

Population

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The Global Picture

When I was born, the human population was about two billion. Today, it is approaching seven billion. In the 1960s, US biologist Paul Ehrlich warned of the consequences of uncontrolled population growth. In forecasting mass starvation if the population continued to grow, he was echoing the gloomy thoughts of Malthus, who argued over 200 years ago that population was increasing faster than food production could be expanded. That prediction has turned out to be wrong so far. It has been a remarkable technical effort to keep food production in step with the growth of the human population, so that the food supply per person is currently as good as at any time in human history. The distribution system results in millions of people being hungry, while dogs and cats in countries like Australia eat well. The world now produces enough food for each person to get about two kilograms per day if it were equally shared — about one kg of fruit and vegetables, about 0.5 kg of cereals and pulses, and about 0.5 kg of protein in the form of meat, eggs and fish. It is a remarkable feat to have increased the food supply as fast as the growing population. There is no guarantee we can keep doing it. Most of the indicators of food production per person — grain, meat and fish per person — have peaked and are now declining slowly, pressuring us to embrace risky approaches like genetic modification of food crops to boost production. Some experts are quite gloomy about the prospect of maintaining the present levels of food

production, and it is very difficult to see how it could be ramped up to meet the needs of the projected future world population.

We face a fundamental biological fact: no species can keep increasing its numbers in a closed system. Sooner or later, the population of any species is stabilised or reduced by natural forces: predators, disease, the limits of the food supply or the limited capacity of natural systems to process waste. The total human population is still growing at about 80 million people a year, or about a quarter of a million a day. So the global population increase is about the size of Adelaide every four days. In the demographic community, some have noticed a slowing of the rate of increase in recent years and predict that the world population will peak at about nine billion, while others see it going even higher. Unless there are large-scale disasters or unforeseen outbreaks of disease, there will be about 1.5 times as many people on the planet in the middle of this century as there are now. That means we will need 50% more food, water and other resources than we currently use for the allocation per person to remain at the present level. This is a huge challenge. In terms of slowing climate change, the challenge of reducing our greenhouse pollution is made more difficult by the growing population. All other things being equal, more people means more energy is needed for warmth, food production, water supply, transport and cooking. I will return to this general issue after discussing the Australian situation.

Australia

Our population is about 21.5 million and it had been increasing until very recently by about a quarter of a million (250,000) each year. This is the combination of the so-called natural increase — the difference between births and deaths, about 130,000 a year — and the net migration, the difference between those arriving in Australia and those leaving, about 120,000 a year on average recently. As Figure 1 shows, the ‘natural increase’ has been roughly the same for the past 30 years, while migration levels have varied considerably. I will analyse each of these components of the population growth in more detail.

Birthrate

There is some confusion about the ‘natural increase’. The average number of children per adult woman steadily declined from the

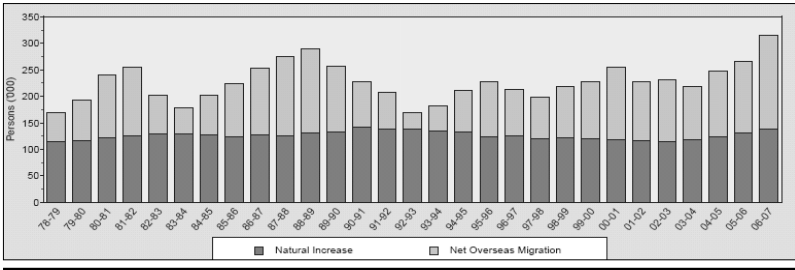


Figure 1
Components of population growth.

Source: ABS.

1950s, when it was nearly four, to a low point of 1.7 a decade ago, before increasing recently to 1.8. For about 30 years, the average number of children per adult woman has been below the so-called ‘replacement rate’. If a couple has two children, they just replace themselves in the next generation. As the current figure is 1.8, some observers have made simplistic comments to the effect that ‘we are not replacing ourselves’ or ‘our population is declining’. These claims are incorrect.

