



LEGISLATIVE ASSEMBLY FOR THE AUSTRALIAN CAPITAL TERRITORY

**STANDING COMMITTEE ON CLIMATE CHANGE,
ENVIRONMENT AND WATER**

(Reference: [Inquiry into the ecological carrying capacity of the ACT and region](#))

Members:

**MS M HUNTER (The Chair)
MS M PORTER (The Deputy Chair)
MR Z SESELJA**

TRANSCRIPT OF EVIDENCE

CANBERRA

THURSDAY, 15 SEPTEMBER 2011

**Secretary to the committee:
Ms S Salvaneschi (Ph: 6205 0136)**

By authority of the Legislative Assembly for the Australian Capital Territory

Submissions, answers to questions on notice and other documents, including requests for clarification of the transcript of evidence, relevant to this inquiry that have been authorised for publication by the committee may be obtained from the Legislative Assembly website.

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Amended 9 August 2011

The committee met at 2.52 pm.

DUMARESQ, MR DAVID, Senior Lecturer, Fenner School of Environment and Society, Australian National University

DYBALL, DR ROBERT, Lecturer, Fenner School of Environment and Society, Australian National University

THE ACTING CHAIR (Ms Porter): I declare open this eighth public hearing of the inquiry into the ecological carrying capacity of the ACT and region. I would like to welcome Dr Robert Dyball and Mr David Dumaresq from the Fenner School of Environment and Society at the Australian National University. I want to remind you of the protections and obligations afforded by parliamentary privilege and draw your attention to the statement on the blue card. Could you confirm for the record that you understand the privilege implications of the statement?

Mr Dumaresq: Yes, I do.

Dr Dyball: Yes, I do.

THE ACTING CHAIR: Thank you very much. Would either of you like to make an opening statement?

Dr Dyball: I thought it would be worth making a little bit of a background statement because we have been asked to present some material on a particular set of projects that David and I have been working on with others which relate to food flows and carrying capacity of the ACT and region. Without being too tedious, I think it is worth while giving a little bit of background as to where that project came from, even if it is not directly related to your questions.

With respect to the school that we are part of, we both run a program in that school called the human ecology program. It is fundamentally about looking at the interactions between humans and their environments and how the environment in turn constrains the humans who are appropriating its resources. To pursue those kinds of thinking, we have been conducting a series of studies that take one of the focal points as being food, because food is fundamentally both a cultural item of consumption that has deep social practices embedded in the choices of food and how it is delivered and resourced, and of course it cannot be produced without the use of biological services somewhere on the planet.

We had a series of studies involving food but in a very broad and integrated sense. So we have been looking at things like food security, where we would treat security as an emergent property, or the dynamics of a complete food system. We would include such things as agricultural production, ecosystem services—understood from a sort of biological perspective—supply chain analysis and the way that companies and industries might monitor their production and distribution and then the ethics of food security and consumption. So it is much broader than understanding food production as an agricultural issue or an environmental or developmental issue for certain parts of the Third World, although those issues do cut across. These are the sorts of approaches that we take in integrating these different insights into understanding food and food security in the broad sense.

We brought this project that we had already been working on to partner with collaborators in Tokyo and in Copenhagen, Denmark, as part of an alliance. The ANU is part of that alliance. It is called the International Alliance of Research Universities. It is a new alliance looking for big global issues that are challenging humanity across the world in the 21st century. We partnered up with these partner universities to do a demonstration project, to talk about the interrelationships between food production landscapes and points of consumption and how those food items moved across the planet. So the work that we can draw on to present and talk about in this context is part of that global production and consumption linkages program that we were working on. I hope that is reasonably clear as to where this research then fits.

Mr Dumaresq: I have been part of this project that my colleague Rob Dyball has just been talking about. As Rob says, the project is very much a demonstration project. We really want to emphasise that it is still underway. So anything we talk about is yet to be tested in the formal academic criteria of being published in peer review journals. That has not happened yet. We want to be very clear about that. Anything we talk about is at very best provisional in that sense. It is also a demonstration project piloting both methods and approaches. So any of the figures that this project is producing, and even the methods, are all up for question in terms of what we have been doing, because we have been trying to get at a range of issues of the sort that Rob has just outlined. I want to be very clear about that. So we cannot say to you that we have a whole lot of definitive results.

Part of the project has been to look at three cities. There is Canberra and its surrounding countryside, the Australian capital region, which is the ACT, south-east New South Wales and Tumut shire. We have taken, for much of the work we did, 2005 as a benchmark year. Our data has been focused particularly around 2005 because when this project was underway that was the year we could collect global data for. Then there is Tokyo and the Tokyo capital region, and then there is Copenhagen and the Danish capital region, which is the island of Sjaelland.

