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PEOPLE POLICY: THE CASE FOR STABILISING AUSTRALIA'S POPULATION

DOUG COCKS

'There is room in the world, no doubt, and even in the old countries, for a great increase of population, supposing the arts of living to go on improving, and capital to increase. But even if innocuous, I confess to see very little reason for desiring it. The density of population necessary to enable mankind to obtain, in the greatest degree, all the advantages of co-operation and of social intercourse, has, in all the most populous countries been obtained. A population may be too crowded, though all be amply supplied with food and rainment. It is not good for man to be kept perforce at all times in the presence of his species. A world from which solitude is extirpated, is a very poor ideal. Solitude, in the sense of being often alone, is essential to any depth of meditation or of character; and solitude in the presence of natural beauty and grandeur, is the cradle of thoughts and aspirations which are not only good for the individual, but which society could ill do without. Nor is there much satisfaction in contemplating the world with nothing left of the spontaneous activity of nature; with every rood of land brought into cultivation, which is capable of growing food for human beings; every flowery waste or natural pasture ploughed up, all quadrupeds or birds which are not domesticated for man's use exterminated as his rivals for food, every hedgerow or superfluous tree rooted out, and scarcely a place left where a wild shrub or flower could grow without being eradicated as a weed in the name of improved agriculture. If earth must lose that great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or a happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary long before necessity compels them to it.

It is scarcely necessary to remark that a stationary condition of capital and population implies no stationary state of human improvement. There would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living, and much more likelihood of its being improved, when minds ceased to be engrossed by the art of getting on.'

John Stuart Mill, 1888 [1848], from
The principles of political economy, pp.454-5.

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PREFACE AND INTRODUCTION

This book has been written for a number of reasons. The first is to convince as many Australians as possible that we have enough and possibly too many people living in this country. The second is to make more people aware that Australia's population growth can be stopped within a generation or so by the relatively simple expedient of reducing net migration into this country to a few tens of thousands per annum. A third is to demonstrate that the population question is an important question, irrespective of one's views on Australia's rate of population change and ultimate population size. That is, the consequences of getting it wrong could be quite unpleasant. A fourth is that writing a book that takes population-immigration questions seriously constitutes a protest against all the gobbledegook, newspeak and throwaway lines politicians and other 'leaders' offer as reasons for their positions and actions concerning population-immigration matters. I want to do what I can to force population-immigration issues onto the political agenda and unhorse the politicians and others who want to keep them off.

I see the achieving of these immediate purposes as my contribution to bringing about a change in public and political opinion which might lead to my ultimate purpose, a change in the Australian Government's population policy. At present we have a Clayton's population policy, the one you have when you are not having a population policy.

I am in fact convinced that population stabilisation is an idea whose time has come for Australia although it is unlikely that, by the time this book is published, some version of population stabilisation will be government policy. If perchance so, no harm done and the book will still have a role to play in ensuring that a policy U-turn does not occur. If not, then my original purposes remain relevant.

Several recent experiences have helped to bring me to the point of writing at length about the population question. One is that when being interviewed by a diversity of media people after the publication of my 1992 book on managing Australia's natural resources (*Use with care*, New South Wales University Press) I was astonished at the interest shown in the very few pages I had devoted to the population question therein.

Another is the six months of 1994 I spent on secondment from CSIRO (Commonwealth Scientific and Industrial Research Organisation) to the House of Representatives Long Term Strategies Committee at the time it was making an inquiry into 'Australia's population carrying capacity', hereafter called the *Jones Inquiry* after its chairperson, the Hon Barry Jones.

I found it very illuminating to find a structure in the ideas of the 271 public and organisational submissions to that Inquiry and prepare a draft report for the Committee's further consideration. While I am quite critical of that Report's attitudes and recommendations (or rather lack of them), I agree with much of its contents and indeed, this book quotes extensively from it and its submissions. I have particularly enjoyed quoting and paraphrasing memorable bits from the submissions of 'ordinary' people and have assumed that submissions, collectively, are a representative sample of the opinions of Australians interested in the population question.

Mentioning my employer, CSIRO, provides the opportunity to state quite clearly that while CSIRO has supported my efforts to develop a perspective on the population question, this book is a personal and not an organisational statement of position.

A third reason for writing *People policy* is that it represents an intellectual challenge. Can I get on top of the spaghetti-like tangle of arguments about population and comb them into an interesting and persuasive story? Can I put my finger on their strengths and weaknesses? It is over ten years since the excellent *Populate and Perish* (1984) collection of essays edited by Birrell, Hill and Nevile attempted to survey all aspects of the population question in the Australian context; and five years since JW Smith (1991) edited *Immigration, population and sustainable environments: the limits to Australia's growth*. Now I would like to have a go.

While my own position on the population question is being declared at the outset, I have tried to present arguments for and against a much larger population as fairly as I can. Not only does my mind-set as a scientist pull me in the direction of wanting to look disinterestedly (in the proper sense of that word) at both sides of the argument, but I do not want to be accused of setting up and then destroying straw dummies. Finally, there is always the possibility that by setting out both sides clearly I might change my own mind, a reflection of the half-joke 'How do I know what I think till I see what I say?'

In any event, I think the case for stabilising Australia's population within a generation or so is strong enough to withstand the strongest possible presentation of the case for population growth. Putting this another way, the case for major population growth is weak while the prima facie case against population growth, the precautionary argument, is strong.

Models of conviction

As I explain presently, the range of demographic choices facing Australia two generations into the future (a generation is about 25 years) extends from c19 million and near-stable to c37 million and growing fast. It is not possible to 'prove' that a population of 19 million in 2045 would be better than a population of 37 million, or vice versa. Proof is possible only in closed mathematical and logical systems of inference from undisputed assumptions.

So how might people become convinced that we should aim for some part of that range in preference to some other part? I have come to the conclusion that open-minded people faced with making a choice between options for action, when each option presents a range of arguments for or against, pre-consciously use a 'weight of evidence' model of the 'proving' process.

For someone trying to decide in the public interest, which of these demographic options to support (say), consideration of a wide range of partial arguments can be thought of as piling argument after argument on either the 'large population' or the 'small population' pan of a balance. At some point the balance will tip to one side or the other. The process has much in common with a jury reaching a degree of conviction that, beyond reasonable doubt, the accused is guilty.

Each person, quite subjectively, values each argument as carrying much or little weight. For example, economists particularly value economic arguments irrespective of which 'pan' they fall into; ditto for environmentalists, demographers etc. People who have a strong private interest in a particular choice have to try even harder to recognise and discount their biases.

Some people's balances will tip after only one or two arguments have been loaded. Others' balances might never tip; these are the true agnostics. Prejudiced people are those who have prejudged the arguments and come equipped with a 'pre-tipped' balance. Not all arguments are positive; sometimes they take the form of unloading a piece of received wisdom from its pan.

Another related approach to trying to integrate diverse arguments is to view the task as one of testing a 'null hypothesis' in the spirit of a scientific experiment. This amounts to hypothesising that some existing situation is optimal and asking whether the sum of arguments marshalled is sufficient to convince anyone to reject the null hypothesis.

Here this means hypothesising that the present population (or perhaps the present rate of population growth) is optimal and asking whether the available arguments are sufficient to move one away from that position. Barry Jones took this tack in his Parliamentary Committee's forementioned inquiry into Australia's population carrying capacity. The Committee's Recommendation 10 stated that 'Proponents of radical change to existing policies should bear the onus of proof...'

Most people picking up this book will have an 'initial position' on the population-size question. Whether I can present the arguments neutrally enough in the first place and whether the process of spelling out the full range of arguments is likely to persuade many people to change their initial position are matters that can only be guessed at.

In any case, whatever the reader's model of conviction, s/he is invited to reflect on hir (my word for his or her) own position now and chart any movement in that position as the book unfolds. What we have in the population question is a highly complex but poorly documented and understood network of processes and downstream implications. Stand aside and watch your mind in action.

Outline of the book

The book is organised into chapters as follows:

Chapter 1, *Historical background to the population debate,* shows that for much of Australia's history as a federation, the conventional wisdom has been that Australia should have a population in the tens of millions, if not more. Opinions have differed more on the speed at which this could and should be achieved. That conventional wisdom started to dissolve in the late 60s but has not yet settled down in a new mould.

Chapter 2, *Australia's demographic choices*, sets the parameters for debate over population size and rate of change over the next 50 years and beyond; what is likely to happen and what could happen rather than what should happen.

Chapter 3, *The politics of population and immigration policy,* explains why Australia has only an implicit population policy and, since many community groups have an interest in protecting or changing that policy, what is likely to happen to population policy in the future.

Chapters 4 to 9 present arguments for and against a major population increase under the respective headings of *economic arguments, resource availability arguments, environmental arguments, social arguments, international arguments and general or 'other' arguments*. Here, as well as presenting demure statements of received arguments, I include many assertions paraphrased or quoted from Jones Inquiry submissions and elsewhere (referenced to submission numbers in Appendix 1 as (J...)) . Most of these latter are in no sense *arguments*; but they are illuminating reflections of the diverse values, perceptions and attitudes brought to the population debate by a variety of people.

In Chapter 10, *Overview of arguments about population size*, I draw together the suite of arguments in earlier Chapters in a 'pan-tipping' exercise, all the time recognising that many of these arguments will continue to evolve, that I may not have done them justice and that new arguments will emerge. This chapter is an attempt to weigh and add diverse arguments and come to a summary conclusion about the desirability of pursuing a significantly larger Australian population.

Chapter 11, *Options for an Australian population policy,* introduces some relevant principles and some broad options for population policy before moving to a discussion of the desirable components of a well-rounded population policy. As well as immigration, these components include programs focused on natural increase, Aboriginals, tourists, overseas aid, internal migration, and education.

Chapter 12, *Complementary policies,* discusses four areas that fall outside population policy proper but need well-chosen policies so that they can work in concert with population policy to maintain and improve quality of life. These are ecologically sustainable development, settlement policy and regional planning, education and social learning and technology search and assessment.

Chapter 13, *Learning to adapt*, briefly discusses the principles of successful social evolution and is an attempt to put Australia's population questions into this context. This chapter asks whether it is possible to think usefully about the population question in a broader way than in terms of just the values considered important by Australian society in the last decade of the 20th century. While Chapter 13 cannot meet the ambitious goal of thinking about the population question in the context of the next thousand years of Australian history, it does sketch out four plausible futures for the next fifty-plus years: three based on 'natural' combinations of population, economic and governance goals and one driven by the contingency of uncontrolled mass migration. While crystal balls do not exist, this chapter will be successful if readers agree that our chances of achieving 'quality survival' of Australian society are improved by attempting to look far ahead.

Chapter 14, *Take-home messages*, recapitulates the book's most important observations, judgements and arguments. It includes a point-by-point reminder of what the debate is and is not about.

The book has a firm hierarchical and sequential organisation. If you feel a bit lost as to where the presentation is up to or where it is going at any time, return to the contents list and contemplate it gravely for a while. Then, refreshed and reassured, return to the odyssey. Good rowing.

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CH 1. HISTORICAL BACKGROUND TO THE POPULATION DEBATE

Public debate about the foreseeable and desirable size of Australia's population began within a few years of European settlement in 1788. This chapter takes up the story of that debate after the formation of the Australian Federation in 1901. While discussion for present purposes can be quite brief, much of the material introduced is available in considerably more detail in the recently published 'The European peopling of Australasia' by WD Borrie (1994), the doyen of Australian demographers.

The early 1900s

The 'population problem' perceived in the founding years of the Australian Commonwealth was:

> ...whether we shall be able to people the vast areas of the continent which are capable of supporting large populations. This can only be done by restoring and maintaining a high rate of natural increase or by immigration on a large scale, or by both these means...(Royal Commission Report 1904)

At Federation all the major political parties boasted 'a white Australia' as the first plank in their platforms. Population policy was built on fear, firstly in an attempt to keep the 'yellow races' out and secondly to build up the numbers of Anglo-Celtic sons of Empire in defence of the young nation (Canberra Times 1994). For 20 years the goal of building a 'great nation...hold(ing) a commanding place amongst the peoples of the world' was unquestioned (Royal Commission Report 1904).

The 1920s

Then came debate over the optimal and maximal size of Australia's population. The trigger here was an ambitious British plan to 'stock the dominions.' Under this plan, net migration to Australia between 1920 and 1929 was 349 000 people and an ultimate population of 100 million was foreseen and widely demanded (National Population Inquiry 1975; Pope 1987).

However, the Sydney university geographer Thomas Griffith Taylor (1922) argued, somewhat opaquely, on the basis of the limited data available then on Australia's climate, soil and water resources that Australia could never support more than 65 million. Much later, Taylor (1937) reduced this estimate to 20 million, largely because he assumed that people were to be maintained at a much higher standard of living than his earlier calculations had indicated. Taylor also predicted that the population would be no more than 20 million by the year 2000. After a decade of stormy controversy, Taylor departed Australia and the population debate quietened down.

Whether population growth raised real GDP per capita was not an important part of the population debate at that time but subsequent analysis suggests that whereas pre-1930s immigration clearly expanded economic activity, it probably did not advance real income per capita (Pope 1987).

The 1930s

During the depressed 1930s, visions of an eventual 100 million Australians collapsed with the drying up of migration from Britain and declining fertility. Community hopes for great population growth were replaced with concern over possible population decline (Borries 1958).

The 1940s to 1960s

At the end of World War II a massive immigration program, drawing no longer on just Britain but on much of Europe, was begun to build a population and economy capable of defending itself in future wars. This policy was widely supported in the community (Borrie 1958) and championed by A.A. Calwell, Minister for Immigration in the post-war years who wrote:

> Additional population is Australia's greatest need, for security in wartime, for full development and prosperity in peacetime, our vital need is more Australians. The Pacific war taught Australians a lesson we must never forget---that in any future war we can never hope to hold our country unaided against a powerful invader...Australia can increase her population three-fold or more and still provide full employment and adequate standards of living for all (Calwell 1948).

The remarkable aspect of the post-war situation was the support, over a period of about 25 years, of both Labor and non-Labor parties for the post-war immigration program and for population growth in general. The population debate focused on the appropriate rate of increase. How fast should we grow and what size of migrant intake could we absorb each year? An annual immigrant goal of 1% of population was widely supported. The idea of an optimum population (initially that maximising per capita real income) as debated in the twenties and thirties was forgotten in the euphoria of the post-war economic boom (J179).

The 1970s and 1980s

It was only after about 1968 that the whole basis of the post-war immigration program began to be questioned. Reasons for emerging concern included the prospects of US-style 'congestion' and the recognition that 'Australia is environmentally a very vulnerable country that requires very careful nursing by a limited population, if that environment is not to be destroyed (Borrie c1973). A new element entering the debate at this time was the active promotion of the idea of zero natural growth, even though this was implicit in earlier discussions of population optima (National Ppoulation Inquiry 1975). not to be destroyed'.

A National Population Inquiry---the Borrie inquiry---reflecting these concerns was begun in 1970 and reported in 1975 (National Ppoulation Inquiry 1975). The terms of reference for the Inquiry included a study of the situation in countries with which Australia had particularly close associations, the study of contemporary population theories, including the concept of zero population growth, and the economic, sociological and ecological consequences implicit in these. The Inquiry also examined the growth potential of the population, the effect of variations in rates and patterns of that growth, the distribution of population (where people live) with particular reference to the growth of major urban centres and how technological advance affected the use of available resources and the distribution of population (Borrie c1973).

Both the Inquiry and the prevailing government's response to the Inquiry cast doubts on the utility and feasibility of an optimal level or optimal rate of growth of population. It was deemed more realistic to let population change as a result of efforts made to achieve other goals relevant to a humane and equitable society, such as making family planning services available (Borrie 1994).

Previous recognition of the threat of environmental degradation as a reason for concern over population growth was not reflected in the Inquiry report itself, and one commentator said that the Report's discussion of the environment was was 'decidedly off-hand' (Priorities Review Staff 1976).

This perception changed dramatically over the following 17 years up to the publication of Australia's next major report on population management.

The 1990s

The National Population Council report

The Population Issues Committee of the National Population Council (NPC), an independent advisory body to the Australian Government, reported in 1992 on 'major issues which could arise from the increase in Australia's population, in order to contribute to development of a national population strategy' (National Population Council 1992). The Population Issues Committee's basic conclusion was the need to recognise the wide-ranging and significant impacts of population on the economy, environment, society and international issues. On the relationship between population growth and economic growth, the report says:

> ...in the absence of economies and diseconomies of scale, population growth *per se* has only marginal long-run impacts on per capita GDP.
>
> ...because of our limited present knowledge of economies and diseconomies of scale, it is not possible to state on this basis that population growth *per se* enhances or reduces the productivity basis for economic progress.
>
> ...However, indirect analysis of population growth and growth in output per head...not dependent on direct estimation of scale effects, has usually found a positive effect.

On the population-environment link the report says:

> ...if natural capital is not to be depleted rapidly in the face of increasing population, there will have to be significant improvements in the efficiency with which resources are utilised...
>
> ...there are major effects of population not well-monitored by free market-prices (sic) in relation to the protection of ecological processes and systems, maintenance of natural capital as an amenity, maintenance of natural systems capable of absorption of wastes and preservation of biological diversity...
>
> ...population adds a significant component to growth of greenhouse gas emissions and to other related demands on natural capital...
>
> ...maintenance of ecological integrity should be the responsibility of all Australians and that responsibility should not be diminished by adjustments to population size. Development of other appropriate domestic environmental policies remains the essential priority...
>
> ...there is some significant evidence of negative influence of urban population growth on urban ecological integrity...

The Australian government rejected the National Population Council's recommendation for a population policy 'which seeks to influence and respond to population change so as to advance economic progress, ecological integrity, social justice and responsible international involvement'; thus:

> ... A population policy is one whereby government seeks to anticipate and respond to population trends and prospects in the light of their impacts and anticipates impacts of public policy on population trends themselves. It also directly seeks to influence the determinants of population in order to deliberately alter the size and/or nature of the population...

> ...Such a population policy should be achieved not by specification of any long-term population number, since a large range of determinants are subject to change. Instead an optimal population policy should be pursued, and that refers to whatever combination of population size, location and demographic characteristics best serves Australia's goals (J247).

Ecologically sustainable development reports

Since the reports of nine government-sponsored working groups established in 1990, ecologically sustainable development (ESD) or ecological sustainability has become widely accepted in the Australian community as a set of principles to be met by the systems for both the production and consumption of market and non-market goods and services (ESDWGC 1992). These principles include the advancement of material and non-material well-being; intergenerational and intragenerational equity; the protection of biodiversity and the maintenance of ecological systems; dealing cautiously with risk and uncertainty; and the recognition of global dimensions.

The ESD process identified nine crucial elements of a population policy consistent with ecologically sustainable development including:

> . The policy should provide clear statements of long-term population size and growth rate objectives, including the possibility of zero or negative population growth, based on the best understanding of the economic, environmental, social and cultural impacts of population growth. Such statements can then provide an appropriate basis on which an immigration policy can be formulated that promotes the achievement of ecologically sustainable development.
>
> . The policy should consider the impact of various economic, environmental, social and cultural forces on the distribution of population, especially in the urban and regional development contexts.
>
> . The policy should emphasise that the skills base of the population is more relevant to Australia's economic prospects than simple population size...
>
> . Given the many uncertainties involved, especially relating to the impacts of population on ecological systems (J12), the policy should adopt a precautionary approach to population issues. Such an approach is also warranted in the light of the time-lags between population growth and its resultant effects.
>
> . A population policy should be co-ordinated with economic, environmental, health, education, foreign aid, social justice and cultural policies...

Although the overt pursuit of ESD appears to have been quietly abandoned by the federal government, the recommendtion for studying the links between ESD and population was one of the few recommendations out of the hundreds in nine ESD Working Group reports to be explicitly rejected by the government (McNicoll 1994).

The Ahlburg Report

When the morality and effectiveness of Australia's foreign aid contribution to family planning programs was questioned, the Ahlburg Inquiry (1994) examined: (a) the nature and significance of the links between population growth, economic development and human well-being in developing countries; (b) how family planning affected fertility; and (c) the human rights implications of family planning programs. The report clearly supports Australian input into population programs in developing countries. It is also important for concluding that in some circumstances population growth is inimical to development (but see Demeny 1994).

Australian National Report on Population

The Cairo 1994 United Nations International Conference on Population and Development has provided the most recent opportunity to present Australia's policies and programs in this area. The Australian National Report on Population, prepared by a broad-based National Committee (1994), was submitted to the conference as 'the official document of the Australian government' and hence can be assumed to be consistent with government policy. Thus the current official view of the relevance of a population policy and of the idea of an optimal population is conveyed in the following two extracts from the *National Report:*

> The desirability and character that a formal population policy might take is not clear-cut in the context of a country like Australia, where low levels of domestic fertility are generally not considered a problem. (p29)
>
> The Australian Government has not specified an optimal population level for a number of reasons. Chiefly, there is no clear formula for a workable population policy in a developed country with low fertility. (p45)

The Jones Inquiry

The Long Term Strategies Committee of the House of Representatives, chaired by the Hon Barry Jones, conducted an inquiry in 1994 into the topic of Australia's long-term carrying capacity. The Committee's somewhat confused report (1994) managed to avoid making any recommendations on what Australia's population-immigration policy should be, confining itself to yet another call for a population policy, some administrative recommendations, and a demand for the community to debate the pros and cons of having a large, medium or small population---the very topic on which many hoped the Committee would show leadership.

The Jones Inquiry and those disingenuous quotes from the *National Report* mark the end of history and the start of current affairs. Current affairs are not taken up, however, until Chapter 3 which gives a perspective on the social and political interests participating in the contemporary population debate. This allows Chapter 2 to brief the reader with some basic demographic material on recent and projected population change in Australia.

CH 2. AUSTRALIA'S DEMOGRAPHIC CHOICES

> Population growth is like driving in the rain. You can't stop straight away no matter how hard you brake. (Keith Adkins in J175).

This chapter is based on Australian Bureau of Statistics data and projections and data from the Department of Immigration and Ethnic Affairs. It tries to convey a sense of 'population inertia', the idea that population numbers cannot be changed quickly. Even with the introduction of aggressively pro-natalist programs (programs encouraging more births) and immigration programs of historically high proportions, it would take more than a generation to double Australia's population.

The population management decisions that Australians make and abide by today will not greatly change numbers in time for the centenary of federation. They will however determine population numbers and, equally important, population stability (the rate at which population is changing) in 50 years time.

Recent history of population growth in Australia

Australia's population is one of the fastest growing in the group of developed countries comprising the Organisation for Economic Co-operation and Development (OECD). Total resident population at 31 Dec 1992 was estimated at 17.6 million. This compares with a population of 17.4 million at 31 Dec 1991 and 15.3 million at the same date in 1982.

Since 1981 population has increased by 13% but the shares of population in each of the capital cities has changed by no more than 1%, with Sydney and Melbourne recording falls and Brisbane and Perth recording increases. On balance there has been no change in the share of the national population in capital cities, and in aggregate the capital cities accounted for 63% of the nation's population in 1990 as they did in 1981 (O'Connor 1993).

The population growth rate for the 1992 calendar year was 1.06%, compared with a growth rate of 1.25% in 1991. The annual rate of population growth has been decreasing steadily since 1988 when it was 1.78%. The lower rate of growth in 1992 compared with 1991 was due to a decline in net migration (a measure of the net addition to the population through permanent long-term international arrivals and departures) to its lowest level since 1976.

During the last decade Australia's population has been increasing naturally by a relatively stable 0.8% per annum. By contrast population growth due to net migration gain has fluctuated from 0.4% in 1983 to 1.0% in 1988 and 0.3% in 1992, fluctuations which reflect changing immigration policy.

One complication in thinking about the contributions of births and immigrants to population growth is that immigrants have children! Thus, between 1947 and 1973, 59% of the increase in population was due to post-1947 immigrants and their Australian-born children (Price 1975). This translates into over 70% of Melbourne's and two thirds of Sydney's growth for that period. Immigration has the double effect of increasing population and accelerating the urbanisation of the population, since most immigrants settle in the capital cities (Young 1992). The consequences of immigrant-driven city growth feature strongly in later arguments for and against population growth.

Replacement level fertility, the situation where each woman in the population is just replacing herself, is represented by a Net Reproductive Rate (NRR) of 1 and a Total Fertility Rate (TFR) of 2.1 (see Appendix 2). However, a sub-replacement level fertility will not make a population decline unless the population has a regular age structure. In Australia where there is a large cohort (age group) in the adult ages, births exceed deaths even though individual fertility has been below replacement level since 1975.

The official view after the fall of fertility in the 1970s was that pro-natalist policies were ineffective and unnecessary (McNicoll 1994; J177). Reasons suggested for this fall include greater female workforce participation, later marriage, access to contraception and abortion, and the high costs of housing and raising a family.

The number of settlers arriving in Australia over the last decade increased from 69 800 in 1983/84 to a high of 145 320 in 1988/89, declining significantly to 76 330 in 1992/93. The planned intake for 1994/95 is 86 000 places (including 13 000 refugees and other humanitarian categories). Settler arrivals include non-visa settlers such as New Zealanders and returning Australians and visa arrivals under the Commonwealth Government's Migration and Humanitarian Programs (Table 2.1).

The official objectives of the Migration and Humanitarian programs are: to reunite Australians with their immediate family members, enhance Australia's skill base, contribute business expertise and investment, and meet Australia's international obligations to refugees and displaced persons.

Over the past decade the number of people permanently departing Australia has ranged between 20 000 and 30 000 per annum. Adjusting settler arrival figures for permanent departures, net migration gains for the period 1983/84 to 1992/93 are given in Table 2.2.

Table 2.1

Main categories of people arriving in Australia
(1993-94 persons in brackets)

1. With permanent residence visas (settlers)

1.1 Family reunion visas
1.1.1 Preferential (close relatives) (33 800)
1.1.2 Concessional (9 400)

1.2 Refugees etc (14 100)

1.3 Skilled worker visas
1.3.1 Employer nomination (4 000)
1.3.2. Business migration (1 900)
1.3.3. Special talent (160)
1.3.4. Independent plus other (12 200)

1.4 Special eligibility (1 300)

2. With temporary residence visas
2.1 Overseas students (41 500)
2.2. Labour market participants (20 900)
2.3 Other (67 200)

3. With visitor visas (2 270 200)

3.1 Tourists (1 696 100)
3.2 Business (202 200)
3.3 Other (372 100)

4. With nominal visas

4.1 New Zealanders (no limit on numbers) (c2000 net)

5. Without visas

5.1 Returning Australians
5.2 Illegal entrants (-12 300; six month estimate)
5.3 Babies born here (c139 300)

[6. Permanent departures (27 300)]

Source: Department of Immigration and Ethnic Affairs, (1994a,b).

Table 2.2 Components of recent population growth

	Net migration gain (000)	Short stay arrivals (000)	Overseas student visas issued (000)	Natural increase
1983-84	49.1	992.4	12.2	129.7
1984-85	73.7	1 061.7	12.0	127.6
1985-86	100.4	1 263.5	15.1	123.0
1986-87	125.7	1 589.5	20.1	126.7
1987-88	149.3	1 990.5	37.7	125.7
1988-89	157.4	2 220.3	47.0	131.4
1989-90	124.6	2 147.2	63.3	132.4
1990-91	86.4	2 227.4	35.6	141.6
1991-92	63.8	2 519.7	34.5	134.8
1992-93	35.1	2 785.6	34.7	143.8
1993-94	42.5	3 210.4	41.6	139.3#
1994-95 (est)	51.0##	n.a	45.0##	139.3##

projected using base year 1992/93
Dept of Immigration and Ethnic Affairs internal working estimate

Table 2 also shows other components of population growth over the last decade; natural increase, number of short-stay arrivals (mainly tourists) and overseas student visas issued. The Department also estimated that in December 1993 there were almost 70 000 people in Australia who had overstayed their visa periods, about the same as the number of temporary residents including students and specialist workers. Complications encountered in developing population 'balance sheets' and 'movement accounts' include changes in category of arrivals after their arrival, and the issuing of 'multiple entry' visas.

But it's not all growth

In 1989-90, five states/territories gained population in net terms from other states/territories. These were Queensland (39 500), Western Australia (8 400), Tasmania (6 600), Australian Capital Territory (1 500) and South Australia (600). The states losing population were New South Wales (39 800) and Victoria (9 800) (ABS 1994b).

Figure 2.1 shows the settled areas of Australia in general terms. Figure 2.2 shows the large areas of Australia where estimated resident population fell by either more than 5% or by up to 5% between 1986 and 1991 (McKenzie 1994). The scale of the figure does not permit the display of additional areas of population decline found in the central parts of all State capitals.

Fig.2.1 Settled areas of Australia

Adapted from Holmes 1985

Fig.2.2 Areas of population decline 1986-91

Adapted from McKenzie 1994

Population projections

Before discussing the benefits and disadvantages of populations of different sizes, it is helpful to summarise Australia's feasible options in these matters. Australia is fortunate in having a reasonably well-defined range of achievable 50-year population targets to consider. Fifty years is the length of time required to achieve substantial population growth, decline or stabilisation and is a convenient time frame within which to focus this book's discussion.

If mortality continues its slow decrease as life expectancy grows; if fertility rises back to replacement levels; and if gross immigration is returned to near its high post-war level of 1% of population per annum (meaning 170 000 initially), Australia's population in 2040 will be c37 million and growing fast, e.g. to c53 million in 2067 (Figure 2.3).

Conversely, if fertility remains at its current level, a little below replacement, and immigration (including refugees) is set at the lower end of the post-war range (c50 000 net per year), Australia's population in 2040 will be c23 million and almost stationary. If fertility rates do not change, a net immigration of c50 000 per annum represents a 'population Rubicon' above which the Australian population will continue to grow for many decades. For example, immigration of 100 000 net would see population reaching c26.7 million in 2040 and still rising at the end of the 21st century. If net immigration were to be reduced immediately to zero, the population in 2040 would be 19-20 million, having started to decline circa 2027 (ABS 1994b; J246)

If fertility stays at 10% below replacement (replacement equals 2.1 children per woman) and net immigration at c30 000, the population will begin to decline between 2027 and 2040 (J177).

Australia still has a relatively youthful age structure (J179). Projections by the Australian Bureau of Statistics indicate that in 2041, depending on fertility, mortality and immigration assumptions, median age will have risen from 33 to about 42 and the dependency ratio (people under 14 plus people over 65 per 100 people of working age) from 50 to 64-66. Immigration at any feasible level is not regarded as likely to change these projections significantly (National Population Council 1992).

Fig.2.3 Population trajectories under different net immigration rates

Source: **Young 1994**

The choices

Australia is in an extremely fortunate position in relation to population policy: our population, unlike many countries, is not yet out of control and, through migration controls, can still be managed (J210). Apart from possibilities such as war, uncontrolled mass migration, major disease epidemics and mass starvation, Australia has the political choice, through adjustments to its immigration program, to bequeath to the people of c2045 anything between a near-stable population some 15% larger than at present and a rapidly growing population over twice the size of the present population.

Not quite. One Jones Inquiry submission (J66) argues strongly that this range of choice is merely theoretical and government control over immigration levels can be easily exaggerated due to pressures that include for reasons which include a powerful migrant lobby, geopolitical factors and European-style labour market arrangements (J66).

When discussing a doubling of population it has to be asked if sufficient migrants to do this are available. People have largely come here because economic conditions are good (e.g gold rush, post-war boom; (J175)) and, given the abysmal poverty of much of the world, there is little doubt that a simple-minded goal of filling a large migrant quota, irrespective of skills and so on is attainable. However, the important point is that we do have a choice and that many people (e.g. most Jones Inquiry submission writers) wish to see that choice actively exercised because of the magnitude and significance of the consequences. Equally important, this book assumes we have the moral right to make that choice (Smith 1991).

Population distribution in 50 years

> Sydney's population has doubled three times this century. A child born this year will see Sydney's population reach the present population of Tokyo. (Lyn Stephens 1994 for Dudley Progress Association in J151).

The Australian Bureau of Statistics has modelled the state-by- state distribution of Australia's 2041 population under a range of assumptions about mortality, fertility, overseas migration and interstate movement (ABS 1994b). With the possible exception of Tasmania, the population of every state and territory increases throughout the projection period. The most rapidly growing states and territories are Queensland, Western Australia, the Northern Territory and the Australian Capital Territory. The population of Queensland increases from 3.1 million in 1993 to between 5.4 and 6.2 million in 2041, and the population of Western Australia increases from 1.7 million to between 2.7 million and 3.0 million in 2041.

The population of Victoria increases from 4.5 million to between 5.3 and 5.8 million in 2041. The rate of growth of the population of New South Wales, though not as low as Victoria's, is similarly below the national average, rising from 6.0 million in 1993 to 7.9-8.7 million in 2041. The population of South Australia rises from 1.5 million in 1993 to about 1.7 million in 2041 with annual rates of growth (0.1-0.2%) comparable to Tasmania where population remains close to its present half million.

The ABS forecasts that within the states most immigrants will settle in the capital cities and that the drift away from inland centres will continue (J177). The fastest growing centres of population, according to current projections, will be the coastal areas of Queensland and New South Wales, metropolitan Sydney, Melbourne and Perth (National Population Council 1992).

As an indication of the difficulty expected with managing population distribution (cf total population growth), one Jones Inquiry submission quotes the New South Wales government as having said that 'nothing' can stop Sydney growing (J204). Past government attempts to stem population flow to cities or divert growth away from cities (closer settlement, growth centres etc) have not worked (J18).

It can probably be taken as a given for this study that major population growth in Australia means major capital city growth; and that population densities within the major capital cities will rise as planners struggle to constrain the areal extent of these cities.

CH 3. THE POLITICS OF POPULATION AND IMMIGRATION POLICY

Life imitating art

The metaphor that suggests itself for the current population/immigration debate in Australia is a play in the manner of Samuel Beckett in which many of the actors are speaking in code, some are shouting at each other while wearing earplugs, and most are disguised as the same character, someone called The National Interest. The stage is covered throughout the play with sleeping figures identically dressed as a character called Joe Public. A bit-player called Chicken Lickin bursts in occasionally to announce that the sky is falling in. However, each time this happens another character called No Worries descends on a skyhook to report that all is structurally sound up there.

From backstage, a chorus of good burghers intermittently chants 'old verities'. Sometimes a chorister wanders onstage to listen to what is taking place, and on returning to the chorus attempts to introduce a 'new verity' which a few others take up for a minute or two. The plot does not progress obviously in any way except that in the final scene an attentive audience comes to realise that the chorus has been slowly changing its chant throughout the play.

The population debate in Australia is really two debates: one about annual immigration numbers and the other about total population levels.

The central question in the immigration debate concerns the number of people to be given permanent resident visas in this and coming years. The central question in the population debate is whether Australia should set itself a target population level and target rate of population change to be achieved by some future date; and, if so, what should that date, rate and size be?

The link between these two questions is that answering one implies an answer, or at least a thin group of answers, to the other. Thus, given a prediction of net immigration intakes every year till (say) 2050, and making status quo assumptions about the demographic composition of that intake and the fertility-mortality parameters of the resident population, it should be possible to predict, moderately well, the size of the Australian population and the rate at which it would be changing in every year up till 2050.

Conversely, given a target for the size and rate of change of the Australian population at some future date, it should be possible to ascertain whether that target could be achieved by adjusting the migrant intake in each of the intervening years and, if so what the successful sequence or sequences of annual targets would have to be.

What the polls say

Recent opinion polls consistently show that the Australian public is strongly (about 70%) in favour of low immigration and hence, by implication, in favour of a population of much the present size (e.g. Saulwick 1991; Milburn 1994; Morgan poll May 1992). Betts (1993) shows the percentage favouring a reduced migrant intake has increased from 16% in 1961 to 73% in 1991. Population, as distinct from immigration may be growing somewhat as an issue; some 12.6% of respondents to a 1993 ABS survey of perceptions of environmental problems cited over-population as a problem (cf 40.2 citing air pollution) (ABS 1993; J246). Submissions to the Jones Inquiry ran at 213/271 (79%) in favour of the present or a somewhat lower population and only 20/271 (7%) clearly favoured a larger population.

