits of environmental flows are.

**Ms LEY**—Economic benefits?

**Dr Beare**—Even just conceptual benefits and what they are going to be doing with it. If you think about it carefully, they say that we need 30 or 40 per cent of water to get pristine conditions or returns. Is that real? Can we ever go into pristine conditions? Is that what we really want? What is our view of the environment that we want? Once we have that view, I guess we can go out and try to get it. But I do not see a cohesive view as to what people really want. To me, that is an important aspect of this environmental flows debate that has not come forward. Everybody is worried about the economics of it—but we could have bought the water for \$300 million.

**ACTING CHAIR**—Is that all—\$300 million?

**Dr Beare**—I think that is roughly what it would have cost.

**Ms LEY**—But we would have then closed down farming activities.

**Dr Beare**—We would have had to wear structural adjustment issues and stuff. I agree that there would have been things that would have had to have been done.

**Mr SECKER**—What we need is a good flow—a natural one.

**ACTING CHAIR**—Suspend democracy for a decade.

**Dr Beare**—We can do a reasonable job of costing these things but we really have not been able to do much about the benefit side. I do not necessarily believe it is important to put dollars on environmental outcomes. I do not believe that is necessary, but I think you have to have a clear set of environmental outcomes to offer up to the community so that they can make a judgment.

**Mr FORREST**—I represent an area which includes about 800 kilometres of the Murray Valley on the Victorian side. Ms Ley represents the northern side in New South Wales There are probably 50,000 irrigators.

**Mr SECKER**—I represent the southern side.

**Mr FORREST**—We have about 1,500 kilometres of the Murray tied up here. I read your submission, and the hairs were standing up on the back of my head. I know that they are tough questions and we have to be adult enough to answer them. If I could just summarise what I gleaned out of your suggestions about water pricing, you are actually saying that the water market now has tested our capacity to buy the rights to water, and we will pay up to \$1,500 for the right to have access to a megalitre of water, but that does not give us a drop of water; it just gives us the right to have access to it. After that there is a cost for a public supply. If I am in a public system, there is the cost to the water authority to get the water delivered to my property or, if I am a private diverter, I put my own pumps in and I pay all the costs for electricity,

pumping and so on. But in all of that there is no value for the water. I think that is what your submission is saying—that there is no actual value for a glass of water. If I buy a glass full of beer, I will pay \$2, but with water I will pay less than 0.005 cents. I think that is what your submission said to me.

**Dr Beare**—I am sorry, I do not write well then. We have put in this infrastructure that allows us to harvest water—and we are talking here about regulated systems—and allows us to redirect the timing of when we use the water. That is what storages are principally about. We have put in channels to allow us to redirect water to areas where we want to use it. That is all costed, and it has to be paid for—and it should be paid for: if it is a sound economic investment, it should pay for itself.

We use that water to produce anything we wish—for example, rice; I do not have anything particular against rice—and we receive a net return on that water. It might return \$20 a megalitre as a return. Whether you as the land-holder and the manager of the property see that \$20, because you own the entitlement to the water, or whether you have to, in essence, compete with others and pay for that water in a market where somebody else owns the asset, that is what is happening. There has got to be a return to you as a land-holder or a manager and there is a return to the water as an asset. Who gets that return depends on who owns it. Again, it is a question of separating out the ownership of the asset versus the return to water as a commodity, as a productive input.

**Mr FORREST**—But you are actually saying that we are not paying enough for water.

**Dr Beare**—No. I think that in some cases we are not paying enough for water, because we are not necessarily seeing the full cost of what we do and our uses. For example, to take a case in point, if we think about the water being used in the Goulburn-Broken, the ground water systems there are pretty clean, the return flows are clean and in fact the water that is not used and transpired up comes back down to the system and becomes return flows that are either available for the environment or for other irrigators—and it is fairly fresh. For the most part, you would probably not be too worried about the external impacts of irrigation there. Where we think about some place like Barr Creek or Mildura, where we are sitting on top of hypersaline ground water and we are pushing that hypersaline ground water into the river system, that external effect imposes a real cost downstream in terms of reduced yields to agricultural producers and increased urban development costs for urban users. So there is a real cost that is not being borne, and more water is probably being used there than we would really wish—or it is not being used as efficiently as it should. So we need an increase in the price of water, either to stop the use of it or to get people to use it more efficiently. And that is sensible: it is not necessary but it is sensible.