One of the reasons that we took this approach for this study is the scaling issue—that is, the Canberra region is about 500,000 to 600,000 people in about six million hectares. The Copenhagen capital region, the island of Sjaelland, is about four to 4½ million people in about a tenth of that area. And Tokyo is the world's biggest agglomeration of population—42 million people in three million hectares. So we had across the three cities essentially an order of magnitude scaling up of population between Canberra, Copenhagen and Tokyo as part of the way we were doing this, to look at the relationship between populations and the lands that they are living in.

The approach has been for us to try and look at the way in which food actually moves across landscapes, and including the whole planet's surface, to provision the people living in those cities and those landscapes. The way we have gone about doing this is to look at essentially publicly available data to see whether or not we can get an estimation of where food comes from for the people living in these cities, where that food is produced and what are the actual landscapes that it is produced from. Again, I want to emphasise that this work is not finished and much of what we have done has not been fully tested, if you like, in science for this.

A couple of issues arise there. The data is very difficult to get and requires a very large amount of work to actually get hold of, and with a lot of the work we have done we have had to make quite large assumptions about much of what we have done, which are always contestable.

There are very large jurisdictional issues about trying to work out what is flowing across what boundaries, whether we are talking about local government boundaries, state government boundaries, national boundaries and then international trade flows. There are issues there. Again, a lot of this data is, at the very best, we would say, indicative about what might be occurring.

In our work for the ACR area we took to be what we hoped would be those agricultural commodities that make up most of what is produced in that ACR region. We chose the agricultural commodities for study here. There are 12 of them. We are not in any way claiming completeness about all food flows because for any one group of people we are talking about thousands and thousands of individual items. There is another scale issue there about trying to look at flow.

We were trying to pick, for the three cities, what we thought would be the commodities on a cultural and economic and trade basis, the largest movers, the biggest volumes—so both cultural importance and food volume importance. For the ACR we picked sheep and cattle meat, pig meat, chicken meat, dairy products, wheat and apples. We also picked grapes and then lettuce as a green-leaf vegetable. Indications are that the production of those account for about 84 per cent of agricultural production out of the region. So we reckon we have got a reasonable kind of coverage around that mass level.

It is very clear from the work that over time there are big changes in these areas. What happens in the farming sector around a particular area, as happened, say, in the ACR, with huge changes—out of wool and into cattle—that occurred, say, in the early 90s, is that big changes can occur in farming systems. We are talking often about what has happened in a particular year or a particular decade where you can actually get data.

For the data that we have we are really looking through the first part of the 21st century. What it shows is that Canberra, sitting as the major population centre in the middle of the ACR, sits in a very large surplus of biological productivity, as indicated in the production of a range of food items locally. They are mainly sheep and cattle meat, wheat, apples, and dairy products, it is not so much a surplus, it looks like about a break-even point—something like that.

One of the ways to conceive of the sorts of indicative results out of our project is that the ACR population is a population which essentially eats from across the whole of the surface of the planet. We trade material in and out of the ACR across the whole of the planet. The people of Tokyo and the people of Copenhagen do the same thing. In that sense, we can now say from a human ecological perspective that city populations are globally based for the ecosystem services that they depend on.

The ACR population is no different. We happen to be a population which has in it a range of considerable surpluses. Of course, when we say that, what do we mean by “surplus”? It is not that that production is not already used, that it is sitting there

unused. In fact, it is the opposite; it is already completely used by humans that live elsewhere on the planet. So all of that surplus, if you like, production is already traded to places like Tokyo. In that sense, when we are talking about this notion of surplus, we mean that it is available to be traded elsewhere.

For a whole lot of other food products that people inside Canberra and the surrounding region want to eat, we depend on people elsewhere who have surpluses trading them to us. That is where Canberra sits in that notion of a flow of food that is now planetary-level based. Perhaps I should end there and say that is a very brief overview of the work. If you want to ask questions, we can go into more detail about how we have arrived at some ways of going about doing that work and so on. Perhaps I should ask for some responses.

THE CHAIR: I thank the deputy chair for filling in. I was held up; my apologies to both of you. This was a really interesting overview of the work that you are undertaking at the moment—the idea that our food comes from local sources but also right across the globe. Do you have any thoughts about where there does need to be more food production being supported in our local region? Do you think that is an issue or not such an issue because there are global markets?