Research indicates that the ethnic vote was worth 3-4 percentage points to the Australian Labor Party (ALP) in the 1993 federal election (Economou 1994) although whether these votes were in seats where it made any difference is another question. It is commonly held that ethnic communities favour high immigration although 'there do exist ethnic lobby groups...that do acknowledge the Australian population problem' (J170). Ethnic views on population as distinct from immigration have apparently not been studied (O'Connor 1990).

Other opinion polls show that the environment and the economy are considerd about equally important by the Australian population (J211). The significance of this is not particularly clear but it can be taken as an indication that neither environmental nor economic arguments about population size will easily carry the day in moving public opinion on the issue of population size. Opinion polls on population matters must be treated with caution as Goot (1985) explains.

Why Australia has no population policy

As a reference point, consider the United Nations' definition of population policy:

> ...measures and programmes designed to contribute to the achievement of economic, social, demographic, political and other collective goals through affecting critical demographic variables, namely the size and growth of the population, its geographic distribution (national and international) and its demographic characteristics...(UN Economic and Social Council, Population Commission 1972)

The Australian Government does not have an explicit position on what immigrant numbers will be admitted in future years, nor does it have any formal process for setting immigration targets for one year ahead let alone decades ahead. Similarly, it has no position on size and rate of change of population in the longer term future, be it 2 030, 2 045 or 2 088 AD.

In short, Australia does not have an explicit population policy. This is surprising for several reasons. The first is simply that so many people believe, subject to a range of premises and assumptions, that the quality of life (Parmenter 1994) enjoyed by the people of any country will, inescapably, much depend on the size and stability of its human population. Thus population attributes appear to be a matter on which collective action, and therefore public policy, is likely to be necessary.

The second reason is the considerable advice that has been given to governments over the years that Australia should have a population policy. Reinforcing this is the absence of outside advice to the contrary. The Borrie report in 1975 recommended reducing immigration and (eventual) zero population growth (Nat.Pop.Inquiry 1975). It rejected 'two extreme Australian responses---populate or perish' and the 'zero growth' thesis which assumes little or no link between population size and national security---as shibboleths that greatly oversimplify the real situation'.

The Committee to Advise on Australia's Immigration Policies (FitzGerald report 1988) recommended a population policy to the extent that immigration quotas should be more stable and set some years in advance, not determined ad hoc from year to year. The National Population Council (1992) report highlighted the need for the government to recognise the wide-ranging and significant impacts of population on the economy, the environment, society and international issues. One of the key recommendations of this report was that the government should develop a 'constructive ' population policy which inter alia sought to improve coordination in government, directed policies at the whole population and took a 'precautionary' approach to environmental issues, but did not involve setting an optimum population number. Despite this recommendation, the government did not adopt a formal population policy on the grounds that it could be largely achieved by better co-ordination within government programs and better recognition of population issues within other government strategies such as *Ecologically sustainable development, Better cities, National housing strategy* (J247).

This no-policy position was reinforced in Australia's official submission to the 1994 Cairo conference on population and development (National Committee 1994).

> ...Australia does not have an explicit or formal population policy directly aimed at influencing the level of population. ...the Government decided that a formal population policy (particularly one which would specify population targets) would not be appropriate for Australia, given its low levels of fertility and diversity of community views as to the character and objectives of such a policy.

The last part of this quotation seems to be saying that having a range of community views on a topic is an argument against having a policy position on that topic. Surely it is the role of government to find a way through such divergences, a way that can be accepted (grudgingly perhaps) by most as legitimate?

Stakeholders in immigration-population policy

> By and large, unions and greens have always contained large proportions of anti-migration activists, while business and the ethnic lobby have been strongly pro-migration. A powerful change in the net balance of forces comes from the turn of policy makers against high migration, mainly on economic grounds. (Prof. Barry Hughes in Walsh 1994)

Just who are these community groups, the stakeholders in our pluralist society with an interest in the size of the current migrant intake and/or the size of the Australian population in the longer term? One major division occurs between those who are interested in the size of the current migrant intake and its short-term implications for people's quality of life and/or their own personal advantage, and those who are interested in the quality of life consequences in a generation or two for a much bigger population than we have today.

Those interested in the size of the current migrant intake divide naturally into *anti-immigrationists* who want migration reduced and *pro-immigrationists* who want migration to increase or, at least, continue at current levels (cf Smith 1991). Those interested in the size of Australia's population in the longer term divide naturally into *populationists* (or expansionists) who want a substantially higher population than at present, and *stablists* who want to see the Australian population stabilised, sooner rather than later, at levels not greatly different from the present population level. The community also contains a very small group of *reductionists* who would like the population to become dramatically smaller than it is at present.

Pro-immigrationists may or may not also be populationists but they cannot logically also be stablists. Anti-immigrationists may have no views on long-term population. If they do, they are likely to be stablists but could be populationists seeking population growth through pro-natalist policies.

Pro-immigrationist and/or populationist groups include:

Migrant organisations such as the Federation of Ethnic Communities' Councils of Australia who wish to protect the present procedures for allowing Australian residents to sponsor relatives as immigrants. The Federation has lobbied recently for an overall increase in the immigrant intake (*Canberra Times* Mar 14 1994).

Minority expansionists who wish to see more people of a particular religion, colour, ethnicity, political ideology and so on, either in absolute numbers or as a share of the Australian population. This result could only be achieved through a substantial selective immigration program.

Traditional expansionists who wish to see the Australian population enlarged by migration from 'traditional sources' which appears to mean Europe rather than Britain. The National Party and the Returned Servicemen's League have endorsed this position (Jupp 1993).

Migrant-dependent entrepreneurs such as migration agents and lawyers and some industry groups such as the Housing Industry Association, the Business Council of Australia and the National Employers' Federation.

Migrant-dependent bureaucrats such as (so many people think) the Department of Immigration and Ethnic Affairs. Some academics in migrant studies centres might be seen as informal members of this group.

Open-door humanitarians who are not formally organised but who would grant permanent residence to all who want to come to Australia to live. Some church organisations possibly fall into this category.

Economic libertarians who see any restrictions on migrant numbers as a 'restraint on trade' and therefore inimical to economic efficiency.

The 'can't be doners' who believe that Australia cannot control migrant numbers and therefore should not try.

Growth-oriented state and territory governments, such as that of the Northern Territory, for whom growth in the size of the local economy is their paramount goal and who see national population growth as necessary to achieve this.

Anti-immigrationist and/or stablist groupsinclude:

Mainstream environmental groups such as the Australian Conservation Foundation and Australians for an Ecologically Sustainable Population who see population stabilisation as one of the means of achieving a sustainable society (ACF 1993). Both organisations want migration cut to about 30 000 per annum, equivalent to zero net migration, to achieve population near-stability in the next few decades(J223, 256).

City dwellers who believe that their quality of life is declining mainly because of population growth. Submissions to the Jones Inquiry suggest that this could be a very large group.

Infrastructure providers who find that the limited funds available for public infrastructure provision can neither maintain nor upgrade existing infrastructure adequately nor provide enough new infrastructure for additional people within their jurisdictions. There may have been some recent additions to this group from the ranks of Treasury economists.

Minority protectionists such as Aboriginal groups who consider their political influence is diluted in a society with a much larger population.

White supremacists who want people of European descent to make up a very high proportion of the Australian population because they believe such to be 'better' in some sense.

Cultural protectionists who want one clearly dominant set of shared values, ideas and customs in Australian society and not a number of sub-cultures based on large and expanding migrant groups. The fledgling political party Australians Against Further Immigration is in this group (and perhaps other groups) but also has an additional goal: that the pervasive culture should not be an 'Asianised' culture (McCormack 1992). Neither Australians for an Ecologically Sustainable Population nor the Australian Conservation Foundation have a policy on multiculturalism.

Off-shore humanitarians who believe that Australia can help the world's poor more by offering them community-level aid in their own countries than by bringing in relatively small numbers as migrants to become affluent Australians.

Self-sufficiency proponents who doubt the capacity of the Australian agricultural sector to feed a population significantly larger than at present and who do not wish the country to depend on food imports.

The Australian Democrats, the third party in federal politics, who have a policy of population stabilisation and reduced immigration (see below).

The unemployed and their supporters who, whatever the economists say (see Chapter 4), believe that migrants take jobs that should go to those already living here.

There are numerous other small groups with mixed affiliations that span pro- and anti-immigrationist, populationist and stablist positions. For example, most economists probably have a residual sympathy for pro-immigrationist and populationist positions despite the acknowledged lack of disciplinary support for these positions.

Demographers have long been coy about questions of population size, preferring to think more about population change (McNicoll 1992a). Lincoln Day and Christabel Young from Australian National University are two demographers who have argued openly for population stabilisation now (J177). Another Australian National University demographer, John Caldwell (1994), told the Jones Inquiry that he could see no reason for disagreeing with an earlier (1975) estimate of 60 million as Australia's carrying capacity.

Engineers and physical scientists tend to be 'technological optimists' and in favour of population growth whereas biological scientists tend to be 'ecological pessimists' and against population growth.(J134; J241; Keyfitz 1993). Like the economists, other professionals cannot or do not produce reasoned conclusions from within their disciplines to support their positions.

In fact, while the community may hold a range of views on population policy, a very clear majority of Australians, albeit for diverse reasons, have somewhat similar ultimate views on the matter. Most Australians are opposed to large migrant intakes and hence, by default if nothing else, to substantially larger future populations. In practice, most are more 'anti-immigration' in the short term than 'pro-stability' in the longer term.

Nonetheless, the Australian Government does not have to contend here with the problem common to so many policy issues that, whatever is done, a significant proportion of the electorate will oppose it. Prima facie, it should be possible to formulate a population policy acceptable to most Australians.

Australia's implicit population policy

In one sense it is incorrect to say Australia has no population policy. Having a population policy, at least by default, is an existential choice. Just as those who are not bald must choose a hairstyle, a country must have an implicit or explicit population policy. So, perhaps the answer to the 'Why no policy?' question is that though Australia does not have an explicit population policy it has an implicit population policy consistent with majority views? Not so. A fair attempt to infer Australia's unstated population policy is as follows:

> Australia is happy to accept whatever population eventuates by taking in up to 100 000 immigrants a year for the foreseeable future, with the actual annual number depending on an intuitive political judgement in the range between:
>
> (a) a maximum number that anti-immigration and stablist groups will accept without protesting at a level that cannot be ignored in a democratic system;
>
> (b) a minimum number that pro-immigration and populationist groups will accept without threatening to withdraw electoral, financial or other support from the Government.

As unforgettably described by the acerbic Peter Walsh (1990), a former participant in Cabinet decisions on annual migrant intakes, what we have here is a 'process of blowouts and cave-ins', or as described by the Department of Immigration and Ethnic Affairs, picking a number which 'seems about right'(J247). To the extent that these maximum and minimum numbers differ, the government's predilection appears to be towards the upper end of the range.

If this is the tacit population policy then it will lead inexorably to much larger populations in the long term, up to 26.7 million in 2041 under ABS (1994b) projection assumptions. That is, Australia has an implicit population policy incompatible with majority views. But not different enough to set off a backlash amongst stablists and anti-immigrationists that could not be ignored. This in itself is a good reason for not making an implicit policy explicit. But why have such a policy and how does the government get away with such a contrary policy?

Perhaps the answer is that the government genuinely believes it knows better than the public what is best for them and that it has a responsibility to show leadership and pursue the best interests of the country in the face of uninformed opinion, even if this has to be done somewhat clandestinely?

There probably is a core of belief in the ranks of both the major political parties that 'more is better' when it comes to population. A (disappearing) rump of federal politicians belongs to a generation whose views were formed in days of undisputed support for population growth and high immigration. Conversely, there is probably not a core asserting that 'more is worse'. This may be some part of the explanation being sought, but not a large part I feel.

Political parties and governments are not only the arbiters between 'players' in pluralist democratic societies but 'players' themselves with the primary goal of achieving and maintaining political power (Downs 1957). A more likely explanation is that the Government believes that, despite having just drifted there, it has found an immigration-population policy compatible with the old political rule of thumb for keeping in power by 'resisting any temptation to take a hard stand on any issue that might offend a major constituency.'

Provided that the government does not change its current implicit immigration-population policy sharply enough to attract a lot of media and other attention (this would be a 'hard stand'), pro-immigration groups---very much a 'major constituency'---will continue to be reasonably satisfied by the rate of family reunions and other forms of migration. Pro-immigration interests will continue, though, to lobby government to increase immigration.

As long as immigration continues at around current rates, the populationists (those wishing to see a large long-term increase in population) can sit quietly, knowing that with net migration much above 50 000 the Australian population will still be growing briskly in 2050. The populationists are riding on the immigrationists' backs. Whether the populationists would become politically vocal and qualify as a major constituency if migration was reduced markedly is not clear.

This leaves the fourth 'constituency' in the immigration-population policy debate: the stablists. However, the stablists are not seen by government as a major constituency and therefore can be 'upset' without violating the 'no hard stands' rule. There are just not enough community groups opposing population growth vigorously enough to be of electoral concern to the government. Nonetheless, an annual immigration level approaching 100 000 is problematical in terms of whether it would boost the stablist constituency.

Secondary political arguments against a population policy

So, the real reason for not having an explicit population policy and not changing the implicit policy at wave-making speed is almost certainly the judgement that this will win more votes than it loses. However, several other political arguments opposing a population policy are evoked on occasions, quite separate from the two official reasons noted earlier, viz:

1. If fertility is low there is no need to specify an optimum population or have a population policy (migration seems to have been forgotten).

2. Because there is no internationally recognised way of developing population policy for countries comparable to Australia we cannot have a population policy (!!).

Several of the other political arguments are given as follows, together with the normal line of rebuttal raised against them.

<u>Argument: Population cannot be managed</u>

> It cannot be emphasised too strongly that the scope for effective control of population growth is extremely limited in any complex society but especially in a democratic one. (Allan Hall in J230)

> Given the threat of illegal immigration in coming decades, why not increase immigration to the point where our national yearly increase is a mere two per cent? (DP & A Cameron in J130).

> Australian opinion leaders will have to start confronting the logic which says that if one factor of production, capital, is to be highly mobile in the global marketplace, then so too should labour. (B Toohey 1994)

The basic prerequisite for formulating a population policy is that the determination of population size must be a policy variable within the control of government. But the Australian Government does not have the policy tools to control national population with any precision, nor indeed to control long-term population at all within very wide limits. Social, economic and political change determine population levels, not the other way round (J66). This powerlessness includes the natural increase component of population growth as well as the immigration component (J230).

Irresistible international pressures to take refugees and uncontrolled mass migration are strong possibilities. The emergence of European-style international labour markets is another factor complicating population management. Trade in people cannot be constrained indefinitely (J230; J66; Hollick 1994).

Rebuttal of this argument: This amounts to lying down before the bout starts. Catastrophes aside, there is every reason to accept that the Australian Government can control this country's 2045 population to within several million, anywhere between 19 and 37 million people. The fact that a nil net migration policy may not be fully feasible is no reason for not trying to do this (J230).

More to the point, the imprecision (not impossibility) of population control may perhaps be a reason for planning to revise and update targets at regular intervals. It is likely anyway that unfolding events and new information will make such regular revisions desirable.

If the arrival of an avalanche of people is a real possibility then we clearly should be making plans to cope; but that is quite another argument (see scenario 4, Chapter 13), and quite different from acting as though the avalanche is on its way or, worse, setting off the avalanche ourselves.

Argument: It's all too complicated

A population policy cannot and therefore should not be formulated because the full consequences of available immigration choices and population choices are too complex to analyse and foresee. Not only are the consequences of choice problematic, so are the different values each promotes. A population above some size is probably necessary to support large libraries, national orchestras, sporting pursuits, a film industry, health care, a publishing industry, science, and other attributes of high culture. A smaller population would provide a better guarantee of unspoiled wilderness, clean beaches and maximum biodiversity; a smaller population would foster towns of human scale. Perhaps a different number again would foster the goal of maximum per capita dollar income (J179). How can we choose between such value sets?

A variation on the 'too complicated' argument is that the optimum population is constantly changing as capital stocks, markets and other factors vary. It is therefore pointless to try and pick an optimum figure (J53).

A full laissez faire position would be for the government to abandon positive immigration, abandon subsidies to large families and allow the Australian people to choose their own population size (J194).

Rebuttal of this argument: If perfect or even excellent foresight were a prerequisite for policy development, little policy would ever be made. The belief that better decisions, on balance, result from seeking and weighing the evidence that can be marshalled is fundamental to Western thought. It is even more important to honour this principle when the consequences of different choices stand to be dramatically different. Finally, it is a misconception to see population policy as the rigid pursuit of a single optimum figure (see later).

Argument: There are better alternatives

The intelligent use of modern technologies and economic instruments is the most efficient way of ameliorating and internalising the external environmental and socio-cultural costs of economic activity.

Rebuttal of this argument: It is a basic principle of system control theory that complex systems require control systems of equal complexity. In practical terms, this means that all available instruments that have some influence on the quality of life---including population policy---should be used at least to some extent to achieve quality of life goals.

A more homely version of this rebuttal is that the choice of policy instruments to pursue quality of life goals should not be seen as a case of 'either-or' but, as appropriate, 'both'. As an example of blinkered thinking on this point, Des Moore's submission to the Jones Inquiry said that there is no case *for* restricting immigration to overcome environmental problems but he omitted to make a case *against* doing so! (J21).

Forces against change

> The question of whether Australia's population should be limited---and, if so, at what level-remains unanswered, and the major political parties are largely silent on the issue...One reason the population question has proved politically unpalatable in Australia is that it raises two very sensitive issues: birth control and immigration. (*Sydney Morning Herald,* Sept 1993)

Is it possible to foresee a marked change in the Australian Government's implicit immigration-population policy or in its willingness to talk more openly about its policy? Though it is very doubtful that the government would spontaneously take the political risk of changing the present implicit policy at all sharply, there is at least one indication that it may have hopes of easing annual immigration numbers slowly upwards in coming years, namely the following reported comment:

> Questioned over whether [stabilising world population growth] applied to stabilising Australia's population growth...Minister Bolkus said it was well within the capacity of Australia's resources and technology to handle moderate increases in population. (*Aust. Pop.* News Oct 1994)

If this interpretation of Immigration Minister Bolkus' comment as a political pointer is correct, it presumably reflects a judgement that there are more votes to be won this way from pro-immigration and populationist groups than to be lost from anti-immigration and stablist groups. In the long term it may be part of a 'tunnel vision' strategy to 'lock in' the ethnic vote permanently. Of course this same Minister is on record as saying that 'the days of big immigration are over' (*The Australian* June 1994). It could also represent a last gasp of support for the idea that immigration is economically beneficial (see Chapter 4).

The most likely scenario is that the government will not change its implicit population policy (as distinct from its multicultural policy---not the subject of this book) unless or until events force it to change.

Role of the parliamentary Opposition

> Ethnic voters are a critically important political constituency-one to woo, not alienate. (C Wallace *Australian Financial Review*, Nov 1994)

> There are probably 100 small to medium sized [Australian] towns which would gladly absorb another 1000 residents each. (BC Melville for Council for Christian Union in J20).

The Coalition of opposition parties in the federal Parliament also has an implicit pro-migrationist and populationist policy that in no discernible way differs from the government's implicit policy. This explains why the parliamentary Opposition does not probe the government's lack of population policy and force it to be more explicit. The Emperor and the pretender are similarly clothed, and both major forces preserve the status quo.

The conventional wisdom is that this is an example of bipartisan policy, but it seems more a case of the Opposition having been badly burnt by charges of racism against its immigration policy in the late 80s and subsequently deciding to just tag along unobtrusively behind Labor policy (Graham Richardson, former senator, speaking on *Life Matters*, ABC Nov 1994). The Opposition too follows the rule of avoiding giving offence to major constituencies. Both parties are following the 'survival' rule of avoiding inter-party conflict on any issues that could have the potential to split their own supporters and political representatives (McAllister 1993). In the late 80s the Opposition was perceived as pro-immigration but against Asian immigration. There may still be a residue of support for this position but, for the foreseeable future, it is a position which 'cannot speak its name'.

In a situation where an issue cannot be ignored, such as in a party policy document, one gambit is to dress up your position in gobbledegook or talk in code. For example, the Coalition's September 1994 statement of goals for 'Australia's multicultural communities and immigration' contains 11 dot points including (Liberal Party 1994):

. maintain an immigration program, which has broad community support, as an integral part of Australia's nation-building

. administer the immigration program in a manner appropriate to Australia's economic circumstances and our family and humanitarian obligations

. continue our long-standing commitment to non-discrimination on the grounds of religion, race, gender, ethnicity or nationality

Circumspectly, this is saying that, in government, the Coalition will continue the present immigration program subject perhaps to making some adjustment to the size and mix of annual quotas for economic, family re-union or humanitarian reasons. Presumably it is regarded as impolitic to talk of either raising or lowering the annual quota because the first might offend the silent anti-immigration majority and the second might offend the much smaller but very policy-sensitive pro-immigration lobby. There is no mention of the population implications of immigration in the Coalition policy document.

Probably neither government nor Opposition would want to get into a bidding competition for ethnic community votes on the basis of the size of the immigration intake. This runs the risk of eventually stirring the silent majority with electorally unpredictable consequences. To quote Ian McAllister (1993): 'A major policy without a secure popular base represents a potential threat to the stability of the political system.'

It is more likely that both sides will seek 'product differentiation' by offering other inducements to ethnic communities such as more English language training and better employment opportunities. This moves the issue of the ethnic vote from population policy to multicultural policy. The available data suggests only a modest link between views about the level of immigration and multicuturalism (McAllister 1993).

Thus people who might be prepared to move their vote between Labor and the Opposition on this issue have 'nowhere to go' (Hirschman 1970), no choice of policies. The only way immigration-population policy is even remotely likely to change from within one or both of the major parties would be an increase in the electoral popularity of the Australian Democrats or the tiny registered political party called Australians Against Further Immigration.

Clarifying the idea of multiculturalism

Multiculturalism is a vague concept but purports to summarise Australian policy towards the retention of source-country cultures by migrant groups. That is, culture retention will be publicly supported and acknowledged as enriching Australian society provided this is compatible with or does not conflict strongly with basic mainstream values, especially political values but also social, e.g. female genital mutilation. The policy's other main principle is the promotion of equality of opportunity for members of cultural and ethnic groups as for other minority groups. Multiculturalism can be contrasted with *assimilationism* and *cultural separatism* Mackay 1993).

Assimilationism is a policy of encouraging migrants to adopt mainstream values (whatever they are) and reduce their adherence to source-country cultures. *Cultural separatism*, in the Australian context, is a non-policy of doing nothing to encourage migrant groups to share values with other migrant groups and the Anglo-Celtic mainstream.

Culture is another difficult concept (Milner 1994). Although it is regarded by some as old-fashioned, I like the definition of a culture as a set of shared ideas, or perhaps shared ideas and customs. Shared ideas, in the sense of common awareness, are not of course always agreed ideas.

The Australian Democrats, who rarely poll more than 10% of the primary vote in lower house elections, have a policy that: '...the immigration rate must be kept steady and low relative to the very high levels of the late 1980s...The critical objective must be stabilisation of the population' (Aust. Dem 1992). Though this policy clearly differs from that of the major parties, the Australian Democrats do not give population policy much prominence in their suite of policies and it is unlikely to contribute to any future improvement in their electoral performance.

Since neither the Australian Democrats nor the Australians Against Further Immigration is pro-immigrationist or populationist, a large increase in the vote for one or both of these could just possibly induce one of the major parties to overtly consider a policy of reducing immigration significantly. This would not be through fear of losing seats to these parties but as a tactic to claim leadership on a crystallising issue.

Another scenario, also somewhat improbable, is that both Government and Opposition parties become convinced of the need to rein in Australia's population growth on the basis of arguments such as appear further on in this book, and agree to adopt low migration policies openly and simultaneously. This would leave the pro-immigrationist and populationist constituencies with nowhere to go on the issue of intake levels while still allowing both parties to compete for the pro-immigrationist vote on other grounds.

Other obstacles to change

Apart from the lack of policy differences between the major political parties, and assuming that policy change really would be in the public interest, the two most obvious obstacles to change in population policy are the lack of an effective political movement promoting stablist and anti-immigrationist views, and the community's lack of vigorous informed discussion of immigration-population issues

Lack of an effective political movement

At the political level the stablists and anti-immigrationists are up against the fact that the movement to change Australia's immigration-population policy is small, at least in terms of active supporters willing to place population policy at the top of their political agendas. Also, it is fragmented amongst several organisations, a few academics and intellectuals and a large group of passive, inactive supporters whose votes are more likely to be determined by party positions on campaign issues than the population issue. The organisations that oppose high immigration-high population may nevertheless not wish to actively collaborate because of other matters they differ over.

The movement is without a power base in the bureaucracy. It is hard to achieve any significant policy change in the federal political system without having a government department arguing the case for change within the bureaucracy. Interpreting the signs generously, perhaps the Department of Immigration and Ethnic Affairs does not favour increased migration and population but nor does it favour reducing migration and population stabilisation within a generation or so. The anti-immigrationists and stablists might see the Department of the Environment as the best candidate to take up their cause within the bureaucracy but senior officers of that Department have expressed great nervousness about being involved in this issue.

The movement is still battling to avoid a 'racist' tag. As historian Geoffrey Blainey found in 1984 (Blainey 1991) and Opposition leader John Howard found in 1988, it is very difficult to question the level of immigration from Asian countries without being called a racist. It is not the point at issue here but this is a so-called politically-incorrect question which a non-racist might quite legitimately ask. Since these events, some pro-immigrationists have dishonestly but effectively applied this description to anyone who questions the level of immigration, irrespective of source country.

It is in fact regarded as legitimate tactics in political debate to tie as many negative labels as possible to those who seek policies you do not want. This difficulty is sometimes cited as the reason why the Australian Conservation Foundation kept very quiet about its population stabilisation policy for some years (Moore 1991). The movement is still battling to avoid a 'chattering classes' tag---a negative label that supposedly describes well-educated people who do not understand how the world 'really' works and therefore promote impracticable or even 'dangerous' ideas.

The movement lacks the funds to mount either a public awareness campaign or an electoral campaign covering more than a handful of seats. It also lacks a charismatic spokesperson. If a recent Asian immigrant emerged in this role, that would enhance people's perceptions. It also lacks the catch-cries which might make a long-term issue seem more relevant today: e.g. 'for the sake of our grandchildren'; 'Do we want Australia's population to double every 40 years?'

The movement lacks powerful friends. The overt support of people in powerful social positions seems to be a prerequisite for getting new ideas widely accepted. It is hard to think of a single powerful individual supporter of low immigration and population stabilisation besides New South Wales premier Bob Carr.

The movement lacks media support and sympathy. The mainstream media showed a considerable reluctance to either question or defend the correctness of soaring immigration levels in the late 80s but this may now be changing slightly towards support for a lower immigration position.

Lack of discussion

Maintaining the assumption that population policy is an important matter and that the case for a policy change is intrinsically strong, why is there so little serious discussion of this issue in Australian society? Here are some reasons:

There is a general lack of media interest in the population issue and, sometimes, an active discouragement of debate on the grounds that it might increase ethnic tensions. For example, a *Canberra Times* editorial (29 Mar 1994) following 1994 polling successes by Australians Against Further Immigration was headed 'No debate on immigration' and started off: 'What this country does not need is another damaging immigration debate, like we saw in the 1980s.' Six months later however, another *Canberra Times* editorial (2 Oct 1994), headed 'Australia should set a population goal' ended thus:

> The future level of Australia's population has to be planned for in a context of competing considerations. Immigration and social policies should be cast against the background of a long-term view about our desirable population numbers. Without paying the slightest heed to the atavists and racists who seek to stop immigration in defence of 'our' culture, the government should set a preferred population goal and then fine tune its policies to achieve it. There is room for considerable debate about what that goal should be.

There is a widespread fear of being tagged racist if one openly opposes current immigration levels. For example, rightly or wrongly, Australians Against Further Immigration have acquired a racist tag in some circles. Conversely, most people with racist views have learned to avoid discussion and almost certain confrontation.

There is no forum in which the main parties' immigration-population policies can be questioned at length and in depth. Certainly, politicians are quite unwilling to engage in formal debate on these topics.

Significantly altering the current rate of population growth would, in itself, affect the quality of life very little in the short term. In the cities, for example, it might merely slow decline in quality of life---not something likely to be interpreted as a blindingly clear benefit from stopping population growth. Population is a long-term issue in a society that has great difficulty in finding the social energy to debate and deal with long-term issues (McNicoll 1994). Long-term issues are concerned with what is best for our grandchildren. This may also help to explain the lack of interest in the topic in the national media. Reinforcing this point, there is, at all times, a plethora of short-term issues competing for the public's limited attention.

Another reason for a paucity of discussion is that there is great ignorance in the community of the long-term population implications of recent immigration levels. Perhaps people would be more interested in discussing immigration-population policy if they realised that Australia is probably going to have to build the equivalent of two more Sydneys and two more Melbournes by the middle of the next century.

Immigration-population policy is an inherently difficult matter to discuss because of the lack of clear causal links between population and different measures of quality of life and the different weights people attach to these (Nordqvist 1978). It is made even more difficult because the effects of population growth, while cumulatively large, are small at any one place and time. So there is no widespread community belief that it is vital to get immigration-population policy right. Some pro-immigrationists are skilled in diversionary tactics that deflect discussion of population-immigration issues away from core issues such as the immigration quota and population targets to fringe issues such as employment prospects for particular categories of migrants.

How will change occur?

> No one at the beginning of the 1960s could have foreseen how dramatically our population structure would change over the rest of the century...(PP McGuinness 1994)

Though it is not clear just just how it will happen, population policy will change in one way or another at some time. Of this we can be certain. A useful framework for thinking about how population policy might change is the process model of the American political scientist Donald Schon, who has elaborated the notion that a society's shared ideas have rising and falling levels of public support. He sees well-supported ideas, what he calls *ideas in good currency*, as being determinants of public policy, of what governments do. Ideas in good currency change over time, are relatively few, and frequently lag well behind changing events. The essence of Schon's thinking is captured in the following quotation from his book *Beyond the stable state* (1971).

> Taken at any time, a social system is dynamically conservative in its structural, technological and conceptual dimensions. This last represents the 'system' of ideas in good currency (IIGC). Characteristically, what precipitates a change in that system of powerful ideas is a disruptive event or sequence of events, which set up a demand for new ideas in good currency. At that point, ideas already present in free or marginal areas of the society begin to surface in the mainstream ... The broad diffusion of these ideas depends upon interpersonal networks and upon media of communication, all of which exert their influence on the ideas themselves. The ideas become powerful as centres of policy debate and political conflict. They gain widespread acceptance through the efforts of those who push or ride them through the fields of force created by the interplay of interests and commitments ... When the ideas are taken up by people already powerful in society this gives them a kind of legitimacy and completes their power to change public policy. After this, the ideas become an integral part of the conceptual dimension of the social system and appear, in retrospect, obvious.

Note the point that, at any time, society has room for only a few ideas 'whose time has come'. It is as though society has limited attention capacity and when new disruptions appear, ideas for dealing with a current problem are displaced, especially if their prospects of success are limited. The most striking display of Schon's process at work in Australia is the annual budget allocations of the Federal Government, e.g. the changing funding for scientific research, the environment, defence etc. At any time, the Schon process is taking place somewhat independently at different scales (local, regional, national) and within a multitude of contexts (social, economic, religious ...).

At the present time the idea that Australia should be stabilising its population is probably slowly spreading rather than slowly disappearing. Can one foresee a set of disturbing events which would propel this view to the status of an idea in good currency? It could be something as nominally trivial as the fact that Australia has to import wheat for human and stock food during the current drought. The fact that this may be a very low probability event does not seem to stop it from being sensationalised. 'Race' riots seem improbable in Australia but are the type of trigger that might precipitate major policy shifts. Declining quality of city life is a chronic rather than an acute process and therefore an unlikely trigger for policy change. A major illegal entry event? Abuse of the business migration scheme? A powerful documentary film? A reversal in natural fertility trends? (J175). Involvement in a war triggered change that delivered a wave of immigrants from Southeast Asia after the Vietnam war.

The inevitable change will not necessarily be a simple switch from pro-immigration-high population policies to anti-immigration-stabilisation policies. In the process of being lifted onto the policy agenda the focus of population policy may itself be transformed---for instance from permanent residents to total average annual population, from people to 'consumption units', from controlled movement to 'free trade' in people, and so on.

In attempting to foresee how population policy might evolve, one cannot ignore that the portending ideas that might lead to change mostly point to anti-immigration-stabilisation policies rather than a further consolidation of pro-immigration-high population policies. These include the following:

. The quality of life is probably declining in Australia's major cities and this is exacerbated by population growth.

. Population growth is not raising the 'standard of living.'

. People are becoming more aware and alarmed over the growth in the world's population and Australia's part in this.

. The risk of being charged with racism which has tended to dog discussions of immigration and population in recent years has declined somewhat (J170).

. The precautionary principle is more widely accepted as an important device for guiding social responses to change and potential change. Given a lack of obvious benefits from population growth, and deep uncertainty over its possible 'worst case' consequences, we cannot, so the argument goes, risk being guided by the 'wait and see' principle. Both the 'onus of proof' principle and the precautionary or maximin principle suggest a holding strategy of minimal national population growth over coming decades (see Chapter 10).

. The possibility and desirability of managing population at local or regional level is being pioneered by several local government authorities.

. In a post-industrial society, problems of job creation can be foreseen.

These emerging ideas portend a movement towards a more stablist anti-immigration policy stance whereas there are very few *new* ideas around that could promote a more populationist and/or pro-migration stance; one is Immigration Minister Bolkus' unargued assertion that we need high Asian migration to facilitate our economic integration with Asia (Armitage 1994). However, the emerging ideas still have to struggle with long-established and persistent ideas in official, academic and popular thinking that population growth and high immigration are good for reasons such as the following (J179):

1. A large population is needed to defend Australia against invasion.

2. Population growth is necessary for economic growth.

3. Immigration slows the ageing of the population.

4. We have humanitarian obligations to accept very large numbers of immigrants and refugees.

5. Australia is an enormous grossly under-populated continent.

Being a pro-immigrationist demonstrates one's credentials as a non-racist (Betts 1988). This is particularly true for older liberals who supported the abolition of the White Australia policy. The momentum of ideas on population matters appears to favour changing rather than consolidating existing policy. To the extent that conventional wisdoms retarding change are in the minds of the middle-aged and over (those who remember the White Australia policy, World War II and the post-war drive for population) rather than the young, a slow change to a new set of ideas in good currency seems probable. With hindsight the reasons for change will be obvious and it will also be obvious that the portents of that change existed in 1995; we just could not see them.

Conclusion

The Australian Government, whether Labor or Coalition, is unlikely to adopt low immigration and population stabilisation policies unless such shifts are prompted by powerful ideas and disturbing events which demand a political response. New ideas currently emerging point towards a shift away from rather than a consolidation of the present tacit policy. Nevertheless, in the absence of an effective political movement for change, it is difficult to find evidence that change may come about soon.

Change, when it comes, could be very rapid because new social technologies do not have to be developed for new policies. Existing social technologies, primarily the immigration system, can be easily retuned to new population and immigration goals. Also, this is a policy change that can be disguised in a general reshuffle of policy bits and pieces trumpeted as a rich new approach to population policy---not a policy U-turn. Finally, quite apart from its intrinsic merits, a policy of 'population stabilisation within a generation or so' is very marketable in terms of its simplicity.