I will give you another example of the sort of thing we deal with. I have heard people say that in the Goulburn-Broken area it is a really good thing that they are going to be moving a lot of irrigation from furrow to either drip or sprinkler, and they will be saving virtually half their losses. That is not necessarily a good thing, because if the farmers retain that water right and they use it and they expand their activities it will actually work the river harder, and they will transpire more and there will be water that is not coming downstream for other users—and that is clean and potentially quite fresh water.



**CHAIR**—That is the water that runs back, and if you use it more efficiently and use—

**Dr Beare**—And then you give the rights to the water to the irrigators who made the saving. In some cases there is an argument to be made that potentially if you save water in this particular location, you should have to share it with the environment or the other downstream irrigators.

**CHAIR**—Who is saying that? Just stretch that out a bit, because it is a very important point. This is the flow back to the rivers from irrigation: if you change the irrigation and make it more efficient, you then do not get the flow back to the rivers.

**Dr Beare**—At the moment, if an irrigator saves water on a farm, they will save 100 per cent of the—

**CHAIR**—How are we handling that and what is out there to—

**Dr Beare**—In some cases that is fine, and in some cases it is probably a detriment—or at least imposes costs downstream that need to be considered—and in some cases it generates an environmental benefit. If you increase water use efficiency in the problematic areas, you will see a net environmental benefit. In fact, irrigators need more incentives than they would naturally see, for that to happen. So it is where it is happening that matters.

**CHAIR**—So making people more efficient is not just the answer; you have to look at where the water is being used—on what land and which area.

**Dr Beare**—I am not an expert on specific irrigation areas, but I understand the MIA virtually has no return flows from it at all, and so any savings you make in the MIA are true savings, but I understand that if you make the same savings in Coleambally there are return flows that you would potentially have to consider in terms of what is available to other users.

**Mr SECKER**—The return flow can also have a pollution problem.

**Dr Beare**—Yes, in terms of both salt and chemical run-off.

**Mr SECKER**—And faeces?

**Dr Beare**—Yes.

**Mr FORREST**—What you are saying is that there is a cost in the process, and this is post-irrigation and impacts on the river and so on. You have said that pretty clearly. The challenge is: who should pick up that cost? That is the real challenge, because ABARE constantly tells us that primary producers are pricetakers and it is almost impossible to pass on an increased cost to them. Is there a capacity for the broader community to pick up some of these costs?

**ACTING CHAIR**—Who pays for a sustainable environment?

**Dr Beare**—Again I think a good example is that of getting increased water use efficiency in the Riverland and in the Victorian Mallee. There are positive benefits to downstream users.

There are lots of them. There is a 'free rider' problem, because, if someone invests upstream, everybody else gets the benefits and they do not capture them all.

**Mr FORREST**—I have them all. You have already mentioned Barr Creek. I have every possible variant of the problem, and so does Sussan—so who is going to pay?

**Dr Beare**—The question really comes down then to the fact that we need to get some sort of public investment or public intervention to get the right outcome. We only have two possibilities. One possibility is to wreck regulation by the states, which is I think what is happening mostly in South Australia. We have the option to essentially use Commonwealth and state funds to subsidise these activities. It is an interesting case as to whether or not you could go in and tax in any way, because it is unconstitutional, as I understand it, because the states basically have the responsibility for the resource but they cannot tax. I am not a lawyer, but it might be that if you tried to, for example, levy charges—

**CHAIR**—Unconstitutional across state borders.

**Mr FORREST**—The Constitution presents us with a lot of problems when it comes to water.

**Dr Beare**—With resource management in general—you take away one half of your tools. Even though people hate the sound of taxes, taxes are actually much more flexible than things like quantity restrictions. If you think about it, if you have a salt credit scheme and it is really limiting the total volume of water that is available, what happens when you get a hot, dry year and commodity prices are good? There is no flexibility in the system for farmers to pay or adjust to take advantage of that, whereas if it were a tax based system they could keep it moving. I think it is important to remember that quantity based restrictions are not flexible in terms of how they deal with adverse demand conditions. There is an argument to be made there.