Mr Dumaresq: My response to that is that there are multiple possible answers to that. It really depends, I think, on which set of indicators we want to privilege the most, whether they be social, economic and/or biophysical indicators. One of the things we are doing in this project is moving away from generic footprint analysis and looking at real, actual land areas and where they are based. To give you some idea of where the work is heading on that, there are strong indications, for instance, that if people in the ACT eat chicken meat, the chances are they are depending on soy beans grown in south-eastern Brazil. So in terms of ecosystem services, if you eat chicken meat bought at pretty much any shop in Canberra, you are actually depending, in part, on a farmer in somewhere like Brazil.

THE CHAIR: To provide the feed?

Mr Dumaresq: To provide the feed for the chickens, yes. You could argue that more of, say, the grains that are grown in the ACR—soy beans are not one of them—could be put towards feeding chickens that feed people inside the ACR. But that would simply be displacing the movement of that grain, which at the moment goes to that very large Australian wheat surplus which goes to feed people in Tokyo and so on. It is very clear, for instance, that people in Tokyo depend for a substantial part on their wheat imports from south-eastern Australia. The ACR produces, in that sense, a surplus of wheat, as does the rest of south-eastern Australia.

It is difficult to answer your question in saying, “Is it a good thing or a bad thing?” Our work is indicating quite strongly that you are really just going to trade one thing off against another. We could increase production of certain sorts of food here, but it means, for instance, trade in base items might go down. The other thing to say here is that if we change land use then other values, other indicators, are going to be traded off against. So it is quite clear that there is land available inside the Australian capital region for increased agricultural production, but it is already used for other things. There is not surplus capacity in that sense. I suppose that would be one of the things

we would want to be saying.

THE CHAIR: An issue that seems to be coming up is around food security. You talk about trading your surplus and being able to get things in from other places. Are you factoring any of that into your model? I am sorry, we have covered that. I may have missed it.

Dr Dyball: One distinction you might make is this: when you are talking about food security, are you talking about being confident in your ability to provide the food that the people of the region want and expect to be able to eat? Of course, you can do that by growing it and you can do that by purchasing it. If you are an economically wealthy centre, like Tokyo, Copenhagen and Canberra all are, they are basically going to be food secure because they are wealthy enough.

The second question then that you might be getting towards is this: do you mean that your food is sovereign, that within your jurisdictional area you actually physically produce the food to sustain the population, such that if some cataclysmic thing happened to the global food supply networks you could survive? The answer to that latter question then would be in a fortress island, the Australian capital region, you could feed the population of the ACR with the food grown within the ACR. However, you would be looking at a reasonably mundane diet based around meat and potatoes—actually, not potatoes.

Mr Dumaresq: Meat and wheat, and apples—meat pies.

Dr Dyball: Surprisingly, meat pies figure quite strongly in the traditional Australian diet.

THE CHAIR: And apples.

Dr Dyball: You can have an apple for afters.

Mr Dumaresq: There would not be a lot of oranges and bananas.

MR SESELJA: Fine wine; lots of fine wine too.

THE CHAIR: Yes, and truffles.

Mr Dumaresq: Yes.

Dr Dyball: I do not think you would actually be able to meet the entire ACT consumption of wine.

Mr Dumaresq: No. Interestingly, the early data indicates that we would be in a very severe wine shortage, actually.

Dr Dyball: That is right.

MR SESELJA: Is that right? That is very scary!

Dr Dyball: That is right. That is why we have got a lot of interest from people. All I am saying is that there are two ways of thinking about that question. A slightly follow-up question, talking about the capacity, is the extent to which you could actually increase the total biological productivity of some land area, such that it was simply capable of producing more, say, by changed, good management practices. Then you need to be thinking about whether that is an input-driven increase in production, say, through increased fertiliser uses or increased water. You can get in whatever you think the limiting factor on that land is, such that you could actually raise the amount that you put out. Or you could actually raise the amount that that landscape can produce through good farming practices that build soil conditions and do a range of other sorts of things to work with nature to produce more off their land.

Our project at this stage is not looking at that question, but obviously, if a sound farming practice was able to actually increase the amount that the land could yield, without negative side effects in terms of the input costs and subsequent pollution loadings that could occur if done badly, of course you would change the equation somewhat.

