

# **Comments on the Productivity Commission Draft Report on Migrant Intake into Australia**

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## **1. Introduction**

I appreciate the opportunity to provide comment on the Commission's Draft Report on such an important issue for the future of Australia. Although I have some fairly deep points of disagreement with some aspects of the report, I offer the following comments in a spirit of constructive, if critical, engagement. My comments are limited to just a few of the issues covered in the report, due to my particular interests, and to the time realistically available to me to devote to this.

## **2. The Assessment Framework**

In section 4.2 of the Draft Report and in particular Figure 4.1 the Commission has clearly laid out the relationship between net overseas migration (NOM) and population policy. The Commission describes how it is using an 'integrated framework' which captures the economic, social and environmental 'dimensions' (p. 119) or 'domains' (p.116) of the Australian community's wellbeing. The Commission reiterates its previously stated position that it is not seriously considering the option of stabilizing Australia's population growth (i.e. to gradually move to a growth rate at or close to zero); the Commission's focus is instead on how population growth can be properly managed and made 'sustainable' (p. 119), an approach which it believes reflects the bipartisan policy of recent Australian governments, and is also consistent with the expressed views of other mainstream advisory bodies such as the Committee for the Economic Development of Australia (Pincus and Hugo 2012). The Commission recognizes that achieving sustainability will inevitably require trade-offs between economic, social and environmental factors. The Commission models a projection for the growth of the Australian population from 2015 to 2060 using the historical average rate of NOM at 0.6% of total population per annum. This yields a population of 40 million in 2060 and of these, 13 million would be additional migrants.

Draft Finding 4.1 states that:

Decisions about the level of migration are the responsibility of the Australian government. They involve balancing a complex set of economic, social and environmental policy objectives

There is no comprehensive empirical basis for setting an aggregate level of immigration over time that would improve the wellbeing of the Australian community. Improving incumbents' wellbeing is likely to be consistent with a range of immigration rates, which is determined (among other things) by the efficiency of the provision of infrastructure, the efficiency of the labour market, technology, settlement services and external factors.

On the face of it there is nothing in the above finding to prevent consideration of zero or close-to-zero population growth as one option which could improve, or at least maintain, the well-being of the Australian community. It will all depend of the evidence which is brought to bear in the assessment, including not just 'empirical' evidence but evidence which rigorously investigates the meaning of terms such as 'well-being' (not equivalent to monetary income or GDP, for example) and 'sustainability'.

In this respect, the range of evidence which the Commission offers is not as 'integrated' as the reader is first led to hope. In terms of its modelling the Commission has put effort into a general equilibrium economic model, but has done no modelling of biophysical factors and constraints. In Chapter 6 some use is made of the systems dynamics modelling of Sobels (2010) to discuss environmental considerations, although the Commission sees fit to downplay the results of the Sobels (2010) work in footnote 30 of Chapter 8 – without offering any alternative research or analysis.

Since the question of population stabilization – in Australia and elsewhere – is to a considerable extent about the biophysical limits – both globally and within bioregions – which must be respected in order for humans as well as all the other creatures and plants of planet earth to thrive, then surely such biophysical parameters must be seriously studied? Indeed it would not seem unreasonable for the Commission to be taking a leading role in ensuring such models are actively developed and updated as an ongoing important source of evidence for government deliberations. 'Productivity' depends fundamentally on the workings of the natural world, and the ways in which human societies interact with these natural systems. The fact that such studies are not happening is regrettably an indicator that the Commission is still operating within the increasingly antiquated thought patterns of neo-classical economics – which with its doctrine of infinite substitutability of inputs through innovation etc, has never been able to accept the proposition that there may be limits defined through certain biophysical processes. Or if there is any acknowledgement of such, then the

creation of markets is viewed as the most appropriate way for these to be factored into social decision making. Neoclassical economics is merely the most recent (i.e. 20<sup>th</sup> century) expression of the cornucopian narrative of using science-based production methods to extract boundless riches from nature – and create an earthly paradise – first expressed with great foresight by Francis Bacon in the 17<sup>th</sup> century (Jonsson 2015; Leiss 1972).

That there are other modes of thinking well under way in the economics profession is not in dispute (for example Foxon et al 2012; Alcott 2012; Daly and Farley 2011), but it is unfortunate that the rate of adoption of these within the main policy research agencies is low.

The terminology of ‘economic, social and environment dimensions’ is a symptom of a flawed way of thinking which (perhaps unconsciously) levels out these ‘dimensions’ onto a single plane of equivalence, when in fact what is at issue here is a matter of *levels* and *dependencies*. The economy *depends* on the environment (specifically the ecology) but not vice-versa. This symmetrisation of the relationship between economy and environment sets up a way of thinking whereby these abstract dimensions can seemingly be traded off between each other in a calculus of subjective well-being. Such an approach risks losing sight of the fact that ecological processes are real, objective processes which do not depend on human states of mind.