**ACTING CHAIR**—Do you mean that in some years there is more water than in other years?

**Dr Beare**—It is not so much the supply side but the demand side that is the problem. If you have a year that is very hot and dry all of a sudden it is worth a lot more to get that water in there and yet you have an absolute quantity restriction on it.

**Mr SECKER**—That is the problem: when it is hot and dry is when you need to water the most and that is when the water is not there.

**ACTING CHAIR**—And that is when it gets more expensive.

**Dr Beare**—You can see how this stuff gets a little unpopular: we know, in the Murrumbidgee, that during the summer in most years those channels are running at 100 per cent. They are just flat out. If you want to put in a new investment, for example, in a vineyard or something, and you cannot get reliable delivery of the water at the time you want it because you are competing with a bunch of other people who are engaged in pasture based activities or opportunistic activities—and you all have the same access rights to the channel infrastructure; there is no charging for that—then that is a problem. One way to settle that problem would be to say that water is more expensive in the summer. You could fix it that way, but people would not like it.

**ACTING CHAIR**—No, they would not.

**Dr Beare**—They would not like it, but it would work. It would be unpopular but it would work. So how do we engineer something that is not going to be quite so unpopular but might give us that same security of access and timing that would allow us to see the investments take place in higher risk activities that require water to be delivered at the right time? But that is what reform is about, I think—trying to get those things dealt with.

**Mr WINDSOR**—I think you have hit on a very important point. I do not want to say something you have not said, but what I think you are saying is that there are no blanket solutions and we really have not developed a policy that has an outcome yet. We are still very simplistic. If you want to overcome the salt problem in the Murray below Morgan, you just double the flow and halve the VC. What you are saying is that there have to be better ways of doing that—and the same with the Barmah Forest. We are talking about a national inquiry here. I do not think the states have even got to that level. The CSIRO have got all this tremendous modelling as to what will happen in the future if we do not do this and we do not do that and where you have weirs across the Murray-Darling—in terms of salt loads and all that sort of stuff, and what is happening with the Grampians. If you ask them to model backwards and tell us what it was like before any dams were put in, they say, ‘Gee, we haven’t done that.’ Are you saying, regarding policy, that we have to decide what we want rather than deal with the symptoms?

**ACTING CHAIR**—Good question. Let us have your intellect on that one.

**Mr WINDSOR**—Maybe I am getting it wrong.

**Dr Beare**—I very much agree that we really need to have a set of outcomes that we really want to get. Generally speaking, we have agreed that we want to hold the line at Morgan. I think actually that to some extent we have been overly Morgan-centric. But, if that is what we want, and I go after it with engineering works and I try to improve irrigation efficiency and move irrigation back from the water and the river fronts as much as I can—in a very narrow area, probably starting in Mildura and running down to about Lock 2, that will—

**Mr FORREST**—But I think that is happening.

**Dr Beare**—It is happening. I am not saying that people are ignorant of the whole thing, but I think that sort of thing should be supported. It is sound and well targeted.

**ACTING CHAIR**—But haven’t goals been set by a ministerial council?

**Mr FORREST**—Yes.

**Mr SECKER**—By COAG.

**ACTING CHAIR**—So COAG has set them. So you do not think that they are the right goals?

**Mr SECKER**—Doesn’t the major policy question come down to whether it is better to spend public moneys on creating better efficiency with respect to the existing resources or to go down the road of taxing, levying or charging for water? Isn’t that the major policy question?

**Dr Beare**—I do not think I quite know the answer to your questions, but I will answer both of them as best I can. First of all, what we want to do, to the maximum degree possible, is to set up the right investment incentives; to get people investing in the right activities and to provide an incentive, whether it be a subsidy or a tax, so that it makes up the difference between what is right from a private investment point of view and what is going to get the right investment from what we think is a public investment point of view. That, to me, is the central aspect of what your institutions are supposed to be doing. You ask whether it should be a subsidy or a tax. Subsidies have certain advantages in their own right because they attract people to come out and volunteer and take part. You can use them quite effectively, especially if you go through a competitive tendering process to ensure that you are getting reasonable return for the public expenditure. Aside from constitutional problems, you have all sorts of compliance and avoidance costs associated with taxes, but in many cases these activities are very large scale and they draw potentially on public expenditure. It is quite large and significant. It is competing with a whole host of things.