Meanwhile, it is the task of this book to present the arguments for and against low immigration and population stability as fairly as possible. The book itself is political to the extent that it openly favours low immigration and population stabilisation and will no doubt be used politically when it suits. However, its more important role is to help people decide whether 'the public interest' in relation to population policy is something beyond the short-term interests of the Liberal Party, the Labor Party, the Housing Industry Association, Federation of Ethnic Communities Councils of Australia etc etc, and ask what is best for ordinary Australians and their grandchildren.

CH 4. ECONOMIC ARGUMENTS ABOUT POPULATION SIZE

> Roosters crowing do not make the sun come up, caravans do not push cars and population growth does not cause economic prosperity. (Keith Adkins in J175).

A number of submissions to the Jones Inquiry ask the question 'Growth for what?', implying that population growth cannot be an end in itself (J186). While this position is explicitly or implicitly rejected in other submissions, most submissions judge population growth (or decline) according to how it affects the 'well-being' or welfare of some combination of human populations---present and/or future, Australian and/or non-Australian (J72).

Another way of putting this is that population growth should be judged in terms of its contribution to the achievement of certain goals, social, economic and so on. A few Jones Inquiry submissions additionally recognise the well-being of non-human populations as a criterion but, for simplicity, this can be thought of as a possible social goal.

The many aspects of a population's well-being can be broadly grouped into economic well-being, environmental well-being and socio-cultural well-being. Economic well-being is commonly referred to as 'standard of living' whereas the phrase 'quality of life' is normally used to cover environmental and socio-cultural well-being and, occasionally, economic well-being as well (J165). For example: While peoples' standards of living may have risen, their quality of life has declined.' (J206).

There is also considerable agreement, both implicit and explicit, amongst Jones Inquiry submissions that the broad parameters of the society that seeks high quality of life for individuals include:

. a liberal democratic system of government with a strong concern for social justice;

. an ecologically sustainable system of production and consumption, one that very strongly protects the future amenity and productive values of natural resources---biodiversity, air, water and earth materials (J214);

. a smoothly functioning mixed economy---one with healthy public and private sectors.

Overall, the Jones Inquiry submissions that refer to economic issues tend to refute supposed economic benefits of population growth in general and immigration in particular. This effort is misplaced, at least to the extent that recent official inquiries and professional economists writing on the matter have claimed, at best, minimal short to medium term economic benefits from immigration and have said little of an analytical nature about the long-term costs and benefits of population growth. See, for example, Committee to Advise on Australia's Immigration Policies (1988).

In the following sections, economic arguments about the benefits and disbenefits of population growth in the short or long-termare grouped according to economic growth and stability; scale; labour market; external account; city size and management and distribution. Distributional or 'winners and losers' arguments are political rather than economic in the eyes of most economists but it is convenient to include them in this chapter.

Economic growth arguments

Total output arguments

There is little doubt that Australia's gross domestic product (GDP) will rise as population does. However, this is of little significance in itself, except that high GDP countries offer larger markets which may assist them to secure more favourable terms in trade deals (J162, 169). Also, there may be situations where the total size of the economy is important, for instance, in determining a country's ability to wage a prolonged war.

However, there is a 'fundamental flaw' in concentrating on GDP rather than GDP per head (J210). This elementary distinction is not widely appreciated, perhaps even amongst economists (J261): that it is not the size of the cake that matters but the (average) size of each individual's slice. Even accepting the 'total vs share' distinction, income per head (standard of living or average capacity to purchase market goods and services) is a poor, and at best partial, measure of quality of life and its response to population growth is therefore of limited relevance to the population debate (Daly and Cobb 1989).

Another apparent limitation to the usefulness of GDP per head is that this average figure conceals a wide variation between individuals; in particular, real incomes of certain sectors of the population may be declining even as average GDP per head rises (see labour market and distributional arguments below). Economists rebut this observation (which is really about equity; see below) by pointing out that in principle, and provided the transaction costs of doing so are not excessive, a rise in average GDP per head allows the losers in this situation to be compensated by the winners in a way that makes everyone better off. In the real world this usually does not happen.

However, winners may not be able to compensate losers, even in theory, if GDP per head does not rise sufficiently to compensate those who suffer unpriced external costs (e.g. pollution) which are not included when GDP is calculated. Putting this another way, conventional GDP per head may be rising while GDP per head corrected for unpriced external costs is falling (Joske 1991; Mishan 1993). This calculation has not been attempted, to my knowledge.

Notwithstanding, much research has explored the population-GDP link, particularly through the use of econometric models of the economy (Wooden 1994). For example, Nevile (1990) models per capita income as insensitive to population growth between annual rates of 1.1% and 1.6% and suggests it could be much lower outside (both above and below) these limits. CIE (1988) modelling suggests GDP per capita could be 4.5% higher in 2030 with annual net migration of 125 000 compared with GDP per capita under zero net migration (Centre for International Economics, 1988).

One recent theoretical economic analysis demonstrates that, subject to a range of assumptions, immigration is likely to increase average resident income per capita. Since these assumptions (which include efficient resource pricing) do not fully hold in the Australian economy, such results can only be suggestive (Clarke and Ng 1993). Failure to separate the economic effects of population growth on migrants and non-migrants was the basis for Parmenter's (1990) effective criticism of the influential 1985 study by Norman and Meikle.

Taken together, these and other studies 'seem to suggest' that immigration generally confers positive economic benefits on the Australian population, although the size of these measured effects is quite small (Wooden 1994). Certainly economists have not suggested we pay migrants to come here!

Capital stock and 'crowding out' arguments

As population grows, the income share available for consumption, after provision for investment sufficient to maintain a constant per capita income, falls rapidly. It rises as such growth decreases. As an example, suppose that some 15% of net national income is regularly saved and invested. If population is growing at (say) 3%, some 10-12% of income is required to ensure that average capital per person is kept constant---so only a few per cent of savings will be available to increase the capital stock per capita beyond this level (Priorities Review Staff 1976). There is also general agreement that the funds brought in by migrants and migrant savings are insufficient to maintain capital available per worker, even taking account of investment induced by this falling capital-labour ratio (Wooden 1994).

Clearly, short-term population growth is likely to put downward pressure on Australia's ability to equip its workforce and upward pressure on the need to raise overseas funds. A longer-term consequence is to slow movement towards capital-intensive as opposed to labour-intensive industries.

Much immigration-induced capital investment is in areas of capital widening rather than capital deepening. That is, investment is put into things like housing and urban infrastructure rather than in productive enterprises, manufacturing etc (every 10 000 migrants trigger the building of 3 500 dwellings at a net cost to the community of about $60 000 per dwelling including off-site infrastructure such as schools, hospitals, police stations, sub-arterial roads, public transport etc) (Committee of economic enquiry, 1965; Spiller 1993). This is important because it is capital deepening which raises productivity per head. Another version of this 'crowding out' argument is that just as the need to provide population-related infrastructure might crowd out productive investment, it might also crowd out the community's propensity to invest in improved environmental quality (McGlynn 1992).

The 1992 National Population Council report comes to a somewhat different conclusion. In the long run an expanding population will produce expanded output at historically comparable per capita levels (ie, assume no diminishing returns to labour) which will be saved at historically comparable rates. Hence the economy will be able to fund infrastructure requirements for the additional population. However, there do not appear to be 'mechanisms which guarantee that a sufficient share of population-driven output growth will be devoted to infrastructure requirements' (National Population Council 1992).

Murphy and others (1990) attribute many urban environmental problems to inadequate investment in particular types of infrastructure, including sewage treatment and public transport. In part this is due to improper planning, resulting from high variability rather than high levels of immigration. (McGlynn 1992).

Technological innovation arguments

Australian discussions of the economics of population growth have paid relatively little attention to the fact that probably the most important contribution to sustained growth in income per head is productivity growth achieved through technical change. Standards of living are determined not by economic growth per se but by improvements in productivity (J234). Most of these benefits are gained by investment. Whereas population growth requires investment in schools, houses, factories etc to provide for a growing population, a stable population makes productivity-raising investment more feasible. The more rapid rise in income per head of a stable population is more likely to generate the domestic saving necessary to support the associated investment process (J230).

The counter argument is that growing domestic markets demand output increases and hence investment in technologically advanced equipment. Productivity is partly determined by the technology level of the economy's capital stock and this level is likely to be higher under population growth than under a stable population, simply because population growth is likely to raise the proportion of the capital stock which is of recent vintage. Thus the average level of technology will be more advanced (Priorities Review Staff 1976; McGlynn 1992). This effect is not likely to be large under most circumstances and (see below) likely to be confounded with scale effects.

Conclusion

Overall, the cautious conclusion suggesting itself is that a limited period of rapid population growth is likely to lead to small declines in productive capital per head, productivity and in infrastructure per head in the short term. In the longer term these effects are likely to be reduced or exacerbated depending on factors such as changes in technology levels and in skill and employment levels in the additional population.

Economic stability arguments

Traditionally, economic policy has aimed at cutting back on migrant intake during recession and increasing it during expansion. This has presumed that migration increases supply faster than demand. Yet if this presumption is false, or there is an appreciable time-lag involved, such an approach may add to problems of stabilisation and counter-cyclical policy. It is largely accepted that immigration is not a good instrument for the counter-cyclic management of demand (Priorities Review Staff, 1976; National Population Inquiry 1975; J247).

The conditions under which immigration may be expected to provide a net stimulus to employment arise when rates of growth of aggregate demand are high and when increased rates of immigration are likely to add to investment in housing and other population-related activities. At the very time immigration is most likely to peak as a stimulus to growth, effective macro-economic policy requires that growth in demand should be curbed, not intensified. In the more common situation where the labour supply/demand effects of immigration more or less cancel out (see below), immigration is more of a dependent variable than an initiating cause of growth (J230). Note however that population growth due to immigration has shorter lag effects on supply and demand than population growth due to natural increase.

Interest rate arguments

To the extent that population growth is unpredictable (e.g. because of variable immigration intakes) the riskiness of investments increases and this will be reflected in interest rates and hence in investment levels (McGlynn 1992). This is unlikely to be a large effect overall.

Inflation arguments

Immigration leads to an increase in the demand for goods and services, and also the supply---by increasing the economy's resources of labour and capital. The inflationary effects of immigration depend on the balance between these effects and on whether the economy has surplus capacity. If demand exceeds supply, and there is little surplus capacity, the consequences will be inflationary---and vice versa (Nevile 1984).

Foster and Baker (1991) concluded that immigration has a small uncertain effect on inflation (as well as a small positive effect on output per head and small uncertain effects on other key aspects of the economy such as wage levels, inflation, the current account deficit and unemployment).

External account arguments

Immigrants and exports

The central economic problem concerning immigration in Australia's foreseeable economic circumstances is that there is no substantial link between immigration and the growth of industries capable of competing in the global market place. (K Betts & R Birrell in J127)

Immigrants and foreign debt

Migrants usually needed to borrow large amounts of money to establish themselves in Australia and therefore were an indirect contributor to foreign debt. (Alexander Downer 16 April 1994, *Canberra Times*)

Given that the current-account deficit is identical by definition to national dissaving (saving minus investment), there has been a hardening of attitude against what is seen as dissipation of the available domestic saving pool to finance mere duplication of existing activities (of which the housing spread would be the prime exhibit). (Barry Hughes in Walsh 1994)

Immigration raises the growth rate necessary to stabilise the unemployment rate...and places a wedge between the joint attainment of adequate domestic growth and external balance (debt stabilisation). (Mitchell 1992)

Immigrants and the current account deficit

Academic research suggests that recent immigration has not adversely affected Australia's current account deficit (J53; Junankar et al, 1994; Centre for International Economics 1990). This is challenged in Jones Inquiry submissions and elsewhere with the argument that immigration must exacerbate our foreign debt problem, given that borrowing by migrants to establish themselves takes place and flows through into higher off-shore borrowing by banks (Joske 1989, 1991; Fred Argy in Wood 1990). That is unless it can be established that migration contributes to the expansion of the tradeable goods sector by increasing (net) exports, or the production of import replacements, and that this contribution offsets the largely overseas capital that must be spent on migrants' establishment needs (J179, 197). It can also be noted that such overseas borrowing increases the money supply, which in turn tends to increase prices (Nevile 1984).

If exportable goods are also consumed domestically, the quantity offered overseas will be both smaller and dearer and, depending on the price elasticity of demand (the extent to which the quantity demanded changes with price) the value of exports will fall (elastic demand; more probable) or rise (inelastic demand; less probable).

In an interview with *The Australian* (22 Dec 1994) Immigration Minister Bolkus suggested that Asian immigration should be increased because it would boost exports and increase economic integration with Asia. How this might happen, or indeed what 'economic integration' means was not explained (Armitage 1994).

Longer term effects

Looking to the longer term, concern has been expressed for the impact in coming decades of substantial population growth on Australia's balance of trade (J215). The four sectors commented on in these speculations are manufacturing, agriculture, minerals and tourism.

Larger domestic markets would both decrease the availability of agricultural produce for export and increase imports of manufactured goods and, presently, oil (J78). For example, while the total food energy produced in Australia increased over the period 1961-92, the proportion exported decreased from 68% to 52% (Newman c1994). Only a small proportion of the workforce is in export industries and therefore a big increase in population is likely to add more to demand for imports than to supply of exports (J81). Australia's diminishing oil supplies are seen as part of a growing balance of payments problem which can only be exacerbated by a growing population (J65, 236).

A decline in food exports, without a substantial improvement in non-food productive efficiency, would inevitably lower non-food living standards. This production improvement would be necessary, not to improve living standards, but to prevent them from falling (J230). But this scenario ignores the possibility of compensating adjustments occurring in the economy in response to these processes (J21). For example, increased demands for imports might intensify the push to produce primary products for export (J179). It is equally plausible that Australia could overcome its reliance on resource exports and earn its way in the world through trade in manufactures and services, including tourism (J169). These same adjustments could also occur in the absence of population growth.

Of course, while export growth might ameliorate the balance of payments problem it might also put additional stresses on the natural resource base by way of land clearance, tourist developments and so on (J234). It is this tenuous causal chain which underlies the argument that increased population could threaten the quality of the non-urban resource base and natural environment (see environmental arguments below).

One Jones Inquiry submission identifies another longer-term problem in relying on exports of minerals to maintain the standard of living of a growing population. To the extent that our standard of living is linked to minerals production, it must eventually fall because of the inevitable future decline in mineral production (J230). The bigger the population, the bigger the per capita fall.

In relation to tourism growth prospects, one longer-term possibility that must be recognised is that a larger domestic population might degrade the very features that attract overseas tourists and their currency (J234, 65).

Summary

Basically, 'balance of payments' arguments acknowledge:

1. An impact on our ability to continue to enjoy a wide range of imported goods if we have to import capital to support extra people or divert goods from export to home consumption.

2 Possibilities for and problems hidden in countering this impact.

Overall, balance of payments arguments must be regarded as suggesting that population growth is a potential problem but not one that this is clearly demonstrable either for the shorter or the longer term.

Economies of size/scale arguments

> **The Hawke view**
> It's my personal belief that a larger population, rather than a smaller population, is going to be for the benefit of Australia long-term... The bigger the population, the better in economic terms because the bigger the domestic market. There are economies of scale, your competitive unit cost position improves. (RJ Hawke, Dec 1989 in *The Australian Magazine*).

> ...the strength of the previous pro-migration argument to boost the size of the domestic market, hence to gather in additional economies of scale for producers, is being sapped by the new low-tariff era growth of export markets. Those who want greater migration would seem to have the job in front of them. (Prof. Barry Hughes in Walsh 1994)

Existence and magnitude of scale economies

One general phenomenon claimed to confer an important benefit on larger than present populations is the 'economies of scale' (reduced unit costs) associated with the larger production runs needed to supply goods to larger populations (J169; Norman and Meikle 1985). A 1990 study concluded that immigration made some contribution to the achievement of scale economies, despite the difficulty of separating these from associated improvements in technology (J247). Recent work using the ORANI model of the economy suggests that, though real, such economies of scale are likely to be very small (Peter 1992).

However, the existence and size of scale economies and, conversely, diseconomies across various sectors of the economy is problematic (J230). Some emerging production technologies (see below) for example are less scale-sensitive than the technologies they are replacing. More broadly, the long-term impact of technological change on economies and diseconomies of scale needs further study; both have been falling (J259). Note also that economies of scale are a function of market size, not population, and can therefore be gained by an increase in consumption per head or by producing for export markets (J230, 256).

Most advantages of scale can be gained through free international trade. If in some cases large-scale production can be gained only through protection from imports, the protected industry may reap economies while spawning increased losses elsewhere in the economy as the proportion of relatively inefficient industry rises (Priorities Review Staff 1976).

The British economist Alexander Carr-Saunders, writing in 1925, noted that as the capital stock and business organisation of a country varied over time, the optimum population would also vary, ie the population at which the marginal person would generate social benefits just equal to his/her social costs (Carr-Saunders 1925 in J53).

Putting this another way, static economic theory suggests that even if a growing market allows economies of scale to be reaped, there will come a point where the combination of diminishing returns to labour (declining marginal productivity) with other more-or-less fixed production factors will make population growth uneconomic (J250).

Even if economies of scale persist as population increases, then doubling Australia's population by 2045 will do little to allow us to reap such economies in comparison with our large and growing trading partners. Nor will our cities reach the size where they can compete with London, New York, Tokyo etc as nodes of a telematics-based global economy (J259). However, if it could be demonstrated that there is a population plateau at which economies of scale level out, this assertion would be more debatable. One unsubstantiated figure suggested to the Jones Inquiry was that a market of 80 million could capture most economies of scale (J184).

It is ironic that even though our population has outstripped that of successful manufacturing countries like Sweden, Austria and the Netherlands we are supposedly still not large enough to reap economies of scale (J194). A more tenable position is that population growth, by expanding the domestic market, would provide a base or platform from which producers could tackle export markets (J179). Of course, population growth for this reason might merely mask Australian industry's lack of initiative in entering world markets (J215).

More-than-proportional diseconomies and economies associated with increasing city size are a related issue of some importance which is discussed below.

Overall, it has to be concluded that economies of scale arguments for population growth are, at best, inconclusive. This is a little weaker than the conclusion of the National Population Council in 1992, based on indirect evidence about population and growth, that some positive scale effects have been found (National Population Council 1992).

The 'opportunities to trade' argument

This is not a major argument but must to be noted. One economic but non-econometric reason why GDP might rise more than proportionately with population is found in the 'opportunities to trade' argument. This is not a formal argument but an assertion that opportunities to engage in productive activity are higher in a society with a higher population (J21; Clarke et al 1990).

The 'negotiating strength' argument

A country with a large domestic market (or high GDP) may well be in a better position than a country with a small domestic market to secure advantageous terms when negotiating trade deals with other countries (J169, 252).

Labour market arguments

> The argument that we need more people to make a bigger economy to provide more jobs for a larger population is like a dog chasing its tail. (R Jurgenson in J154)

Unemployment arguments

During the last decade there has been widespread acceptance of the view that population growth through immigration is economically beneficial through its effects on the labour market. Despite the prima facie argument that unemployment has steadily worsened during 20 years of high immigration (J100), formal empirical studies have suggested no significant historical average relationship between immigration and unemployment (Withers and Pope 1985; Pope and Withers 1993; Foster & Baker, 1991; J247). More recent work by Pope and Withers (quoted in Hanratty 1993) suggests that reduced immigration helps to contain unemployment in times of recession. This is consistent with the results of economy-wide modelling studies of immigration and unemployment which are sensitive to whether they assume real wages to be inflexible downwards with increased immigration, as they are likely to be in recessionary periods (Peter 1993). Not only is it claimed that immigration does not cause unemployment but also, although not without challenge (J215), that it probably adds more to the demand for labour than it does to the supply and so is a net stimulus to the growth of employment (J230).

While these benign economic attributes of immigration are based on competent applied econometric studies, basic economic analysis encourages scepticism (J230; Mitchell 1992). One would not expect immigration to 'cause' unemployment. What causes unemployment is a decline in aggregate demand. If aggregate demand remains low and immigration continues then there will be a rise in unemployment, especially amongst recent migrant arrivals. Thus, although largely balanced by increased employment amongst native Australians, in the last two recessions unemployment rates amongst recent migrants have risen to over 30% (Wooden 1994). Such distributional effects cannot be used as arguments against immigration if immigrants are still better off than if they had not migrated.

It has been pointed out in recent debate that there is a substantial endogenous component in migration flows into and out of Australia in the sense that such flows depend on current economic conditions in Australia and overseas (Junankar in Hanratty 1993). Thus the underlying labour market effect of continued immigration into an economy with high unemployment is to induce a decline in immigration and an increase in emigration (J230). It is also widely agreed that Australia will face a difficult task in creating jobs for all in coming decades, whether job-seekers are migrants or the increasing number of native-born (J179).

In conclusion, what can be defensibly argued is that immigration will not increase unemployment. However, it probably cannot be argued that economic growth via population growth will reduce unemployment. A reasonable (conservative?) working hypothesis is that the labour supply-labour demand effects of immigration more orless cancel each other out. Notwithstanding, unemployment is likely to remain high in Australia for the foreseeable future.

Wage level arguments

Foster and Baker (1991) detect only a small uncertain effect from immigration on wage levels. There are no accepted causal arguments relating immigration to declines in real wages in recent years. There is no evidence to suggest that immigration levels are maintained to keep wage costs down for the benefit of employers by providing a 'reserve army of labour'.

More theoretically, Clarke and Ng (1991) argue that while wages will fall with higher levels of immigration due to declining marginal productivity, other resident Australians, owners of non-labour factors of production, will benefit by more than the value of wages lost. Of course, if real wages are inflexible, as many economists believe, labour increases from immigration will tend to lead to higher unemployment (Peter 1994; Sloan 1994). Norman and Meikle (1985) conclude that average long-term wages will be lower with immigration than without it.

Skills arguments

It can be argued that the population's level of job skills is more relevant to Australia's economic prospects than simple population size (Throsby 1992). It can also be accepted that the high-unemployment Australian economy no longer needs unskilled migrants (J2, 105), and that many low-paid jobs traditionally taken by migrants have been exported to the low cost economies of east Asia (J210). But what of skilled migrants?

Output per head following population growth through migration will tend to rise if the migrant workforce's productivity is higher than that of the resident workforce. This could be due either to greater skills or greater motivation. There is research evidence, not undisputed, that the skill levels of past immigrants exceeds that of the general population, although this is less likely to be true of more recent immigrants (Wooden 1994). It may become even less true if the balance between economic and humanitarian immigration continues to move in favour of the latter. It may also become less true as the educational levels of Australian-born workers continue to rise (McGlynn 1992). To the extent that migrants are more skilled than present residents, and if immigration per se does not increase unemployment, the local workers with marginal skills are the ones most likely to lose jobs in rising unemployment (Garran 1994).

It is sometimes suggested that population growth is required to ensure a good match between type of labour demanded and that supplied. Insofar as labour market theory has not been developed under expanding population assumptions, such suggestions can only be supported informally (J230).

Whether skills imported have historically matched skills needed is another question (J179). Despite the fact that surpluses of skilled people in source countries do not match Australia's needs, our skills selection procedures remain unfocused. Certainly it has been argued over the years that skilled migrants were needed to eliminate 'bottlenecks' in the economy. However, a recent *Australian Financial Review* editorial (6 April 1995) argued, somewhat perversely, that it would be a mistake to target migrants with specific skills because they might 'lack the flexibility to adjust to the rapid pace of change'. The 1992 report of the National Population Council recommended a tightening of skill qualifications for prospective migrants (National Population Council, 1992; J247) and this began in 1992-93. This view was further recognised in setting 1994-95 immigration quotas by reducing the independent skill category and expanding the employer-nominated category. Another relevant strategy is to bring in needed skilled workers on a temporary basis (Wood 1994).

Australian industry is not all that keen to train its own skilled workers, a process of cost externalisation (J186). It has been suggested that employers would be less willing to lobby for an intake of skilled migrants and more prepared to train residents if they had to pay the migrant establishment costs currently met by the community (J24). There may be a case for a 'foreign worker' levy on employers such as Singapore has (Millbank 1994).

Research, however, supports (although minimally) the hypothesis that immigration has not displaced the training of Australian-born workers (J21). An economic case for limiting migrant intakes from non-industrialised countriescan be made, perhaps, from their record of trainability and adaptability (J21).

Overall then, there is no convincing evidence that per capita incomes have been or will be significantly raised by the additional skills of migrants as distinct from their workforce participation. Furthermore, it must be recognised that

. skilled migrants are probably those most needed in their home countries (see moral and ethical arguments below; J61);

. skilled migrants are less available nowadays than in earlier decades (J179);

. importing skilled labour as the economy emerges from recession is likely to raise the level of long-term unemployment (Mitchell 1992).

City size and management arguments

Research has shown clear correlations between city size and average resident income per head (calculated net of transport and some infrastructure costs), a relationship holding over the present size range of Australian cities (J259). However, note that income differences across the range of Australian capital city sizes are of the order of a few hundred dollars per annum and may in fact be in the process of coming together rather than diverging.

The size vs income-per-head relationship is important in relation to forecasts that population growth in Australia will continue to concentrate in the major cities (J179). The implication is that if Australia's population grows and this growth takes place in the big cities, the average standard of living will rise.

Income per head is higher in cities for 'agglomeration' reasons such as more specialised services, the presence of company headquarters, greater capital mobility, more employment opportunities and hence higher participation rates (J259). What is not clear is the extent to which this relationship reflects an income redistribution from rural to urban areas, a population size effect and an incomplete accounting of all the costs, including the environmental and socio-cultural costs (e.g. congestion, crime) of big city life.

Murphy et al (1990) find diseconomies beginning to emerge as city size increases (J177; Murphy et al 1990). Such diseconomies show up, in part, as per capita increases in the real costs of services (water, sewerage, electricity, solid waste disposal etc) and in increasing costs of pollution, congestion etc. For example, the 1992 National Population Council report concludes that there are very large urban infrastructure requirements for Sydney's continued expansion and and that significant diseconomies of scale are involved in providing that infrastructure (National Population Council 1992).

The economic arguments in favour of city growth and hence population growth have to be set against environmental and socio-cultural arguments against city growth---since there are no environmental and socio-cultural arguments in favour of city growth, especially beyond 1-2 million people (J223).

What also needs clarifying is the apparent incompatibility between the now conventional economic wisdom that population growth will do little for per capita incomes at national scale and arguments that population growth should help raise per capita incomes at city scale.

Government budget arguments

There is wide agreement that the provision of physical and social infrastructure in Australia has not kept pace with population growth in recent decades and that this has diminished quality of life for many Australians (Economic Planning Advisory Council 1988; J195, 249) .

Nationally, 80% of present roadworks budgets will be needed for maintaining the road system by the end of the 1990s. Given the slow growth in budgets for infrastructure, the implication of major increases in maintenance needs is that there will have to be major reductions in funds for expanding and upgrading purposes. The South Australian Parliamentary Public Accounts Committee estimated that, by 2010, replacement expenditure will swallow up all of today's capital spending budget for that state.

The point is, urban growth is a very real threat to the quality of existing infrastructure. By not replacing infrastructure at the appropriate time, the present generation is imposing a burden on the next generation, one that is already destined to bear the burden of supporting more retirees per worker than the present generation (Kirwan 1991). Slowing the rate of population increase would make infrastructure budgets go further. However, note that the high mobility of the Australian population, and how this involves urban expansion, also imposes a continual demand for new population-related infrastructure.

There is agreement that it is expensive for state and federal governments to provide social services and the infrastructure (schools, hospitals etc) to establish migrants on arrival. The combined net cost to State and federal governments could be as high as $25 000 per migrant over five years post-arrival (Mathews 1992; Centre for International Economics, 1992; J54). State governments alone make capital outlays of about $30 000 for each new lot added to the urban fringe. Not that there is any evidence that migrants are responsible for a disproportionate share of new infrastructure costs (Murphy et al 1990) or make more infrastructure demands per capita than the native-born. The issue here is numbers, not ethnic origin or culture (J24). Nonetheless, it would increase the burden on service providers if populations of inner cities became 'immigrant dominant' as better-off older residents moved out while poorer immigrants moved in, as has happened so obviously in the USA (Self 1993).

Academic research does however suggest that in the longer term immigration generates government revenues that more than repay government expenditure on establishing migrants, ie a fixed annual level of immigration should not increase and would possibly decrease the national debt (Wooden 1994).

One attribute of a stable population is that the non-elderly age cohorts are all of a similar size. This allows the community to avoid the costs of having to first provide and then abandon infrastructure as abnormally large cohorts move through their lives, e.g. closing schools and opening nursing homes. In an economy with a stable, as distinct from a growing, population there is less demand on savings to provide new population-related infrastructure and hence more savings are available for productive infrastructure (J61). A corollary of this is that it is much easier to plan the provision of infrastructure when population is stable or changing predictably because fertility is more or less constant.

While, in principle, capital accumulation (or capital protection) per head might be expected to be greater with a stable population empirical evidence on such matters is lacking (J230).

'Winners and losers' arguments

> Immigration seems to me like an exercise in 'lemon socialism'; costs are socialised while benefits are privatised...'Immigration has been good for employers over the last 30 years but not employees; real wages have declined and unemployment risen and unions have been weakened. (Keith Adkins in J175)
>
> Immigration raises business profits while the community pays through infrastructure provision and declining quality of life. (W Kersop, in J215)
>
> It is not fair to pass on to the ordinary taxpayer the cost of population growth in making things like land, water and wilderness more expensive. (Sheila Newman for Australians for an Ecologically Sustainable Population in J170)
>
> There is no doubt some groups' self interest is served by high migration. The multicultural industry is the most obvious example. The Housing Industry Association is another. (Peter Walsh 1994)

Population growth, whether through internal or external immigration, is widely considered responsible for a range of 'winners and losers' in economic terms. The issue is clouded though by the fact that it is taking place against a larger trend towards increasing economic inequality in Australian society (*The Economist*, 5 Nov 1994). Those who are losing through population growth are often those who are losing through economic restructuring.

From a strictly economic perspective, the question of *who* wins or loses from population growth is irrelevant provided that the winners could *in principle* compensate the losers. Here, even such theoretical compensation could be in doubt if the gains in GDP per head from population growth are as small as suspected and therefore likely to be swallowed up by the administrative costs of ensuring that all losers are compensated. (The reverse side of the economic perspective, accepting that winners could compensate losers, is that there is no *economic* way of choosing between two different mixes of winners and losers; that is an equity judgement).

In practice, compensation is usually non-existent or the by-product of a broader social agenda and what matters politically is how narrowly the gains and losses from economic growth are distributed amongst different community groups and the political importance of those groups. When gains and losses are confined to just a few distinct groups, the political argument for the activity producing those gains and losses is weakened, not strengthened.

There is little doubt that any putative small gains in short to medium-term GDP per head from immigration will be largely captured in the first instance by a few sectors of the economy, most notably the building industry and suppliers of goods and services to migrants (J59). Owners of fixed assets will benefit as prices are bid up by a larger population (National Population Council 1992). Although many return home, most immigrants are winners whose establishment costs are subsidised by residents. Other obvious winners are the 'immigration industry' including immigration agents and lawyers.

Groups sometimes identified as losers from population growth include entrepreneurs who suffer increased input prices such as land prices and rates; consumers who suffer price increases for goods and services; first home buyers; workers who lose jobs as public and private enterprise refocuses on a changing pattern of demand; and taxpayers who meet the public costs of establishing migrants (perhaps non-humanitarian immigrants should be charged an entry fee equal to the direct and indirect costs they impose on the resident population).

Others identified as losers include big-city residents who suffer decreased quality of urban services (a loss in real income rather than cash income) and residents who suffer uncompensated losses in the environmental and social quality of their lives (see Chapter 6). This includes established residents who have been forced by rising housing prices to move to newly-established suburbs (Wulff et al 1993).

These groups are no more than some obvious examples from whole networks of the winners and losers that can be traced after a population increase. Further comments on some of the noted groups follow.

In the few large cities where most migrants settle, the consequent increase in the demand for housing pushes up house prices (Birrell 1990; Murphy 1993; J234). This effect is exacerbated by trends towards privatising the supply of infrastructure associated with housing development and the incorporation of those costs into housing prices. That is, privatisation reduces government outlays, but at the cost of higher block prices (J179). It was estimated in 1990 that immigrants create about 70% of the demand for housing in Sydney and about 55% in Melbourne (Bisset 1990).

In terms of other urban distributional effects, the governments's burden of providing new urban infrastructure for an expanding population is considered responsible for reducing the rate of replacement and upgrading of old infrastructure (J197).

City growth imposes different costs on different geographic and socio-economic groups in terms of loss of services and costs of accessing services---for example the opening and closing of schools and hospitals. Generally, the lower socio-economic groups suffer the most because they forced to the outer suburbs (or out-of-town) where they are disadvantaged in terms of travel, health care and other facilities (Maher et al 1992).

Murphy et al (1990) find greater polarisation between rich and poor as city size increases (J177; Murphy et al 1990). As cities grow, reductions in quality of life are greatest in inner city areas where greater numbers of the elderly are more susceptible to pollution and where traffic levels rise in streets designed for another age (J244).

In a number of Jones Inquiry submissions one can detect a concern that even if population growth raises average incomes, the proportion and number of poverty-stricken people will continue to increase (J111; Self 1994). However, whether this already apparent trend is attributable to population growth rather than other factors would be difficult to demonstrate.

The question of identifying the full range of benefits and disbenefits associated with city growth and which groups these affect is a very difficult one. What can be said is that there are major institutional impediments to ensuring that revenue generated by population growth does transfer appropriately to meet the infrastructure and related service needs created by that growth (National Population Council 1992).

These and other costs associated with migrant influx may be behind the current out-migration from capital cities to smaller cities and non-metropolitan centres Murphy et al 1990). Both departing and remaining city residents may thus be incurring external costs generated by this form of population growth. The relationship between immigration levels and patterns of internal migration needs further study.

Most of the above points are couched in terms of the distributional effects of immigration, but whatever the source of population growth it seems that the probable external costs imposed on the existing population by extra people far outweigh the external benefits.

As a working position, it is difficult to escape the conclusion that residents of our largest cities, particularly the poorest, are likely to suffer uncompensated declines in real income as a result of further population growth and that, until this overhanging inequity is redressed, it remains a significant argument---moral, not economic---against such growth.

Resource and amenity dilution arguments

If the economic benefits flowing from the exploitation of Australia's natural wealth are not limited by workforce size, then the larger the population, the smaller each individual's share of these benefits. This is a partial explanation sometimes given for Australians' high standard of living from gold-rush times till the early 20th century. It is an argument for smaller rather than larger populations, all other things being equal (J96). However, as natural capital becomes an ever smaller part of the total capital used to produce Australia's wealth this argument loses force.

Amenity capital such as beaches, wilderness, waterbodies, snowfields can always be better managed but cannot be fundamentally augmented. Increasing population therefore reduces amenity capital per head. The question, at least in principle, is whether gains in built capital can compensate for losses in such natural capital.

Resource bequest arguments

Since natural capital such as soils, water supplies, landscapes, forests, rangeland and fish stocks is destroyed during primary production (tourism, mining, farming, forestry and fishing) without a matching creation of productive capital of similar value for the use of future generations, a redistribution of capital from future to present Australians is taking place. The question here, however, is not the size of that transfer but how much of it is due to population growth. Very little I suspect given the export orientation of Australian primary industries.

It is sometimes argued as follows that environmental degradation, the loss of functionality (usefulness) of natural capital, is not an inevitable consequence of population growth. This happy result is because a more populous society (which is also more efficient and more prosperous) can afford the extra expense of preventing environmental degradation (J169).