The number of children per adult woman has dropped, but the number of adult women is still increasing. This is due to the past birth rate and the fact that many migrants arrive here in their fertile years. So the total birth rate is still much greater than the rate at which we are dying. In the average recent year about 250,000 babies were born in Australia and about 120,000 people died. That meant the population would have been increasing by about 130,000 a year, even if there were no migration to Australia. And the birth rate has actually increased in recent years, possibly stimulated by the policy of the Howard Government of offering financial inducements. Apparently concerned that the annual difference of births over deaths was ‘only’ about 130,000, Peter Costello included in a Budget cash incentives of \$4000 for having children. He even suggested that it was women’s national duty to have more children when he called on couples to have three children: one for the husband, one for the wife and one for the country. There is debate about whether the money offered is directly responsible for the recent increase in the birthrate, but it has certainly coincided with an increase of about 50,000 births a year over the historic trend, as shown in Figure 2.

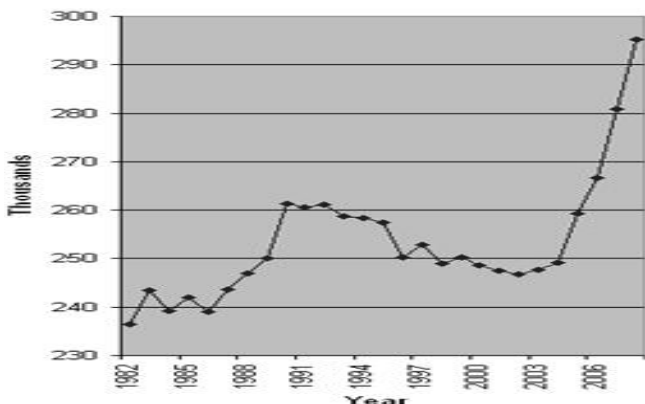


Figure 2
Births year ended September.
Source: ABS.

Despite this unprecedented spike, the average number of children per adult woman in Australia is still below the replacement rate, as shown by Figure 3. What this means is that if there were no migration, we could look forward to a time (about 2030) when the population would peak and then very slowly decline. We can see this effect in a country like Japan, where the birth rate has been below the replacement rate for 40 years and there is very little net migration, so the population has stabilised. One consequence of Japan's stable population at a time when the average lifespan is still increasing is a change in the age profile; basically, more of the population are above retirement

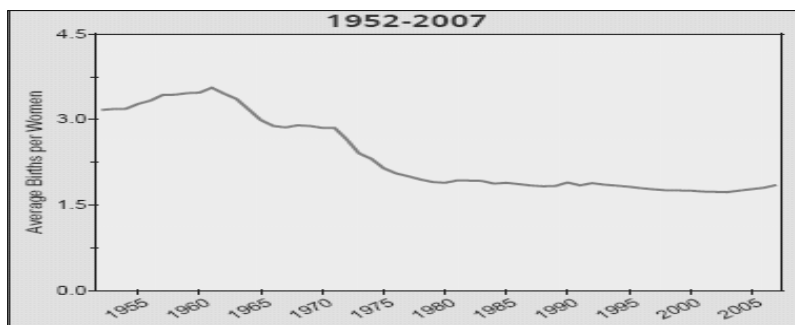


Figure 3
Average number of children per adult woman in Australia.
Source: ABS.

age than ever before. Some economists see this as a problem, based on a simple model that sees those in work as supporting those who have retired. In the modern world, an increasing fraction of retired people have funded their own retirement through superannuation or other pension schemes that are not a financial drain on the workforce. So the simple model does not apply, although it is still used in public debate to justify increasing our population.

Migration

The second factor driving population growth is migration. There have been several studies of how different levels of migration affect our population. As I noted in the previous section, if migration did not occur, the population would peak about 2030 and then slowly decline. If you add in low levels of migration, the population still stabilises, but later in time and at a higher level. The studies show that a net migrant intake of up to about 60,000 per year will still allow the population to stabilise. But average migrant intakes above 70,000 cause the total population to keep increasing into the distant future, because many of those who come here will have children, who will in turn have children of their own. There is no disagreement of any substance about these calculations. There are different views about the way we should respond.