**Mr WINDSOR**—If one of the problems is that there is not enough water in the river, why wouldn't government just enter the water market and buy the stuff?

**Dr Beare**—Why wouldn't it? It is the most effective way to get it. In a discussion with one of the district operators in the Murrumbidgee, I asked whether they got to keep all the water they saved as an irrigation district. The answer was yes, so I asked why they were not lining their channels and saving the water. The answer was that it is not worth it.

**Mr SECKER**—Pumping is expensive. I could do that on my property with irrigation, but it is a double cost.

**Dr Beare**—Yes, it is not worth it. So why would the government go in and buy water through interventions in terms of saving water if it could be doing it much more cheaply by just going to a market and getting it?

**Mr FORREST**—Also, a government participating in a commercial water market is a major distortion.

**Ms LEY**—Yes; because the government can pay.

**Dr Beare**—You are dealing with a market that is already totally distorted by state governments that decide that your water right is exactly what you have and they tell you what you are going to get.

**Mr SECKER**—Every election they promise a new dam and a new irrigation scheme.

**Dr Beare**—Care needs to be taken. We do not want the government intervening in a way that will allow opportunism. I will retract a bit of what I said. There are instances where the government could go in and save water for good environmental outcomes. There are places to go. My argument would be that there has been this notion that we have taken water out of the Snowy for the Snowy and it is not coming down to the Murrumbidgee, so we should save the water in the Murrumbidgee. It does not really gel. We know the Murrumbidgee is actually supplying South Australia with water, so why don't we save the water down lower where it will

do us a bit more good and account for it there? I think you need to look at the system entirely—to take a broad view of it and recognise that the opportunities will be highly specific and highly localised. There are definitely positive things that can be done, at least on the lower river. I think it is a lot tougher to do stuff up north.

**Ms LEY**—I think we have to recognise that dissociating a water right from the land has huge social implications. I can already see it in areas in my electorate, where I have heard anecdotally that people are selling out because of the drought. The land has been left and the water has gone, permanently traded out, even to the point where people are appealing to those selling not to do that. It only has to happen in a small percentage of farms, and you have really changed the regional economy of a small town. It is happening now.

**Dr Beare**—That is fixable. One has to recognise that water rights are not just things in dams. Water rights are rights to infrastructure, and water rights are the way you are being charged for your infrastructure and access. That is all bundled up in your rights. If you do not do two-part charging on infrastructure charges, you will get stranded assets. That will happen. If I am in your irrigation area and I sell my water out, the balance of the fixed charges are now levied upon a reduced population and the charges go up.

**Ms LEY**—I think you have to leave a percentage of your water. I think it is 40 per cent in this particular instance, but you can permanently trade out 60 per cent. Under COAG we have to have this fully efficient water market. I think we were supposed to have it by February.

**Dr Beare**—But you are trading a water right that is not correct. The correct water right says that if you are in an irrigation area and you have a set of fixed charges—those charges that are not volumetric sensitive, such as channels et cetera—you cannot escape those charges by selling your water out.

**Mr WINDSOR**—That is only where you have a community asset. There is a lot of variation that does not apply.

**Dr Beare**—To that extent you have a real problem, I have to agree. If people are going to sell out the water, it will raise other people's costs to a significant degree. That should not be happening. The converse is true. Where it is going, their costs are being lowered because we are putting all our charges on a volumetric basis, and it is not the right thing to do. We could do something constructive there but it is confusing and irrigators are not certain. I have a lot of sympathy for that; nothing about water has ever been transparent. With reform processes, people are nervous about anything you might do. Most people in New South Wales think that they have a volumetric entitlement, but they actually have a share entitlement unless they own a secure water right. They call it a volume, but they mean a share. It has been confused. I do not say it has intentionally been confused, but somehow the way it has grown up has been very difficult. We manage our systems totally differently. For example, Victoria holds a whole year's water supply in Dartmouth, and New South Wales runs their storages to the very edge. It has totally different implications for the value of those rights. That is not a problem necessarily, but it does have implications for how much these dams will spill. Basically Victoria is going to spill a lot more water than New South Wales, which means there is a lot less winter flow and there are different environmental outcomes from those in New South Wales. All these things are so tied up.