The Commission’s aim of an integrated framework for assessment is somewhat undermined by the emphasis in later chapters of the Draft Report solely on the economic modelling effort which estimates that in the ‘with migration’ scenario the additional GDP per person will be around \$5100 in 2060. In a genuinely integrated assessment it would seem reasonable to make a serious attempt to weigh this relatively small (gross) benefit against all of the *costs* of increasing population driven largely by immigration. We know from Draft Findings 6.2, 6.3 and 6.4 in the Draft Report that there will indeed be additional costs in relation to housing, land, water, amenity, sanitation, waste processing, congestion and ecosystem services – although these are not quantified (not that they can or should be all converted to dollar terms – assessment in this context is very much a matter of assessing incommensurables).

Nevertheless, surely the Commission’s report should engage in some in-depth analysis of how these benefits and costs might be reasonably brought together into some overall framework which can assist the reader to compare, weigh and assess all of these things together. That is the job of an ‘integrated assessment’. Instead it appears that the reader is left to put the pieces together – or not. And in that case, the most likely outcome will be that

certain readers (political decision-makers, the media) will seize upon the “\$5100 better off” headline, without doing the much harder work of balancing that against the many costs that are not so easily captured in a single number.

If I may be permitted my own thought experiment to explore how a genuine ‘integrated assessment’ might work. Let’s say it is the year 2060 and I am on a median \$70k or \$80k per annum salary (in 2015 dollars) including my \$5100 ‘population growth’ bonus (leaving aside for the moment what we all know – that the amount of \$5100 would by no means be distributed equally). Might it not be the case that I would view \$5100 as a rather meagre offset against the higher housing prices, the congested cities, the run-down services, the loss of species and habitat and so on, that I have been living with for decades as a result of continual population increase? Who is to say that I might prefer to be \$5100 ‘worse off’ (less than 7 percent of my income) and still have all the amenities and ecosystem services that I had in the old days?

And yet – the Commission apparently wants me to believe that I will be satisfied with the trade-off because this growth will have been ‘sustainable’. What exactly could that mean? It appears that for the Commission it means that institutions will have been designed – and predominantly this means the design of markets – so that the increased costs of population growth can be met, largely through the expansion and improvement of infrastructure, no doubt a good proportion of it ‘user pays’.

But how will we know if it is ‘sustainable’? Is it sustainable if in 2060 I feel no sense of net loss and I feel adequately compensated with my \$5100 bonus? Or is it sustainable if, in 2060, the best scientific evidence (refer the biophysical models above) at the time indicates that growth has been well-managed and we are assured that the same rate of growth can continue through to 2160, 2260 and beyond?

In actuality the Commission provides scant evidence about the effects of immigration on incumbents’ well-being – however defined. In terms of the effect of NOM on per capita GDP there is precious little evidence of a more than trivial positive effect. By way of comparison, the 2015 Intergenerational Report projects a growth in aggregate GDP of 2.8% per annum over the next 40 years, but that of per capita GDP is projected at only 1.5%. So while the population will be growing briskly, the welfare of individuals will not be keeping pace with that of the economy as a whole (Commonwealth of Australia 2015, p. xi). Thus, even sticking to the Commission’s narrow terms, how will future immigration-driven population growth

provide the extra purely economic resources for added infrastructure and environmental protection?

Looking at this question of sustainability through the lens of recent history, even for the past 15 years of fairly high population growth in Australia, can we say that that has been ‘sustainable’ and has the infrastructure kept up? Many would say not. Unique areas of land and ecosystems which have been irreversibly destroyed through housing, roads, parking lots, infrastructure and so on, and congestion in amenity, health, housing, transport and other services has intensified. These costs are often not explicitly specified but simply absorbed by long-suffering users. And looking to the future the Commission is putting great import in the need for infrastructure to keep pace with population growth. The Productivity Commission’s own report on ageing points out that the total public and private capital investment needed to manage population growth over the next 50 years will be five times the total that was needed over the last 50 years (Productivity Commission 2013, p. 9). With federal budget deficits as far as the eye can see, and government reluctance to borrow for infrastructure, where exactly are the investment dollars coming from? Or is it more likely that with continuing population growth, infrastructure will simply continue to become more congested and the natural environment more degraded?