At one end of the spectrum, most environmental scientists recognise that the demands of the current population are already doing irreversible damage to our natural systems. They argue that every additional person increases the demand for resources and the pressure on natural systems, so we should aim to stabilise or even reduce the population. Accepting further increase would mean that we were accepting further decline in the capacity of natural systems to meet our needs, thus condemning future generations to a poorer quality of life. At the other end of the spectrum, some politicians and business leaders believe that a growing population will mean a greater demand for goods and services and therefore they support rapid increase; there have even been calls to expand the net migration to boost the economy. The inward migration target for the 2008-09 year is the highest in our history and this figure was justified by claims of skills shortages. As I wrote, there was belated recognition that bringing in more workers does not make any sense when we are

moving into a period of high unemployment levels, so the target was revised downward. But the overall increase in the Australian population in 2008 was about 400,000. This is the greatest increase in any year in our total history. It brought the population up to about 21.5 million.

Of course, it is simplistic to paint this as an argument between polar opposites of environmental scientists and economists. There are many people who support immigration for non-economic reasons, such as the social and cultural diversity migrants bring; others oppose it for that reason, seeing it as changing Australian culture in ways they do not support.

Adding the Factors Together

Let me make clear where I stand. I am a patron of the group Sustainable Population Australia (SPA) because I believe there is no prospect, even in principle, of a sustainable society unless we stabilise the population at a level that can be supported at acceptable social and environmental standards. There is no doubt we could keep increasing our numbers in the short term, but the scientific evidence shows we would be steadily reducing our quality of life. More seriously, we would probably be reducing the long-term capacity of the land to provide for the needs of future generations, given the evidence that this is already threatened by population levels.

The Australian Bureau of Statistics has computed likely future population figures for Australia, based on different assumptions about the birth-rate and the migration levels. Series A assumes high fertility rates (1.9 children per adult woman) and what were considered high rates of migration (140,000 per year). On those assumptions, the Australian population would be about 33 million by the middle of this century and 44 million by 2100. Series B projection assumes a fertility rate of 1.7 and net migration of 110,000; if those were the trends, the population would increase to 28 million by 2050 and 31 million by 2100. Series C assumes even lower rates for both factors: a fertility rate of 1.5 and only 80,000 net migrants per year. Even on that basis the population would still increase to 25 million by 2050, but it would then decline to 22.4 million by the end of the century. The present rates of fertility and migration mean we are tracking close to the Series A projections, with the birthrate slightly below the assumptions, but

the net migration well above. So we are on track for the population to increase by another 12 million people in the next 40 years and to more than double by the end of the century. Further, since government policies have increased migration levels and encouraged women to have more children, an outside observer would conclude that these trends have at least our tacit support.

The overall demands of our present population and lifestyle choices are degrading our natural assets, as documented by three national reports on the state of the environment. Jared Diamond concluded that the most likely future for Australia is declining living standards in a steadily degrading natural environment. The impact on our environment is determined by how many of us there are and how we choose to live. Twenty-one million carnivores have more impact than the same number of vegetarians. City people who drive cars have more impact than those who cycle or use public transport. Those who live in large houses use more resources than those in more compact dwellings. That being said, if our lifestyle doesn't change, more people will inevitably lead to further degradation of our local environment. If our population grows, we will only reduce the rate of damage to the environment if the impact per person is reduced more rapidly than the population increases.

The Politics of Population

I have discussed the measures introduced by Peter Costello, as Treasurer in the Howard Government, to encourage Australian women to have more children. At the time of writing, there is effectively bipartisan support in Canberra for this approach. Both the ALP Government and the Coalition in Opposition see population growth as either inevitable or desirable. This support is based on simple myths that see increasing population as good for the economy, or needed for our security, or a desirable investment in our future.