Mr Dumaresq: What the project clearly indicates is that, for any particular human community that wanted to move towards that kind of notion of food sovereignty, even setting aside fairly standard notions of comparative economic advantage, you would have to answer this question—and this would really apply to somewhere like Canberra: do we have in place the actual infrastructures to do that sort of processing, production, distribution and preservation of a food supply from those sorts of local sources? At the moment, although this has not been directly part of our work at all, it is quite clear that we do not have that local infrastructure to do that. This is quite outside the scope of the project we have been talking about. It could be kind of there, though. We do not have inside the ACR the facilities to process the levels of meat, wheat and so on that are produced inside the ACR and which go outside the ACR for those processing levels. So if you are looking at, say, increasing to some very large percentage the food sovereignty inside an area like this, that, to me, would be a very serious question for a jurisdiction.

THE CHAIR: You would have to look at investing?

Mr Dumaresq: Very much so.

Dr Dyball: You could imagine having signature local menus so that people could drive around and go to vineyards and eat locally produced sausages, which would be more of a tourist and economic kind of thing, too, which could be well worth doing for those sorts of reasons. But in terms of actually where most people—

THE CHAIR: Feeding people every day, day in and day out.

Dr Dyball: Yes, that is right. You are not hitting the food stocks in places like Woolworths and Coles, and that is where most people do most of their food acquisition. You would at some point have to think about the energy costs of sending people driving around Wee Jasper to feed off sausages. Whatever the putative environmental benefit of the organic, locally produced sausage eaten in Wee Jasper would be, the energy cost of driving out there to consume it would perhaps have to

come into a consideration of the balance.

THE CHAIR: That is quite an interesting one, because what comes up in what is talked about in many forums now is that idea of food miles. It is not necessarily the idea of the occasional trip to Wee Jasper; it is more about this global market and our food coming in. Do you have any particular view on that? Mr Dumaresq, I think you may have some views on that.

Mr Dumaresq: Again, this is outside this project we have been talking about. There is other work that I have done on this. Again, it really comes down to which set of indicators you want to privilege. So is it just the actual distance that the food has travelled? Is it the amount of, say, fossil fuel energy that has been expended to get it there per kilo of food or is it per calorie of food energy value? Is it per value of protein and essential nutrient content of the food? You might think this is a typical academic and scientific response, but in the end, when you are trying to get an accurate measurement of this stuff, this is where we start to really come down to this. Is it greenhouse gas emissions per kilo of food energy or whatever it is there? So which one of these is it? Or is it that we are actually trying to value a cultural marker?

THE CHAIR: It is more about a social and cultural aspect.

Mr Dumaresq: Yes. I do not have the work data to demonstrate this, but if, for instance, people inside the ACR or even in the city of Canberra wanted to culturally value eating a Canberra region raised chicken, for instance, I strongly suspect that the greenhouse gas emissions per kilo of chicken meat would go up substantially because of economies of scale which are also physical scale factors. If we then went about building the infrastructure to grow, process, transport and preserve those chickens that came at that level in the ACR, I suspect we would be doing much of it from scratch and essentially replicating facilities and infrastructure that already exist. That is something that has always struck me about this argument that is rarely ever talked about and is almost never investigated in that whole debate.

MS PORTER: In the social aspects of what you have been doing, have you been looking at people's attitude towards food or is that not something that you have been looking at? The reason I am asking that is because in the ACT it appears to be—and I do not know that we have actually proved this—that we buy too much. Gone are the days when mum, dad or whoever would just go down to the corner shop before preparing the evening meal and get just what they needed for that, while picking up children from school or something. Now we go and do these massive, big shops once a week or once a fortnight and tend to—this is a generalisation, of course—over-purchase: “This is on special. I’ll get a stack of that. I’ll probably need more of that.”

In the end, we find that it is past its use-by date or, if it is fresh food, it is actually not edible any more. So it is thrown out. We are always filling up our landfill with this stuff, or hopefully putting it into compost if we can. This is not good for our environment, it is not good for our purses and it is not good for greenhouse gases when we are going to the shops and purchasing this stuff which has had to be got here, and we are wasting trips in cars in order to cart it all back and forth. Have you looked at that attitudinal stuff at all?

Dr Dyball: The project that we have been talking about has not at this stage looked at those sorts of wastage figures. We have been deliberately looking at just the total load placed on the environment—so using the mass figures, the crude consumption figures, and not how much of that material actually reaches its final destination and people eat it. There are some fairly well-established figures about the sheer volumes of food wastage. I am not aware of studies specifically of Canberra households but they share a number of attributes of affluence and accessibility. You could be fairly confident that the wastage levels that come as a result of that would be present.