Might it be the case that ‘sustainability’ is becoming a tired cliché, only useful for going through the motions of decision making for development approvals (cf. Benson and Craig 2014; Brown 2015)? For there is no real guarantee that all this growth will be sustainable. More likely it will come down to what people are prepared to put up with – adapting (if possible) to the very real impacts of whichever major biophysical constraints begin to assert themselves, as well as to the many incremental ‘boiling frog’ or ‘thousand cuts’ effects which chip away at amenity, at quiet enjoyment and at the lives of the creatures in the natural world endeavouring to go about their natural business. At the end of the day it is very hard to resist the momentum of the big development interests, the ‘money men’ (and women). The message from the big end of town (and the generally supportive bipartisan government apparatus) is that this population growth is going to happen whether the existing general population likes it or not. It is going to happen because there are a few powerful ‘stakeholders’ who make a motza out of it. And that growth will be ‘sustainable’ *because we say it is*.

Two other inter-related questions about the methodology for the integrated assessment concern the *time horizon* and the *selection of the annual rate of net overseas migration* (NOM). In relation to the time horizon, why stop at 2060? Why not go on to 2120, or 2160? In other words, does the Commission consider there will ever be a time when population growth in Australia will have to, or ought to, stop? Since any population growing at a constant % rate will grow exponentially, is the Commission recommending perpetual exponential population growth for Australia? This is a non-trivial point, for example in relation to the Commission's claim in Draft Finding 8.1 about the putative 'demographic dividend' that migration could offer in the evolution of population ageing – because the Commission alludes to the fact (although is careful to not make a big point of it) that any such dividend would only be temporary up to 2060. To not model further into the future to show how such temporary improvements might either persist or could come undone – as they most certainly would unless immigration kept increasing ad infinitum – seems disingenuous. But of course it does provide another headline 'benefit' for migration-driven population growth to 2060.

Similarly the choice of the 0.6% annual NOM rate for the modelling exercise is not given any justification, other than the fact that it is an historical rate and it is presumably regarded as politically safe (although surely a recommendation for perpetual exponential population growth is *not* politically safe – voters don't know much demography but most of them would understand the word 'exponential'. See section 3 below). But on their own, these are not justifications for why a rate of 0.6% annual NOM should be assumed to continue in the future. Does the Commission believe that the same rate should also continue through to 2120 and 2160? If so, what would be Australia's population at that point? If not, what are the criteria to be used to determine when another rate of growth should be applied from a certain point of time onwards?

A genuine integrated assessment must pull together all of these strands, and as part of that there must be exploration of the multiple 'value frameworks' which are an irreducible part of any policy assessment, and no more so than when considering future population growth. Such values include:

- the ideas of sustainability and resilience;

- ideas about growth and well-being that are embedded in visions of a ‘big Australia’, and in other visions of a more ‘stable state’ (both are visions which are expressed within segments of the Australian community); and
- the question of whether non-human creatures and habitats also deserve moral consideration in making these assessments.

Exploration of these value frameworks, the assumptions underlying them and their varying interpretations within the Australian community, are a crucial part of an integrated assessment. All too often the assumptions about well-being and growth embedded in neoclassical economics serve as the default ethical framework for all assessment. In an era where we are clearly facing some kind of epochal transition to a post-carbon, post-endless growth world, when there are many smart and creative people trying develop new ways of thinking and new modes of organization (for a few examples among many, see Heinberg 2012; Heinberg 2015a; Heinberg 2015b; McDonald 2014), it is simply not good enough to rely on the same tired clichés.

One final comment on the first sentence of Draft Finding 4.1, which reads:

Decisions about the level of migration are the *responsibility of the Australian government*. They involve balancing a complex set of economic, social and environmental policy objectives. (emphasis added)

While the highlighted phrase might be considered a truism, it is also a surprisingly incomplete picture of Australia’s parliamentary democracy. Do the wishes of the electorate play no part in this equation? Is Australia immune from the lessons from the rise of the radical right in Europe in the face of political elites’ deliberate exclusion of voters from decisions about immigration (see Art 2011; Ford and Goodwin 2014).

In the light of the discussion so far, the following is a suggested amendment to Draft Finding 4.1:

Decisions about the level of migration are the responsibility of the Australian government *and people, through a process of informed debate within the community and within Australia’s democratic institutions*. Such decisions involve balancing a complex set of economic, social and environmental policy objectives.

There is no comprehensive empirical basis for setting an aggregate level of immigration over time that would improve the wellbeing of the Australian community. *Such judgements require detailed exploration of a broad range of evidence about community values concerning the nature of wellbeing, ecological sustainability, resilience, pluralism and social cohesion, as well as data about economic and biophysical parameters*. Improving incumbents’ wellbeing is likely to

be consistent with a range of immigration rates (*including a NOM of zero*), which is determined (among other things) by *community values*, the efficiency of the provision of infrastructure, *biophysical parameters*, the efficiency of the labour market, technology, settlement services and external factors.