This argument assumes: (a) that a more populous society is also more productive; and (b) that there are political and social mechanisms for diverting such dividends to environmental management (J259). If such mechanisms do not exist (and they don't really), the increased consumption of a more prosperous society tends to make environmental degradation worse rather than better, especially if, as is quite possible, environmental quality degrades more than proportionately with population growth (doubling population more than doubles environmental degradation) and the costs of pollution, similarly, rise to disproportionately high levels as residue quantities increase (L Summers in *The Economist* 30 May 1992).

One aspect of inter-generational equity which is never considered in political discussion---because it would be politically difficult---is that combined well-being over present and future generations might be raised by lowering current mineral production in anticipation of much higher prices in the distant future. The impact of this on today's standard of living, via reduced exports, would be greater at higher populations.

Conclusion: On balance, under population growth, future generations will see more people sharing less natural capital of lower functional capacity than the present generation does. For many people, additions to the stock of built capital will not be an acceptable compensation for losses of natural capital. While the direction of this redistribution seems clear, its size is not.

Key points in economic arguments

> **The range of views**
> ...research so far shows ... that immigrants, in total, have not robbed jobs...; have not inflated prices...; nor have they adversely affected the current account deficit...(David Pope in J53)
>
> More migrants are economically disastrous. (AK Mann in J76)

The approach of this chapter has been to use the technical literature and basic economic reasoning to identify the probable effects on a range of economic indicators of short-term population growth through migration. These include GDP per head, balance of payments, inflation, wages, employment, government expenditures, production and marketing costs, living costs and capital accumulation.

Unfortunately, economies are exceedingly complex beasts. There are multiple links and feedbacks between these indicators and it is difficult to draw strong conclusions about population effects on them by using either formal models or basic economic reasoning. The limited evidence suggests that effects on most indicators lie between slightly positive and slightly negative. There is even less evidence of how long-term population growth affects indicators..

Few economics studies take on the difficult task of comparing the economic benefits and costs of having a larger rather than a smaller population in 2045. We just do not have plausible models and methods for identifying the full spectrum of benefits and costs associated with a marginal increase in medium-term population. Will the economy be more dynamic, skilled, flexible and efficient? Will per capita stocks of natural, human, institutional and man-made capital be higher in 2045 with a population of 19 million than with a population of 37 million? Should we be auctioning immigrant visas or subsidising immigrants to come here? (McNicoll 1994).

As a general point, a 'post-industrial' economy will need fewer people to provide the equivalent of today's range of goods and services. The consumption of market goods may also fall over time, even though there is little sign of this yet. Will Australians continue to want rising material living standards anyway---at least as measured by contemporary economic indicators, which fail to capture what some economists have called 'the hidden costs of economic growth'? If population growth does improve individual purchasing power then it will tend to increase per capita residue production simultaneously (depending on the materials-intensity of production) and hence the per capita costs of ameliorating or living with such residues. The term *uneconomic growth* was coined to describe how the external costs of economic growth outweigh its net market benefits (J250).

Over the shorter term (on our way to 2045), current arguments and literature lead to the fundamental operational conclusion that macro-economic and individual indicators of economic welfare will not respond to variations in net immigration levels, at least in the low to moderate range. Even if all these diverse effects could be quantified, it still would not be possible to amalgamate various partial indicators into a single indicator of the economic benefits/disbenefits of population growth. That is, there is no method of summarising measures of diverse economic effects into a single umbrella number. Altogether, it is difficult to argue that population growth is a necessary condition for an efficiently operating Australian economy with rising living standards.

Future of the economic case for immigration

Since economic arguments in recent years have drifted from strongly supporting immigration to being more or less neutral, it would not be surprising if immigration eventually comes to be painted as economically detrimental. Conventional wisdoms always change gradually. The next position along the spectrum of opinion is foreshadowed in the 1972 Report of the US President's Commission on Population Growth and the American Future, which could:

> ...find no convincing economic argument for continued national population growth...The health of our economy does not depend on it. The vitality of business does not depend on it. The welfare of the average person certainly does not depend on it. (United States President's Commission on Population Growth and the American Future 1972, p 53)

A point of psychological interest in the arguments of 'economic optimists' (and 'technological optimists') is that they are optimistic that Australian society will be able to **cope** with the consequences of population growth (J21, 241). The word *cope* implies that a problem (caused in this case by population growth) can be solved or ameliorated if enough effort is made. There appears to be little interest from this group in *preventing* the problem.

Professional economists willing to argue the economic case against immigration are still few although as far back as 1984 Professor Jon Nevile said:

> ...most economists believe that the short-term effects of high levels of immigration are detrimental. However, there is no general agreement concerning long-term effects, and many economists have argued strongly that these effects are probably beneficial. I disagree. (Nevile 1984)

In 1989 Stephen Joske, now economic adviser to the deputy leader of the Opposition, published an analysis of both the economic consultant's report to the FitzGerald Committee and *The economic effects of immigration* produced in 1985 for the then Minister of Immigration (Joske 1989). The main conclusion from his review of the two (then) most recent major studies of this question is 'that immigration cannot be justified on economic grounds alone, and there may be negative effects of immigration, such as less training, distortion of investment and in particular balance of payments problems, which, although difficult to quantify, suggest that lower immigration may be desirable for economic reasons'.

In 1994 Professor Barry Hughes noted that policy-makers had turned against high migration, 'mainly on economic grounds' (Walsh 1994).

The steady-state economy

> ...economic well-being is not dependent on population growth. On the contrary, if the objective of policy is rising living standards then that aim is more likely to be achieved with a stable than a growing population. (AR Hall in J230)

If the weight of economic opinion does swing against today's views on population and economic growth, a possible candidate for a replacement conventional wisdom is the idea of transition to a steady-state economy, one characteristic of which is a stable population (J255). In a steady state economy, so the argument goes, public and private resources can be invested in improving the present population's quality of life instead of always stretching these resources to meet the additional needs of an increasing population (J211, 154, 61).

Population growth is not necessary to maintain employment, growth of output and income per head. Growth in per capita services consumption allows this. A stable population has money to invest in technical change that otherwise would be diverted to population-related investment such as schools, hospitals, houses etc (J256).

The idea of a steady-state economy has been written about at some length in recent years and is quite academically respectable, though it attracts little interest from professional economists. As far back as 1972 the distinguished and now venerable HC Coombs discussed how an Australian economy with a stable population and a commitment to 'sustainable' pollution levels and to minimally depleting non-renewable, particularly scarce non-renewable, resources might function (Coombs 1972).

A last word from Immigration Minister Nick Bolkus
At the macro-economic level immigration has, at the most, a slightly beneficial impact on a range of economic indicators. (Bolkus N, 1994, Letter to editor, *Australian Financial Review*, April 22)

A last word from Professor Judith Sloan
Overall, it is difficult to escape the conclusion that immigration policy should be decided on grounds other than economic---such as social or humanitarian factors. Ultimately, immigration policy should be about the kind of society we want, not about economics.(Sloan J, 1994, Taking immigration into account, *Australian Financial Review*, April 21)

CH 5. RESOURCE AVAILABILITY ARGUMENTS ABOUT POPULATION SIZE

Does the bio-physical nature of the continent, the environmental and natural resource base, in any way suggest a national population target or, alternatively, population levels that should/should not be exceeded?

That is the question this chapter deals with. A good general definition of a resource to take into the discussion is 'anything you would rather have more of than less'.

Notions of maximum population

In practice, discussion of the above question is concerned with whether a knowledge of the country's natural resources extends to identifying:

1. a maximum *resource-limited* population, one for which each member, but not one person more, could, in principle, be allocated a complement of local resources sufficient to meet their life needs; or

2. a maximum *well-fed population* which, indefinitely, can be well-watered and well-fed on Australian-grown food (this is a special case of the first notion, focused on food-producing resources); or

3. a maximum *subsistence population* which, if exceeded, would tend to decline because of increased deaths from malnutrition; or

4. a maximum *high-quality-of-life population* or so-called *optimum population*; exceeding the maximum would reduce its collective quality of life. A country's optimum population can be defined as the estimated maximum number of people who can live long, healthy, self-fulfilling lives there indefinitely.

Estimates of each of these four categories of maximum population levels have been and are still described at various times as the national *carrying capacity* or Australia's human carrying capacity. Carrying capacity is thus a term with multiple meanings which leaves it open to considerable confusion (see Wilks 1993 for a recent review), so it should be qualified as (say) Type 1 carrying capacity (maximum resource limited population), Type 2 carrying capacity (maximum subsistence population), Type 3 carrying capacity (maximum well-fed population) or Type 4 carrying capacity (maximum high-quality-of-life population). The feasibility and usefulness of estimating maximum adequately resourced, maximum subsistence, maximum well-fed and optimum populations is discussed presently, but the outmoded term carrying capacity will be largely avoided, except for a short historical discussion.

Maximum resource-limited population

> ...there is reason to believe that the long-run supply and demand curves for most resources are fairly elastic. (R Ridker 1973)

Analyses to determine the maximum adequately resourced population are called *limiting-resource analyses* and focus on the question: What maximum population could be adequately supplied, per capita, with a prescription list of various natural locally supplied resources? The origins of limiting resource analyses in Australia lie in attempts to resolve two contrasting perceptions, which, following Griffith Taylor, might be tagged *environmental determinism* and *cornucopian possibilism* (Owens and Cowell 1994; J45). One is that we may not have enough drinking water or food-producing land to feed and water even the present population indefinitely. The other is that we have the natural resources to allow indefinite sustenance of perhaps hundreds of millions of Australians (Ruthven 1990).

In its simplest form, environmental determinism suggests that the amount of natural resources a country has imply a practical upper limit on its population (J45). The argument is as follows. Each additional person uses an immutable vector quantity of arable land, water, sunshine, iron, etc to meet their life needs. If one or more of these resource requirements is already being stretched to its limits, then the population cannot grow, although just how this demographic ceiling takes effect is not clear.

Water

Water is the resource most commonly mentioned as standing to limit Australia's population growth even though, as Bruce Davidson (1969) first pointed out, Australia is one of the world's best-endowed countries for water per capita (but not per hectare; see Table 5.1). In Table 5.1, Belgium is the only country with less than 1 000 m^3 per person annual supplies, the level at which countries qualify as 'water-stressed' under a well-known rule of thumb (Postel 1992). In all, some 250 million people, mainly in Africa and the Middle East, live in water-stressed countries.

Table 5.1

Total (km^3) and per capita ('000 m^3) annual renewable water resources for selected countries

	Area ($m\ km^2$)	Total (km^3)	Per capita ('000 m^3)
Canada	9.22	2901	106.0
Australia	7.64	343	19.5
Indonesia	1.81	2530	13.2
USA	9.16	2478	9.7
Vietnam	0.32	376	5.4
Japan	0.37	547	4.4
Turkey	0.77	186	3.2
Belgium	0.03	8	0.8

Source: World Resources Institute 1994.

Simple calculations of the population that could be supported by using all divertible supplies at current per capita rates yield numbers of the order of 100 million people (Newman c1994). Nevertheless, it is acknowledged Australia's water resources place a more immediate ceiling on population growth in both south-east and south-west Australia, but only assuming that northern Australia's unused water resources are not diverted southwards, that irrigated agriculture remains a high priority and that technologies such as desalination are not used (Cocks 1992). Even then this ceiling may be high in relation to present population (Hollick 1992) although Victorian authorities estimate that, at current rates of development, the state will run out of water in 35 years (Department of Conservation and Environment 1991).

It is almost certainly technically possible to provide water to twice the present population, even if population growth is confined to present major population centres, and without towing icebergs to Adelaide. What is not clear is whether Australians would want to pay the price of doing this, or even realise what that price is (J97, 60, 64, 70; Stanger 1991). Components of this price include expensive infrastructure for inter-basin transfers; some loss of water for agriculture and, less so, to industry; and loss of recreation values and conservation values via reduced river flows (Williams 1993). For example, Melbourne will have to turn back some of the rivers feeding the Murray to avoid water shortages. This has implications for urban, agricultural and environmental water requirements elsewhere in the Murray-Darling Basin (J104).

The Sydney Water Board has warned that further development in the city's north-west and south-west corridors will put unbearable strains on the Hawkesbury-Nepean river system (J223). Ever-higher prices for domestic water are resented in several Jones Inquiry submissions from Sydney residents (J170). On the available evidence it would need a 50% increase in the real price of Sydney water every 5 years to maintain constant consumption with growing population and modest growth in per capita incomes (J259). Recently, water conservation measures have tended to balance the consumption increases caused by population growth (J259).

As a generalisation, the already high quality of most urban Australians' drinking water has probably improved a little in recent decades (L Nagy, pers.comm.). However, maintaining the quality (cf quantity) of urban water supplies stands to rapidly become a formidable problem (J241). In turn, many water quality problems are linked to inadequate volumes of supply (J244). Increased demands for urban water in eastern Australia may also reduce river flows and, in turn, reduce fish catches, pollute seafood and destroy fish nursery wetlands (J102, 244) .

There is no objective criterion for judging when the price of water is unacceptably high. At some stage the community may wish to set standards for installing infrastructure; for example, do not pipe water more than X km or between major catchments; do not resort to desalination, icebergs etc (J138). Faced with such self-imposed constraints, it may be possible to make closer estimates of possible water limits to population growth.

Conclusion

Although in no way does it constitute an overhanging 'iron limit' on population growth, providing water to urban Australians is already a major political, technical and economic problem. By rearranging priorities (e.g. forgoing much irrigated agriculture), but still keeping within the current social framework, it could be quite feasible to water, say, twice the present population in 50 years time, albeit at an appalling cost in terms of amenity values, conservation values, environmental values, production values, infrastructure costs, user charges, social conflict and so on.

Minerals and energy

But what about non-renewable resources? It is tempting (though not highly recommended) to compare Australian resource endowments with those of other countries. For example, assessments by Australian Geological Survey Organisation show Australia is particularly well endowed with most of the important mineral resources required for sustaining a technologically advanced society. Apart from our well-known deficiency in oil (offset by large reserves of natural gas), it is only chrome, beryllium, mercury and molybdenum reserves that are either 'small' or 'very small', and only mercury is of critical importance (Sharma 1983). It would be naive indeed to talk about rigidly limiting Australia's population on the single criterion that the country's mercury (or whatever) reserves per capita are low! What the analysis does of course is draw attention to a potential problem for Australian industry.

If it is not possible to develop substitutes or reduce demand for any non-renewable resource it will eventually run out, irrespective of reserve size. Logically then, if it is not possible to talk about the adequacy of non-renewable resources except over a defined planning horizon such as 'the next 50 years', an Australian population of 37 million in 2045 is most unlikely to be regarded as either relatively or absolutely deficient in any important mineral or accessible energy.

In the very long term, there is some possibility that shortages of the mineral exports on which Australia has come to rely would necessitate a fall in Australians' standard of living; the larger the population, the greater the impact of such a fall (J230). Conversely, there may be a case for selling off our minerals as quickly as possible---while the world still wants them! But even so, this strategy does not require an augmented population.

Residue sinks

All development requires energy and all energy use produces residues that pollute natural systems. The simple Malthusian view of pollution is that unless pollution per unit of output can be reduced at a faster rate than total output is increasing due to population growth and growth in output per head, the limited assimilative capacity of natural pollution sinks (airsheds, watersheds) must eventually be over-taxed and air and water quality further reduced towards socially unacceptable levels (Cocks 1992).

Resources are often equated with inputs into activities and productive processes but residue sinks, which accept and transform outputs and by-products from activities and productive processes, are also resources if a resource is anything you would rather have more of than less of. Doubling the population doubles the amount of residual material which has to be processed by fixed stocks of soilscapes, freshwater bodies, estuaries and nearshore waters, plant communities and airsheds (J22). This statement assumes that consumption patterns and waste management technologies do not change with population size.

In recent years discussion of resource limits has diverted from water, land, forests minerals and so onetc to the question of whether the waste assimilation capacities of Australia's watersheds and air sheds are great enough to process indefinitely the wastes produced by Australia's growing population of high consumers of market goods and services.

Once again the amount by which population can increase without unacceptably polluting waste-processing resources is not a single deterministic number. It depends on how much consumption patterns simultaneously change and how much consumption is exchanged for investment in reducing waste production per unit of consumption (J229).

As argued for levels of conventional resource stocks, pollution (unprocessed residues) will not stop population growth in any absolute sense. The number of pollution-related deaths will always be small in relation to the total number of deaths. However, it probably does get more and more expensive to prevent a marginal amount of pollution as the total pollution load increases. An alternative to incurring the cost of preventing increases in pollution is to incur the additional health costs, active or passive, that go with allowing increases in pollution.

Even if the full costs of reducing and/or accepting pollution could be properly quantified in terms of what is thus being given up, it does not follow that this awareness would translate into the imposition of population ceilings (J197). The only way in which the waste assimilation capacities of natural systems (most of which are unknown) might limit population is by regulating loads to socially acceptable levels, for example by setting rigid limits on the amounts of residual materials introduced into specific systems and giving those responsible for conformity to such standards some control over population in each receptor system's 'catchment' (J209, 214, 138).

In principle, resource-based limits on population could be set either by the maximum rate of resource consumption or by whatever maximum rate of waste discharge could be sustained 'indefinitely' (Hettelingh, Downing and de Smet 1991). Thus a maximum sink-limited population might be calculated by dividing the maximum rate of waste assimilation by the average per capita rate of waste production.

This maximum population could only be raised by allowing consumption and waste production per head to fall or by importing some other region's resource consumption and waste production 'quotas', for example, shipping toxic wastes to third world countries desperate to earn foreign exchange. However, expanding Australia's waste processing capacities indirectly by exporting (say) toxic wastes is probably politically unacceptable (J204).

The waste assimilation capacity of the global atmosphere is already internationally recognised as limited in several ways. Limiting-factor analyses do not consider legal or moral limits on consumption and waste production and yet, to the extent that we choose or are forced to behave as responsible world citizens, Australia's quota for CO_2 emissions may set a more rigid limit on population than the availability of any particular resource could. The finite waste assimilation capacity of the world's oceans may yet be similarly recognised.

The septic tank metaphor

The way natural systems treat pollution (unprocessed residues) can be likened to a septic tank of the type used in houses not connected to a sewerage system. If too many people are living in the house, the tank cannot break down all the faeces it receives and the tank starts to smell or overflows. If the houseowner has the resources to build a second tank all is well again; this corresponds, in the larger world, to diverting residues to additional natural systems. Alternatively, the residents can poo less (this corresponds to reducing total production and consumption in the larger world) or buy a new septic tank with a better design so that waste can be processed at a higher rate (the technological 'fix').

As in the larger world, the houseowner can only really discover by trial and error the household size at which the tank will start to break down (cf limits to the assimilative capacity of natural systems) and, even then, will not be sure of the discomfort level at which the residents will insist on some action.

Land itself

Much more is being asked of the environment than in 1788. Because Australia's population has expanded to perhaps 50 times what it was then, and has an affluent energy-intensive lifestyle, demands on the natural resource base have been expanded by a factor of perhaps 1500 in 200 years. What these demands for water, minerals, sinks etc have in common is that they are all demands for special sorts of space or land. The fact is that in this very large country land for most forms of land use is becoming scarce and the causes and effects of this scarcity are at the heart of Australia's resource management and environmental quality problems.

As one expression of Australia's growing national wealth, there have been increasing marketplace demands for land for established uses as well as new uses such as hobby farming. Simultaneously, political or non-market demands for land to be made available for consumptive uses such as recreation and conservation have also increased. This confluence of increasing demand and decreasing supply has intensified competition for private land and political conflict over the use of public land (Cocks 1992). Nevertheless, such competition and conflict do not imply any iron limit on population size--- just, for many, a less attractive society.

Conclusion

> I believe Australia could sustain a much higher population than now in the sense that they could be fed, clothed and educated. However, this would be at great cost to the environment and to quality of life. (M Beresford in J27)

As the economics profession is so fond of pointing out, the limiting factors model assumes that substitutes cannot be found for 'deficient' natural resources, or that technology cannot increase their effective availability, or that 'surplus' resources cannot be used to acquire 'deficient' resources through trade---for example by selling oil to finance the purchase and operation of water desalination plants in middle eastern countries. In their own terms, the economists are saying that the long-term supply and demand elasticities for most resources are probably quite high. What one can say is that it is comforting to be well endowed with natural resources (even though this is not an unmixed blessing in an envious world), but relative or absolute resource 'deficiencies' do not set population limits.

The concept of absolute (brick wall) constraints on population size imposed by the availability of certain natural resources is not particularly defensible; at least not over the range of population sizes being considered in this book (J197). What must to be recognised though is that imposing extra population onto a fixed natural resource base will raise the marginal (opportunity) cost of satisfying certain basic population needs such as food and water. Resource constraints on population size are more like climbing an ever-steepening hill than running into a cliff. At any time, you can decide you have gone high enough.

For reasons of caution---keeping future options open or any other reason--- the community always has the choice of declaring that population will be kept to a level that keeps the per capita availability of certain resources in absolute or 'foregone opportunity' terms within defined limits. This is somewhat different from saying that if such limits are breached, population will surely decline.

Of course, any attempt to manage the ratio of population to resources would draw scorn from almost every fully-baked or half-baked economist in the country. This would not make it wrong. While it would be less direct, it would be no different in principle from setting water or air quality emission standards.

Maximum well-fed population

Estimates of the number of people who might be fed adequately, reliably and indefinitely by Australian farmers vary enormously. Figures put to the Jones Inquiry included 20-25 million, 32-40 million and 30-35 million (J41, 256, 179). The best-known such estimate, made by CSIRO's Roger Gifford and other scientists in 1975, was that we could produce enough food for 60 million Australians if we gave up food exports (Gifford et al 1975). Ten years later, Reg French thought that repeating the Gifford exercise would probably yield a lower rather than a higher figure (French 1984). However a recent revision of the Gifford and friends paper by agricultural economists comes up with a figure of 188 million and discusses the agricultural sector's response to rising population (Henry and Godden 1994; Gifford et al 1975). One empirical reference point in this discussion is the number of people that Australian farmers are currently feeding and, by several estimates, this is about 45-50 million at current Australian levels of nutrition (Clarke 1990; Newman c1994; Nix 1991).

The reason why estimates of future food production possibilities vary so much is that a dauntingly large range of discretionary assumptions has to be made in order to calculate a maximum population that might be well-fed indefinitely on locally grown food. These (Hollick 1994) include:

1. The available area of (a) pastoral land and (b) croppable land and its productivity.
Urban 'sprawl' eats away at arable land on the urban fringes and tends to increase food production costs (J158, 187). For example, valuable horticultural and agricultural land is disappearing around Sydney and Brisbane (J116, 123). Again, how much pastoral land will be retired under Mabo legislation? Also, how much will the productivity of pastoral land be reduced by the impacts of uncontrolled feral animals? (J145). What will be the long-term impact of such problems as erosion, acidification, compaction and salinisation? These are major problems outside the high rainfall areas of Australia. Figure 5.1 shows that the area of farms in Australia has declined by 8% since 1975---for reasons that include land use change and the loss of marginal and degraded lands.

Fig.5.1 Area of agricultural land in Australia 1952-1992

2. The product mix
It is highly reasonable to assert that Australia could support many more than 50 million additional people if it grew potatoes, vegetables etc rather than meat (J137).

3. The technologies
Australian agriculture is highly dependent on liquid fossil fuels which could well have run out in 100 years (J42). Also, what are the possibilities for diverting more irrigation water for food production? (J135).

Opinions differ on the prospects for major agricultural production in northern Australia. Efforts to develop intensive agriculture in the monsoonal tropics have had very limited success over the past 50 years and many dismiss this path as an option (J52). In particular, the area of land suitable for intensive agriculture in northern Australia is likely to have been over-estimated (J259). An alternative view is that a very large population could be fed by locating people in the north of the country and developing irrigated agriculture (J179).

Australian agriculture faces several impediments to sustainability and threats to current production levels. So while we have a very high level of arable land per capita by world standards (2.8 ha v. a world average of 0.33 ha) we must remember that the quality of Australian arable land is very low and that big population increases would soon reduce our 'quality-corrected' area of cropland per head compared to the world average (J123).

One particularly provocative argument is that by producing food for export we are putting at risk our future capacity to feed ourselves. The assumption here is that agriculture is a form of 'slow mining' and that producing food for export advances the day when our soil capital is used up (J265, 170). Going even further than this, we could regard sustainable agriculture as a goal requiring a reduction in the present population (J52). The contrary view is that Australia's population can be increased substantially without endangering agricultural resources (J180). Between these extremes is the cautious position that a truly sustainable agriculture, capable of maintaining self-sufficiency in food for millenia, may involve limiting population to present levels (J52).

Conclusion

> It would be a bad mistake to target Australia's long-term population at the number of people Australia's farmers feed on average each year. Runs of bad seasons could then easily generate major food supply problems and there would be little surplus capacity to allow for any long run decline in food production. (AR Hall in J230)

Estimates of maximum well-fed population are valuable because they can relate population size to such questions as food security and the contribution of food exports to balancing the overseas trade account. Coming up with a working judgement of Australia's long-term maximum well-fed locally-fed population requires balancing several poorly known, unknown and intangible factors including future climatic conditions; future technological advances; future land availability; and future political priority given to food production.

And then there is the prospect of future resource base deterioration: for instance, do we assume that problems like erosion, soil acidification, soil salinisation are solved or not solved when making such a calculation? Without being able to formally justify the figure, I would be very uneasy with any estimate much above twice the present population, say 36 million people. This is not greatly different from the number currently being fed by Australian farmers. It is a figure premised on zero net agricultural exports, minimal climatic change, significant resource base deterioration, current product mix, minor changes in land availability and a high priority on food production.

Maximum subsistence population

> There is little value in knowing what population a draconian subsistence society could support, albeit recognising such to be probably comparable in size to China's present population. (After D Everingham in J213)

The importance of the assumptions that cannot be avoided when estimating a maximum subsistence population can be illustrated simply and dramatically: If it is assumed:

1. that per capita consumption of market goods and services is a sufficient measure of standard of living or quality of life;

2. that total consumption of goods and services in Australia cannot or will not be significantly increased; and

3. that the average standard of living in Bangladesh would be acceptable to Australians (each Australian consumes at about 30 times the level of each Banglan),

then it can be concluded that Australia's maximum population is close to 600 million. Or, putting this another way, Australia's current stocking rate in Banglan equivalents is already about 600 million people!

Other assumptions can yield an even more spectacular result. If we were happy to live at the subsistence level set by the efficiency of photosynthesis (Moss 1985), we could support about one vegetarian per 900 m^2 in the better watered parts of Australia, say 20% of 7.6 m km^2. This computes at 1.7 billion or 100 times the present population!

While such neo-Malthusian calculations are interesting, they have no political relevance at all. The Jones Inquiry assessed the current limits of political debate about Australia's population size as 5 and 50 million, after discarding 'extreme' positions of up to 100 million and down to one million.

Optimum population

Nominating a population beyond which collective quality of life (and this means much more than being well-fed) might be forecast to fall is obviously difficult. There is no accepted method for calculating such an optimum population and certainly no examples of serious attempts at this task for Australia. Equally, it is not obvious that the calculated figure would have much to do with the size and nature of the resource base.

It may be easier, and just as useful, to ask how Australian population growth beyond 18 million might affect collective quality of life. While this question probably still assumes that there is an optimal population, it sidesteps the question of what that population is, meanwhile asserting that something useful can be said about whether we have either passed or are still approaching that optimum. It simply assumes that just knowing which direction to move in is useful enough, without having to know the end-point---i.e. by how much we are *over-populated or under-populated in relation to the optimum.*

Indicators of over-population

Although it turns out to be just about as difficult to make progress on this somewhat simpler question, what does become apparent is that suggestions abound for *partial indicators* of a state of over-population (and a few of under-population; e.g. a country that does not have enough people to maintain its political, cultural and social institutions could be judged under-populated (J179, 175)).

An economist, assuming eventually diminishing marginal returns to population as an input to production, might define a country as over-populated when the most recent addition to the population does not produce as much as s/he consumes. Such an idea can be helpful even if it is very hard to identify the population level at which this occurs.

One Jones Inquiry submission suggests that over-population is best defined as a condition where the community cannot live on its environmental interest and so must deplete its natural capital (J197). More specific suggestions made to the Jones Inquiry about indicators include an increasing level of oil imports (J220); a declining capacity of air and water sinks to absorb wastes; a reliance on non-renewable exports such as minerals (J230); a declining proportion of food production going to exports (J185) and an inability to provide full, worthwhile employment (J97).

Other resource-oriented suggestions here include the importance of a loss of food production capabilities through urbanisation, pollution etc (J97); renewable resources being consumed faster than they are being regenerated (J81, 123); a decreasing capacity of the land to support human life (J129); a declining ability to support ourselves (J185) and rapid price rises in basic resources.

What is the common concern behind these suggestions? All are concerned with whether the resource base can continue to support the present mix of productive activities, the present standard of living and the present quality of life enjoyed by Australians. In short, can the resource base sustain Australia's present way of life? Or, in more fashionable terms, is the present pattern of resource use *ecologically sustainable*?

Certainly it would be useful to the population debate to develop and monitor indicators of ecological sustainability from suggestions such as these, and more, but this still could not lead directly to a conclusion that the optimum population had been exceeded.

Ecological sustainability

In a strict sense it is doubtful if the goal of ecologically sustainable resource use can be met at any population level if this term means that the capacity of those systems to continue to function as at present should remain completely unimpaired.

<u>Resource loss and degradation</u>

> The simple line that people consume resources, therefore restricting the number of people will conserve resources, ignores the fact that the major portion of our production is exported. (Ian Mott for The Growth Lobby in J251)

The concern here is for the loss and degradation of productive rather than amenity resources. Jones Inquiry submissions vary between stating that Australia's population can be increased substantially without endangering our natural resources, specifically agricultural resources (J180), and stating:

> If our population is allowed to grow uncontrolled, then the country will become nothing but a farm that has been overcropped, overstocked and we become more destructive than a plague of rabbits. (Gwenyth Curtis in J187)

However, while it is commonly agreed that land degradation is a symptom of over-population (J107, 116), the argument that degradation of extensive agricultural lands producing export crops and livestock is independent of population size is a more defensible generalisation (J251; Fincher 1991). Would farm exports (and hence degradation) fall if we had a smaller population? Probably not. The causes of land degradation identified in the 1989 report on this topic from the Standing Committee on Environment, Recreation and the Arts included lack of awareness, continued land clearing etc, but not population (J251; Standing Committee on Environment, Recreation and the Arts 1989).

Examples of the loss of natural resources for productive purposes as a result of population growth include loss of prime agricultural land to urbanisation and large lot subdivisions in rural areas (J215); loss of soil nutrients in sewage (J215); and loss of fish breeding and nursery areas from land-based marine pollution (J215).

Population growth in cities does not directly increase the degradation of remote rangelands and croplands. Past degradation has occurred as a result of production for (largely) export markets and population growth is far more likely to degrade agricultural, forestry and pastoral lands further by an associated drive to fund increased imports with increased exports (see balance of payments arguments above). This effect might be exacerbated if a government beset by population problems becomes less willing and able to demand proper environmental management in industries that are critical for the balance of payments and for employment (McGlynn 1992).

Habitat and biodiversity loss

Biodiversity is a recently fashionable term for the variety of life; not just the range of species and genetic variations thereof but also the range of ecosystems in which different mixtures of species live. Does loss of biodiversity matter? Intuition says it does but we do not have ways of measuring the degree and scope of our dependence on other organisms. One can only postulate that ecosystem structure is like that of a boat: you can remove rivets without apparent effect until, at some point (equals loss of keystone species?), the whole thing falls apart.

Loss of habitat is well recognised as the main cause of biodiversity loss. All land use intensification, including urbanisation and the laying down of infrastructure, causes habitat loss. Land use intensification is strongly associated with population growth (J190, 234, 259). A more subtle way in which population growth causes biodiversity loss is that roads and other intensifications of land use increase the impact of weeds and feral animals on native flora and fauna, for example foxes spread down forest roads. Cats and dogs, particularly cats, are now recognised as major predators responsible for the decline of species, particularly small birds and mammals (Crome et al 1994). A more intensive use of water resources as population grows is also causing the permanent loss of small species from creeks and rivers (J246).

Australia's National Biodiversity Strategy recommends a range of policies, programs and guidelines for maintaining the spectrum of the country's biological diversity (J222). Human population management is not part of this strategy even though much population growth is taking place in parts of the continent with above-average biodiversity (J259, 97).

Prospects for population-quality of life modelling

Still continuing with the challenge of identifying an 'optimal' population, this section discusses how environmental scientists have been thinking about and proceeding with a feedback-based modelling approach to understanding the links between population characteristics and quality of life (Little 1972; Cocks and Foran 1994). Their view is that the way to analyse the optimum population question is to understand how a sufficient set of *indicators of quality of life* might respond to population change. Terminology is still fluid but the approach is recognised in descriptors such as 'population-environment modelling' or 'population-environment-development' modelling. We will call it *population-quality of life modelling* or *popqual modelling* for short.

The hope being raised by popqual modelling is that if positive and negative impacts on appropriate quality of life indicators under different population scenarios (e.g. doubling population) could be modelled through time in convincing detail, this would give government a basis for taking a firm policy position on population management.

Sanderson (1992) reviews five feedback-based simulation models which have been used around the world to address environmental-economic-demographic interactions; what he calls 'sustainable development modelling'. His review is competent but does not cover several well-known models focusing on energy use-environmental quality links such as ECCO (Gilbert and Braat 1991).

Two of Sanderson's conclusions are:

1. Such models can be highly sensitive to assumptions about parameter values, an unsurprising conclusion equally applicable to widely-used national economic models such as Australia's ORANI model (Peter 1993).

2. It is difficult for such models to incorporate all possible government responses to a growing population and a deteriorating environment. This is code for saying that they probably will not answer the questions you want answered.

To date, Australia has made no attempts at dynamic or feedback-based modelling of population-quality of life links. However, experience with tools that could be used for this purpose is slowly growing. The National Resource Information Centre has used the powerful WhatIf simulation package to simulate regional water table movement under alternative cropping regimes in the Murray Darling Basin. The Stella simulation package uses an improved version of the system dynamics approach to modelling developed by Forrester (1971) for the famous *Limits to Growth* study (Meadows et al 1972). Stella is being taught and used as a research tool in several Australian universities.

Another way to model population-quality of life links might be by elaborating and 'greening' existing, widely used economic models such as ORANI (cf Peter 1993).

Dynamic input-output analysis is a recent improvement to a classical economic tool which extends input-output analysis to include population and environmental sectors and track them over time (Duchin et al 1993). It has the advantage of making maximum use of the limited data available but would have to overcome the disadvantage of producing nationally aggregated insights rather than region by region insights into the impact of population growth on quality of life.

Quality of life measures

Choice of model structure is but one of several challenges within popqual modelling. Identifying an appropriate set of indicators of quality of life for such exercises beyond such basics as lifespan, literacy, infant mortality, running water and a full belly is bound to be difficult (Morris 1978; Vinson and Homel 1976). One proposal, made as far back as 1975, was that indicators were needed in 12 'social domains': environment, economics, health, education, employment, housing, recreation, social security, culture, public safety, transportation, legal justice (Ontell 1975). Grouping these for brevity, it may be sufficient to look for indicators in just three broad categories: environmental, economic and social.

Environmental indicators of quality of life
Many first world countries have moved to establish state of environment reporting systems in recent years. Australia's (Commonwealth) Environment Protection Agency (1992) is committed to producing a first national state of the environment report by 1995 and individual Australian states are similarly committed.