Those are very difficult questions as to how you would then respond in order to reduce that wastage. It would seem to be utterly pointless, except of course that there is an economic turnover because it is sold. Someone might argue that once they have sold their carrots, they do not care how many of them get eaten; they get the money for the carrots. But it would seem to be a wastage. You are probably aware of studies to try and improve the pick-up of that material. There are some real issues in Canberra about having a third bin for such material and what happens on a summer's day when the prawns went in on Monday and pick-up is on Friday. But in other places that material is readily picked up, and picked up at a profit to the local government body that arranges the collection.

The way you might close those cycles, to get that nutrient and stop it going to landfill, get it back onto the originating soils, and not just onto someone's rose garden—these are complex questions. Of course, by the time you are shipping food to Japan, which is what our study looks at, how you think you might then return those nutrient elements and get them back to some farmland out the back of Gunnedah where it originally came from—they become very complicated questions to answer.

THE CHAIR: Dr Dyball, you just talked about other places being able to collect that organic waste, kitchen waste, and work with it and make sure it gets back out onto the land to improve the quality of soil. Do you have any examples that you could share with us of places, say, around Australia or even internationally where they are doing this successfully? It does seem to be a sticking point with our government.

Dr Dyball: Sure—Germany. Australia is a big place and we are very fond of trucking things around; that is what we do. Does it actually make sense from a total environment perspective to physically collect whatever this material is and physically truck it all the way back to points of origin? Is that the best way of doing that? You probably want to at least think about reducing the wet weight of the material, palletise it or something like that, because they are very big distances. In somewhere like Germany many of your productive hinterlands might be literally 20-odd kilometres from the point of consumption, even within greater Germany itself, whereas in Australia, it could be Perth.

THE CHAIR: So it is the tyranny of distance.

Dr Dyball: There are very big distances involved.

Mr Dumaresq: Just to go back to my point about the chicken meat consumed here, I think ACT consumers would be very wary about paying for the carbon, nitrogen and phosphorus had it been shipped back to south-eastern Brazil.

Dr Dyball: That is right.

Mr Dumaresq: I suspect this is not really a very sensible idea, to be quite blunt. I think we need to be very careful about making blind or gross assumptions that it is really good just to recycle stuff here. One of the points that I make a lot to people is that if we have photosynthetic activity and the water to do it—and that, of course, is a serious issue for us all the time—you can capture all the carbon you need in the land right there free out of the air. That is what photosynthesis does. We do not need, in that sense, I think, to spend a lot on fossil fuel, trucking carbon around the landscape—which is what most of the compost is, to be quite blunt about it.

Again, it is this thing about which indicator we want to privilege. Is it reducing fossil fuel use and greenhouse gas emissions or is it to capture more of that material and get it back on the land and/or efficient use of water and so on? We need to think about the trade-offs there.

Dr Dyball: Stimulating gross biological activity on a farming landscape is probably going to start getting you to quite a few of these destinations that you are thinking of getting to in terms of productivity, regulation, carbon sequestration and cultural amenity values of maintaining economically viable rural landscapes et cetera. There could be a number of indicators that you would care about that you would start to hit if you just started thinking from first principles about what we are doing here—apportioning biological productivity. That means, first and foremost, maintaining and enhancing that biological productivity. Agriculture is just another ecosystem of a particular kind where humans are diverting a particular kind of biological productivity to our stomachs, as best we can.

THE CHAIR: Mr Seselja?

MR SESELJA: Yes, I have a couple of different areas of questioning. I guess the fundamental question for us in this inquiry is whether it is possible to measure the ecological carrying capacity of the region and, if so, how would you describe that? You have looked at the ACT region, you have looked at Copenhagen and you have looked at Tokyo. If it is possible to measure it, and presumably Tokyo is well above its ecological carrying capacity in terms of human population, how would you describe that? Is it possible? If so, how would you describe it in terms of the ACT?

Mr Dumaresq: I think this is one of the key questions. Our work is aimed towards trying to get a good answer to the two questions that you have asked. One is: can we actually do that? And then: what is the answer when we have worked out how to do that? Our project is aimed towards trying to do both those things in some way. I am very wary of saying—because, again, the approaches we are taking are not in any way proven yet. I think we have some way to go. I think we can do it. To give you a very straightforward answer, yes, I think we can measure that sort of biological productivity and its potential and the sort of capacity in an area like the ACT and surrounding areas. Can we do it now accurately? The answer is, I think, no. I see that as a work in progress.