### **3. Public opinion and debate about migration and population**

On page 185 of the draft report, the following statement occurs:

Attitudes towards immigration can and do fluctuate over time in response to political discourse and public discussion (Markus 2014a). Hence, surveys, which are the main methods available to assess attitudes, can be volatile and tend to reflect recent events and the related media coverage. *Nevertheless, most opinion polling suggests that the community as a whole is relatively comfortable about current levels of immigration and population growth.* (emphasis added)

The highlighted sentence is surely a grossly inaccurate summary of the situation, and will need a complete re-work. First of all, it would be necessary to clearly distinguish survey questions relating to immigration and other survey questions which relate to population growth. These are two clearly distinct issues, even though there are definite relationships between the two issues. The analysis by Markus (see for a summary, Markus 2014) is largely focused on immigration and in particular the issues of social cohesion, diversity and potential racism in public opinion about immigration – which is the focus of the Scanlon Foundation which funds Markus’s work. The 2012 results of the Scanlon Foundation survey show 38% of respondents thought immigration was too high and 6% refused/don’t know. Markus (2014) also cites a meta-review of surveys 1999-2010 which found 43% in support of reduction of immigration and 5% uncertain. Even on these data, I am baffled how the Commission concludes that “community is relatively comfortable”. Surely any reasonable person would conclude that these data show a significant difference of opinion in the community about immigration levels.

When it comes to opinion about population growth the misrepresentation in the above highlighted statement from the Draft Report is even more egregious. One of the most in-depth surveys on this topic was the ANU 2010 poll, *Public opinion towards population growth in Australia*. One of its key findings was that: “A total of 44 per cent of Australians favour population growth, while 52 per cent want the population to remain at or below current levels” (ANU 2010, p. 4). Recently a survey commissioned by Sustainable Population Australia and undertaken by the Australian Population Research Institute (APRI), used exactly the same question as the ANU survey and got virtually exactly the same result: 51%

disagreed with the statement that ‘Australia needs more people’ and 38% agreed that Australia needs more people, with 11% don’t know (Betts 2015). This is an important finding because it shows remarkable stability of opinion over time -- since some may have wanted to claim that the ANU 2010 poll results were a one-off and related to the fact that the population issue had more salience in 2010 because of the ‘big Australia’ debate initiated by comments by then Prime Minister Kevin Rudd.

The APRI survey (Betts 2015) is of further interest because it drilled down into people’s reasons for holding the opinions that they do. And even more rarely for these sorts of surveys, it asked questions about the participants’ specific demographic knowledge. These results are of particular relevance to the Commission’s deliberations for this inquiry since the Commission rightly wants to foster informed discussion about migration and population issues, as indicated in its statement in the Draft Report that: “It is up to the political process to deliver an *informed* decision about the change in the size of the population that is in the best interests of Australians.” (pp. 118-119, emphasis added)

Mention should also be made of another useful survey of community views on population growth. Research was done for the Queensland Government by TNS Social Research (2010; see also Newman 2015), entitled *Social Research on Population Growth and Liveability in South East Queensland*. Of particular interest is that this research drilled down to very specific dimensions of liveability such as traffic congestion, housing affordability, waste management, native plants and wildlife, water supply, air quality, marine and waterway health, and many more. The results were that respondents were overwhelmingly negative about the impacts of population growth, with a large majority (often in the order of 80%) believing that population growth brought about a ‘change for the worse’ on these specific indicators.

In another relevant survey which covered a range of environmental issues in Australia (Trantor and Lester 2015), overpopulation ‘in this country’ came third as the issue that had "worried [respondents] the most over the past 12 months", and (in answer to a different question) 51 per cent said it was either a very urgent concern or an urgent concern.

It is perhaps worth acknowledging at this point that quite a few of the relevant surveys on both population and migration issues are funded by particular think tanks and advocacy groups. The Scanlon Foundation was founded by wealthy businessman Mr Peter Scanlon, who is also Chair of the Migration Council of Australia. Mr Scanlon is on record as being a

strong advocate of a ‘big Australia’ and his funding of the Scanlon Foundation is part of that advocacy (Masanauskas 2009; Jakubowicz 2012). Similarly, the founder of the Lowy Institute, respected businessman Mr Frank Lowy, is a supporter of a big Australia and statements by the Lowy Institute Executive support this (Fullilove 2014). On the other side, Dick Smith is another well-known businessman who has entered into the population debate and has provided some strong advocacy against a big Australia (Smith 2011). And there are other (less well-funded) advocacy groups such as Sustainable Population Australia who are attempting to influence public debate, for example by recently commissioning an opinion survey (Betts 2015).