The difficulty of defining and operationalising a comprehensive set of environmental quality indicators is illustrated by recent Canadian attempts to develop a preliminary set of such indicators and nominate 'threshold of concern' values for them (Environment Canada 1991). This work quantifies 43 environmental indicators grouped under the headings and sub-headings of:

. atmosphere (climate change, ozone depletion, radiation exposure, acid rain, outdoor urban air quality)

. water (freshwater quality, contaminants in freshwater ecosystems, marine environmental quality)

. biota (biological diversity at risk, state of wildlife)

. land (protected areas, urbanisation, solid waste management)

. natural economic resources (forestry, agriculture, fisheries, water use, energy)

Few of these Canadian indicators directly indicate environmental (activity-setting) quality. Direct indicators are called *state indicators* and can be contrasted with *pressure indicators* which record changing community levels of various activities. These changes merely tend to lead to changes in direct indicators of quality of life. The changing area of urbanised land is a good example.

This Canadian work also brings out the point that there are no intrinsic standards for judging whether an environmental indicator has crossed an acceptability threshold. The best that the community can (and does) do here is to set arbitrary minimum quality standards for selected state indicators of the quality of life.

Air and water quality standards are obvious examples. Basically these are set in debate between those favouring higher environmental quality and those favouring, not lower environmental quality per se, but the lower production costs associated with lower environmental standards. The difficulty of securing agreement on environmental standards is evident in the time Australia's National Environment Protection Council is taking to set national air and water quality standards.

As society gets richer, air and water quality standards are likely to rise---although, as the Sydney Water Board is now finding, it is difficult to obtain the funds to improve water quality in times when a growing population is demanding extension of as well as improvements to the supply system (Jones and Pearson 1995). But what about something more subtle than clean water, something like landscape amenity value in coastal recreation areas? Although the recent Resource Assessment Commission report on coastal zone management (Resource Assessment Commission 1993) recognised this as a value under threat from coastal population growth, it is going to take time for standards to emerge. First, it even has to be recognised that standards are needed for this quality of life aspect; then simple operational measures have to be developed.

And finally, even if having standards allows us to monitor whether some indicator of quality of life is getting better or worse (and this is extremely valuable in itself), it still leaves us a long way from relating that movement to population change. One particular difficulty here can be identified as the confounding problem. Another, which will not be commented on, is the aggregation problem (Pierce 1990).

The confounding problem

An example; the Alpine Resorts Commission is considering converting Mt Stirling in Victoria from a snowy wilderness to a downhill ski resort. Clearly a demand is being catered for but what portion of that demand is due to population growth, to rising affluence, to a population exodus to regional centres nearer the snowfields and so on? To what extent are Mt Stirling's wilderness values suffering from population growth more than from other factors?

Population growth is in fact only one in a long list of societal processes and/or activities customarily seen as contributing to losses in the environmental component of quality of life. Others on the list are population redistribution, increasing per capita consumption of material goods, waste and residue disposal practices, intensification and extensification of primary and secondary industries, urban expansion, income redistribution, resource allocation procedures and trade policy.

Politically and technically it is important to aim to model the partial impact of population growth on quality of life indicators under diverse assumptions about waste disposal practices, various settlement patterns and so on. In principle this would make it possible to identify the maximum population consistent with any family of settings for quality of life indicators.

In summary then, there are two formidable hurdles to be cleared before popqual modelling might contribute to setting population targets:

1. securing political agreement on an appropriate set of quality of life indicators and on the limits to socially acceptable change in those indicators;

2. finding a technical approach to popqual modelling which allows the effects of population change on quality of life indicators to be both quantified and convincingly separated from a range of confounding factors.

The spectre of the shifting optimum

It is sometimes observed that there is no possibility of identifying and pursuing an optimal target population because this optimum will change as circumstances change. Certainly, the solution to any 'constrained optimum' problem will change as constraints are relaxed or tightened under the influence of new knowledge. The normal response to this worry is to say that you can only make decisions that take account of what you know today. By definition, your decision-making cannot include what you do not know.

But this claim that 'the optimum keeps changing' is obscuring an even more important point well recognised by decision-theorists: choosing between alternatives that can take not only different values but different values at different times, you have to choose between *trajectories* or time-sequences of a variable. In the present case, this means that Society should be choosing between alternative sequences of 'date-stamped' populations, not a single 'best' population at some reference date.

In practice this problem is so poorly defined, so 'wicked', and the data to deal with it is so deficient that the well developed theory of dynamic decision-making under non-certainty (e.g. Sutardi et al 1994) has nothing to offer Australia's population debate. Perhaps that is not quite true. Dynamic decision theory reminds us that the search is for a population policy which is best for both present and future Australians. The fact that such a policy cannot be identified by formal modelling does not invalidate the aspiration.

Conclusion

Some scientists assert that any useful analysis of the population question requires isolating the impact of population change on an appropriate set of quality of life indicators. Such is the hope of population-quality of life modelling. Confounding factors include population distribution, lifestyle, technology choices, environmental management style and the industry mix. Problems and possibilities for further progress in this type of modelling have been discussed. While popqual models can be expected to be sensitive to the country's resource base, they do not deal vigorously with resource availabilities in the way that calculations of maximum subsistence, well-fed and resource-limited populations do.

Both popqual modelling and other more discursive approaches to identifying optimal populations are concerned with much more than the adequacy of the natural resource base, although this consideration is behind much of what is being said. Even if startlingly successful, such popqual models, by themselves, could not identify population targets. Limits of socially acceptable change (Stankey et al 1985) in a chosen set of quality of life indicators would still have to be identified and politically legitimated. Population and other programs to achieve conformity to those limits would then have to be selected and implemented. Good models would simply be a tool for setting this sequence in motion.

We have to admit that dynamic models of population-quality of life relationships will not contribute much to the population question for some time. Nevertheless, research into popqual modelling is the current hope for bringing science to bear on this important question and, along with demographic modelling, must be encouraged and supported.

What does emerge clearly from this section is that, irrespective of the research effort going into popqual modelling, further development of quality of life monitoring systems is a social imperative. The commendable efforts to establish state of environment reporting are a start but agencies such as the Australian Bureau of Statistics and the (Commonwealth) Environment Protection Agency should also be encouraged to probe the feasibility of systems that monitor diverse aspects of material and immaterial well-being. *Unless we first know how quality of life is changing we cannot hope to understand and manage such change.*

More on carrying capacity

> It is no accident that 70 years after Griffith Taylor made the first systematic attempt to define the limits of Australia's population carrying capacity...there is still no agreement on those limits. (AR Hall in J230)
>
> The notion that Australia has a limited carrying capacity confronts a range of prejudices. (William J Lines in J206)
>
> The scientific viewpoint that Australia's population should be limited due to the impending imposition of natural forces or because of some notional carrying capacity should be completely discounted. (John Perkins in J169)
>
> Australia is eating into its capital rather than living on the interest. (David Kitson in J195)

Livestock carrying capacity

When people use the phrase 'Australia's carrying capacity' they are talking the language of the farmer, likening the continent to a large animal farm and the people who live here to livestock (Cocks 1993a). When graziers talk about the *carrying capacity* of their properties they are usually referring to the average number of livestock (sheep, beef etc) which they judge, or hypothesise, they can maintain, year in, year out without relying heavily on purchased fodder; earning unnecessarily low profits; risking widespread stock deaths; suffering unacceptably large swings in income; or running down the property's market value, particularly if this is determined by the condition of soils, plant cover and water resources.

So, for grazier who have already decided they do not want to buy in large quantities of feed in the manner of feedlot enterprises, his/her property's carrying capacity is the average number of livestock on hand that best satisfies their diverse goals such as making a good living, not taking too many risks, being reasonably self-reliant and handing on the property with its carrying capacity intact or enhanced.

Carrying capacity must to be distinguished from *stocking rate*---the actual number of livestock on a property. It varies over time as the grazier moves stock numbers above carrying capacity in good seasons and below carrying capacity in poor seasons; so an estimate of property carrying capacity is an estimate of the maximum indefinitely sustainable average stocking rate.

For the present discussion, the most important point about the concept of carrying capacity is that it is subjective, a matter of judgement. Different graziers assign a different carrying capacity to the same property because they have different values and different goals. A risk-averse farmer stocks conservatively and accepts a low average income because it does not vary greatly between years, whereas a risk-indifferent farmer seeks a higher average income despite higher income variation between years and the risk of bankruptcy. In terms of George Orwell's famous allegory, the carrying capacity of Manor Farm depended on whether the stock were going to live like Napoleon the porcine dictator or Snowball the willing workhorse.

Despite its subjectivity, carrying capacity is a useful phrase for farming people who have a shared perception of the plausible range of estimates and the general determinants of variation within that range e.g. proportion of barren land on the property. To compare large and small properties, carrying capacity is often expressed in terms of livestock units per ha or per km^2 of the property.

Human carrying capacity

When the term is applied to people occupying a country or region, the carrying capacity concept is probably most useful for referring to peasant and subsistence societies with static technologies and little external trade. It is probably fair to say that under such conditions carrying capacity comprises the maximum number of people who could be well fed indefinitely.

However, the term loses its usefulness in discussions about people numbers in modern societies that do not have a shared set of ideas and commonly fail to specify which 'type' of carrying capacity they are talking about (subsistence, well-fed etc). Far better to talk directly about what is being estimated (and why) than confuse discussion by introducing this term of many meanings.

Applying the 'traditional' concept of carrying capacity to a modern society seems to assume that a country's population is limited to the number of people who might be fed with home-grown food, and ignores the possibility of setting up a prosperous and secure economy that is based on trade, not naturalresources, and feeds its people by trading non-food exports for food imports (J191).

Also, traditional carrying capacity estimates ignore the fact that, as the recent history of European agriculture shows, national food production in a modern society is very strongly determined by the prices farmers receive for their produce. If other goods and services are 'traded off' against extra food production by diverting accumulating capital into agriculture, larger populations can almost certainly be fed.

An aside

While gains from trade make it very difficult to estimate a carrying capacity for any region or country, the concept is certainly valid at global level. The world cannot trade with other planets. So, how many people can the planet sustain and at what level between poverty and luxury? (Holdgate 1994). This is a vital question, albeit outside the scope of this book.

Reinventing the carrying capacity concept

Several Jones Inquiry submissions recognise the limited usefulness of food-based or resource-based concepts of carrying capacity and try to elaborate criteria to approximate an operational definition of an optimum population. For example, carrying capacity is the population which at specified gross domestic product per capita, technology and management practices, and levels of net exports of renewable resources, does not reduce the natural capital either by depletion or pollution (J44).

Maximum population or carrying capacity, according to the 1992 National Population Council report, is the number of people that could be sustained without loss of real income, social justice or ecological integrity (National Population Council 1992). This report rejected any possibility of setting an 'optimum' population but advocated an optimal population policy---defined as 'whatever combination of population size, location and demographic characteristics best serves Australia's national goals in full recognition that the nature of this combination will in all probability change significantly over time'. Not very helpful really.

Other Jones Inquiry submissions argue that *carrying capacity* is not a useful term unless it is redefined to mean the number of people who can be sustained at an acceptable quality of life (J179, 96). For example, carrying capacity is a function of what people aspire to in terms of health, happiness, access to open space, beauty, variety, solitude, community etc (J98).

Another attempt to make the term more useful is to define it as the level of use of a resource complement consistent with the maintenance or restoration of those resources in/to some desired state (J256). This is a confusing attempt to capitalise on the useful idea that resources should be managed within specified limits of acceptable change. That is, rather than setting a population carrying capacity, why not set limits of acceptable environmental change and find a population that does not violate these? (J256). The problem with this approach is that if acceptability limits are violated, the population horse will have already bolted.

Another suggestion for making carrying capacity a more useful term is to rename it as *sustainable carrying capacity*, recognising that this term which includes a significant fail-safe factor (J175). Again, what about differentiating sustainable carrying capacity from *transient carrying capacity*? (J212). Perhaps *environmental capacity* is a better term than carrying capacity? (J195).

Sustainability is seen as an important aspect of carrying capacity. Jones Inquiry submissions generally agree that one condition of estimating Australia's carrying capacity is that the size of the population that could indefinitely live in Australia must also be estimated; some specifically mention periods like 'at least the next thousand years' or 'as long as the Aboriginals have lived here'.

Since these discussions do not really clarify the 'true' meaning of the term carrying capacity, it is more useful to see them as a sources of ideas to take into account when we think about what Australia's population should be. Other examples of such ideas proposed in the Jones Inquiry submissions are:

. The most important factor in assessing what Australia's population should be is quality of life (J47).

. The needs of non-human populations should be taken into account when Australia's human carrying capacity is estimated (J49, 136).

. It is widely agreed that an optimum population must be self-sufficient in food (J115, 161).

. A population that is incompatible with a sustainable economy is non-optimal. A sustainable economy is one that remains within the environment's ability to sustain indefinitely whatever the economy and other human activities impose on it. Pre-1788, the indigenous population did not need to produce on a large scale as they had low population and low consumption (J157).

. Climate and climate change have and may sustain a major influence on carrying capacity (J235) .

. Estimates of Australia's long-term carrying capacity should take account of the prospects under environmental damage for maintaining primary and secondary export levels and of estimates of the sustainable harvests of pastoral, agricultural, horticultural and marine produce (J183, 212).

Tracking ecological footprints

Carrying capacities are sometimes expressed in people per km^2 of a country or region. This can be very misleading, and generally should be avoided, but the converse idea of measuring the area of land effectively being used on average by each resident of some nominated city/region can be quite illuminating. Even if a city's residents never leave town, they are using land indirectly to grow the food they eat, to harvest the water they drink, to grow the forests that provide packaging and timber for their houses, to generate their electricity, to accept their wastes and so on. More directly, each city resident occupies land for dwelling, driving, shopping, recreating on, and so on. Some of this directly used land is inside the city's boundaries and some is outside.

The catchy name given to the putative area of land used by all of a city's residents in these ways is its *ecological footprint* (Rees 1992; Rees & Wackernagel 1992). If we can assume that the average area of land per capita in each use supporting a city's population must be maintained as the city grows, we could work out a maximum population which each 'city region' could support; namely the smallest possible population that would just use up all the available land suitable for each 'necessary' use. This could be extended to all city regions in the country and the sum for all the country's regions would be an estimate of one type of maximum adequately resourced population.

So, are natural resources a guide to population policy?

Recall this Chapter's opening question: Does the bio-physical nature of the continent, the environmental and natural resource base, in any way suggest a national population target or, alternatively, population levels which should/should not be exceeded? There are really three questions lurking here:

1. A target population?

2. A minimum acceptable population?

3. A maximum acceptable population?

Having explored a range of ideas about resource constraints on maximum population and walked around black hole discussions of Australia's carrying capacity, we must conclude that our present knowledge of the resource base does not imply any particular population target. If it could be convincingly calculated, maximum high-quality-of-life population would be a sensible target. Suggested indicators imply that sustainable resource use is one important condition to be met by an optimum population but what this means in practice is not clear.

We can also conclude that knowledge of the resource base suggests nothing about the minimum population that should be exceeded for some good reason or below which serious consequences can be foreseen. In fact the idea of an unacceptably low population, set by some characteristic of the resource base, is not an issue in the Australian population debate and has deliberately been left unexplored here. This leaves the question of identifying an unacceptably high population and it is here that an awareness of the nature of the natural resource base as a source of inputs and settings for human activities provides some guidance.

With present international trade and factor substitution possibilities, it is not defensible to argue that any particular natural resource such as water or mercury is so limited in Australia that doubling (say) the population over coming decades is impossible. Certainly the real marginal cost of supplying some important goods (clean domestic water, for example) will rise with population growth, and positional goods like wilderness will have to be rationed. But, while Australia might become a less pleasant country in which to live, there is no foreseeable combination of material shortages that would make Australia uninhabitable for 36 million people in 2045, a not implausible demographic scenario.

The bio-physical nature of the continent, particularly its natural resources and its waste assimilation capacities, does not indicate that local resources could not feed, water, clothe, house and swill out after an Australian population of 36 million. We have not explored the question of whether there are physical limits on populations beyond 36 million because that is the outer bound of population relevant to the present discussion.

However, at this point two major worries emerge.

1. The long-term adequacy of productive resources. Would a population of 36 million be sustainable after mid-century? Would the soils and waters farmers need still be available? For how long? There have to be very serious doubts (Cocks 1992).

2. The long-term adequacy of amenity resources. Might the opportunity costs, in environmental quality terms, of using our natural resources to support extra people increase rapidly beyond the present 18 million population? Might this cost be unacceptably high? Here we are talking about the degradation of amenity resources available to ordinary Australians. This question is an important focus of Chapter 6.

In conclusion then, if it is essential for Australia to remain self-sufficient in food for many generations and if there is a widespread conviction that amenity resources will degrade at an increasing rate with further population growth, the resource arguments of this chapter suggest that Australia should not set itself a long-term population target much outside the 18-36 million range. If Australians do not want to pay increasing real prices for basic services nor to be increasingly rationed in their access to unique natural resources, the target will be much nearer 18 million than 36 million.

CH 6. ENVIRONMENTAL QUALITY ARGUMENTS ABOUT POPULATION SIZE

Thoughts on a difficult word: environment

All environments are environments of something (compliments of Eric Woolmington).

My environment is everything but me.

Environments are settings in which activities can take place.

Environment: the aspects of a place which modify activity occurring there.

Environmental constraints: those aspects of an environment which tend to make that environment unattractive for a specific activity.

> Migrants bring their effluent with them.(Lorna Wright in J225)
>
> Two factors are accelerating the deterioration of the Australian environment. One is our increased technological ability to make demands upon it and the other is the size of the Australian population whose appetites are driving the intensification of the impacts (both through direct demands for resource requiring products and demands for imports which the nation needs to earn export income)....The deterioration of the environment can be considered to be directly proportional to the size of the Australian population. (J Smith in J62)

Some starting-points

The widespread provision to city dwellers of a physical environment with piped water, sewerage and mains electricity has been a major achievement of 20th century civilisation. However, city-dwellers' daily needs go beyond connection to these basic networks and include being in a high quality bio-physical environment that covers both the built (by people) environment and the natural physical environment.

This means such things as clean quiet air (the atmospheric and acoustic environments); easy access to potable water in adequate quantities; easy access to natural areas suitable for outdoor recreation (e.g. bushland); visually attractive (e.g. rubbish-free and nature-rich) landscapes and streetscapes; easy access to a high-quality transport network offering safe streets and ease of movement between activity sites; readily accessible community and commercial service locations; and access to uncrowded and disease-free living conditions appropriate to the climate.

What is a high-quality environment?

Where these sorts of conditions are provided through market transactions, a high-quality environment is one where these conditions are within the reasonable reach of people with low incomes. Where these sorts of conditions are provided as public infrastructure and 'free' community services, a high quality environment is more or less equally available to all; Balwyn and Broadmeadows, Potts Point and Penrith.

Of course it is not enough to have high-quality 'activity settings' in a purely physical sense. These settings must also be managed to properly satisfy the deeper needs for which they are the delivery points, such as healthy food, safe streets, quality hospitals, and short travel times. Notwithstanding, a high quality physical environment is a necessary condition for high quality of life; the quality of the physical environment constrains the quality of the 'goods and services' environment (Lang 1995).

What are environmental problems?

Environmental problems occur where access to the above and other aspects of a high-quality environment are lacking or under threat, either directly or indirectly. Alternatively, environmental problems arise when people's activities are restricted or degraded because of adverse changes in the settings where they take place.

There is unanimous agreement that Australia has widespread environmental problems which must be tackled (Dept. of Housing and Regional Development 1995; J115, 240), although it is also asserted that these may not be nearly as bad as is commonly claimed (J21). It is also widely believed:

. that environmental problems have multiple causes including population growth, population distribution, personal consumption patterns, the industry mix and types of technologies used;

. that population growth exacerbates a range of environmental problems which subtract from the quality of life, particularly in urban areas, and that many environmental problems would worsen with an increased population (J4, 117, 190);

. that the environmental costs of population growth are largely externalised in the sense that the additional people do not bear the bulk of these costs and do not compensate residents who do (J252).

. that there are many ways (technological, regulatory, fiscal, price-modification, educational, demographic) in which environmental problems can be partly ameliorated but all have a cost. This may be a direct cost affecting the community's standard of living or an opportunity cost wherein a problem is solved by using resources that could have been well-used elsewhere;

. that the amelioration of environmental problems lags badly, perhaps by decades, behind their occurrence.

For this book the major points at issue are whether environmental problems are strongly or weakly exacerbated by population growth and, if so, whether the management of population growth should be used, along with other available social policies, economic instruments and modern technologies, to ameliorate environmental problems.

Clearly, if population growth is believed to be only one minor cause of the nation's environmental problems or if there is confidence that environmental problems can and will be tackled just as cost-effectively without the assistance of population management, then environmental quality arguments for population management are seriously weakened (J21).

What we can assume is that there is no disagreement that the *direction* of change in environmental quality as a result of extra population is negative. While it is not inevitable, population growth will tend to reduce environmental quality; the question is how much? (J197, 210). The difficulty is that the environmental impacts of population growth are undoubtedly diffuse in space and time and the course of any particular local problem is likely to be much less sensitive to national population growth than it is to local current environmental management programs (McNicoll 1994). Analytical methods for demonstrating the cumulative significance of numerous marginal impacts of people on 'the environment' have not been developed.

Anecdotal geography of environmental problems

Geographically, environmental problems regarded as sensitive to population growth and size fall into four categories: urban, peri-urban, rural and marine.

Urban environmental problems

> The Sydney basin has a finite population carrying capacity and is clearly approaching its limits of absorbing air and water pollution. Thus no more road-based transport, no more residential land use in the Hawkesbury-Nepean system. (STEP Inc in J87)

The Jones Inquiry submissions make many references to environmental problems caused by noise and the pollution of air and water in urban areas, particularly the metropolitan areas of Sydney, Melbourne, Perth, Adelaide and Brisbane (J223). There is particular concern over environmental problems in Sydney and the impact of these on quality of life (J129, 151). Water quality (drinking water and surface water) is the most commonly cited problem and the degradation of the Hawkesbury-Nepean river system is cited as a grim foretaste of the problems that will arise elsewhere with population growth (J9).

Adelaide's water quality has also declined with the development of the Mt Lofty ranges (J187). Losses of market gardens and woodlots are mentioned among other quality of life effects of continuing population growth in Adelaide (J234, 108). Perth's environment is also seen as deteriorating (J95, 131, 201). The impact of population growth on Perth is described by one Jones Inquiry submission as 'horrific' (J254) and several submissions comment on the side-effects on wetlands heath of groundwater abstraction to provide water for a growing Perth population (J209, 103). Of Canberra, the question is asked what will happen when all the available space has been filled in but the population continues to grow? Will Canberra's future water needs necessitate damming the recreationally important Naas valley? (J115).

Coastal and peri-urban environmental problems

Environmental problems of peri-urban areas, within half to a day's drive of major urban centres, are particularly noted in coastal areas such as Coffs Harbour, Lake Macquarie, NSW Central Coast, northern New South Wales and southern Queensland, lower Hunter Valley, Sunshine coast, far south coast of NSW, and Redland Bay (J160, 223, 151, 85, 179, 119, 156, 201, 205, 50, 142).

The two coastal environmental problems most prominent in Jones Inquiry submissions are the treatment and disposal of sewage, and coastal ribbon development. One submission complains that the New South Wales Central Coast is being made uninhabitable by population spillover from Sydney (J85). In another, coastal environmental problems regarded as population-induced include pollution from sewage, erosion, aesthetic losses, excess recreational fishing pressure and habitat destruction (J210).

Rural environmental problems

Jones Inquiry submissions identified many environmental problems in rural areas, particularly agricultural areas and, even more particularly, the Murray-Darling Basin (J25). The water quality problems of the Murray Darling Basin were predicted to worsen if its Queensland rivers are dammed for cotton irrigation (J91). Recurring examples of rural environmental problems include land degradation; biodiversity loss through habitat destruction (e.g. logging) and declining rural water quality.

In the short term at least, it is difficult to attribute such problems directly to population growth in the big cities. However, there are rural environmental problems induced by city growth. Growing cities make impacts (footprints) far beyond their immediate boundaries. It is their hinterland resources which allow cities to exist (J220). For example, cities take in food from their hinterlands and then lose that food's nutrients in sewage which pollutes marine ecosystems; dams and their associated water catchments have to be provided at the expense of other land uses; and overcrowding occurs in peri-urban and rural recreational settings. The loss of rural environmental quality due to population growth seems to be more demonstrable in the coastal zone than in agricultural and forestry areas.

Marine environmental problems

Several Jones Inquiry submissions recognise that the sea is just as vulnerable to loss of environmental quality as the land (J187). The phenomena of bio-accumulation and bio-amplification (the accumulation of toxics in animals higher up the food chain), for example, can counteract the effects of sewage and other pollutants being diluted in large bodies of water. Problems noted include the destruction of near-shore habitats such as seagrass beds; the impact of sewage and other forms of land-based pollution on marine communities; and threats to fishing stocks from excess fishing pressure.

Both marine and rural environmental problems tend to immediately affect primary producers rather than city dwellers. Indirectly, city dwellers are affected when food supplies decline because natural resources are degraded. Whether such problems are worsening or just continuing is not dealt with by Jones Inquiry submissions.

Comment

The word 'anecdotal' to describe evidence for declining quality of life and the role of population growth in that decline has a somewhat disparaging ring to it. This is not intended. *Personal knowledge*, as analysed by Michael Polanyi (1958), is not only a legitimate form of knowledge but, in many situations, all that *can* be available. Not a single submission to the Jones Inquiry notes any recent improvements in environmental or socio-cultural aspects of quality of urban life, yet much attention is drawn to noticeable declines here.

The strong message from this source is more than just one of slowly falling quality of life. It is coupled, implicitly and explicitly, with the assertion that these continuing problems should be fixed before we consider allowing population to grow (J259). It is not known just how representative Jones Inquiry submissions are, but perceptions of the type being quoted seem compatible with the results of the Australian Bureau of Statistics May 1992 poll: 70.3% of respondents considered that environmental concerns and economic growth had equal importance and 18.8% considered environmental concerns were more important than economic growth (Australian Bureau of Statistics, 1993).

Trends in environmental quality

> The limited data which is available to judge urban environmental performance should be counted as...bad news. (Department of Housing and Regional Development 1995)

Before discussing the possible effects of population growth on environmental quality, it would be helpful to know whether the above sorts of anecdotal perceptions of declining environmental quality are borne out by formal studies. Several studies of regional well-being in Australia in recent decades have shown interest in environmental quality (Sorensen and Weinand 1991) but few have compared regional well-being over time. Nor have there even been formal studies of people's subjective impressions of how the quality of their lives has changed over time (but see the discussion of the Commission for the Future's research in Chapter 7).

Apart from anecdotal evidence then, this leaves us with the evidence obtained by monitoring *indicators of quality of life* such as were described in Chapter 5 when discussing population-quality of life (popqual) modelling, e.g. such things as indicators, over time and by city, of air and water quality, crime rates, disease rates etc.

However, a major collection of factual environmental data by the Australian Bureau of Statistics (1993) shows just how little monitoring of environmental measures has been and is being done in Australia. This may be changing with the acceptance of the idea of 'state of environment' reporting by Commonwealth and state governments but, so far, this movement has involved more rhetoric and rehashing of old figures than serious data collection.

As a generalisation, the few available indicators---for instance McGlynn 1992---suggest, at worst, a slow decline in several aspects of quality of life in the major cities, e.g. McGlynn (1992). The incidence of air and water pollution has stabilised or decreased in most Australian cities in recent years, but noise pollution and traffic congestion have increased (EPAC 1991b). Amongst other examples, the Victorian EPA claims that air quality in Melbourne has improved over the last 15 years (Kelly 1994). Studies analysing such changes in causal terms, for example the role of population growth, have not been done.

The sort of study needed, but for Australian conditions, is exemplified by that of Commoner (1989). For a group of 65 developing countries he concluded that, for impacts arising from the use of motor vehicles, commercial energy and nitrogen-based fertilisers, the nature of the production technology in each case was a more important determinant of environmental degradation than population growth. That is, variation in the technologies used explained more of the variation in degradation than variations in population growth did.

Only the establishment and maintenance of a comprehensive 'state of environment' reporting system will provide the very basic data on environmental quality over time which the empirical study of the relationship between environmental quality and its determinants needs as a starting-point.

The theory of environmental quality

There are no scientific theories of population-environment relationships. That is, there are no well-recognised, succinct, plausible descriptions of step-by-step processes whereby particular changes in particular sorts of human populations will generally lead to particular sorts of changes in particular aspects of particular human environments.

The first reason for this is that population-environment relationships have prompted little sustained scientific research. There is no recognised scientific discipline called population-environment studies or the equivalent, though it may be emerging in the recent and growing efforts by scientists (described in Chapter 5) to model mathematically the links between population and quality of life.

Within an area of interest, scientists normally work by dissecting categories of situations and then selecting one or more of these for study in greater detail and in terms of cause-effect processes. If the targeted situation is 'small enough' to manipulate, then classical science does this through a series of controlled experiments.

One problem with population-environment studies is the wide diversity of situations which might be of interest. It is only too easy to distinguish urban vs rural communities, subsistence vs trading societies, high technology vs low technology societies, high consumption vs low consumption communities etc, but this wide diversity of situations, both in terms of population dynamics and the bio-physical cum socio-cultural settings in which populations evolve, makes theorising and hypothesis testing difficult.

A second problem, already mentioned in Chapter 5 is the confounding problem: environmental quality is determined by a whole suite of factors, not just population. And, most important, it is difficult to disentangle the impact of population growth on environmental quality from the impacts of these other factors. The confounding problem suggests that it might be more profitable to develop a somewhat more general *theory of environmental quality* rather than a theory relating environmental quality just to population.

The PAT and PLOT theories

The confounding problem is well recognised in versions of Paul Ehrlich's (Ehrlich and Holdren 1971) ubiquitous *theory* of the impact of human activity (I) on human environments:

I= f(PAT)

where human impact on the environment, I, is a (f)unction of:

P = population size

A = the activity mix (or the affluence level)

T = technology level used in production of goods and services

A variation on the PAT theory of environmental impact is the PLOT theory (J259) which can be symbolised as:

I= f(PLOT)

where

I = human impact on the environment

P = population size

L = lifestyle (particularly consumption)

O = organisational style of the society (e.g. use of environmental regulations)

T = technologies used (these set the inputs---including space and resources---and outputs---particularly residues---associated with meeting consumption)

What the PAT and PLOT functions are saying is that a small handful of broad thematic factors, one of which is population size, largely determine how much a human society will alter, for better or for worse, some overall measure of the state of its environment over some period of time.

One strength of the PAT-PLOT theories is that they are simple and readily call to mind the things their originators believe are particularly important determinants of the changing state of the environment. Unfortunately they are not testable theories, at least not at the moment. Testing them would require some simple means of measuring complex, multidimensional variables and then being able to find data that would allow such measurement in a variety of situations. Equipped with such data, an analyst could then look for the specific form of the impact function which best explained environmental impact in a variety of social situations.

If this worked out particularly well, we could confidently predict how the state of the environment would alter after a specific change in technology or lifestyle or population size. It would allow some progress on the perennial discussion of whether population has been a more or a less important determinant of environmental impact than, say, technology. It might also let us see how society is organised to manage environmental impacts---it would allow comparison of the percentage change in environmental impact following a 1% change in population versus a 1% change in technology or whatever. However, even with such information, it would be naive to think that the best way of managing environmental quality was to concentrate on only the 'most important' factor.

There are many reasons why fitting simple empirical relationships to data on environmental impact and its determinants, data permitting, is unlikely to work---that is, why PAT-PLOT theories of environmental impact cannot be routinely tested. Lags between causes and effects and interactions between the causal variables are just two of these.

Something of value to the population debate which does emerge from this generally gloomy discussion is the null or 'best-initial-bet' hypothesis: that all determinants of environmental impact are equally important. Anyone asserting otherwise can be challenged. Also, I believe that attempts to refine, develop and test PAT-PLOT type theories are still a useful way of clarifying the environmental quality dimension of the population debate; they are just a long way from yielding definitive contributions.

The next generation of theory

In this spirit some suggestions can be made for developing the next generation of environmental theory beyond PAT-PLOT.

Suggestion 1. We need a theory of *environmental quality* rather than *environmental impact*. 'Environmental quality' unambiguously refers to what directly interests people---the degree to which the environment is a more rather than less attractive as a setting for human activities. The phrase 'environmental impact' suggests changes that make an environment less attractive although this is not necessarily so. Environmental impacts require a further stage of interpretation in terms of their direction and significance in benefit-disbenefit measures for people's quality of life.

Suggestion 2. The point has already been made that numerous partial indicators of environmental quality can be postulated and it may be that, in the interests of making an emerging theory of environmental quality more testable, it should specify first of all which indicators of environmental quality it refers to---for instance, a theory of atmospheric environmental quality or whole-catchment water quality.

Suggestion 3. Quantities of materials and energy 'put through' the activity system seem more measurable and more closely related to environmental quality than 'consumption' or 'affluence' levels.

Suggestion 4. As well as total numbers, where people live is clearly important. For example, the land-based pollution of a bay where water has a long 'residence time' is more of a problem than the same pollution of an open coast with strong longshore currents.

Suggestion 5. The Australian context obviously needs at least two theories of environmental quality: one for individual coastal-city regions and one for individual city hinterlands. The following section elaborates this suggestion.

City regions and city hinterlands

Most Australian population growth is taking place in coastal cities, Melbourne, Brisbane and Sydney in particular. The implications of this growth for environmental quality differ markedly between the 'city region' where most people spend most of their time---working, recreating, commuting, housekeeping etc---and the city hinterland which, populated with far fewer people, produces primary products, supports infrastructure networks and provides recreational and tourism opportunities for city-dwellers. For the purposes of theorising, it is reasonable to assume that each coastal-city region can be defined in terms of one or several coastal river catchments; and that each city region is surrounded by an extensive hinterland.

Each additional person in a city region generates two new 'footprints', one inside the city region itself and one in the city hinterland. A footprint is a mosaic of different land uses in 'fixed' proportions by area, each being part of what is needed to support an additional resident at the city's average quality of life and standard of living (see Chapter 5). The footprint inside the city region comprises the land used directly by an additional resident for day-to-day living and the footprint in the city hinterland allows the resident to be supplied with food, water, extensive recreation and tourism opportunities etc. In practice footprints may fall across the line between the city region and its hinterland but that need not interfere with our theorising.

Nor should we worry that new footprints may change in shape and size as population grows, as technologies change or per capita consumption levels change, or that footprints sometimes extend overseas. In fact the idea of 'changing feet', according to changes in the land use intensity of economic activity (Owens and Cowell 1994), might help us recognise these factors in a 'footprint' theory of environmental quality.

Not only does each additional person generate two new footprints, they obliterate two old footprints. That is, the mosaics of previous land uses are replaced by the land uses needed to service the new resident. For example, farmland inside the city region might be developed into residential blocks and forest in the hinterland might be cleared to grow food for the new resident. Normally, the obliterated land uses are less 'developed' than the incoming land uses but the precise location of each new footprint will depend on the particular type of land allocation process operating, especially the respective roles of land markets and land use planning in that process. Putting it another way, population growth triggers a process of land use change and intensification (Cocks and Walker 1994).

Land uses can be put on an ordinal intensity scale ranging from 'pristine non-use' to 'highly intensive', the latter involving some mix of high human presence, high energy and materials imports/exports, landform sculpting, surface hardening and vegetation modification.

A one-way sampling along the intensity scale, typical for coastal New South Wales (say) might read wilderness, extensive recreation, forestry, pastoralism, agriculture, rural subdivision, residential development, industrial development. Within a single broad use (e.g. forestry), intensification is exemplified by a technology progression such as (say) light selective logging, heavy selective logging, integrated harvesting, intensive production forestry. Change to a more intensive land use can be thought of generically as involving (a) greater flow levels of energy and materials throughput and (b) greater quantities of energy used to transform the natural and built capital stocks of that area.