All the indications out of our current project are that we as a group of humans—

600,000 people, and we have about six million hectares—have a fair surplus of biological capacity around us. As I said, essentially we use that to trade to people, like those who live in Tokyo, who do not have a surplus of biological capacity. In a sense, it is already spoken for. I suppose I have a longstanding, underlying concern about how such measures are used or what we think is the point of them if they are not seen as linkages to what we currently do in those landscapes. I think we are quite a long way away from well understanding what it would mean to have a biological capacity measure, even once we got to it. I suppose that would be part of my response to that. Yes, I think it can be done.

Dr Dyball: I would just add, as living systems—and that is what you are dealing with; our living systems—the capacity is a variable thing. You can manage them better and you can manage them worse. There is not necessarily a set ceiling that you just bump up against. A living system can grow and develop. As to the numbers being carried by that system, do you simply mean the physical number of human beings standing in the jurisdictional area you are talking about or do you mean the total number of people who are already being carried by that landscape, wherever they are on the planet? That second figure is a much, much larger figure already.

In all of these discussions we need to be very cautious about this issue of displacement. You do not want to put in place a policy that has well-intended, good outcomes but simply displaces the problem elsewhere. Of course, the converse applies to that. Some places in the world would be very upset if Australia were to pursue a high carbon sequestration policy and fund agricultural systems to try and get more carbon to the soil if it came at the cost of the ability of those land systems to produce the food that those people currently depend on. If they were setting some kind of policy direction and produced that outcome, they might think that was a very perverse outcome to end up with. I think that looking for these win-win situations and maybe moving towards enhancing the capacity of these landscapes with wise management and not necessarily through linear input to increase output—that kind of thinking—would be the sorts of ways that we might think our way into that problem in future.

MR SESELJA: You spoke before and you have just spoken about enhancing productivity, productive capacity and food security. How much would areas of research on things like genetically modified crops be part of the answer to that question? If we are limited by biology to some degree in our region, how much would genetically modified crops potentially help us to maximise our ability to make our land productive?

Dr Dyball: I can make a general response but not a response based on study, and then David can perhaps say something. At the end of the day, this is a technological response, and technology has helped human societies to increase the amount of material they access—resources of all kinds—since time immemorial. That is what we do. It is another technological device that will change and maybe increase some of those returns. Like anything else, this comes with caveats. Who owns them? What is the financial dependency that you would get into if you were starting to rely heavily upon them versus not relying on them? There might be some trade-offs there.

I would personally suggest that there is not going to be a silver bullet element to this, but there is potential that they would be part of the mix. But cultural attitudinal things

come into play. If I do not want to consume then there are some issues in there. For my part, it would be the reliance on proprietary material for the basis of your food production systems that would be the primary concern. As I say, that is starting to go beyond my research expertise. I would suggest that that is more the concern than whether a genetically modified tomato can actually kill your baby. I do not think that is the problem. I think it is the fact that that material is proprietary limited and that is perhaps a dangerous way to go with your food staples.

Mr Dumaresq: I have no direct expertise in this. I am not a biotechnician at all. From my longstanding observation of food systems and food flows, which is what I have dealt with now for many decades, one of the things that we need to take into account when we start to think about technological advances like biotech in food supply is that I see quite a lot of farming jurisdictions making the active choice not to go down that road, even perhaps at the risk of not increasing productivity, because it makes better economic sense for them not to. They actually have better market access, even maybe better gross returns, because of consumer demand for non-GM foods. So I am also then very wary about the kind of policy settings that say that we must or must not have a particular technology, whether it is GM or anything else, because I see different human groups in different parts of the world having very different adaptive strategies to how they approach a particular technology like that. What is actually best for a particular community is a very open question and depends on a lot of things that are not just about the pros or cons in a very narrow technical sense of a particular technology.

MR SESELJA: You are part of the scientific community here in Canberra. How do the attacks on scientists conducting that kind of research affect things? Does that make scientists think twice about conducting that kind of research in the future?

Mr Dumaresq: I cannot speak from any direct personal experience about that. My straight view as a practising scientist is that I would be astonished if it did stop them doing that. But that is just a very strong personal view.

THE CHAIR: I want to go to your recent research, or it might be wider work that you have done over many years, particularly around this region. Do you have any sense of how much surplus land might be available as arable land that could be used for agriculture? Has any of that sort of mapping been done?

Mr Dumaresq: There are quite a number of studies that have looked at that, or that sort of information is there almost as a by-product of a range of other work. To some extent, buried away in our own work, you could deduce a figure like that. But I would be dishonest if I were to say to you, "I can tell you that." As I said, it has been a by-product of the work that we have been doing. So, in a sense, our own project has the capacity, if you like, to deliver that sort of figure, based on a series of assumptions that are built into the sort of work that has been done. I could not say that it is X out of our project. We could deduce it from the work and then the assumptions build on the work we have been doing. But another research group in this area could come up with a different figure because they would be doing it by a slightly different approach.