At a population conference in Canberra in 2004, I heard a senior journalist argue that population growth was good because it boosts the economy. A questioner pointed out that OECD statistics showed a significant negative relationship between population growth and economic output per person. The countries that performed best on the indicator of increasing wealth per person were those with slow population growth or declining population. There is an economic

explanation for this effect. A country with a growing population needs to invest resources in assets that are, in economic terms, not productive — like houses to accommodate the extra people, power and water for the houses, roads and telephone services to support them and so on. If the population isn't growing, the demand for housing is limited to replacing old stock as it reaches the end of its useful life. So the nation's resources can instead be invested in new technology, new industries and productivity improvements, with related economic benefits. It was therefore no coincidence that the nations that were performing strongly in the late 20th century had stable populations. The journalist said that he hadn't seen the OECD data, but the figures didn't sound right to him and he was sure the people he talked to would not agree with them! In other words, the facts were in conflict with his prejudices, so he rejected the facts and kept his prejudices. His paper still promotes simplistic arguments in favour of growth, undisturbed by the facts.

In our earlier history, it was commonly argued that we needed a larger population to defend our land against the perceived threat of greater numbers in countries to our north. When I was young, I thought that was a convincing argument. Then I heard a radio talk by the late Cyril Pearl, pointing out that the islands to the north of Australia (like Java) had been crowded and the northern parts of Australia had been very lightly populated for thousands of years before the arrival of Europeans! Java has rich, deep volcanic soils that support a large population, whereas the north of Australia has old, extensively weathered soils that are very poor for agriculture. So saying that we should populate the north or the Indonesians will take it over is a bit like saying that if Nigeria doesn't move into the Sahara Desert, it will be overrun by the Algerians! The argument that a large population is needed to defend our land against possible enemies is similarly flawed. A large population was important for defence in the age when military engagements consisted of thousands of armed infantry shooting or stabbing each other, an age that arguably ended when military aircraft were introduced nearly a hundred years ago. Today, defence is largely based on equipment and weapons technology rather than human numbers, as illustrated by the size of the military services. In 1945, there were more than 500,000 men and women in Australia's armed services. Today, the number is about

30,000. In other words, the total number of people engaged in defending Australia is about 10 per cent of the annual increase in the population.

The workforce argument is a complicated one. When the Rudd Government reacted to the 2008–09 economic slowdown by cutting migrant numbers, there was a brisk debate about the impact of migration on employment. Economists mostly argued that incoming migrants create work by increasing the demand for houses, clothes, food and other services, so they boost the overall size of the economy. If that argument is valid, it follows that bringing migrants in to cope with skill shortages is a self-defeating exercise because the migrants create more work than they supply. Regions where there is significant growth in the population, like the Sunshine Coast, have a local employment pattern dominated by the construction industry. So we have a circular argument: people are moving there because there appear to be jobs, but the jobs are dependent on people moving there to create demand for extra housing. That is clearly not sustainable in the long term.

Migration is a touchy area because some unscrupulous politicians use it to stir up antagonism towards new migrants and refugees, while others curry favour in areas where there are many recent migrants by assisting them to bring relatives and friends to Australia. Immigration is seen as an issue of sufficient importance to demand a Minister and a government department. I agree with Tim Flannery who argues that we should see migration as simply one aspect of population and have a Minister for Population, responsible for stabilising the population at a level that can be sustainably supported. We could be more generous to refugees, accommodate family reunions and bring in skilled people where there are shortages, but our overall goal for the future should be to stabilise the population.

Two Queensland local governments, Noosa and Douglas shires, decided in the 1990s to stabilise both their resident and tourist populations by limiting the release of land for housing and tourist accommodation. There was an obvious element of self-interest in these decisions, so they had political support. People who have moved to those desirable coastal areas didn't want their relaxed lifestyle compromised by intensive development. In other areas, such as the so-called Gold Coast, the short-term economic benefits of develop-