Within historic time scales and under historic cost structures, a tract's use normally progresses, in fits and starts, from less to more intensive. Land use change is a one-way street---Intensification Street. Conversely, and perhaps more accurately, it is---at the minimum---expensive, and either difficult or impossible technically, to return land to a semblance of a former less intensive use. Exceptions can be proposed and debated (e.g. reafforestation, restoration ecology) but the general tendency is clear.

The significance of this observation is that land use options, whether considered locally or nationally by public or private land managers, must eventually narrow. Simultaneously, the rate of throughput of energy and materials increases. Public recognition of the 'practical irreversibility' of the processes of land use change and increasing throughput has led to concern for the gradual irrecoverable loss of values associated with less intensive land uses. Just what are these values?

Consequences of land use intensification

Even as they generate social and economic benefits, land use intensification processes tend to consume, ration and reduce the *functional capacity* of natural resources, notably biodiversity, earth materials, water and air---the so-called BEMWA resources. In natural systems, the functional capacity of a resource is measurable against its capacity to continue playing its baseline role in the full range of natural cycles including the nutrient and hydrologic cycles and in gene pool development.

More concretely, concern over the impacts of land use intensification on BEMWA resources takes three main forms:

1. A decline in the availability and functionality (notably productivity) of natural resources valued for primary or resource-based industries. These are tourism, mining, farming, forestry and fishing and the natural resources they depend on (call them industrial natural resources) include, for example, soils, water supplies, landscapes, forests, rangeland and fish stocks. The concern here is essentially economic---for the viability or sustainability of primary industries that degrade or deplete their natural capital at some positive rate.

2. A decline in the availability and functionality of natural resources valued for their direct contribution to people's physical and spiritual health---amenity resources such as air for breathing, water for drinking, biodiversity for marvelling at and landscapes for playing in.

3. A decline in the availability and functionality of natural resources valued for their capacity to provide environmental services; that is, to maintain/improve the functioning of bundles of natural resources with productive and/or amenity values. Most environmental services can be viewed as processes for recycling and channelling materials and energy (but see Van der Ploeg and Vlijm 1978).

Examples of service resources include vegetation for scrubbing the atmosphere, wetlands for depolluting water supplies, ecosystems for recycling nutrients through the food chain, soils for regulating runoff, biodiversity for controlling parasitic and pathogenic organisms, beaches for absorbing wave energy.

The phrase 'decline in the availability and functionality of natural resources' is an accurate but cumbersome description of community perceptions of the negative consequences of land use intensification. Common shorthand alternatives are 'environmental impacts', 'environmental costs', 'environmental disbenefits', 'loss of environmental quality' and 'natural resource dysfunction or depletion'.

All these are negative terms and the positive terms 'sustainability' and '(ecologically) sustainable development' (see Chapter 5) have sprung up as 'ideas in good currency' to express the hope that it might be possible to intensify land use without any associated decline in the availability and functionality of natural resources. Sustainability in this sense is a chimera as an elementary knowledge of entropy (the world's tendency to 'run down') and the laws of conservation of energy and mass confirm (see Perrings 1995).

A 'footprint' theory of environmental quality

In summary, the above discussion suggests that a theory of environmental quality suitable for studying the effect of population change in modern Australia has to recognise the following:

. Regional changes in environmental quality due to population size, distribution and activity pattern differ (at least) between (a) coastal-city regions made up of one or several coastal catchments and (b) coastal-city hinterlands.

. The parties causing the environmental problems, mainly residents of new suburbs, seldom pay the external environmental costs they are imposing on the residents of the city's older suburbs.

. The external environmental costs of population growth are pervasive and cumulative; that is, they affect many people and these effects are, at least, proportional to the magnitude of the population growth. It is in fact reasonable to hypothesise that, in many situations (e.g. traffic congestion), impact thresholds (it's the last straw...) and marginally increasing effects of unit impacts on environmental quality will make the quality effects more than proportional to population growth.

. An incremental urban population change imposes 'footprints' of land use change within both the city region and its hinterland.

. An incremental urban population change obliterates 'footprints' of existing land use within both the city region and its hinterland.

. Which particular land use mosaic that becomes obliterated by a new footprint depends on the type of land allocation system operating.

. The net effect of footprinting is an essentially irreversible intensification of land use.

. Changes in technology or average levels of consumption are equivalent to changes in the size of footprints.

. The residues from increases in material and energy throughputs associated with land use intensification will be processed by residue sinks (airsheds, waterbodies, vegetation and soilscapes) which cannot be locally increased and which are almost certainly decreasing in capacity with land use change and intensification. The consequence of this is a local build-up in the concentration of unwanted materials which makes sites less attractive for various activities.

We can use this budding theory of environmental quality to organise some of the arguments about the environmental consequences of city-region population growth. The land use changes that accompany population growth within a coastal city-region and are likely to affect quality of life indicators for present residents include the extension of urban areas onto farmland, recreation land, and natural areas; urban consolidation (the only way additional population can be accommodated in a fixed-size city region); and the intensification of traffic movement. At the same time, rates of throughput from hinterland sources to water, air and land sinks increase for, amongst others, water, fuel, food, fibre, construction materials and industrial raw materials.

The following arguments are little more than informal attempts to relate plausibly population-induced changes in land use and energy-materials throughputs in city regions to responses in indicators of environmental quality. Coverage of the range of change-response combinations is spotty at best.

City size/growth arguments based on land use change

Some views on growing cities

> Why do we want even larger cities? Sydney has traffic problems, crime, pollution, resistance by population to urban consolidation. (David Griffiths in J81)

> The recent 'Sydney's future' gave a depressing estimation of problems of growth in our largest city but offered no solution. (Barbara Guest in J185).

> Small cities don't have smog and can have ocean outfalls. (Eric Claus in J89)

The effects of immigration on urban environmental problems have been of concern at least since the 1977 *Green Paper on Australian Population* (Australian Population and Immigration Council 1977 in McGlynn 1992). This report stated that reducing immigration would allow infrastructure spending in cities to focus on maintaining and upgrading current infrastructure rather than building new infrastructure. It also mentioned the problems of overusing natural recreation areas near cities and overloading of water supply and waste disposal systems. The same problems and suggestions are current today, 18 years later.

Several Jones Inquiry submissions suggest that residents of big cities, in particular cities with a population above 1-2 million, have reduced quality of life (J11, 14). Capping or reducing population (J67, 10) is seen as a way to lessen future environmental problems. Sydney is widely seen as the model for what will happen elsewhere in Australia if population grows markedly (J155).

Urban expansion arguments

People living on the edges of cities that start expanding find that the open spaces and natural areas that first attracted them are becoming filled in and that rising land prices and rates make it difficult to maintain a 'rural residential' lifestyle.

Visual and recreational amenity arguments

> Humanity requires space. Why else do travel brochures show empty beaches as our 'dream'? (Gael Paul in J167)

Our local surroundings play an important role in our lives; for instance they are enjoyable to look at and offer opportunities for outdoor recreation (J74). In the Jones Inquiry, several submissions asserted that population growth degrades or even destroys outdoor recreation areas; a case of overuse wearing out natural features such as dunes, native vegetation. Once worn out, natural areas can only be replaced, at best, with pleasant but artificial areas. The land use change/intensification accompanying population growth, such as the urbanisation of backdrop hills, is seen by some as destructive of landscape values at a broader scale (J210)

Increasing size and density of development do seem to add to the difficulty of maintaining the present amenity levels of our cities (J232). Figures on how ease of access to outdoor recreational areas is changing would confirm these perceptions. It would be more difficult to check perceptions of the aesthetic losses caused by freeway construction, high-rise development etc.

<u>Positional goods arguments</u>

Positional goods are those which no economy, no matter how efficient, can produce on demand.

Any country has a range of unique natural features that tend to become tourist attractions, such as Ayers Rock. No matter how well managed, they run an increasing risk of 'being loved to death' by local and international visitors as tourist populations grow. At least, the freedom to experience such features becomes rationed or constrained with population growth.

Australia has limited areas of a range of outdoor recreational settings such as snowfields, beaches, fishing spots etc. These become more intensively used as populations grow, simply because substitution possibilities are limited. Though perceptions of congestion are culturally determined, the present generation of Australians is inclined to judge such settings are becoming overcrowded as population grows (J212).

Land use stability arguments

> In my lifetime I have seen Redland Bay change from market gardens to suburbia. (Lesley Inglis in J142)

One aspect of quality of life, at least for those who enjoy their current surroundings, is to be able to live in a landscape/townscape that is changing but slowly, thus avoiding 'change fatigue'. People are more comfortable in landscapes and settings they know well, what is known as 'attachment to place'(Owens and Cowell 1994). Yet the most fundamental physical consequence of population growth is land use change/intensification at a rate that depends on the rate of population growth. Better town planning might be one way of reducing this psychological cost but it is certainly not a cost which those affected can pay to avoid.

Natural disaster arguments

The per capita incidence of natural disasters such as storms, cyclones, fires and floods tends to increase with population. This is a consequence of the fact that natural events cause disasters only where there are people and population growth tends to take place in more rather than less hazardous areas such as floodplains, dense bush or the coast in cyclone areas.

Again, good land use planning and land management can ameliorate such risks but the point remains that prevention and/or response costs per capita are likely to rise with population (Cocks and Davis 1985). Note that this particular cost of population growth differs from other costs of land use change insofar as it is almost wholly borne by new residents moving into more hazardous areas, not old residents.

City size/growth arguments based on land use intensification

We turn from looking at the consequences of distinct changes in land use to the consequences of increasing the intensity at which current uses are carried on.

Urban consolidation arguments

It is claimed that some of the higher per capita costs of managing larger cities (e.g. infrastructure) can be defrayed if people live at higher densities (NSW Department of Planning 1991). Spiller (1993) suggests that the cost of infill development could be $20 000---$30 000 per dwelling less than fringe development. However, higher densities bring their own environmental costs. For example, replacing vegetation with hard surfaces increases runoff (which incurs expensive retrofitting of the drainage system), raises mean summer temperatures (which means more air conditioning and worse pollution) and reduces local biodiversity (J234). Increasing housing density actually decreases our capacity to cope with wastes, and reduces our capacity to cope with rainfall and runoff and recycling (Troy 1993).

Loss of sunlight (overshadowing) is seen as a significant cost of high density living by some. Conversely, light pollution means that the residents of big cities never see the stars as Clancy saw them:

> And he sees the vision splendid of the sunlit plains extended,
> And at night the wondrous glory of the everlasting stars. (AB (Banjo) Paterson 'Clancy of the Overflow')

Human longing for open space is universal and legitimate and, in Australia, realisable---so far (J46, 57). Adequate private and public space for houses, community facilities, recreation etc is basic to the Australian lifestyle. One survey shows some 84% of people (94% of those aged 25-39) would prefer to live in detached housing (J179).

However, in Sydney, and to a lesser extent in Melbourne, urban population growth makes it no longer possible to provide low density suburbia for those entering the housing market. High levels of immigration are occurring at a cost to Australians' traditional housing preferences (J179).

Since present residents prefer low density living (detached housing) to higher density living, and if urban consolidation is a direct response to city population growth, present residents are subsidising new residents. A less prominent inequity of urban consolidation is that expensive units often replace low rental housing, thereby forcing people with low incomes to the poorly-serviced city fringe (Flood et al 1991; J234).

High density housing is itself regarded by many as a form of congestion and responsible for a loss of amenity by others---although compact living is beneficial for older people (Conner 1991; J223). Stormwater from heavily built-up areas is more polluted (e.g. with coliforms from dog faeces) than from lightly built up areas (J204, 234) although this need not mean that the total stormwater pollution load from a consolidated city is higher than from an unconsolidated city of the same population. Conversely, it can be argued that consolidated living becomes attractive to more people when achieved by mixing lot sizes but avoiding lots equal to the average size.

It is necessary here to distinguish between low density living and urban sprawl. Urban sprawl means minimally planned urbanisation and has several negative effects compared with properly planned low density urbanisation. It wastes food land, reduces habitats, encourages pests, spreads waste products and requires more energy for transport, shops, communal facilities (J205).

Congestion arguments

> Predictions in all Australian cities point to massive traffic congestion even with substantial road building. (Newman et al 1993)

> Population growth almost always lowers quality of life of citizens. It leads to overcrowding of roads, beaches, caravan parks, schools and hospitals. (Heather Luvis and David Haselgrove in J77)

Population densities incurring congestion of roads and airspace are culturally determined. Many Jones Inquiry submissions, particularly from the big cities, regard congestion as unacceptable now and, since governments cannot cope with present problems, is likely to get worse with city population growth (J92). The 1992 National Population Council report concludes that diseconomies due to congestion are likely to increase as metropolises expand (National Population Council 1992). Air pollution from noise and 'grime' is also associated with land and air traffic build-up (J72).

Notwithstanding, there is a little evidence that trip times (and per capita travel distances) are not increasing as rapidly as anticipated, perhaps because of the emergence of multi-centred cities with each centre being somewhat self-contained (Brotchie 1992; J259).

A variation on the urban congestion argument proposes that, with population growth, outdoor recreation areas away from the cities---beaches, cross-country ski areas, bushwalking areas, rivers, wildernesses etc---are becoming more crowded and that this greatly detracts from quality of life for many Australians. Price-rationing by market forces can relieve congestion but is regressive on the poor; for example, motels replace campgrounds.

Other approaches to congestion

Although the control of population growth is one means of relieving congestion, there are other means. For example, congestion of various forms can be relieved by taxing those who contribute to it and hence discouraging them from contributing further. This solves the immediate problem but is essentially regressive since it disadvantages the poor even though they do not contribute more than proportionately to the problem. A more strategic approach to congestion is through better urban design and redesign.

Pollution arguments

> **Some views on Sydney's water...**
>
> Sydney's water is so polluted that it does not meet the 1987 National Health and Medical Research Council guidelines on colour, odour or bacteria levels. It can't even pass at any time the more flexible 1980 NHMRC guidelines. (LB Daniel in J204)
>
> And water from Warragamba, in troughs and ponds for a few days, grows green bubbling scum---too much nutrient in the catchment area due to too many peoples' sewage discharge into mountain streams. (Esme Wood in J192)
>
> In the last twenty years the average household water bill has risen from a very low level to rival the electricity bill. (Dane Thwaites in J96)
>
> Population growth in the Hawkesbury-Nepean could lead to water quality decline even if advanced treatment technologies used. (JW Stocker for CSIRO in J259)
>
> **...and air**
>
> Public transport cannot adequately service the outer rim of Sydney's fan-shaped sprawl. The air flow patterns created by our geographical position and coastal geology severely limit the carrying capacity of the Sydney air shed. (Elspeth Murphy for MOSES in J155)

With current technologies and consumption patterns, and depending on watershed, airshed features etc, a more populous city imposes greater loads on its relatively fixed waste assimilation systems (J205). The pollution problems most likely to affect individual city residents as a result of population growth include both air quality and water quality. Air quality tends to deteriorate with city size because the efficiency of dispersing air pollutants declines with city size, i.e. pollutants tend to build up to higher levels (J234).

The need to control photochemical smog severely hampers the further development of Sydney and Melbourne. Smog is worse in bigger cities because polluted air persists over the city longer and gets more polluted. Expert opinion maintains that stringent controls, particularly of car emissions, will be needed to keep air quality acceptable in Sydney and Melbourne as they grow (J259). Except for nitrogen oxides which are factors in the production of photochemical smog, major pollutant loads (e.g. carbon monoxide, non-methane hydrocarbons, sulphur dioxide, lead) in metropolitan areas did not show any significant increase between 1975 and 1986 (Simpson and Auliciems 1989).

The water quality of a growing city's catchments tends to deteriorate because the associated intensification of land use increases the quantities of activity residues finding their way into the more or less fixed quantities of water passing through those catchments. While many Australian households use water filters or buy bottled water (J123), there is little evidence that the quality of drinking water supplies to metropolitan areas is declining---a result probably achieved by incurring higher unit real treatment-costs (Aquatech Pty Ltd 1994; J134). However, water quality in the estuaries, rivers and coastal waters of settled Australia is generally of poor quality and quite clearly declining (Department of the Environment, Sport and Territories, 1995).

Per capita costs of maintaining water quality

Water pollution with sewage provides one of the classic examples of diseconomies of scale accompanying population growth. If a few people per mile live along a large river, their sewage may be dumped directly into the river and natural purification will occur. But if the population increases, the waste-degrading ability of the river becomes overstrained, and either the sewage or the intake water must be treated if the river water is to be safe for drinking. Should the population along the river increase further, more and more elaborate and expensive treatments will be required to keep the water safe for human use and to maintain desirable fishes and shellfishes in the river. In general, the more people there are living in a watershed, the higher the *per capita* costs of avoiding water pollution will be. (Paul & Anne Ehrlich 1970)

[Something this statement overlooks is that river flow volumes decline when water is diverted out of river channels and into urban supply systems. Any pollution load thus has to be diluted in a smaller river flow volume.]

Noise pollution is of major concern to many Australians. A 1986 survey by the Australian Environment Council found it to be a more important problem for people in New South Wales, Victoria, Queensland and Western Australia than air, water or waste pollution (Australian Environment Council 1987). Since traffic noise (including air traffic) is a major component of noise pollution, it is highly likely that noise pollution is of even greater concern now than it was then.

Other approaches to pollution

There is a wide range of technologies available for reducing air and water pollution and there are policy instruments (e.g. full cost recovery from users) available for encouraging their use. However, even the best pollution technologies, widely used, are not perfect and there is always a danger that the gains in reducing pollutants by technology will eventually be lost as population grows; total levels of pollution are what matter, not what they would have been without management (J57). An environmentally responsible population of 36 million is always going to have at least twice the impact of an environmentally responsible population of 18 million (J177).

Solid waste arguments

> Many cities are facing disposal crises as population growth simultaneously produces more waste and reduces the available land for dumping. Waste disposal is another classic case where per capita costs tend to go up as population grows. (Paul & Anne Ehrlich 1970)

For example, one estimate is that Sydney has sufficient landfill sites to last no more than 6 years (J194) after which new refuse tips will have to be established a long way from the communities they serve (Cook 1991; J244). It might also be argued that if per capita incomes are higher in bigger cities (see above), then consumption per capita will also be higher and, all other things being equal, so will waste per capita from this higher consumption. If this point is correct, it implies further exacerbation of waste disposal costs per capita in bigger cities.

The increasing per capita cost of successful solid waste disposal in growing cities is an economic argument against population growth, not an environmental argument. The environmental dimension is that the 'footprints' of new disposal sites impose a loss of environmental quality in terms of landscape values, contributions to congestion etc. If solid waste is not properly managed because higher unit disposal costs cannot be funded, the environmental cost is direct as the garbage-clogged streets of New York and Los Angeles attest.

Health arguments

Temperature and moisture are both critical to the ability of viruses, bacteria and insects to multiply. Malaria and other insect-borne diseases could come to affect a higher percentage of the population if the present population spread to sub-tropical coastal areas continues (J235, 145). Amongst other things, subtropical coastal populations are creating mosquito breeding areas (canals, swimming pools) (J242). Malaria could become permanently established in Queensland and the Top End as population densities rise (J145). These effects stand to be magnified under the rising temperatures and rainfall of climatic change (J235).

Population growth through immigration from countries with poor health services has been suggested as a possible reason for anticipating an increasing incidence of epidemics of 'old' diseases such as tuberculosis, polio, whooping cough, Hepatitis A and B (J207). This possibility is accentuated by Australia's current poor record on routine immunisation. Increased migration might also necessitate wider monitoring for a wider range of diseases (J242).

Many environmental health professionals believe that future population increases will jeopardise the average health of Australians in terms of communicable diseases, environmental diseases (e.g. asthma, water-borne enteric diseases, airborne lead and particulate toxification), food security (e.g. fish poisoning), and social problems (Curson 1991; J134, 244). The link between asthma and traffic-generated air pollution is now well established (Quinn 1992; J100). Metropolitan areas have higher levels of mental health problems than non-metropolitan areas (1977-78 Australian Health Survey) but it does not follow that this rate will get worse as cities grow.

An increased rate of rodent control measures is likely to be required with population growth (J242). As a worst case scenario, increasing interaction between humans and animals such as rodents might assist more diseases like AIDS to cross the inter-species barrier (Professor Frank Fenner, quoted in Ewing 1995).

If more higher-density living is a consequence of population growth, the risk of epidemics of infectious diseases, particularly virus diseases, is increased (Ehrlich & Ehrlich 1970). Higher-density living may well encourage tuberculosis (J100) and increase levels of physiological and psychological stress (J63, 205). Growing demands for water with population growth exacerbate the problem of deteriorating water quality and associated health risks. The approach of avoiding this by eliminating pollution is impossibly high at present. Ill-health which can be traced to population growth constitutes a particularly strong argument against it simply because the health of the individual is so highly valued in our society. Despite all this, today's age-specific death rates show little link with settlement size (R Birrell, pers comm).

Lifestyle argumentss

A major environmental consequence of the greater consumption of goods and services accompanying population growth is an increase in the quantities of anthropogenic residual materials which have to be processed by the country's natural systems (waterways, estuaries, plant communities etc). These quantities depend on material goods consumed per head and number of consumers. Since such systems become polluted and reduce quality of life when the rate of residue introduction exceeds critical values, lifestyles can be only maintained under population growth by reducing materials consumption per head or by the widespread introduction of new less-polluting technologies in production and residue disposal.

In practice, under increasing real incomes, consumption per head is actually rising, albeit somewhat tempered by an ageing population (J170) and reductions in residues per unit of consumption as a result of using cleaner technologies. One factor accentuating per capita consumption trends is the aspiration of poorer people to consume as richer people do, along with the acceptability of conspicuous consumption which tends to be both resource intensive (e.g. holiday homes) and environmentally degrading (e.g. speed boats, 4-wheel-drive bush-bashing).

The implication of rising per capita consumption and finite residue processing capacity is that numbers of consumers (equals population) must be reduced to maintain quality of life and to meet emerging international obligations (J179). The argument that population growth should be curbed in order to protect present average consumption levels would offend many people.

Population growth is reducing the range of lifestyle possibilities at all settlement sizes, not just in Sydney and Melbourne (J220). When small settlements like Broome and Port Douglas expand their numbers, their role in providing certain permanent-lifestyle options is not taken over elsewhere. In terms of lifestyle options it seems desirable to retain a continuum of population densities from crowded cities to utter solitude (Ehrlich & Ehrlich 1970). Population growth may also indirectly reduce future lifestyle options if funds for coping with urban growth are not available for social experiments to create new types of settlements (J48).

Complementary approaches

Clearly, many of the putative environmental problems stemming from population growth derive more particularly from the fact that such growth appears likely to be concentrated in a few big cities. However, the idea of pro-active decentralisation to slow big city growth is regarded with great suspicion by politicians and publics alike (J160). Notwithstanding, it seems there is a need for research to develop new models of guided decentralisation and present these for public debate (Stilwell 1991). Dealing with the 'uneven settlement pattern of migrants' could be another way to approach this problem. But the Department of Immigration and Ethnic Affairs has examined the options for doing this and found all to be ineffective (J247).

Overseas studies suggest that patterns of urban growth can strongly influence pollution and congestion costs (Spiller 1993). Despite this promise, land use planning in Australia's big cities appears to have failed to make a significant contribution to these problems. For example, many noxious industries, once on city outskirts, become inappropriately positioned as cities grow (J244). New paradigms for city planning are needed.

Key points in environmental arguments

The environmental quality of a city region can change for many reasons such as consumption patterns, land use and land use intensity, technologies, the product mix and population size. It is difficult to isolate the *size* of the particular contribution of population here, but it is likely to be widely agreed that the *direction* of change in environmental quality imposed by extra population is negative. Putting this another way, it seems we have no suggestions on the table on how an increase in the population of a city-region might lead to an *improvement* in any aspect of environmental quality.

This leads to the conclusion that larger populations cause greater environmental degradation than smaller populations, if all other factors are held constant (J210). An environmentally responsible population of 6 million in the Sydney Basin is still going to have twice the impact of an environmentally responsible population of 3 million. But this does not mean that the degradation in environmental quality for each individual will double. The 'more people equals more degradation' result could be predicted to remain true even if efficient cost-internalising measures are applied; although at lower 'optimal' levels of degradation than without such measures.

Theoretically, with proper management of technologies, consumption and so on, an area should be able to increase its population and still reduce environmental impact (J169). But don't hold your breath. We live in a society which can, at best, respond only very slowly to problems involving externalities and certainly cannot pre-empt them (Mishan 1993). The problem is even more daunting if the external unpriced costs of population-driven economic growth are greater than the collective gains in GDP per head. They could be.

In practice, per capita consumption in Australia is increasing rather than decreasing (J210). This increase (which also raises residue production) might also be tentatively proposed as a fairly direct consequence of population growth if it is accepted:

1. that population growth in Australia is predominantly in the cities; and

2. that per capita incomes are higher in larger cities (see Chapter 4).

The generic argument

> Solutions should not be assumed for population-related problems through other policies, unless the institutional and other mechanisms required to effectively implement those solutions are in place. (National Population Council 1992)
>
> Even if population growth were playing a minor role in producing a particular (environmental) problem, population policy may provide one of the most cost-effective ways of addressing it. (Samuel Preston 1994)

Population growth is neither a necessary nor a sufficient condition for environmental degradation; it is however,a strong predisposing factor.

Environmental quality arguments against substantial population growth take the following general form:

1. Future Australian population growth is likely to be concentrated in the country's biggest city regions.

2. Environmental quality is an important component of quality of life. Many indicators of the quality of city region settings for people's everyday activities are currently unacceptably low and tending to get worse, not better.

3. One significant primary cause of past decline in urban environmental quality has been population growth, expressed through the secondary 'downstream' processes of land use change and land use intensification.

4. Future population growth will inevitably express itself through the same processes and hence cause environmental quality losses in the same way as has happened in the past.

5. Adopting social and material technologies which reduce the rate of land use change and the rate of material and energy throughput tends to ameliorate but not eliminate this decline in environmental quality. It cannot be assumed that such technologies are likely to be used until the requisite mechanisms are in place.

6. Even after foreseeable amelioration through technology, the associated rate of *uncompensated* loss of environmental quality is still likely to be high enough to constitute a strong argument against population growth.

Each individual step in the above argument is open to challenge and research. A great deal of work must be done to confirm (or weaken) the plausibility of both the steps and of the overall argument. Even then, it does not follow that the environmental quality argument against population growth will be widely accepted as strong, or even legitimate.

However, if this book is to base its policy recommendations on current knowledge, it must now take a position on the population-environmental quality link. My own conclusion is that the nature of Australian society makes foreseeable population growth more rather than less likely to lead to distressing losses in quality of life for most present and future Australians; certainly population growth is highly unlikely to lead to improvements in the environmental dimension of quality of life.

Think about this one

In 1960 about 10 million Australians produced a real GDP of about $7200 per head. In 1991 about 17 million Australians produced a real GDP of about $16 200 per head. If GDP per head is assumed to be a rough measure of per capita impact on the environment (but see Jacobs (1991)), then, in population units called '1960 Australians' the total environmental impact of the 1991 population was equivalent to about 40 million '1960 Australians'.

CH 7. SOCIAL (DIS)BENEFIT ARGUMENTS ABOUT POPULATION SIZE

Some theory

National population growth increases the size and overall density of populations in individual city regions. To a lesser extent, service populations in city hinterlands may also grow, although this may be masked by a parallel 'drift to the cities' (McKenzie 1994). Residential, commercial and industrial land uses replace all farmland, recreational land and natural land that has high, medium or low productive, amenity or service value.

Land uses that intensify (as distinct from being replaced) due to the demands of a larger regional population include areas of urban consolidation, transport corridors, sewerage system corridors, natural recreational areas that cannot be duplicated (e.g. beaches) and higher order services (e.g. universities) not immediately duplicated during population growth.

Thus, the secondary changes determining the social consequences of population growth are the same as those determining the environmental consequences. In terms of social benefits and disbenefits for the *existing* city region population (the tertiary effects) what is the effect of these changes in population, land use and land use intensity?

The immediate answer is that benefits seem to be extremely limited; indeed, I cannot think of any. Perhaps there is an increase in the range of lower order services (e.g. supermarkets) available to people living on the fringes of the existing city. Land prices are likely to rise in established urban areas and this will be welcomed by some. Perhaps population growth will take the city region past thresholds at which higher-order services (e.g. cultural activities, specialist medical services) become viable.

Conversely, as set out below, there are some obvious disbenefits. Generalising these, population growth constrains (stops?) options for some activities for some people (e.g. via loss of local open space) and/or reduces the quality of activity-options (e.g. outdoor recreation, housing) and non-discretionary activities (e.g. being caught up in an increasingly clogged legal system).

This simplified overview ignores population movements other than the movements of newcomers into new urban areas such as emigration from the city region, relocation within it, temporary movements between regions. It does not recognise groups other than (a) old and (b) new residents of (a) city regions and (b) hinterlands---for example, future generations, residents of other regions. It may still prove a useful skeleton on which to hang some ideas.

Some specific matters for concern

Social and cultural arguments about population size are particularly concerned with whether the quality of activities involving relationships between people and the quality of activities depending on the organisations and systems that serve group and individual needs are sensitive to population change (J48).

Amongst the important socio-cultural needs that should perhaps be met to achieve high quality of life are: adequate health services; adequate interesting food and attractive housing; a lively social, artistic and cultural life; a good education; proximity of family and friends; worthwhile employment; quality leisure time; and opportunities to refine the democratic system and civil liberties. Other needs include freedom to produce 1-2 children, knowing they will inherit a stable, safe comfortable world and a social milieu that promotes senses of conviviality (J170), respect for the individual, autonomy, self-esteem, a sense of place and belonging and security in one's daily life.

Trends in the social quality of life

Hearsay and anecdotal evidence

Submissions to the Jones Inquiry identified various problems indicating that these needs are not being met in Australia's cities. Their residents haveto contend with more loneliness and alienation, more homelessness, increasingly expensive housing, less access to beaches and parks, increasingly crowded community facilities, a scarcity of peace and solitude, growing ethnic tension in Melbourne and Sydney and rising crime levels (J234).

These problems are not necessarily a result of increasing city size, but in the English-speaking world this correspondence has been a common experience. Also, problems can increase in magnitude without increasing in intensity per person as cities grow; for example, new residents may suffer from poor public transport but the problem may be no worse for established residents.

Other evidence

As with relationships between environmental quality and population, there is little evidence with which to compare changes in plausible social quality of life indicators against population size in particular places. More interest is shown in comparing social quality of life between places (see Ferry 1991).

A public opinion survey carried out by Reark Research for the Commission for the Future in 1988 (Eckersley, pers comm) asked people if they thought various aspects of life (a) had got better or worse in the past 20 years and (b) would get better or worse in the next 20 years. Table 7.1 records the percentage of respondents identifying worsening conditions for 16 aspects of life.

Table 7.1 Australian attitudes to change and the future

	Percentage saying things are worse:	
	over past 20 yrs	over next 20 yrs
Issue		
Crime and violence	92	74
Pollution & quality of the environment	79	55
Level of personal debt	77	55
Unemployment	69	48
Moral & ethical standards	58	31
Poverty	50	45
National economy	46	26
Home ownership	39	52
Relations Aboriginals & white Australians	36	23
Standard of government	35	17
Quality of education	34	21
Community health	26	19
Relations between different ethnic groups	25	21
Australia's competitiveness on world markets	25	11
Standard of living	24	28
Working conditions	10	15

Source: Commission for the Future 1988.

Table 7.2 records views from the same survey about the likely quality of life early in the next century.

Table 7.2 Perceptions of quality of life in Australia next century (percentage of respondents)

%

Much better	5
Better	25
About the same	30
Worse	34
Much worse	6

Source: Commission for the Future 1988.

Australian life expectancy figures, which probably integrate a number of aspects of social and environmental quality of life, have improved significantly since the 70s but these mask big differences between social groups and, probably, other confounding factors that make the effects of population size *per se* difficult to isolate (Brown et al 1991; Australian Bureau of Statistics 1994a; Economic Planning and Advisory Council 1991a).

City size/growth arguments

City growth and personal relationships

> **Safety needs**
>
> If the city I live in doubles in size, safety will decrease. (HN Dengate in J145)
>
> For an environment to be safe it generally needs to be stable. If the environment keeps changing rapidly, the individual experiences the need to remain vigilant in case of unpredictable personal danger.(Sheila Newman for Australians for an Ecologically Sustainable Population) in J170)

It is widely recognised but not well documented that per capita rates for crime, drug addiction, alienation, sociopathy and other social problems are higher in big cities than in small cities and towns (Mukherjee 1995; J197, 141). Child and gender violence, suicide and marriage breakdown may also be candidates for this list (J142).

Even if the crime rate per head is no higher in big cities, people (with the help of the media) see all crime in their city as a threat to them; that is, people are responding to the total crime sheet, not the per capita incidence (J238) . While this may be illogical it is a view that matters. If growth in city populations means higher densities of population human compassion may decline (J151). Busy cities create unfriendliness through a 'vicious circle' of time, money, materialism and space. The more you work the less time you have for self, family and friends. Even more time is lost because travel in big cities less efficient (J253). In cities it is hard to find and enjoy a quiet natural area these days. Parks, for example, are becoming undesirable places to be in for much of the day (J222).

Cities can be viewed as living systems and bigger cities are more complex systems than smaller cities. For example, interactions between people, especially strangers, increase more than proportionately with population. Not only does managing a large city require a much more sophisticated management system than a smaller city, but the same fault in the management system can be catastrophic in a large city but make little impact on a small city. The minor incident that sparked the 1990 Los Angeles riots is sometimes given as an example. The long chain dependency that accompanies the specialisation of function in big cities means that small breakdowns in function can have widespread consequences---the disruption of petrol supplies, for example.

Insofar as population growth in Australia is likely to mean capital city growth, and that these types of problems show little sign of coming under control, a socio-cultural argument for minimal population growth can be made. However, it has to be set against economic arguments favouring bigger cities (see Chapter 4). Research shows that social and economic benefits may increase as city size grows to about 500 000, although after it reaches about 1 million people social conditions deteriorate, and after about 2 million economic conditions also deteriorate (J177, 223, 154). The full spectrum of costs and benefits associated with big city growth must be much better researched (J222). Another way of interpreting the above points is to suggest that they present an argument for population growth to take place (if there is to be population growth) in smaller rather than larger cities.

City growth and personal freedom

When discussing quality of life it is an interesting puzzle that people do not miss what they have never had. Conversely, former rights, freedoms and options that are lost are missed particularly deeply. Local population growth is seen not so much as a threat to the large freedoms like democracy (but see geopolitical arguments in Chapter 8) as it is to small everyday freedoms (J145). Jones Inquiry submissions identify a range of activities which have been already or will be regulated or disappear or take longer to accomplish or be priced out of reach with population growth: for example, burning autumn leaves, meat-eating, lying on a quiet beach, living in detached housing on a large block, using lots of water (J167). The privacy of detached housing is threatened by the erection of multistorey apartments during urban consolidation.

One freedom likely to be lost with increased population concerns recreational choices, as when hunting and fishing must be restricted to conserve target species and bushwalkers have to go further to get away from people (J103). Access to wilderness and quietness is a freedom or option we have seen eroded in our lifetime (J145).

Restrictions on pet ownership and enjoyment increase with city size. Dogs can no longer be walked on some Sydney and Melbourne beaches during the swimming season. The Sydney Water Board estimates that dog faeces contribute 5-10% of faecal coliforms in storm water, rising as high as 50% in densely populated areas (J204). This is not a problem in Yackandandah! Cats kill large numbers of birds and now have to be kept in at night in some jurisdictions.

One serious loss of freedom---choice of marriage partner---would occur if immigration was stopped or drastically reduced (J247). On balance though, population growth tends to reduce personal freedoms and activity options and to raise the level of social control over individual activities.