My point here is not to disparage business people or others from entering public debate and directing their philanthropic efforts to helping shape that debate; in fact quite the opposite. All of these people are to be congratulated for contributing to the civic life of our nation. I do believe that Mr Lowy and Mr Scanlon are motivated by genuine views about what is best for Australia (and not merely by narrow self-interest) just as I believe the same about Mr Smith and other players in the debates about migration and population. It is not a worthwhile starting to point to try to disparage or discount survey results from these think tanks and advocacy groups, simply because they are supplied via those groups. In the main such surveys are competently done using proven methodologies – although of course there will always be scope for looking at these matters in detail (for example question wording, sample design). But in the main, the data provided through these surveys need to be assessed on their merits and treated as useful contributions to the debate.

On page 187 of the Draft Report there appears the following:

The Lowy Institute (2014, p.26) also asked a more general question about ‘the best target population for Australia in the next 40years’. In 2014, about 22 per cent of respondents were in favour of a population at the current level (about 23 million) or smaller, *while 76 per cent were in favour of increasing the population to 30, 40 or 50 million*. These results were consistent with the results of the same survey question in 2010 (figure 6.4). These population numbers are broadly in line with [the Draft Report] projections based on an annual NOM intake of 0.6 percent which implies a population of around 40 million by 2060 (chapter 8), so the views on immigration intake and population size are not inconsistent. (emphasis added)

Sadly, there appears to be something awry with the above highlighted claim. In order to explore this, the relevant table from Lowy Institute (2014) is replicated below:

	2014	2010
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Less than the current size of 23 million people	4%	4%
Around the current size of 23 million people	18%	22%
30 million people	42%	43%
40 million people	25%	23%
50 million people or more	9%	6%
<b>Total: 30, 40 OR 50 million</b>	<b>76%</b>	<b>72%</b>
Don't know/none of these	2%	1%

\* In 2010, this was asked as 22 million, which was then the estimated population size.

Source: Lowy Institute (2014), p. 26.

Lowy Institute (2014) chooses to sum the 'total' row to show the sum of 76% for those respondents in 2014 who personally think the best target population would be 30, 40 or 50 million people. I am not sure if it would have occurred to the Lowy Institute or Productivity Commission writers that this table can also be summed to show that *64% of people think the target population should be no more than 30 million!* It is a matter for speculation whether this is an undergraduate-level error of data interpretation, or whether it is simply public relations dodginess.

The above result from Lowy (2014) is remarkably consistent with the results in Betts (2015, Table 2) which reports that 67% of respondents believe that Australia should aim for a population of no more than 30 million.

The results from both Lowy (2014) and Betts (2015) very clearly show that a large majority of Australians are *not* in favour of attaining the level of population of 40 million in 2060, as projected in the modelling in the Commission's Draft Report. It barely needs to be added that it also reveals as a nonsense the Draft Report's claim that "the community as a whole is relatively comfortable about current levels of immigration and population growth."

It would be more accurate and sensible for the Commission to recognize that there are major differences of opinion within the Australian community about both immigration and population growth. There is undoubtedly a significant majority (at least 65%) not in favour the kind of population growth the Commission is proposing.

The real question which merits consideration is why, in the light of this evidence, are these views not reflected in the political platforms of the major parties? Instead, there is a bipartisan consensus (even amongst many in the Greens Party) of support for ongoing

population growth. One can only speculate here about some of the reasons for this ‘dampening down’ of the population debate at the level of the political and policy elite:

- the possibility that population issues rank low in voter priorities when they are in the voting booth;
- the effect of powerful lobby groups such as migrant communities and development interests – upon whom both parties depend for support;
- a generalised semi-conscious understanding that making population a matter of policy focus is taboo due to range of historical, religious and ethical factors (Coole 2013);
- as a concomitant to the preceding point, a general (mis)perception that population growth is not something anyone can do anything about to moderate or control;
- broadly shared ideologies which express faith in the ability of technology and markets to accommodate continuing increases in population; and
- citizens’ lack of knowledge of the connection between immigration rates and population growth.

#### **4. Effects of urban scaling and urban form**

On pages 214-215 of the report, the following statement occurs:

More people does not necessarily mean that environmental amenity or utility will be reduced for the existing population. But the effect depends very much on the investment response and the planning arrangements and regulations that govern these investments. It also depends on the behaviour of new immigrants and whether they adopt the existing social norms (Sobels et al.2010). Analysis of HILDA and ABS data suggests that, on the whole, the consumption patterns of immigrants are similar to the resident population.