GIS technology makes this sort of work, at one level, relatively straightforward. To be blunt, if someone pays people to do it then essentially it can be put out, I suspect, in a

relatively straightforward way—again, looking at the sort of limitations to be built into the assumptions that you do about the sort of land classes you are excluding or including. At that level, it is a relatively straightforward exercise.

THE CHAIR: One of the things that have come up is the encroachment of greenfields development for residential housing on otherwise quite arable land that could be used for agriculture. I am not just talking about the ACT; there are issues across the country. Is that an issue in the Australian capital region?

Mr Dumaresq: I think for people whose land is being taken over to put into urban development, it is a very serious issue. More generally, again we come back to this question we talked about before about the difference between this notion of food security and food sovereignty. If we look at it from that sort of view, which is the sort of project we are doing, it is very unclear to me that, across the ACT, either is a serious issue. But I could not give you measured figures. I suppose we could go out and do that as a piece of work from the databases we have. As I said, at the moment the ACT produces very large surpluses of a range of food products. And we are talking about these coming from very big areas that are much bigger than any kind of urban or industrial land use across the ACT. So in that sense, no, but whether or not the best land in a particular part of the ACT might be undergoing a land use change away from being productive, for food or even for other biological productivity uses, that is a different question. Again, there might be specific local concerns.

Dr Dyball: We can certainly say from the three cities project that when Tokyo expands, it physically expands across some incredibly productive landscapes, probably at least double—

Mr Dumaresq: Some of the most productive in the world.

Dr Dyball: So as that land goes out of production, if they augment and replace the missing food that was grown on that landscape in an Australian landscape, you need a much higher hectare equivalent to deliver the same volume of food. So those phenomena certainly do happen. But inside the ACT, if you did a land use mapping of the ACT, the first thing you would have to do is sit down and say, “What’s up for grabs? What are you prepared to imagine putting under the plough? Do you instantly assume the national parks are not available or are they up for grabs? Are they in or out of the equation?” They are certainly doing jobs like water harvesting, purification and other amenity values. There are some things you could exclude on the ground that the slope just is not suitable for growing food. With some other things you might say that they are just politically non-negotiable for a variety of reasons. With this huge land area, you would then be saying, “Is it in or is it out?”

Of course, with some of these landscapes, you simply could not, say, plant them to crop. There might be fairly open rangeland for animals. Taking those animals off those landscapes to increase the productivity of the landscape by growing more primary feedstock like grain is simply not going to work. So there would be a complex set of policy and attitudinal things about what you would and would not even consider, and then you would have biological things about what the land could or could not physically do. You could end up with a very moveable set of figures to then play with—in answer to your question about how much is there.

Mr Dumaresq: But at the front end of that, it is a relatively straightforward mapping exercise, if you have a set of criteria about land suitability, to simply map the ACT and the surrounding region about what land comes in most categories, no matter what the current land use or vegetation cover is.

THE CHAIR: In the ACT, as you might have noticed, there is support and a growing movement around community gardens. In fact, there is now a push for a community farm. There has been talk about some of our street trees being changed over to fruit trees, for instance. Do you have a view on all of that? Do you see that that is important for social inclusion and for being part of a community group and also from a health aspect—being able to grow your own vegetables? Is that really where it sits or does it also form an important part of our food?

Dr Dyball: I am familiar with Todmorden—Todmorden is a little village near Manchester—where they did this. They converted large amounts of public land to food producing land. One thing to note is that the person who drove it was an incredibly dedicated woman who took this thing on; it was very much a one-person thing. An initial thing to ask is: who would actually have carriage of such an activity here in Australia? Would it have longevity and would it all go to weed within two years because someone got bored and some key person moved on?

That aside, I suggest that the primary reasons would be those sorts of things you talked about—getting to know where that food comes from and getting some kind of awareness about what goes into a plate of food. Just possibly, you might get better awareness about what was in and what was out of season as well as physical activities, physical engagement, community building and a sense of ownership of things—all of those things that you see from Hugh Fearnley-Whittingstall shows. All are really good, valuable outcomes.