Other social arguments

Cultural richness arguments

People who cannot find like-minded people to interact with in small cities can often find them in large cities. However, large cities probably still have the same proportion of people who cannot find soul mates as small cities have (Mumford 1961). In other words, increasing city size does not automatically increase the *proportion* of people able to join groups/communities with interests similar to their own. Also, since a growing city makes interaction more difficult (e.g. congestion, travel time, personal safety) big cities do not necessarily promote conviviality.

It is commonly held that the richness of a city's high cultural life (e.g. the arts) and intellectual life (e.g. science) increases with its size up to a level of perhaps 1-2 million people. In other words, cities like Sydney and Melbourne are unlikely to become significantly more culturally and intellectually stimulating by continuing to grow. High cultural life also depends on free movement between countries but this movement does not have to be permanent (see Hoch 1987).

One Jones Inquiry submission sounds a warning to the contrary: that a much reduced population would make it difficult to maintain our present range of social institutions, such as governance, the justice system, the transmission of ideas (J179).

The ethnic dividend

The Australian population is more ethnically diverse than that of any other Western nation (J179). There is general agreement that Australia has benefited enormously from past waves of immigration in cultural terms such as the diversification of eating habits, the arts, and first hand experience of other cultures and views. Also, looking to the future, a larger, culturally diverse country may possess immeasurable advantages in a world where cultural awareness has become a prominent and desirable feature in international dealings, trade, tourism and marketing (J169).

Conversely, there is a common perception that further cultural benefits from immigration are likely to be very much smaller than those gained so far. In particular, the community is reluctant to see the culture 'Asianised' (J125; McCormack 1992). In a post-industrial society, cross-cultural enrichment is more likely to occur between in-situ authentic cultures (via travel and information technologies) rather than between transplanted cultures.

At current immigration rates, the change in ethnic or national-origin makeup of Australia's population as a whole is likely to be relatively small (J252). Nevertheless population flows in and out of the country would continue even under a regime of nil net migration and the ethnic composition of those flows would probably continue to increase ethnic diversity, albeit at a slower pace than in recent decades. Also, the need to accept refugees and an inability to control illegal migration totally will continue to modify ethnic composition (J230).

Social cohesiveness arguments

Ethnic antagonisms

> There are limits to the amount of cultural diversity a society can tolerate without going the way of Yugoslavia. (Terence Fowler in J72)

Our recognition of the benefits of cultural and ethnic diversity has to be balanced against potential disbenefits. There is much debate over why Australia has experienced so little ethnic tension and antagonism (by international standards) given the country's large numbers of immigrants from non-Anglo-Celtic backgrounds since World War II. Reasons offered include a diversity of intake (J241), a supposed tolerant streak in the national character (Saulwick Age poll, May-June 1994), a supposed indifference to newcomers, and the rapid provision of full services and citizenship rights to immigrants (Jayasuriya 1995). This happy situation has held fast even through hard economic times.

What is quite unpredictable is whether this relative ethnic harmony would continue under a program of continuing immigration from one or a few ethnic groups or collections of groups, such as Asians. Given such a program, the possibility of ethnic divisiveness would have to be taken into account under precautionary thinking (see below) about Australia's future population (Sowell 1994; (J125).

Notwithstanding Australia's fine record on migrant assimilation, migration does and will continue to bring some level of ethnic and national origin tensions (McAllister & Moore 1991; J111, 43). For example, if quality of life deteriorates and immigration is blamed, sections of the community may vent their frustration on migrants (J131). Almost three quarters of a surveyed group of overseas students reported encountering prejudice and discrimination when they were in Australia (Bureau of Immigration, Multiculturalism and Population Research 1995). Suggestions for minimising such antagonisms include reducing immigration to (a) reduce the proportion of the population to be assimilated (J252); and (b) to provide a low-immigration period during which ethnic conflicts will die away as migrants become assimilated (J123, 163; McAllister & Moore 1991). Education is highly important too.

Reversing the above argument, reducing and forestalling ethnic tension is a reason for reducing immigration and, in the process, reducing long-term population. Also, if population growth was slowed, this would provide a breathing-space in which to examine the benefits and disbenefits of multiculturalism as distinct from assimilationism (J7, 125; Ramsey 1994; Moore 1994).

Resource use conflicts

Another aspect of social cohesiveness is that within the last 15-20 years there has been a massive increase in social conflict over natural resource allocation and management issues---for example, logging native forests. Since society has failed to develop mechanisms for resolving such conflicts in ways perceived as legitimate, and such conflicts are largely caused by the land use intensification associated with the demands of larger populations, some argument for minimising population growth can be made around this point.

Jones Inquiry submissions present several other scenarios in which population growth leads to social dislocation:

. Australia's egalitarian culture has depended in part on a recognition that there is enough to go round. Inequality and polarisation may rapidly set in once a sizeable middle class recognises that it is impossible to extend its standard of living to all members of an ever-increasing population (J147, 197, 222).

. If population continues to increase, social and political problems will become immense as the nation struggles to control a disaffected underclass of unemployed, many of whom will be educated and articulate (J215). If the wants of one section of the population are satisfied at the expense of others' the political system becomes unstable and revolution becomes a possibility (J183).

. Ecological impact may not be what brings a halt to our quality of life. It may be that as population density increases, like Calhoun's famous caged rats (Calhoun 1962), it is conflict that rips society apart (J234, 90). The links between crowding, psychological stress and violence have been reviewed by Proshansky (1984) and Kelly and Galle (1984).

Demographic arguments

Demographers identify an optimum population as one that has not only the right size and stability (zero population growth) but also a fairly regular age structure, thus avoiding the social and economic upheaval that rapidly increasing or decreasing numbers in successive age cohorts produces (Day 1971; J60, 177, 98). Other suggested attributes of a demographically optimal population are low birth and death rates (J98). Low birth rates are desirable once the idea of a stable population is accepted simply because the alternative implies high death rates and that is not acceptable in our society.

While demographers might have such a view of what constitutes 'an optimal population', remember that this is just as much a value judgement as the economists' argument for a goal of increasing real incomes. Putting this another way, professional analysts can clarify but not make the choices facing the community. This must be done through political processes. In the present case, demographers' views have to be set against, for example, religious views which value quantity of life (J128).

Nonetheless, demographic analysis yields important insights, highly relevant to the population debate. The myth that immigration is an effective tool for either permanently or temporarily reducing the average age of the population has been punctured by simple demographic analysis (J98, 177). Australia still has a relatively youthful age structure and the population will continue to age slowly for some decades (J13, 179). The government accepts that immigration is an inappropriate tool to counter demographic ageing (J247).

While some regard demographic ageing as a major problem in terms of the dependency ratio (McGuinness 1994), remember that all age-groups generate social costs---all babies are totally dependent but less than 0.5% of the aged require full nursing home care (J170). It can be argued that, in dollar terms, the future age structure will cost less than the present one (J179).

The real demographic problem of the next two decades is not growth in the numbers of the elderly but the big increase in numbers of potential workers (J179). Fashionable projections of continuing high unemployment claim that high immigration can only exacerbate this problem. Lower population growth will also make it easier for those who wish to work past current retiring ages to do so (Long Term Strategies Committee 1992b).

<u>The mind-set argument</u>

A general community acceptance that the population will not grow any more stands to release a burst of social energy as people realise that all the burdens of coping with newcomers' needs have been lifted. That same energy can now be channelled into improving quality of life for those already here and coping better with the changing demand patterns generated by internal migration. Without some justification, this is not so much an 'argument' as an 'interesting idea.'

Genetic health

It could be argued that increasing the Australian population would increase the gene pool and thereby increase the number of highly talented people, simply as a statistical phenomenon (J170). The counter argument to this is that there are many less drastic ways of raising 'cleverness' levels; better education for example.

Conversely, the gene pool represented by the present Australian population is more than large enough to curb the degenerative conditions associated with recessive genes (McEvedy & Jones 1978). The long-term implications of a stable population for the rate of birth defects, an issue raised by MacFarlane Burnet in his book *Dominant mammal* does not seem to be a discussion point within the community (J28, 179; Burnet 1970).

The Victorian world's fears of the weakening effects of miscegenation in human populations seem absurd today and no basis for an argument against population growth through non-Caucasian immigration. Equally, 'hybrid vigour', well-recognised in plants and lower animals, is not a concept applied to human communities.

Ethical and social justice arguments

The basic argument here starts from the position that the present generation of Australians has an ethical (moral) obligation to conform to evolving standards of intra- and inter-generational equity. The further question of inter-national equity is considered in Chapter 8; see Throsby (1992). Australians have a deep-seated responsibility to their descendants (J65) and must not limit future generations' decisions on how they will live (J220).

If significant population growth makes it difficult or impossible to achieve such standards, then such population growth should be avoided. That is an ethical position which has to be set against (for example) the ethical position that we should be ' inviting more people to the banquet of life' (J72). It has already been pointed out under 'economic arguments' that population growth tends to reduce the real incomes of many capital-city residents and to transfer (natural) capital from future generations to the present generation. The ethical position was taken there that it is unacceptable for the poorer residents of the big cities to suffer uncompensated declines in real income as a result of further population growth.

Inter-generational equity

The issue of inter-generational equity or social justice only arises if adjusting the rate of population growth in the short term changes the levels of short-term and/or long-term marginal net benefits (disbenefits) to the population of the time. If it does, it becomes a question of equity as to where the balance between these two effects should be set (Norton 1989; Borcherding 1991).

Unfortunately, this is a broad and difficult question and cannot be answered at all well. Points to consider include the extent to which population growth produces an irreversible loss in natural resources; the extent to which this is offset by increases in man-made capital; and the extent to which man-made capital is likely to be accepted as a substitute for lost natural capital. Also consider the extent to which climatic change might affect the rate of loss of natural capital and the extent to which current resource depletion will cause future suffering (J137).

For example, it is sometimes suggested that if the interests of future generations were fully recognised, current mineral production is excessive in volume and sold at prices that are too low (J230). One principle proposed as a measure to balance inter-generational interests is to try to leave resources and the environment in the condition in which they were inherited (J230).

A Jones Inquiry submission from the Aboriginal and Torres Strait Islanders Commission suggests that high population growth will not be good for Aboriginals (J260); that this will mean more attention paid to immigrants; a smaller voice in a larger population for Aboriginals; and a loss to development of land important to Aboriginals (J170). Another Jones Inquiry submission asserts that Aboriginal land needs must be identified and met before major population growth can be seriously considered (J174).

Speciesism

A second line of ethical argument starts from the position that humans have no right to threaten the existence of other species of animals. Since population growth disturbs and destroys habitat, and since this is mainly why species decline, population growth is unethical (J230).

Conclusion

Ethics is about what people 'ought' to do. However, to argue for a position on ethical grounds adds nothing to the content of that argument. What it does do is flag an appeal for values that are particularly important to the proponent of that argument. It may also imply a tacit assertion that the argument should be more seriously considered because it is based on altruism rather than self-interest.

Key points in social arguments

There is a pervasive but poorly documented view in Jones Inquiry submissions and elsewhere that quality of life has been slowly declining for most Australians in recent decades (J192). The focus of this perception is environmental quality and socio-cultural needs rather than economic welfare, which tends to get mentioned mainly in relation to increasing poverty (e.g. unemployment).

While it is recognised or argued that much more could be done to arrest this decline, population growth leading to land use change and intensification is widely blamed for it. Thus, coping with the demands of population growth deflects society's energy from maintaining whatever environmental and socio-cultural well-being it has. A 'catch up' strategy becomes the only possibility.

Amongst the more important partial indicators of social quality of city life hypothesised as being jeopardised by future population growth are:

.The quality of personal relationships; e.g. with respect to crime, security, conviviality, ethnic tension.

. Freedom to enjoy a range of collectively important everyday activities without the need for greatly spending much more time and money; e.g. gardening, outdoor recreation, owning pets.

. A level of public acceptance of resource allocation decisions.

. Unemployment and its consequences.

. Indicators of social justice, within and between generations.

Indicators suggested as likely to improve with population growth include:

. Cultural richness.

. Establishment of higher order services and activities.

Most socio-cultural arguments relate more to the perceived short-medium term costs and even more dubious benefits of population growth than to the question of whether a larger population in (say) 2045 promises better socio-cultural well-being---once the costs of getting there have been sunk.

It might be inferred that, if such a larger population was still growing, most people would consider a larger population undesirable. Why would our ability to cope with population growth be any better then than now (an 'onus of proof' argument; see Chapter 9)?

But what about a much larger *stable* population in 2045? Could this improve socio-cultural well-being? This question really does not arise, simply because a much larger stable population in 2045 is not a demographic option. As pointed out above, the only way a more or less stable population can be achieved by the middle of the next century is to stop the present population from growing, as soon as possible.

While this book argues against significant population increase, Chapter 10 discusses fast versus slow growth strategies (predicated on the assumption that population growth has been accepted as a social goal).

CH 8. INTERNATIONAL ARGUMENTS ABOUT AUSTRALIA'S POPULATION SIZE

The long view...

> ...we will end with a slowly declining [world] population, perhaps from the end of the coming century, and perhaps reaching our present numbers again in two or three centuries time. (John Caldwell 1994)

...and the short view

> We are rapidly becoming horribly mired in the logistics of the survival of mega populations on earth. (Sheila Newman for Australians for an Ecologically Sustainable Population in J170)

In this chapter, we take up arguments concerned with relations between the peoples of the world, specifically between Australians and others. These divide broadly into arguments about how we should contribute, via population policy, to solving the world's population-related problems ('global citizen' arguments) and how we can best ensure, again via population policy, the quality survival of Australian society in an overpopulated world (geopolitical arguments). But first some background.

The world population situation...

It is widely accepted that even though total fertility rates are falling in many countries, world population is likely to double to more than 10 billion before approaching stability late next century (United Nations Fund for Population Activities 1992). It is problematic whether those unborn people can and will be provided with the means to live in even frugal comfort. Currently 1 billion people live in quite unacceptable poverty. It is also widely accepted, in Australia and elsewhere, that all countries have a responsibility to stabilise their populations as quickly as possible. For example, Australia was a signatory to a declaration by the world's scientific academies, meeting in New Delhi in 1993, that the world population goal should be zero population growth within the lifetime of our children (J215, 246, 94; Graham-Smith 1994).

...and its relevance to Australia

However, population growth via immigration (Australia's way) is commonly seen as in line with this injunction, since it is more 'population transfer' than population growth. It is difficult to disagree with this provided that migrant women do not have more children as a result of moving to Australia than they otherwise would and that the transfer of migrants does not affect birthrates in some way in the 'source' and 'sink' countries---for example residents feeling they have to 'match' migrant birth rates.

On balance, Australia is probably doing something to reduce the rate of world population growth by bringing in migrants who will have fewer children here than if they had not migrated (J94). The numbers involved are quite insignificant though.

Factors sometimes nominated as warranting consideration when Australia's response to the world population outlook isformulated include the risk of external coercion and the promotion/protection of 'Australian' domestic values such as generosity, independence, responsibility and morality.

Coercion and sovereignty

The initial relevance of the world population outlook to Australia is that it presages a disturbing scenario in which nation states are increasingly likely to come under international pressure to accept immigrants and refugees (J21); to control their own populations (J255); to help reduce global warming and global ozone production; and to provide aid to poorer countries (J197). While such pressure may be well-intentioned, presumably we will continue to want to make our own decisions on these important matters.

For example, since any imaginable population growth in Australia would still be insignificant globally, Australia can make its population decisions without reference to the world situation. Supporters of such a hardline position may argue that world population is coming under control quite rapidly as living standards around the world rise. In 20 years the trend in less developed countries has been from 6 to 3.7 children per woman. The implication is that Australia need not be overly influenced by the spectre of massive world population growth when deciding its own population policy.

Generosity

Coercion aside, exposure to the world population scenario may convince us to voluntarily accept people looking for a better life, or to use our resources more generously in other ways to help the world through what looks like being a very difficult century to open the new millenium. On a per capita basis, Australia is still the most generous country in the world in terms of welcoming refugees. I for one would be pleased to see us retain that distinction.

Responsibility

Judging from submissions to the Jones Inquiry, many Australians consider we have at least a responsibility within the global context to bring and hold our total fertility rates to or below replacement level (J3, 7). Others go further and consider that Australia has an international responsibility to stabilise its population as soon as possible (J175).

Morality

Sometimes the international dimension of Australia's population policy is raised in the form of a moral imperative: does a small population have the moral right to occupy a large country when other countries are becoming more and more crowded? (J176, 137). The implication is not that low population density or high land area per capita is immoral (I assume) but that a relatively high value of natural assets per capita is immoral.

The further operational implication is that we should have a large immigration program. Or perhaps that the world should have a program to equalise global natural assets per capita? Or that Australia should unilaterally share out its resources? But these would be simplistic responses to a complex question.

The deeper moral question is what we should be doing to help our own people and those of other countries lead better lives. Australians need to consider two complementary questions (J98):

. What kind of life is it feasible to strive for in Australia?

. What are Australia's obligations to the rest of world?

These questions can only be answered by identifying the benefits and disbenefits to all parties of the various ways in which we might assist---large-scale immigration, expanded aid programs, and so on. Having done that, the moral thing to do is choose between those options with a generous spirit while remembering that we have a particular responsibility to present and future Australians, and we can do only so much without destroying ourselves (J98).

While many Australians accept that each nation is ultimately responsible for managing its own environment, economy and population, most also accept that Australia has a responsibility to help other nations do these things (J24, 204). But just what constitutes a program of responsible and effective assistance? It probably involves taking migrants, managing Australia's contributions to global pollution and various forms of foreign aid.

Global citizen arguments

The general thrust of each of the following 'global citizen' arguments is that a major increase in Australia's population over coming decades is likely to have undesirable consequences for important indicators of global well-being including marine and atmospheric pollution, food access, the economic capacities of migrant source countries, fertility and education levels in aid-recipient countries, and so on. The exception, on the other side of the ledger, is the undeniable argument that movement to Australia would probably improve quality of life for migrants and refugees accepted into Australia in large numbers.

The following sections discuss the implications of population growth in Australia for global well-being in further detail.

Global pollution arguments

> The fact that Australians are such gross polluters is sufficient reason to limit our population. (SH Allen in J148)

What has Australia's population got to do with global pollution? Australians, on average, are great contributors to global pollution, particularly atmospheric pollution but also land-based marine pollution. The latter is not yet as much a matter for imminent international regulation as the former is, because marine pollution is still largely localised and there are as yet no clear symptoms that the oceans are approaching their global capacity to process pollutants. Nevertheless Australian governments are likely to come under increasing domestic and international pressure to finance infrastructure (treatment systems) to stop deliberate (sewage, ocean dumping) and collateral (contaminated stormwater) disposal of residues offshore.

One specific area in which Australia had (until recently abandoned) a formal international responsibility was for it to reduce its emissions of greenhouse gases. Australia, among the world's highest per capita producers of greenhouse gases, was conditionally committed to reducing national CO_2 emissions by 20% by 2005. Although this translates into a cut of 20% per head for the current population, the required cut per head is magnified as population increases. For example, if Australia still had the same CO_2 quota after a doubling of population, the arithmetic shows that the required cut per head would be 60%, not 40% (J179).

The extent to which reductions in CO_2 production can change standard of living and quality of life depends on how those reductions are achieved. Note also that acceptance/imposition of greenhouse targets by the international community could reduce Australian living standards in a less direct way as well, by reducing our massive coal exports (J226).

To the extent that CO_2 production is a strong function of population (and not just a function of our particular export industry/technology mix), population increase in Australia through immigration will produce a greater deterioration in global environmental quality than if those immigrants had stayed home. One pointer here is that urban areas currently account for about 50% of Australia's greenhouse gas emissions (Dept. of Housing & Regional Development 1995).

The concurrent assumption required to reach this conclusion is that Australia is unwilling/unable to reduce CO_2 production per capita. On short-sighted self-interest grounds, Australia would never reduce CO_2 emissions simply because our total (not per capita) emissions are a small fraction of the world total. It follows, under this argument, that we harm ourselves more than we help ourselves by reducing emissions---but we also lose international goodwill.

Immigrants produce much the same quantities of residues as other Australian consumers do (J170) but immigrants from low-consumption countries will add more to global pollution than immigrants from industrialised countries (J121). *Australia's contribution to global pollution is probably minimised by no migration at all.*

Global resource use arguments

> Our global environmental responsibility requires us to either reduce the size of the population or the per capita demand or both. (Citizens Against Unsustainable Populations in J157)

The first argument under this heading is a moral one. Perhaps Australians have no moral right to consume resources lavishly in a poor world, even if this is done sustainably (J255). One moral principle behind this position is that individual consumption shares should be as equal as possible. If this argument carries any weight, it will carry even more weight as population grows, and it sits uncomfortably beside present inequalities in consumption (e.g. black versus white) in Australian society.

A second argument focuses on the trade effects of population growth in Australia. It assumes that increased global resource use is undesirable per se and suggests that population growth in Australia will increase both local resource use, via exports, and, via imports, overseas resource use. Australians use renewable and non-renewable resources from domestic sources and, via imports, from other countries. Australia supplies resources to other countries in the form of exports. Natural population growth or immigration to Australia from less developed nations is likely to result in increased imports, meaning increased overseas resource use, and eventually (to balance population-induced rises in imports) increased Australian resource use (depending on the resource component in such exports and imports) (McGlynn 1992).

However, it would be extremely difficult to conclude that population growth would make such increases in trade and resource use intrinsically (un)desirable. Amongst the many factors to consider would be the size of conventional 'gains from trade' recognised in economic theory; balance of payments effects (see Chapter 4); sustainability implications, including the likelihood of 'resource exhaustion' (see Chapter 5); and increased residue disposal/pollution costs and equity considerations, both within trading countries and between generations.

For example, what are the implications of increased trade today in terms of exacerbating local and global shortages of important resources such as petroleum in the first half of the 21st century? (J65). What are the costs and benefits to developing countries able to export more to a larger Australian population? At this time, we can only conclude that the whole matter of trade-induced effects of population growth on resource use would benefit from further research.

Global food strategy arguments

> The world is going to need our food soon. (Robert Wolcott in J162)

Perhaps. But remember that the World Food Price Index has halved since 1970. Recent falls in world grain production probably reflect poor prices more than declining production capacity, although that is also a factor. At one level Australia is, through its exports, already feeding c50 million and clothing c300 million in other countries (J145). This is self-interest rather than generosity of course, since we do not export food and fibre at a loss.

Nevertheless, there could be advantages in terms of a *world food strategy* (if there was one!) if Australia remained a major food exporter instead of using this same food to feed a larger domestic population. For example, Australia is one of few countries that can rapidly deliver large quantities of food to famine and other disaster areas and this will become more noticeable as agricultural protection diminishes around the world. Again, given the seasonal variability of agricultural production, humanity becomes more vulnerable as the geographical spread of food exporting countries narrows (J221). If this line of reasoning stands up to closer analysis (and it probably does), it is an argument for minimal population growth in Australia.

Foreign aid arguments

The basic argument here is that if we stopped increasing the population we would be able to increase Australia's foreign aid by using savings made on the costs of establishing migrants and of bringing up more children. But, politically speaking, there is no reason why savings in these areas would be diverted into foreign aid. In fact, since aid is commonly thought of as some percentage of GDP, the larger economy required for a larger population might actually generate more foreign aid.

Still, if reducing population growth did allow Australia to increase foreign aid by using the funds it now spends on settling immigrants, its limited resources would end up helping more people more fundamentally than the current immigration program does. For example, providing aid to dig wells in third world villages is more useful than providing an immigrant with a job that allows a new car to be purchased.

In Chapter 11 it is suggested that the size and focus of the foreign aid budget is an important part of population policy, particularly as an 'insurance' against uncontrolled mass migration, and that reducing population growth puts us in a better position not only to help others, but to help ourselves. A collateral bonus from favouring offshore over onshore aid is that this could encourage the purchase of Australian exports in aid-receiving countries.

There is a final powerful argument against giving aid to third world peoples (other than refugees) by allowing them to come to Australia. It is that we have our very own ready-made third-worlders right here (Table 8.1). They are called Aboriginals and have a stronger claim than any other third world people on any generous urges felt by mainstream Australia.

Table 8.1 Who'd be an Aboriginal?

	Total population	ATSI population
Life expectancy at birth		
females	80	62
males	71	56
Infant mortality per 1 000 births	9.6	25.4

Source: Australian Academy of Science (1994).

Population siphoning arguments

> The world is overcrowded and the problem is not going to be solved by moving people from one country to another. (Bob Whitworth in J61)
>
> When it would have so little effect on world overpopulation it is not a dog-in-the-manger attitude to be unwilling to overload the lifeboat. (Valerie Yule in J128)
>
> So long as people can run away from the effects of overpopulation the issue will not be addressed where it is most pressing. (Marion Gledhill for NSW Family Support Services Association in J145)

Should Australia be taking in large numbers of immigrants (and hence growing fast) in order to give source countries a period of respite in which to gain control over their economic, environmental and population problems? Several Jones Inquiry submissions point out the futility of this proposal (J18, 179). Even if Australia were to take in 50 million people, the number who might be fed without importing food, the rest of the world would have zero population growth for 215 days. The world would have gained little and Australia would have the massive task of settling this number of people.

Another aspect of population siphoning is that if Australia attempts to maximise the economic benefits of immigration by seeking particularly skilled migrants, we may be greedily taking the very people of most importance to source countries in their attempts to solve the problems of achieving sustainable societies (J75, 204, 253); effectively an argument against skilled migration and hence a partial argument against population growth.

The same argument might be used against seeking wealthy migrants from developing countries---for example, Australia's *business migration* scheme. It would of course be socially and politically unacceptable to allow skilled or rich migrants from wealthy but not poor countries. It can, of course, be argued that Australia should be open to all people wishing to live in a different country (J255). However, while the right of everyone to leave their own country is recognised, it is not matched by the recognition of a complementary right to settle in their country of choice (J98).

Brain drain
Between 1985 and 1990, poor fella Africa lost an estimated 60 000 middle-level and high-level managers as emigrants. In Ghana 60% of doctors trained in the early 1980s have left the country. In some Latin American and Caribbean countries, over 20% of all graduates choose to emigrate. The greatest exodus of trained professionals is from Asia, many of them scientists for whom America is the principal destination. Between 1972 and 1985 the four major exporting countries (India, the Philippines, China and the Republic of Korea) sent more than 145 000 workers with scientific training to the United States (United Nations Development Program 1994).

Humanitarian arguments

> Australia has a responsibility to offer a home to people from overpopulated nations and to oppressed people. (Marion Gledhill for NSW Family Support Services Association in J149)

Refugees are people who are forced to leave their countries for life-threatening reasons. Many Jones Inquiry submissions (but see J140 for an exception) recognise that Australia should be particularly generous in accepting refugees from political tyranny and natural disasters---the Good Samaritan argument (J98, 137). Note that, on a per capita basis, Australia could continue to be the most generous country in the world in taking in refugees and still maintain a zero net migration level. This is because some 30 000 people per year permanently depart Australia.

Some people believe Australia should go beyond this level of generosity and accept very large numbers of refugees, irrespective of the consequences for present and future Australians (J170). This is a value position which cannot be readily disaggregated into arguments for and against; one relevant principle (Ten 1991) is that while a community has general obligations to those in need, it has a special obligation to its own present and future members. What can be said is that it would almost certainly be a politically unacceptable policy.

Refugee status is a matter of degree (J98). For example, not all refugees need permanent residence; just residence till conditions improve in their home country. Highest priority should be given to refugees who are most seriously in need, hungry and persecuted. Certainly refugees should not be selected under pressure from ethnic lobby groups.

The high opportunity cost of resettling refugees should be noted; the money to resettle one family could alternatively be used to 'help whole villages at grass roots level' (J158). The same 'opportunity cost' argument was noted above in relation to settling non-refugee migrants but here it is a much weaker argument.

It can be argued that part of Australia's responsibility to accept refugees arises because we have helped make them refugees through our support for the General Agreement on Trade and Tariffs, the arms trade, the International Monetary Fund, and so on (J255). These are supremely complex assertions which just cannot be debated to a firm conclusion here.

Role model and image arguments

> Australia is the best country in the world to demonstrate an ecologically sustainable population. (Sandra Kanck in J191)

Australia is perhaps in a unique position to demonstrate to the world how it is possible to manage successfully the 'three legged stool of sustainable development' viz population, economy and environment (J8, 65). This would include an exemplary system for safe, efficient accessible birth control and other developments that make it possible to reduce childbearing (J98).

Australia has the luxury of not having to think obsessively about sheer survival. We can think about the long-term (see Chapter 13) and about the sustainability of the whole world and we should be doing so on behalf of others (RM Douglas background material submitted to Jones Inquiry). However, it will not be possible to do this if Australia's population is growing rapidly. Similarly, as long as Australia does not have a population policy, any claims to being any sort of a role model invite derision. Having even a small migration program may dispel any impression that we have closed our doors (J252). On the other hand, no matter what size the migration program is, unsuccessful migration applicants will feel angry with Australia (J237).

It would be in line with the philosophy of the United Nations World Population Program to limit population growth in Australia (J246). On this point, we can note pledges made by the Australian Government at the United Nations International Conference on Population and Development in Cairo in September 1994. Australia was a signatory to a 20-year Programme of Action which commits us to formulate a national strategy and program to deal with population and development problems as an integral part of an overall development and planning process. The government agreed to monitor progress towards its population goals (J55, 94). If these are not expressible in measurable form then worthwhile monitoring is not possible.

Geopolitical arguments

Geopolitical arguments attempt to foresee how external threats to and opportunities for the quality survival of Australian society are affected by Australian population and immigration policy.

Defence arguments

> ...engagement with Asia transforms defence fears into co-operative security arrangements. (Editorial, *The Canberra Times,* 2 Oct , 1994)
>
> There is no evidence to support the theory that economic interdependence leads to peace. (Paul Dibb in Barker 1995)

It has been recognised for many years that 'we could easily become a focus for political pressures stemming from a more general resentment of inequities in the global distribution of wealth' (Priorities Review Staff 1976). A few Jones Inquiry submissions present or recall the traditional argument, widely accepted till the 1970s, that Australia must encourage population growth to deter hostility or even invasion from other nations (J169, 179, 184, 203). However, the hope that a larger population might forestall 'land envy' from overseas seems naive and futile (J241). Whatever we do, Australia is going to have about 1% of the east Asian population in 2030.

The more standard rebuttal to the 'large army' argument is that modern warfare depends more on sophisticated weapons than on the 'cannon fodder' obtainable only from a large population. Sweden and Israel are examples of small-population countries regarded as having well-developed defence capabilities. Nonetheless, note that if the cost-effectiveness of a modern defence system is somewhat independent of population size (and it probably is), then a larger population implies a smaller defence cost per head (McGlynn 1992). For what it is worth, World War II found the biggest economies on the winners' dais.

But again, is this another spurious either-or argument? Surely more bodies plus sophisticated weapons provide the best defence? Perhaps, but if a larger national population would imply larger populations in north Queensland, the Top End of the Northern Territory and the Kimberleys, it can be argued that a more populous Australia would in fact be easier to invade. This is because urban infrastructure would make it easier for invaders to establishm beachheads than if they had to land on rugged uninhabited roadless coastlines---an Australian version of the Russian defence strategy against Hitler and Napoleon. Also, any population-induced infrastructure in the north, such as a Lake Argyll-Perth water pipeline, would be vulnerable to attack.

Other arguments under the 'defence' heading are that a larger population would be harder to sustain in war, and that to 'fill up' the country so that it does not appear empty would be self-defeating (J128). Perhaps the strongest point to be made on the defence issue, albeit an appeal to authority, is that none of the 1976, 1987 or 1994 Defence White Papers argues that we need more people for defence (J179).

Self-sufficiency and influence arguments

All countries have some level of desire to be independent, free from reliance on other powers (J21); and there is little doubt that Australia could be largely self-sufficient in (basic) material goods if an isolationist political philosophy prevailed (J170). While intrinsically inefficient in a trading world, developing larger home markets might allow a wider range of products to be produced somewhat less inefficiently.

The tenor of Jones Inquiry submissions is against such a strategy (J221). For example, the strategy of increasing the Australian population to make us less dependent on volatile export markets for primary products has a superficial appeal but leads very quickly to questions about balance of payments difficulties (how to finance imports) rather than visions of independence (J162).

International influence arguments

As noted in Chapter 1, the early years of the century saw considerable support for the idea that Australia could and should become a great power by becoming a heavily populated continent. It is now realised that even if Australia's population grows many-fold, it will always be relatively small in comparison with such regional population giants as China, India and Indonesia. And, inevitably, it will become relatively even smaller in the foreseeable future. Nevertheless, some vestiges of this attitude linger on in the utterances of a few public figures (J246).

While populous countries may have some advantage in trade negotiations (Chapter 4), the idea that a country must have a large population to play an influential role in regional and world affairs is specifically rejected in several Jones Inquiry submissions (J92, 205). The somewhat vague case for needing a population of 35 to 40 million to retain what influence we have in world and regional affairs is made in Dalrymple (1988).

Key points in geopolitical and global citizen arguments

It is clear that there is a strong community feeling that Australia should meet its responsibilities as a global citizen. However, approaching this through high immigration is presented as having limited benefits and some significant costs for the rest of the world (as distinct from Australia). These costs include the opportunity cost of spending limited funds on settling immigrants rather than helping much greater numbers of less fortunate people in their own countries. Also to be counted here are the increases in global pollution and global resource use which occur when immigrants from developing countries adopt Australian consumption patterns. Australia's capacity to help smooth out variable world food supplies would also be diminished by having to feed a much larger domestic population.

So, apart from a clear willingness to accept refugees in generous numbers, the thrust of domestic opinion is that Australia should discharge its responsibilities to an overpopulated world through a large and well-targeted aid program. Geopolitically, there seems to be little point in attempting to build up the Australian population to:

. significantly improve our defence capability;

. better resist possible pressures to accept massive numbers of immigrants;

. significantly improve our capacity to influence regional affairs;

. improve the terms on which we trade.

CH 9. RISK-AVOIDANCE AND VOODOO ARGUMENTS ABOUT POPULATION SIZE

Preceding chapters have developed arguments for and against major population growth in terms of its implications for resource scarcity, economic well-being, international relations and socio-environmental quality of life. The common aim has been to foresee and evaluate what might happen under substantial population growth. This present chapter is premised on *not* being able to foresee the consequences of population growth with any confidence. With this starting-point, it asks: Is there anything that can be said for or against population growth?

The chapter's first group of arguments concentrates on suggestions for choosing a population strategy that is *risk-avoiding* where 'risk' is taken as synonymous with 'danger' or 'hazard'. The second group, *Voodoo arguments***,** evaluates some rules of thumb about choosing a population strategy when the consequences of choice cannot be foreseen. Voodoo arguments do not rely on cause-effect (deductive) reasoning.

Risk-avoidance arguments

Precautionary arguments

> There are strong arguments against increasing Australia's population. If these are correct the results from a significant increase in population could be harmful and, practically, irreversible. If these arguments are incorrect, there is no great harm done and the population can be increased in the future. Why take the risk? (David Griffiths in J81)
>
> If we underestimate optimum population we leave future generations with freedom of choice and no harm done. (Helen Black in J127).
>
> It is much easier to increase a small population than to decrease a large one. (Keith Adkins in J175)

Precautionary arguments can take various forms but all basically express the idea that if any course of action might possibly have disastrous and irreversible consequences then it should be rejected in favour of any other course of action that does not include the possibility of extreme disaster amongst its foreseeable outcomes (Harding and Fisher 1994; J197). For example, despite the uncertainty of the impact of climate change induced by global warming, the possibility that the consequences could be catastrophic (e.g. for food production) is a precautionary reason for avoiding any actions that might cause global warming. The possible effect of atmospheric ozone depletion on crop and fish production is a comparable contingency (J223).