*On the positive side, more people can allow more efficient use of existing and new infrastructure by lowering the unit costs of delivering environmental amenity and utility from both built and natural environmental assets (cite footnote 21). On the negative side, more people means pressures on these assets, which in the case of the built environment can be described as congestion, and in the case of the natural environment as environmental degradation. Congestion mainly affects those using the assets, while environmental degradation can have wider effects. (emphasis added)*

Footnote 21, cited in the above paragraph, is as follows:

Bettencourt et al. (2007) analysis (sic) of the scale effects of cities in the US and Europe found that there were increasing returns to scale for innovative and social activities, but negative scale effects on new AIDS cases and serious crimes.

Household electrical consumption and water consumption were neutral with effect to scale.

In relation to the applicability of the findings of Bettencourt et al. (2007) to urban scale effects for innovation (which Bettencourt et al. found to be superlinear), and for built infrastructure (some found to be sublinear), a number of recent studies have called into question the generalisability of these and related findings (Arcaute et al 2015; Cottineau et al 2015; Louf and Barthelemy 2014; Shalizi 2011). It would seem the findings of Bettencourt et al (2007) should be used with great caution when seeking to identify additional benefits to innovation or built infrastructure contributed by urban population growth.

In relation to the Draft Report's claim that population growth can lower "the unit costs of delivering environmental amenity and utility from both built and *natural environmental assets*" (emphasis added), it is unclear what would be the underlying mechanism to cause a lowering of unit costs for the delivering the utility of natural environmental assets, when urban development is typically involved in destroying or radically modifying such 'assets', which include natural habitats as well as agricultural land. Perhaps this is a matter of more clearly explaining what the Commission has in mind.

One further point in relation to the work of Bettencourt et al (2007; see also Bettencourt 2010), is made in a comment to the journal *Nature* by four scientists (Porter et al 2010), and foreshadows the topic covered below in section 5 of this submission:

Recent contributions on cities (Nature 467, Issue 7318; 2010) have largely ignored a central issue for their future: that of how their inhabitants will be fed given that more than 50% of humanity resides in cities. This represents a historically significant demographic shift that will leave fewer farmers to cultivate the food on which cities currently do and will depend in the future. Over the past 40-50 years, the proportion of humans who farm has dropped by 20% to under 45%. The provisioning service of food production for cities will either have to be sourced from remote hinterlands located across the globe or cities will have to incorporate their own food production by such developments as peri-urban farming. *A scientific question posed by food in the cities is how cities and the land areas needed to feed them scale in relation to city population density. The expectation is that such scaling is positively non-linear because of the highly variable biological productivity of terrestrial and marine ecosystems that produce these food services. In other words, larger cities will sequester proportionally larger and more marginal low-productive areas of land in order to be fed.* Thus, the scaling between city population and land area sequestered for their food is likely to be non-linear with size of city. Local urban and peri-urban food production tends to increase the yield per unit area and may partially counteract such a trend. Providing food services to cities contradicts Bettencourt and West's thesis (Nature 467, Issue 7318; 2010) that, with respect to their use of infrastructure, carbon emissions and other services, cities are proportionally more efficient per

inhabitant. By contrast, food security of dense mega-cities is possible if there exist elsewhere low population dense, large land areas yielding disproportionately high food surpluses, upon which a city population can depend. (emphasis added)

Porter et al's (2010) comment can be linked to a more general point that cities cannot be viewed as closed systems – they are highly dependent on resource inputs from both near and far – and this must be a major factor in considering policies to ensure urban sustainability and resilience.

One final comment on urban form relates to the statement in the Draft Report that “immigrants may well be less intensive in their use of energy than incumbents, given the observed preference toward higher density urban living,” (p. 224) and hence may contribute to lower per capita levels of carbon dioxide emissions. However, the automatic presumption that higher density living is less energy intensive needs careful assessment before arriving at conclusions. For example Recsei (2009) offers the following pertinent points (compare also Bawden and Williams 2015):

On the question of greenhouse gas emissions, a recent study which allocates greenhouse gas emissions to final consumption at the household level<sup>1</sup> shows that on average per person emissions in the high-density inner city areas are nearly twice that in the outer low density areas. Another study shows that there are more greenhouse emissions from domestic energy use in high-density living (5.4t/person/year) than in detached dwellings (2.9t/person/year)... This results from lifts, clothes dryers, air-conditioners and common lighted areas such as parking garages and foyers. What is more, the energy required to construct high-rise is nearly *five times* the energy needed to build single-residential, per resident.

In Australia high density hardly reduces travel intensity at all. Research on Melbourne areas shows that the people squeezed into newly converted dense areas did not use public transport to any greater extent than before and there was little or no change in their percentage of car use....