As to whether you would significantly contribute to changing the food security, I suspect the issue would come back to this: you would end up with some kind of percentage of food that this landscape was producing as a percentage of food consumed. By the time you put your landscapes into the mix, next to Woolworths' purchases—or Coles, or whatever the supermarket-based mix was going to be—I suspect it would still be quite a small figure. With due regard to water usage per unit of food produced and those other scale issues that go on, I think you would have a whole pile of reasons why you would think it was a good idea and worth pursuing, but total food security or increased food sovereignty may not be one of those things that you would then point to.

Mr Dumaresq: There are a couple of things I would add to that. Partly because it is under examination at the moment I have just supervised a thesis which looked at the relationship between community gardens and social inclusion—exactly this point. It has some very interesting things to say about this. As I said, it is under examination at the moment. I am sure the author, when it has finished being examined, would be only too delighted to promulgate the results. I would simply say that there are mixed messages there and there are some very interesting reasons as to why that might be the case.

The other thing that I would say comes from direct personal experience. I spent many years as a commercial grower, farmer, in this region, providing—and this is now many decades ago—fresh produce into Canberra at a small level, at the sort of level that is now done at the farmers market and so on. One of the things that I noticed as a local grower—and I think this is a serious issue to look at with these kinds of public good, public resource food growing enterprises—was that in climatic regions like this they produce enormous seasonal surpluses very quickly. Everyone gets very tired of zucchinis, pumpkins and tomatoes in late autumn in Canberra. This has serious impacts on people who are year-long commercial growers because they cannot sell their produce or the price is at an uncompetitive level.

I found this to be a serious issue as a local commercial grower. This would be something that needs to be seriously thought about. A city like this, as we have tried to point out from the beginning, cannot exist by just eating what it can grow in season. It has to have a supply of food coming into it year round. I would be concerned about a city, say, investing a very large amount of resources in street trees and community farms and so on if they seriously were threatening the livelihoods of the people who are supplying the city year round. I think that a calculus would need to be done. I think it is an issue that, again, sometimes gets forgotten here. I suspect, though, for most of the time the level of production out of these enterprises is going to be at a level that will not affect that, but it is an issue that needs to be thought about.

THE CHAIR: Have you had any contact with the farmers market as far as knowing the growers who supply to the farmers market? We had some earlier evidence to this committee suggesting that the food was coming from Sydney; it was not coming locally. Have you had any examples of that?

Mr Dumaresq: I had a research student that did some investigation of the farmers market some years ago. It is a time slice back from then. I do not have current information. Again, I am wary about saying things. The only thing I would say is that it is relevant that what came out of that research project was that, as I understand it, the people who were starting the farmers market needed to bring people in and they gave stall holdings to a range of resellers. Those people continue, for very good reasons, to be there in the farmers market.

I think we need to be very careful in assessing the impact of the farmers market in what we are talking about. Are we talking about the food that is there being sold by a range of stall holders who are, effectively, just simply resellers, like any retailer? Then there are people who are coming to the market as, if you like, direct farmer sellers of their own produce. I think there is considerable confusion between those two groups and the availability of food at the farmers market, which is one of the things that came out of that piece of research. How much that is still the case, again, I am not sure.

Dr Dyball: Also touching on the issue of consumer sovereignty, if the information is there and transparent—so it is not false—consumers can choose for themselves. They can see what the point of origin is. For some of these things, of course, the question might be: do you just bring the closest orange in? If it is not within 100 kilometres is it not local? Again, you end up with these definitional things. I think there is a difference between trying to pass off, say, Chinese garlic as being local garlic when it

just is not; that is false. There might be other reasons why you wanted to have a range of materials available so they were suitably labelled.

Mr Dumaresq: To give you a very quick snapshot about some difficulties there, I did another piece of research in south-west Western Australia with another research colleague. This was in 2006. We looked at people's versions of what they saw as local. This was in the city of Perth, and it also included visitors to the city of Perth. We found that there were at least three versions in many people's minds about what was local. A lot of people thought that for various products Perth was local. A lot of people thought that south-west Western Australia was local. People who were visitors to Perth thought that Australia was local. I have seen some other work done elsewhere in the world and in Australia that tends to indicate that too. What is local is a very moveable feast and very problematic, actually.

Dr Dyball: Particularly in a country like Australia where you do not have a cheese that has come from the same monastery for the last 1,000 years.

Mr Dumaresq: That Western Australian work is published, if people wanted a reference to it.

THE CHAIR: As there are no further questions, I would like to thank you very much for appearing before the committee this afternoon. A copy of the transcript of the proceedings will be sent to you. If there are any corrections could you please pass those through to the committee secretary. Once again, thank you very much for giving us that time; it has been very useful.

The committee adjourned at 3.52 pm.