ment have obscured the long-term costs, so the natural advantages that attracted people are being destroyed by successive waves of new construction. So Noosa and Port Douglas were interesting case studies: could it really be true that there are economic advantages in stable populations rather than endless growth? The 2008 local government elections provided an interesting endorsement of those policies by the electorate. I suspect the Queensland government thought it could stamp out these anti-growth attitudes by strategic re-alignment of boundaries when they reorganised local government. The changes amalgamated Douglas Shire with Cairns, which has strongly promoted growth, while Noosa was combined with the pro-growth shires of Maroochydore and Caloundra to form the Sunshine Coast Regional Council. If the aim was to put an end to the notion of stabilising population, the move backfired spectacularly. With the Port Douglas electors added to Cairns, the new shire elected a Green mayor! On the Sunshine Coast, the former Noosa mayor [Bob Abbott] ran against the former Maroochydore mayor in what was effectively a plebiscite on the future of the region. Abbott romped home with over 60% of the vote and a majority in every polling booth, giving him an unprecedented mandate for his approach of developing sustainably.

My conclusion is that most politicians and economists favour growing populations because they see the overall size of the economy increasing if there are more people. Growth is explicitly supported by government policies to increase migration and encourage reproduction. Individuals see disadvantages of growth as well as benefits, so voters are likely to support stabilising the population when given the choice.

The Impact on Climate Change

The main driver of climate change is the increasing concentration in the air of the 'greenhouse gases' like carbon dioxide and methane. This is, in turn, the direct result of the pattern of energy use. In Australia, our direct and indirect energy use adds up to about six kilowatts per person around the clock. This is much more than you use directly in electricity, gas and transport fuels. All facets of modern life — our housing, food supply, water, clothes, entertainment — involve large quantities of energy. Since almost all the energy we use

comes from fossil fuels (coal, oil and gas), it puts carbon dioxide, methane and other greenhouse gases into the atmosphere. This process has been going on at an increasing rate since the Industrial Revolution over 200 years ago: increasing use of fossil fuels has made our lives much more comfortable, but has changed the composition of the atmosphere. Carbon-dioxide levels have increased from about 280 parts per million to over 380, while methane levels have doubled and concentrations of other greenhouse gases like oxides of nitrogen have also increased. We are now seeing the undeniable effects of our strengthening the Earth's capacity to trap heat. Global average temperatures are up about 0.8 degrees and rainfall patterns have changed. Snow and ice is retreating, while extreme weather events have become more frequent and more severe. Vector-borne diseases like dengue fever are spreading as the insects that carry the infections spread into areas that were previously too cool for them.

When I wrote *Living in the Greenhouse* 20 years ago, I summarised the science. It was predicted to get hotter and wetter in the north, with increased risk of cyclones, flooding and spread of vector-borne diseases. It was expected to get hotter and drier in the south with more severe heatwaves and a risk of more serious bushfires. In 2005, when I wrote *Living in the Hothouse*, Scribe Books used a picture of the 2003 Canberra fires for the cover. As the editor said, the 2003 summer, unusually hot and dry by past standards, was a foretaste of what we can expect more frequently in the future if we fail to curb climate change. We should not have been surprised by the events of February 2009: severe heatwaves in South Australia and Victoria, catastrophic fires in Victoria, floods in Queensland and northern New South Wales, and a serious outbreak of dengue fever in northern Queensland. We can't say any of these events was a direct outcome of climate change, but we can say they are all exactly in line with what science has been saying for over 20 years. More importantly, the science is now warning we can expect more disasters of these kinds if we keep polluting the atmosphere.

The Fourth Assessment Report of the Inter-governmental Panel on Climate Change, the UN's scientific advisory body, warned in 2007 that global greenhouse pollution needs to peak by 2015 and then start declining to much lower levels by 2050 to give us a chance of avoiding dangerous climate change. It said that industrialised

nations like Australia should aim to reduce our share of the pollution by between 25 and 40 per cent by 2020, with a long-term goal of much larger reductions, effectively decarbonisation of our energy system, by the middle of the century. As I was finalising this essay, the UN convened an international scientific conference on climate change in the Danish capital, Copenhagen. Reviewing the more recent science, it concluded that change is happening much faster than scientists had expected and revised the targets for reducing the rate of releasing greenhouse gases, leading the Danish Prime Minister to observe 'Business as usual is dead'. The International Energy Agency, which has historically been quite conservative about the need to change the pattern of energy supply and use, broke with its tradition in late 2008 when it said the world needs 'nothing short of an energy revolution'.