## **5. Peri-urban land and food production**

Although the Commission recognizes that “population pressure is undoubtedly reducing the share of peri-urban land that is available for agriculture,” the Commission contends that “immigration does not threaten food security in Australia” (p. 223). Three reasons are given for this:

First, the Draft Report states that Australia is a net exporter of food. While this fact is undeniable, and Australia's important contribution to feeding the world has long been recognized, it is also a fact that, as Candy et al (2015) point out, levels of food production at a particular point in time do not necessarily reflect a *stable* supply of nutritious food:

Food supply chains are complex systems involving production, distribution and storage, often designed for efficiency rather than resilience... This is evident in all aspects of the Australian food system. Agricultural production is dominated by large-scale, single-crop or minimal rotation farming dependent on external chemical inputs, irrigation and mechanization... Distribution systems are mostly road freight with increasingly longer supply chains, based on 'just in time' practices ... Spurred on by concern for market efficiency and as a matter of international trade policy, Australia also does not hold any food reserves for use in the event of a major disruption to the food supply ... The food system is therefore vulnerable to short term shocks such as oil and fertiliser price hikes and extreme weather events that disrupt food access and allocation.

Practices that increase production at the expense of essential eco-system services can also result in (and exacerbate) more gradual stressors such as land degradation and water scarcity. These have implications for long-term productivity and future food production ... Rather than causing sudden events or shocks, these factors result in a slow decline in both the health and the adaptive capacity of the food system or sub-systems within it. (Candy et al, p. 713, citations omitted)

Candy et al (2015) report on a major ongoing project of systems modelling and scenario analysis for the Australian food supply to 2060. A pilot project has already been conducted for the state of Victoria, using three scenarios, and it was found that “a domestic surplus of foods that are required for a nutritious diet for the population has not been achieved in any of the three scenarios.” (p. 719)

In a study of Australian cropping yields 1850 to 2001, Turner et al (2016) have found that “the expansion of aggregate cropping area has effectively masked landscape degradation impacts associated with continual production activity on ‘ageing’ land. We estimate yield loss from combined land degradation to have increased to 9%, though the aggregate impact has been masked by the introduction of new land.” (p. 22)

New land cannot continue to come into production at the long term historical rate of 2% because it would be a geographical impossibility – it would “overrun the Australian landmass within a century” (p. 34). Therefore the future of Australian cropping is likely to be very different from the past. In particular, the authors conclude that “potential degradation impacts due to evident constraints in land expansion could lead to a doubling of yield losses with a few decades (in Australia). This may potentially counter yield improvements from technological progress, such that food production is insufficient for projected population growth.” (p. 36)

Another recent study of scenarios for Australian agricultural production to 2050 is somewhat more upbeat in that it finds that agricultural production can theoretically continue at high

levels even on less land, as land-use is converted from agriculture to carbon plantings, biofuels and bioenergy (Grundy et al 2016). However these scenarios appear to depend on a range of significant public policy initiatives, including a \$50 per ton carbon price. In addition, the authors express a note of caution:

Sustained agricultural production and farm income is predicated on continued productivity improvement over the coming decades; the current evidence of a decline [in productivity] is therefore disturbing. Increased levels of food production can be achieved, but this sensitivity to productivity and reduction in land area devoted to food production revealed in the modelling suggests the need for urgency in growing the measures needed to enhance and sustain agricultural productivity. (p. 81)

The above evidence is presented to suggest that there are reasonable evidentiary grounds to believe that the stability and security of Australia's food supply does face significant risks (see also Parker and Stewart 2014; Farmer-Bowers 2015; Lawrence et al 2013). With that point established, I want to turn to the second reason the Commission believes there is no ground for concern about immigration-driven population growth threatening the food supply:

But at most, feeding people here instead of their country of origin only slightly changes the pattern of food flows and overall demand for food. (p. 223)

On the face of it this statement may seem unobjectionable until one reflects upon the fact that this is a reference to an (imagined) state of affairs in 2060 or thereabouts. It is apparently assuming that there will still be ample liquid fuels to power rapid just-in-time global transportation networks, and similarly for food distribution within Australia. It is a view of the unfolding of the future as a continuous and uniform extension of the present, a continuation of business-as-usual globalisation. As such, it ignores the virtual certainty that the 21<sup>st</sup> century will be one punctuated by disruption, whether by climate change, shortages and price volatility of energy (especially oil), water shortages, mass movements of populations due to war, climate change and environmental degradation, and geopolitical conflicts arising from one or more of the above (for a lucid overview see Barnosky and Hadly 2015).

In an age of systemic global risks and associated threats of disruption, it may very well make a difference whether in 2060 there are an additional 13 million mouths to feed in Australia due to immigration-driven population growth. A prolonged shortage of oil could wreak havoc with our current model of food production and distribution, including import/export.