**CHAIR**—Are there other parts of the world that are easier?

**Dr Beare**—I do not think it is easier in any place. I can give you some examples of a few things from the US. Along the Columbia River, which runs on the border of Washington and Oregon, they had a real problem with their salmon coming back down the river—they either had to go through the turbines or over the top of the dam. On balance it seemed better to go over, so they were only stunned for a little while! But I think there was something like a one in 10 chance that if the fish went through the turbines they would not make it through. There are about 15 dams. They wanted more water in the springtime to flush them down. They could easily have bought the water from up the top, in Canada, because the US gave the Canadians a heap of money to put in a bunch of hydro-electric dams, but nobody bothered to give them any powerlines to ship it in. They could have bought it, but the water had to go through the state of Idaho, and Idaho pumps it dry. So you cannot buy the water. For a while in California—I do not know whether it is still true—they were trying to sell water, but the law said that unless you extract the water you do not own it. They went to the trouble of putting in those diversion dams to temporarily extract it, but it got rejected by the states.

**Mr SECKER**—What about the Yangtze River in China? It is actually controlled by one national government. Have you looked at comparisons there?

**Dr Beare**—Actually, it is not the Yangtze River.

**Mr FORREST**—For the Three Gorges Dam they are going to shift three million people.

**Dr Beare**—It is interesting to note.

**Mr SECKER**—Is it the Yangtze or the Yellow River?

**Dr Beare**—You warned me about giving false information, but I think this is true: the Yangtze River in flood in one hour puts out more water than the Murray-Darling in a year.

**Mr SECKER**—They have lost thousands of people.

**Dr Beare**—Farmers are sitting there, trying to pile up dirt to get away from the water. The problem in China is in the north.

**Mr SECKER**—They have a huge head of water when it flow down.

**Dr Beare**—They have thousands and thousands of tiny farms, a radical increase in urban demands and tremendous problems with pollution.

**Mr WINDSOR**—Could you repeat that statistic?

**Dr Beare**—In flood the Yangtze River puts out more water in an hour than the Murray River puts out in a year. It is a phenomenal volume of water.

**Mr WINDSOR**—Is it true that the Fitzroy River in Western Australia has the second highest discharge of any water in the world into the ocean?

**Dr Beare**—I do not know the answer to that question.

**Mr FORREST**—I think you are offering us a suite of options. One will not fit all, and you talked about that, but you used a term in here that confused me. When you talked about changing property rights, you said that care needs to be taken to avoid special interests or rent-seeking activities. Could you clarify what you mean by ‘rent-seeking activities’? It is point 12 in your summary.

**Dr Beare**—I guess what I was trying to alert to is that, when you start significantly changing who potentially is going to own the water rights, you will get an awful lot of special interests looking to acquire those rights to the potential exclusion of others.

**Mr FORREST**—It is a water baron concept. We have heard this quite a few times.

**Dr Beare**—You can say that you could be indifferent if the water were owned by farmers or if it were owned by people in Sydney or Melbourne if it is just an asset, But that is not totally true, because you could get a situation, if there were enough concentrated ownership, where they could try to extract the maximum rent from the value of the water as opposed to the maximum economic return from the water’s use. Those are different sorts of things. It is the same thing if a central agency owned a dam. It could manage the dam to make the maximum return to the water as opposed to the maximum value of the water use.

**Mr FORREST**—Speaking from the Victorian experience, there are some rules in there that prevent that sort of thing. You cannot just bank it. If you have not made use of it within a period of time, it is compulsorily put it back into the market. I think that is the way it operates.

**Dr Beare**—I must admit that there are so many fine details with water.

**CHAIR**—Thank you very much for your very good evidence and for being with us today. We certainly appreciate it.

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

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

**Committee adjourned at 6.23 p.m.**