While most politicians still see the economy as paramount, such leading economists as Lord Nicholas Stern in the United Kingdom, Jeffrey Sachs in the United States and Professor Ross Garnaut in Australia have said that it makes economic sense to respond now to climate change. Even in narrow economic terms, they say, the likely costs of climate change are far greater than realistic estimates of the cost of slowing down the changes. As one example, a study released in March 2009 calculated that it would cost \$28 billion over the next 40 years to convert Australia completely to a mix of renewable energy supplies. That total figure for the next 40 years is much less than the Rudd Government is spending this year alone on its response to the global financial crisis!

Population and Climate Change: The Bottom Line

How does population affect this? Put simply, the total greenhouse pollution of Australia is the product of our numbers and our average impact per person. In the absence of lifestyle changes to reduce energy-related pollution per person, every additional Australian increases our impact. That means proportionate increase in greenhouse pollution; indeed, this is so inevitable that the Australian delegation at the 1997 Kyoto conference argued that we need a more generous target than any other industrialised country because of our rapid population growth, while more recently the Rudd Government defended its inadequate target for greenhouse-gas

reduction by saying that it amounted to a significant per capita cut if the population increases as predicted! In a strict arithmetic sense, they are right. If our population does increase by another 3.5 million by 2050, as it would on current trends, there will be 25 million Australians rather than 21.5 million. If there are no changes in the way we live, that will mean about 16% further increase in the greenhouse pollution resulting from our energy use, which is already about 34% above the level in the Kyoto base year of 1990. So just reducing our impact by the Rudd Government's inadequate target of 5% will require a reduction in the pollution per person of about 50% from the present level, while a responsible target like 50% reduction in the national impact would require bringing pollution per person down to about a quarter of the 1990 figure. Those figures show why there is political timidity about setting a responsible target.

At the same time, lifestyle factors are going in the wrong direction, at least partly as a response to climate change. As it gets hotter in southern Australia, more people are getting airconditioners, so they are burning more dirty coal to fight off the effects of burning dirty coal. As rails buckle and cooling systems fail, commuters abandon public transport and drive cars, thus burning more oil to avoid the effects of burning oil — and leading to political pressure to squander more of the infrastructure budget on wasteful road schemes. With rainfall declining, several States are building desalination plants, using electricity to combat the effects of electricity use. So Australian greenhouse pollution is spiralling out of control. Each year there are more of us and each year we use, on average, more dirty fossil-fuel energy. That is why our energy-related greenhouse pollution is now a third greater than it was in 1990.

Scientists are divided about what should be the responsible target for Australia in 2020 because the science has a level of uncertainty. That will always be the case for predicting the future impact of changing a complex system, like the Earth's climate system. There is genuine uncertainty about both the overall impact of a given increase in greenhouse gases and the rate of change. Of more concern, our knowledge of the Earth's system does not allow us to predict in advance the risk of passing critical thresholds or tipping points, beyond which change is rapid and potentially irreversible. Some cautious scientists are urging reduction of our greenhouse pollution

by 25% by 2020; others think this would make the risk of dangerous climate change unacceptable and urge much larger cuts. I think we should be cautious. If you insure your house against fire and it doesn't burn down, you might resent spending on insurance. But it is a better outcome than saving money by not insuring and losing everything if a fire happens.

We should spend public money now on rapid conversion to clean energy sources and efficient use to reduce the risk of dangerous climate change. Unfortunately, many politicians focus on the very short term of the electoral cycle. On that time scale, they are tempted to save money (or spend it on more popular projects, like sporting facilities or roads), rather than invest in protecting our future.

Conclusion

Increasing population makes it harder to respond responsibly to climate change by reducing our greenhouse pollution. We should set a goal of stabilising our population at a level that can be sustainably supported. In the short term, we should phase out the financial incentives for larger families and set migration targets of 60,000 a year or less. As concerned individuals, we need to counter the poisonous rhetoric of the mass media, equating growth with progress and spreading groundless fear about the alternative of a sustainable future.



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