Although there are large uncertainties about the rate of sea level rise due to human-induced climate change, there are plausible scenarios where large sea level rises could affect the deep

water ports of Australia and our trading partners. (cf. Romm 2015; Ng et al 2015). It would seem prudent for our political leaders and their policy advisory agencies to be factoring these disruptive risks into their integrated assessment of future scenarios – rather than peering into the future through a tunnel of never-ending sameness.

The third point that the Commission makes with respect to land and food supply is as follows:

Overall, population growth as a result of the current levels of immigrant intake does not threaten Australia's food security. It does, however increase the competition for land in peri-urban areas and housing will crowd out agriculture and other activities in some areas. This process of change is ongoing and agricultural production can and does relocate.

It seems that in this statement the Commission both giveth and taketh away: yes agriculture on peri-urban land is being destroyed, but it is okay because “agricultural production can and does relocate”. It is a bit hard to fathom this latter statement – other than as another expression of the neoclassical doctrine of infinite substitution – when it is well known that good agricultural land is very scarce in Australia. Less than 10% of the continent is arable land, and “much of this is marginal with respect to water and nutrient regimes” (Nix 1988). The question is, “relocate” where? Clear more forests? Move onto more marginal agricultural land elsewhere? Undertake more intensive cultivation of remaining (diminishing) agricultural land? Both of the latter options would require more nutritional inputs such as nitrogenous and phosphate fertilisers, which each have associated cost and risk factors (e.g. dependence on fossil fuels for manufacture and transport, and global phosphate scarcity). In view of the risks identified above in recent modelling studies of Australia's food production system (and particularly germane here, the lack of ability for further expansion into new land, and indeed the likelihood of reductions in land use allocated to agriculture), why would a government or one of its key advisory agencies want to acquiesce to continuing and often irreversible re-allocations of good quality arable land to urban-related uses?

The Commission's statement that “agriculture can and does relocate” is perhaps reflective of the Commission's genuine belief that market processes are the best way to allocate peri-urban land. In which case such land will always be viewed “as land awaiting urban development.” (Buxton and Carey 2014, p. 191) This view seems consistent with the Commission's previous benchmarking study on urban planning where there appears to be little interest in the fate of peri-urban land, other than to get it efficiently allocated to the highest bidder – in which case

agricultural uses will always eventually lose out. As McFarland (2015) notes, this is the standard economic approach to land allocation:

From a classic land-use perspective, such change in use [away from agriculture] is outwardly regarded as land going from a lower to a higher value use. This ignores the actual costs of land conversion. The environmental impacts of the increasing urban footprint at the peri-urban are known to include such items as reduced diversity of species, loss of environmentally sensitive land, increased water pollution from urban runoff, increased air pollution, removal of natural vegetation, increased soil erosion and increased risk of flooding .. The current system of land economics, however, does not factor in the full costs of the environmental impacts... (p. 173)

One might add to this list of omissions the option value of retaining good quality arable land in an era of increasing threats to food security.

The Commission's benchmarking study was almost entirely focused on improving the planning system to increase economic benefits narrowly construed (i.e. to expedite the approval process for developers), without detailed consideration of the importance of environmental, ecological and agricultural issues. The findings summarized from that study (e.g. Box 6.10) seem to have little relevance to the issue at hand, namely protection of environment and agricultural land – unless Box 6.10 is a coded statement from the Commission that it does not view such matters as a priority compared to the overall need to keep the development process moving. Interestingly, the benchmarking study did mention favourably the option of setting urban growth boundaries (Productivity Commission 2011, p. 135), although this is not mentioned in Box 6.10.

Unfortunately urban growth boundaries have gone the way of most attempts to put stable limits on development in certain areas. As a result of population pressures (from population growth in Australia in recent decades) this has fuelled developer activity and the political process has been used to redefine the assortment of supposedly fixed boundaries, belts, wedges and zones, such that the sprawl is permitted to more ever-outwards (Buxton and Groenhart 2013). The result is indeed a 'tangle' of economic, legal and scientific issues (McFarland 2015) – which is probably a polite way of putting it. Among those who have studied these matters, it seems one thing is clear, that markets in land are not the way to protect agricultural and other ecosystems in the peri-urban areas. This is a matter where strong and stable regulation is required, to create protected agricultural and conservation areas – but crucially this regulation has to be backed up by a broad political consensus. Such approaches are not impossible – they appear to be working in cities such as Portland, Toronto and Vancouver (McFarland 2015; Buxton and Carey 2014).

In light of the above discussion, I respectfully suggest that the Commission include a finding to the effect that:

*Population growth in Australia is threatening the viability of valuable sources of agricultural production in peri-urban areas, which contribute to Australia's ongoing food security. Managing this land-use conflict will require much stronger regulatory approaches backed by renewed efforts to build broad-based community support for such measures.*

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