Another example concerns the possibility that pollution effects on people may turn out to be markedly worse than is currently recognised. In fact there are regular discoveries of new consequences of old pollutants (e.g. hormone-like effects of DDT on human sperm counts) and of new types of pollutants in residues from established activities (e.g. carcinogenic particulates emitted by petrol and diesel engines) (J250; Sharpe and Skakkbaek 1992). Strict precautionary thinking would argue against introducing new chemicals into society.

Thus, if pollution, including greenhouse gases and ozone depletants, is population-related, a precautionary attitude to (global) population growth can be advocated. Note here that some 26% of Australia's greenhouse gas emissions come from the transport sector---most of it from private cars.

Another example is that Australia's oil-dependent agricultural production system could be crippled by a future 'oil crisis' (J255). If self-sufficiency in food is seen as vitally important then precautionary thinking would suggest minimising population growth to minimise the possibility of losing that self-sufficiency.

But what of precautionary arguments against population growth per se? These are based on the perception that population growth contains the seeds of environmental and social disaster; does not contain any prospect of obvious economic, social or environmental benefits; and is irreversible for all practical purposes (J98).

Coupling this perception with the perception that a stable or slowly growing population does not appear to contain anywhere near the same prospect of such disaster, leads to the adoption of a conservative or precautionary position on the population-size question; that is, minimal population growth is favoured.

A weaker form of the precautionary principle is to see it as focused not so much on avoiding disasters as an attitude of mind that gives full, but not pre-emptive, weight to unpleasant but uncertain consequences when alternative courses of action are weighed up. Thus:

> Until we are successfully tackling many of our present and growing social and environmental problems related to increased population pressure, it is wiser to maintain a population-stability policy. (Valerie Yule in J128)
>
> A decision to reduce immigration rates and encourage families to have no more than two children can be made, purely on the grounds that we are unsure of the long term sustainability of our present population. (Geoff Preece for Central Coast Branch, Australian Conservation Foundation in J132)

Thus, precautionary thinking suggests that there should be a moratorium on population growth until environmental issues are sorted out (J160). Although precautionary thinking might lead to advocating *world* population stability (and Australia is part of the world), there is no specifically Australian macro-disaster in the offing to make it more important to think in precautionary mode here than elsewhere.

The 'ain't broke' argument

Maxim: If it ain't broke, don't fix it.

Australians already enjoy one of the highest quality of life levels in the world. We should do nothing that might disturb this for the sake of *possibly* doing even better (J215). Why deliberately change one of the fundamental dimensions, population size, of a society that has achieved (or perhaps stumbled into) a felicitous state? The 'ain't broke' argument is a variation on the precautionary argument, except that the latter is concerned with making choices that avoid the very bad and the other is concerned with making decisions that retain the good.

Bird in hand arguments

The essential argument here is summarised in Keynes' observation that 'if you look after the short run, the long run will look after itself'. Or perhaps by the maxim that 'a bird in the hand is worth two in the bush'. Thus if there are substantial short-run benefits from immigration these should be taken as outweighing even quite large long-term disbenefits from the population growth that immigration brings. In the event, it is not clear that immigration does bring substantial short-term benefits and therefore the real test for this somewhat suspect line of reasoning cannot be made.

Notwithstanding, when cost-benefit thinking is taken furtherthan this argument allows, we arrive at the potentially useful principle that a high population should be sought only if the short-run plus long-run benefits outweigh the short-run plus long-run disbenefits. A similar criticism can be made of the crude precautionary arguments that deliberately ignore the full spectrum of consequences and focus solely on 'worst case' outcomes when alternative courses are weighed up.

Onus of proof arguments

> Just why should Australia have 25, 30 or 40 million people? (Stuart Mead in J65)
>
> The strongest argument against population growth is the lack of arguments for population growth...The arguments for continued population growth have not been articulated and would not stand scrutiny if they were. (HN Dengate in J145)
>
> We are frequently told that the more migrants we have the better life will be for all. I haven't noticed this policy working yet. (Elizabeth Musgrave in J188)
>
> No increase in population should be allowed that would debase our present quality of life. (James Gerrand for Australian Humanists in J152)
>
> An increase in population will automatically lead to more consumption of resources, pollution and degradation of the environment, particularly in the coastal zone. To those who say it need not be so, the onus of proof is on them. They must prove that the population increase can be managed by planning because the record of population increase to date has automatically led to the degradation of the environment...(Gordon E Hocking in J194)

There is a widespread conviction that unacceptable congestion and pollution have historically accompanied population growth and an accompanying concern that further population growth will worsen this situation (J92). People with this concern argue that the onus of proof that population growth will not have further unacceptable environmental consequences lies with the proponents of such growth. Thus, 'if government cannot cope with a population of 17 million now, how can they expect to cope with 30 million'? (J134). People who say numbers are not the issue must show why basic proportionality does not apply here (J250).

Applying this principle would, for example, require all plans involving population growth to incorporate some form of environmental costing (J170). Meanwhile we are saddled with a no-onus population policy which is a by-product of an immigration program the government seems unwilling or unable to justify in terms of size, composition or benefits.

Conclusion

The four 'risk-recognition' arguments just outlined can be combined into a single summary statement which I view as usefully supportive of a stablist and anti-immigration position in the population debate:

Unless it can be 'proved' by the proponents of significant population growth that the short-term plus long-term benefits outweigh the short-term plus long-term disbenefits we should avoid such growth in case it exposes us to social and environmental disaster or destroys our present quite high quality of life.

Voodoo arguments

Following others' use of the term to describe Ronald Reagan's economic beliefs, I will use *voodoo* to describe acausal or dogmatic arguments in which particular actions or states are asserted to produce, by some wholly unspecified process, some particular effect. Examples from other times and places are commonly drawn on to support, by induction or analogy, such *'after this, therefore because of this'* reasoning. A second type of voodoo or acausal argument asks that our decision-making be guided by 'a higher power' in the form of an authority figure, a precedent or an ideological position.

Population size and density arguments

> **Does Australia have low population density?**
>
> The population density of Australia is 70 times higher than Greenland, four times higher than western Sahara, twice Mongolia. (Helen Black for NSW Branch of Australians for an Ecologically Sustainable Population in J127)
>
> It is ridiculous to compare the number of people per sq km in Australia with that in Europe and conclude that we are underpopulated, since most of Australia is desert or near desert. (Charles Birch in J261)
>
> As a sparsely populated nation, the size of our population must grow, but such growth must be determined by Australia's national interests.
> Business Council of Australia, c1993
>
> Judging countries on the basis of people density is about as sensible as comparing them on sheep density. By Australian standards, most countries have a low density of sheep AND SHOULD BE DOING SOMETHING ABOUT IT. (Anon)

The population density argument involves the naive view that if country A can be made like country B in one respect (e.g. population density), then it will become like it in other respects (e.g. high quality of life). It rests on comparing Australia's population size and population density with those of other (carefully selected) countries and arguing that we should be more in line with those countries.

At its most simplistic this line of argument sees value in conformity for its own sake. For example: 'Why shouldn't we be more like Europe'? (J155). A more developed form of the argument is that if Australia had a population density comparable to that of countries it regards as having a high standard of living/ quality of life, then it too would have a high quality of life. This 'magic' argument offers no reasons why this would be so and ignores the fact that quality of life in Australia is already amongst the best the world has to offer (J215).

Since the countries of western Europe and North America are the most often mentioned in this context (J21), the implication is that Australia should have a population of perhaps several hundred million. Yet in environmental terms Australia is actually more like Africa than Europe or North America (J170). But even that is a red herring. The inescapable conclusion is that the physical size of Australia is largely irrelevant to discussions of the optimal size of its population (J22, 170, 114, 224). Unfortunately the simplistic argument that being different must be wrong continues to hold great sway over unthinking minds.

Perhaps if Australia had a high proportion of fertile (well-watered and nutrient-rich) land and a long history of European settlement extending back centuries to the days of labour-intensive peasant agriculture, the population density today might approach that of Europe. Neither of these conditions apply.

Almost every country in the world believes it has enough or too many people. The apparent exceptions are the four countries actively seeking immigrants---USA, Canada, New Zealand and Australia. Of these four countries, Australia's migrant intake per head of population is the highest. Prima facie, why is this country like those other three (assuming they are correct) and not like the other 170 or so countries?

Some international comparisons

Just as it is not possible to infer how many people 'should' be living in Australia from a knowledge of the local soils, climate and so on (see Chapter 5), it is not possible to do this by looking at the soil-climate-population combinations of other countries. There are many reasons for this, one being that there is no reason to assume that population in any country has reached equilibrium with its resource base. In fact, by definition, this cannot be so in any country where population is still growing.

As pointed out in Chapter 5, soils and climate are important primarily as determinants of land capability for agricultural production. In an era when agriculture is a small and declining sector of most developed economies, the number of people who can be employed in agriculture indicates little about the numbers who might be employed in the total economy.

However, it may be useful to identify the parts of Australia that are homologues in soil-climate terms with other parts of the world and then compare the way in which bio-physically similar regions are farmed in Australia and elsewhere. If, for example, the coastal plains of the Northern Territory are bio-physically similar to the coastal plains of southern China, it may be of some interest to compare the populations and agricultural systems of the two regions. This exercise would then suggest that, under a system of subsistence peasant agriculture, a great population could be accommodated in the Northern Territory.

As noted, the soil-climate homologues for the 80% of Australia classified as arid or semi-arid are in Africa and, like much of Africa, incapable of sustainably supporting any form of agricultural production other than extensive pastoralism (and hence a low-density population). Conversely, the better-watered 20% of the continent can support agricultural crop and pasture systems analogous to those of western Europe and North America. This is not to say that the higher rainfall areas of Australia could support farming populations at the same density as western Europe or the mid-west of the United States. To begin with, Australian soils are infertile by world standards and the Australian climate is highly variable. A further reason is that Australian farmers have not enjoyed price supports and subsidies, as have northern hemisphere farmers, in recent decades. Thus there is no reason, for example, to expect the density of the farming population of Gippsland to gravitate towards that of the Netherlands.

Population growth rate arguments

> It is often asserted that population growth is good for the economy. Nigeria and Bangladesh would be economic superpowers if population growth led to prosperity, Japan and Europe would be doing badly. (Keith Adkins in J175)
>
> Nations with the highest standards of living nearly always have low rates of population growth. (Heather Luvis and David Haselgrove in J77)

The essence of the prima facie argument for the economic benefits of a low rate of population growth is that it is at least suggestive that countries that have risen rapidly in the per capita income league table in recent decades have controlled population growth; for example, Germany, Japan, Switzerland (J197, 234). In Australia, conversely, a high level of population growth over the past 20 years has been paralleled by a decline in the quality of urban life for many (J215) and a modest increase in GDP per head by OECD standards. Domestically, the state with the highest rate of population growth during the 1980s, Queensland, had the lowest rate of growth in Gross State Product per head (Moore 1994).

Sweden has stabilised its population at 8 million and has overtaken Australia in terms of wealth, perhaps because its savings are used to finance industrial infrastructure rather than social infrastructure for an ever-growing population (J101, 223). So much for the inductive arguments for a low rate of population growth. The converse argument (i.e. against a high rate of population growth) is that the rate of population growth in Australia in recent years has been unusually high by several international measures and is therefore likely to generate new and unforeseeable consequences.

Appeals to authority

If it proves too difficult to reason out, step by step, what Australia's population strategy should be, one solution is to ask an 'expert'. For example, rather than present arguments on their merits, several Jones Inquiry submissions quote conclusions reached by people who, prima facie, might be expected to have a thoughtful, informed, somewhat disinterested position on the population-size issue. Unfortunately, authorities often have conflicting opinions. What to do then? Appeal to a meta-authority?

Most Jones Inquiry submissions quoting authorities cited people favouring a low population for Australia. For example, David Smith (author of *Continent in crisis*); Dr Tim Flannery of the Australian Museum, who favours a population of 6-12 million; Professor Paul Ehrlich who favours a population of 10 million (J249). Professor Glenn Withers is quoted, not for his overall position on the population-size question, but for his conclusion that 'ecological integrity would be best served by no additional numbers'.

One Jones Inquiry submission quotes David Suzuki and Jacques Cousteau as authorities who favour a global population of only a few million and therefore an even smaller Australian population (J19). Another quotes the National Population Council's estimate of 50 million as a maximum carrying capacity 'involving significant social, economic and environmental costs' (J22). Another quotes three economists (Nieuwenhuysen, Gittens, Joske) to establish the neutral economic effects of immigration (J81).

It is interesting that the Jones Committee itself showed an almost obsequious respect for authority figures in its deliberations. The report reveals that an assertion from a professor or doctor of philosophy carried much more weight than a similar assertion from Doris Smith of Wagga Wagga or Jonas Barry of Werribee. In this book I have bent over the other way, if anything, by looking for and using the key thoughts in Jones Inquiry submissions from many 'ordinary' people.

Another form of authority is religious authority (J20); for example, injunctions to 'be fruitful and multiply' might be taken as encouraging population growth (J170).

While quoting an authority figure is not totally without value, an authority's view is ultimately only as convincing as his or her detailed arguments. The opposite to attempting to convince through appeals to authority is called 'the disabling of criticism'. For example, the assertion that an argument can be ignored because its proponent is racist (J224); or the assertion that the Vatican's views on population should not be taken seriously because it is a city state with a vested interest in growth (J170). Irrespective of which side of the debate they favour, ad hominem arguments are not acceptable; the *content* of all arguments must be scrutinised.

Arguments in the population debate are often polarised along disciplinary lines (J132). Anti-population arguments are seen by some as the arguments of scientists, and pro-population arguments as those of business and economists. This perception is offered by one Jones Inquiry submission as the reason why many young people who are ignorant of science and feel threatened by it dismiss anti-population arguments (J170). Another asks 'which of these groups has it right?' (J141) and another suggests giving more weight to the views of scientists (J122).

Appeals to precedent

Most regional human populations throughout most of human history have been more or less stable, falling under the Malthusian forces of war, pestilence and famine and rising to a plateau again as these blights passed (McNicoll 1992b). The precedent argument is that we should manage population to achieve the long-run stability of most earlier societies.

Similarly, most societies for most of history have been more or less ethnically and religiously 'pure'. Nowadays, most countries with large groups of different ethnic and religious populations have considerable social tensions (J168). The 'precedent' argument is that Australia should avoid population growth if that involves ethnic and religious mixtures.

Other precedents cited in Jones Inquiry submissions include the observation that some countries, including some of the wealthiest, most stable and enviable European societies, do have population policies. Finland, for example, has a policy of population stability (J247, J220). Another precedent cited, but as an 'anti-model' rather than as a model, is: 'every country and government in the world is committed to the insanity of economic growth' (J170).

While widespread precedents cannot be accepted unthinkingly as appropriate for Australia, we should examine them carefully to see why they should be accepted or rejected.

Appeals to ideology

Big is better, small is beautiful; big is bad, small is stupid. Here we are quoting those who genuinely want a much larger, or much smaller, population than we now have, although they do not really know why. That is, they cannot articulate any reasons for their preferences because these are unanalysable or 'primitive' in the psychological sense.

Another untested ideological position which resurfaced recently can be summarised as 'immigrants are dynamic'. A quote from an April 1995 *Financial Review* editorial provides a good example.

> Based on Australia's experience to date, a robust and relatively unrestricted immigration program offers the best chance of producing the population mix which is needed to generate the sort of dynamic and outward-looking economy we need. (*Australian Financial Review*, 6 April 1995)

With about a quarter of the adult population already born overseas, one would have thought this foreseen bonanza from immigration would have already occurred!

Holding an ideological position is always legitimate but should be recognised and acknowledged for what it is, not least by those who hold it. Also, if they want to win the support of others, ideologues must endeavour to introspect and winkle out the origins of their preferences (Self 1993).

Conclusion

Rules of thumb are an important aid to decision-making in an uncertain and poorly-understood world. However, they work best when tried out frequently enough for the user to get a grasp, by trial and error, of the range of situations they can apply to. The voodoo arguments in this section can be likened to newly-proposed rules of thumb for which 'domains of relevance' have yet to be established. Unfortunately, because the situations identified in voodoo arguments are not everyday situations, the inductive verification of supposed cause-effect links is difficult.

So, while such arguments on balance favour low population growth they are too weak, dishonest or misleading to play any part in the present evaluation. One tangential value of voodoo arguments is that they may suggest interesting ideas worthy of more serious analysis.

Speed of growth arguments

> There is evidence that rapid population growth leads to an increase in crime, social breakdown, welfare dependency and urban sprawl. (Heather Luvis and David Haselgrove in J77)
>
> There are sound economic reasons for expecting output per head to rise faster the slower the rate of population growth. (AR Hall in J230).
>
> Communities that grow slowly accommodate change better. (Olive Langham for Melville Environment Group in J249)
>
> If we do set a carrying capacity figure we should move towards it as slowly as possible. (Dane Thwaites in J96)

To avoid confusion, recall that the section above, 'Population growth rate arguments', was about identifying the population growth rates of successful countries with the intention of imitating these. Here we have a different question: whether there is a 'best' rate to grow at (if a decision to grow has been made).

From this starting-point, growth rate arguments accept that the rate at which population changes is important (J234) and they are about the 'best' speed at which to approach a declared population target. Is slow (fast) growth 'better' than fast (slow) growth? Ideally, the costs and benefits of approaching the target at different speeds should be compared. This can be done only informally and indicatively but must be attempted.

One argument is that if bigger is better, then the population target should be approached with all possible speed, so that the benefits of size can be enjoyed sooner rather than later. The rebuttal of this argument starts from the recognition that any population target can be set only very tentatively and that the costs of overshooting the 'correct but unknown' target could be very high and difficult to reverse. This is a 'precautionary' argument sensitive to the momentum of population growth (Catton 1987; J230).

It is in fact a well-known principle of systems theory that systems changing rapidly as they pass *thresholds of change* suffer greater disruption than systems changing slowly through such thresholds (Sanderson 1992). To quote ecologist Charles Birch, 'left to themselves populations tend to overshoot limits with subsequent catastrophic declines' (J165; Birch 1975). The speed at which systems can approach capacity is illustrated by the old story of lilies growing in a pond and doubling in area each day. Just one day before the pond is completely covered, it is only half covered!

According to Toffler (1970), the basis of the argument for slower rather than faster change is that 'the rate of change may exceed individuals' capacity to adapt'. Population growth in urban and peri-urban areas is characterised by land use change and intensification. This changes the familiar daily living spaces of individuals, which in turn tends to dislocate people's sense of place and sense of belonging (J170, 204). It can be argued that people have a right to an environment that changes as slowly as possible within society's control. As well as changing 'places', urban growth produces change and transience in the other factors that threaten people's capacity to adapt---personal contacts, ideas, organisations and possessions (Toffler 1970).

Still at a concrete level of argument, environmental damage can be a slow and piecemeal process. It may take place slowly over many years with each generation largely ignorant of past losses of environmental assets (J234). In this situation, it can be argued (cf the parable of the boiling frog) that a high rate of population growth will produce change at a noticeable rate and therefore at a rate that induces ameliorative action. The counter to this argument (National Population Council 1992) is that slower population growth buys time to develop more sustainable technologies; allow renewable resources time to regenerate; and to impose lower residue loads on natural sinks while better systems are being developed.

It is sometimes argued that population growth is required to ensure a match between the type of labour demanded and that supplied. Even if this could be demonstrated (which is difficult (J230)) it is a problem that our finite world must eventually face. This is not an important argument.

It has to be concluded that there probably is always a limit to the rate of population change which a region can accommodate without undue disruption (J252). Ideally, a region's population should not be increased before the necessary physical and social infrastructure is in place (J149).

On balance, and assuming that population growth is to be pursued, slow growth is safer and less disruptive than fast growth. Fast growth would be preferable only if the net advantages of a large population overwhelm the net advantages of a small population. Without getting into that debate again here, the practical result of favouring slow population growth, for whatever reason, is equivalent to favouring a small population increase over the 50 years or so timeframe we have concentrated on in this book.

CH 10. OVERVIEW OF ARGUMENTS ABOUT POPULATION SIZE

> If the best [economic] case that can be made for population growth via immigration shows it to be 'marginally positive, benign or neutral' (John Nieuwenhuysen, Director, Bureau of Immigration and Population Research)---while the overcrowding of Sydney and damage to the environment are plain for all to see---why do we continue with this madness? (Gordon E Hocking in J194)

As pointed out in the Introduction, conviction is ultimately a personal and subjective matter. So, in deciding between (i) advocating major population growth or (ii) advocating a population stabilised at about the present size, the different reasons for favouring one stand-point or the other have to be identified, weighed and 'added up'. If one stand-point ends up with more or most of the more important reasons in its 'balance pan', it gets adopted.

Rather than just collating summary statements of the diverse arguments presented in preceding chapters, I have chosen to base this overview on my personal ranking of the importance of selective collections of consequences of population growth. More specifically, the chapter considers the modifying impact of population growth on prospects for achieving (or avoiding) seven different less-than-certain desirable social goals (or undesirable 'anti-goals'). A goal is something one tries to achieve and an anti-goal is something one tries to avoid.

Each of the seven social goals (anti-goals) that are more or less likely to be achieved as a result of population growth is implied by one or several of the arguments for or against major population growth as presented in preceding chapters. For example, to argue that population growth will reduce coming generations' access to quality amenity resources implies a social goal of treating all groups within and between generations equitably.

In distilling just seven goals I judge to be both communally important and putatively sensitive to population growth, I have necessarily discarded other goals implied in a few 'minor' arguments and have given no weight at all to what were called voodoo arguments in Chapter 9; recall that these are the consequences of doubling population as foreseen by authority figures or ideologues or as foreseen according to what supposedly successful or unsuccessful countries have experienced in terms of national population growth.

Each of the seven impacts to be ranked is expressed as a qualitative change in the likelihood of a particular social goal being achieved (or 'anti-goal' being avoided) as a result of significant population growth rather than minimal population growth. That is, I have attached a likelihood to reaching each goal under minimal population growth and then judged how that likelihood might change under significant population growth.

Note that I have not just ranked the goals themselves, but the *importance attached to a subjective change in the likelihood of reaching each goal*. Thus a big change in the likelihood of reaching a moderately important goal might be judged more important than a small change in the likelihood of reaching a very important goal. However, the ranking has been done gestalt-fashion and not by pseudo-quantitative methods.

Collected consequences of population growth

> Community views on population size differ because population size is not a goal in itself but a means to achieve goals and these differ. (Valerie Yule in J128)

The following sections present, in rank order from most important (1) to least important (7), the various changed consequences of allowing the Australian population to double over the next 50 years, rather than stabilising it at around the current size.

1. Urban environmental and social quality of life

Significant population growth stands to produce a significant increase in the present moderate probability that, even without such growth, a range of urban environmental (e.g. pollution, congestion, services, amenity) and social (e.g. personal relationships and freedoms) quality of life indicators will deteriorate markedly for most Australians.

Comment: Environmental and some socio-cultural arguments on population size stem from the recognition that population growth is largely and unchangeably a capital city phenomenon, that the quality of urban life is in slow, apparently unmanageable, and often inequitable, decline and that (long-term) population growth has been a major, although not exclusive, cause of that decline (J51, 215), at least in the sense that if population growth slowed to a trickle the quality of urban life would begin to improve. There are insufficient theory, data, methods and studies to support this perception of causation. At best the evidence is prima facie and unchallenged but, to many, the niceties of formal argument are irrelevant; the matter is self-evident.

Also, since no significant reasons are ever presented to explain why population growth might actually *improve* any environmental or socio-cultural aspects of quality of life, the prima facie case against major population growth on urban quality of life grounds must be judged to be quite strong.

I would be less inclined to make this my most important reason for favouring population stabilisation if I could see real evidence that Australian society is, or is likely to begin, deliberately and comprehensively tackling urban quality of life problems in other ways such as decentralisation, functional urban design, consumer education, economic incentives for reducing externalities and the adoption of materially efficient technologies; appropriate complementary policies and programs must to be in place before any reassessment of this position seems warranted.

2. Antagonism between community groups

Significant population growth stands to produce a moderate increase in the present low probability that Australia will become socially sundered, both in terms of ethnic-cultural conflict and conflict over access to resources.

Comment: Significant population growth can only be achieved through an expanded immigration program and hence, collaterally, a change in the ethnic-cultural mix (irrespective of the source of migrants). It is my belief that, with the present ethnic-cultural mix, the dual social processes of acceptance and assimilation will quite rapidly produce a society in which ethnic-cultural conflict is a rarity. However, this belief has to be demonstrated before we consider any further reworking of the ethnic-cultural mix with its associated risk to social harmony of the rate of demographic change exceeding Australian society's capacity to adapt. This position in favour of the status quo is buttressed by the lack of significant arguments in favour of reworking the ethnic-cultural mix.

I would be less inclined to make this my second most important reason for favouring population stabilisation if I could see real evidence that Australian society was, or was likely to begin, deliberately and comprehensively creating conditions under which racism and xenophobia would wither (e.g. worthwhile social roles for all) because people were too busy living long self-fulfilling lives.

The possibility, with significant population growth, of bitter social conflict on other (non-ethnic, non-cultural) grounds should not be ruled out and is much a part of this collective consequence as ethnic-cultural conflict. Much social conflict between interest groups in Australia follows land use change and land use intensification, two processes which are strongly associated with population growth in city regions.

3. Quality and availability of resource-based goods and services

Significant population growth stands to produce a significant increase in the present moderate to high probability that, even without such growth, the real per capita cost of providing Australians with many goods and services based on natural resources (e.g. food, water, biodiversity, residue sinks, amenity resources) will increase markedly and inequitably.

Comment: Within the present international trade and factor substitution possibilities, it is not defensible to argue that any particular natural resource such as water is so limited in Australia that a doubling (say) of the population over coming decades is absolutely impossible.

What is likely, however, is that the real marginal cost of supplying some important goods (and clean domestic water is a good example) will rise with population growth, and positional goods like wilderness will have to be rationed. Even without population growth, such increases are foreseeable due to increases in per capita consumption, land use change, land use intensification and degradation---and hence substitution---of present resources.

If such increasingly scarce goods are rationed by price, it will exacerbate the potential inequities in their distribution between not only current, new and future populations, but rich and poor current populations.

4. The plight of the world's poor and displaced peoples

Significant population growth in Australia stands to produce:

(a) a modest increase in the current low to moderate probability that Australia's contribution to solving the world refugee problem will be increased somewhat

(b) a modest decrease in the current low probability that Australia's contribution to solving the problem of third world poverty will be increased somewhat

(c) combining (a) and (b), a very modest increase in the probability that Australia's contribution to addressing the plight of the world's poor and displaced peoples will be increased somewhat.

Comment: Although increasing Australia's population through immigration tends to improve our already comparatively good record for taking in refugees from the world's trouble spots, the cost of doing this could inhibit any improvement in our comparatively poor record of helping the poor of the third world in their own countries.

On balance it is my judgement that we stand to help the world's poor and displaced peoples fractionally more by significantly increasing population than by stabilising population within a generation or so.

Note that this judgement is made in terms of what is likely to happen, not in terms of what could or should be done. The weight of argument in Chapter 8 is that Australia should discharge its responsibilities to an overpopulated world primarily through a large and well-targeted aid program and responsible stewardship of its own resources. This is not incompatible with continuing our comparatively generous refugee immigration program.

5. Sustainable use of global resources

Significant (Australian) population growth stands to produce a small increase in the current moderate to high probability that the world's natural resources will be managed unsustainably and with an undue bias in favour of exploitative over conservative use.

Comment: Because Australians consume goods and services at a rate well above the world average, any increase in our population stands to increase the world's total and per capita throughput of energy and materials with consequent pressures on resource quality and global marine and atmospheric waste assimilation sinks. While these increases might be proportionately tiny because of our small population, they are still large enough to leave Australia open to criticism as a profligate member of the world community.

Population growth in Australia undoubtedly contributes more, for example, to global warming than population growth almost anywhere else, mostly because we consume ferociously, but also because we produce energy-intensive exports such as wheat and aluminium for the world.

While Australia must, for precautionary economic reasons, try to use land, materials and energy more efficiently, it is hard to argue that our style (as distinct from level) of resource use is any more unsustainable than elsewhere in the first world. This may change as the more vigorous efforts to achieve sustainability of some countries (like Canada and the Netherlands) begin to pay off.

6. Gross domestic product per head

Significant population growth stands to produce a very small increase in the present (i.e. with present population) moderate to high probability of sizeable increases in gross domestic product per head.

Comment: It seems likely that GDP per head will continue to rise even with minimal population growth, although the increases may be taken out as extra leisure and services rather than in ways increasing material and energy throughputs. Our interest though is in the question of whether GDP per head will rise faster or slower with significant population growth than without it. Some small additional economic gains per head may perhaps be made by actively increasing the population in the short to medium term but these are not unmixed and not unchallenged; for example, these additional gains must be seen as at least partially offset by an unchecked growing concentration of wealth. The longer term economic implications of major population growth are virtually neglected in Jones Inquiry submissions and elsewhere.

Economic arguments, considered collectively, are inconclusive and probably should be quarantined from the debate on population size. However, I will accept that there is a minimal case for the net economic benefits of population growth; but it has only minor importance in the present ranking exercise.

7. National defence

Significant population growth stands to produce a very minor increase in the current moderate to high probability that Australia could successfully defend itself against foreseeable military attack.

Comment: Geopolitically, population growth does not appear to be a significantly useful strategy for enhancing Australia's defence capabilities and influence as a regional power or for protecting sovereignty over trans-border population movements.

Lead in the saddle-bags

All of the above seven broad consequences of population growth are effects on the achievement of important goals. Ranking is simply a way of expressing what probabilities of what effects we might change if we were given just one, two...seven wishes.

The three most important impacts of significant population growth (1-3 above) involve a greater subjective probability of significant anti-goals being reached (low urban quality of life, social conflict and reduced resource access). Consequence 5 (slightly worsened prospects for sustainable global resource use) is a fourth line of argument against population growth. Conversely, the three consequences suggesting that population growth might improve life for tomorrow's Australians and others, are ranked 4 (a slightly better fate for the world's disadvantaged), 6 (slightly better prospects for increased GDP per head) and 7 (slightly better prospects for defending Australia).

By this analysis, the case against major population growth is much stronger than the case for it. Others could go through a similar analysis and legitimately come to a different conclusion. Expressing these consequences geographically, population growth is likely to have its worst impacts in Australia's city regions while having some minor national benefits---perhaps. Globally, population growth in Australia may help the world's disadvantaged a little while simultaneously harming the world's resource base.

In addition to the seven fairly concrete consequences combined into the preceding analysis there are two more abstract but pervasive implications which seal the case against significant population growth. One is that population growth, through its generation of unmanageable externalities, contains an alarming prospect of social and environmental disaster which is not foreseeable in a scenario of population stabilisation; that is the precautionary argument must be taken seriously. The other implication is that the consequences of population growth seem likely to be, on balance, inequitable in the sense that they produce significant numbers of 'uncompensated losers'.

Because they have not been born and we cannot ask them, we do not know if our grandchildren will condemn us for bequeathing them, as a result of resource dilution, degradation and loss following population growth, a much-reduced stock of natural capital in exchange for a somewhat increased (perhaps) stock of built capital per head. One reason why they might not is that they won't know what they have lost---like birds born in an aviary. Speaking as their self-appointed representative in the 20th century, I believe that the present generation is imposing an unacceptably high, inadequately compensated loss of natural capital on future generations (even though they are probably going to be 'wealthier' than us).

In the present generation, it is the urban poor who stand to suffer a disproportionate share of the increased living costs and uncompensated losses in environmental and social quality of life identified earlier as likely consequences of population growth. An increase in the number of Australians living in poverty, relative or absolute, is too high a price to pay for the nebulous benefits of population growth.

There is an extensive academic literature on methods of choosing between multi-attribute alternatives like population levels but this book is not the place to explore these (see Dyer et al 1992). It is, however, worth suggesting that those seeking a considered position on the population question should try, in their own ways, to bring the range of arguments together and make a collective judgement about them. Those who knowingly reduce the population debate to a one-dimensional argument are either stupid or think that others are.

Overall, the case against major population growth is not all that strong, just a lot stronger than the case for it. I would not like to see that sentence selectively quoted as ... the case against major population growth is not all that strong ...

What about the alternative perspective, the cases for and against population *stabilisation*? The position here is that there do not appear to be any arguments to raise against population stabilisation *per se.* But have significant arguments for stabilising population been revealed? Its strongest advocates would claim that population stabilisation is a necessary condition to be met if quality of life is to be improved or even maintained (J60). While willing to accept something akin to this as a working rule, I do not think it is a position which can be established from any sort of well-tested predictive model.

Apart from the iron law that any population must eventually stop growing, several benefits from having a stable or stationary population have been canvassed. Some of these are subtleties such as freeing people from constant adaptation to change but others, such as the way we use and accumulate capital (e.g. widening versus deepening), are more concrete.

But, from a policy perspective, it has to be appreciated that, demographically, Australia cannot have both a stable population and a much larger population in 2045. The range of choice for the middle of the next century is between a more or less stable population not greatly different from the present size and an approximately doubled and growing population.

On quality of life grounds, equity grounds and cautionary grounds, the arguments for seeking a stable population at the lower end of this range must be judged stronger than those for seeking a population at the higher end of the range. In the vernacular, a growing population is lead in the saddle-bags.

CH 11. OPTIONS FOR AN AUSTRALIAN POPULATION POLICY

> The responsibility for all this mess clearly rests with government. (LB Daniel in J204)

This chapter focuses on elaborating and evaluating the *policy and program options* available to a federal government seriously interested in developing an Australian population policy. It draws on several interesting (but not necessarily congenial) ideas in Jones Inquiry submissions to flesh out and give life to the basic options.

It starts by sketching out the broader policy context within which population policy has to be developed. Population policy has *components* in each of the three domains of economic, social and environmental policy. Also within each of these three policy domains there are issues which cannot really be seen as the object of population policy but which must be dealt with by *complementary policies* with a strong awareness of how these will complement or work against population policy.

The chapter then simplifies the problem of policy choice to a small handful of options. A clear preference is expressed for a policy option that can be summarised as 'a near-stable population within a generation or so'. The remainder of the chapter is spent on identifying several component programs which collectively would allow the preferred population policy to be operated comprehensively enough to qualify as a policy focus in its own right, not as a collection of bits and pieces scattered across more established policy domains.

The identification and discussion of complementary policies interacting with but not part of population policy is left till Chapter 12.

The society-environment-economy triangle

> It is quality of life, not quantity of life that is crucial to future generations. (Ann Rayner in J172)

The primary responsibility of Australian governments is to do the best they can to ensure high quality of life for all Australians, present and future (J234, 40). This includes playing an appropriate international role as well as adopting appropriate domestic programs and policies. The issues demanding government attention change frequently but a review of arguments for and against major population growth/ population stabilisation throws up three policy areas persistently seen as central to achievement of high quality of life: managing environmental quality; managing the size and composition of per capita real incomes; and maintaining and enhancing socio-cultural values. For convenience, these can be tagged as environmental policy, economic policy and social policy.

Population management is a component in each of these policy areas, although perhaps not a major component of economic policy. It is thus an integral part of managing for the well-being of Australian society (J220). For example, 'just about every problem facing us could be reduced with fewer people' (J192).

To avoid any misunderstanding, it must be clear that population management is not a necessary and sufficient instrument in itself for achieving high quality of life. Quality of life is a 'three-legged stool' requiring the continual development of wide-ranging environmental, economic and social policies. What is being inquired into here is the role and content of an active or direct population policy within that broader policy mix.

Broad options for an Australian population policy

> Australians have already made their wishes known by having fewer and fewer children. They have consistently indicated that they are opposed to high levels of immigration. (LB Daniel in J204)

At its broadest, population policy is concerned with all demographic characteristics of the Australian population over time. But the core concern of population policy is population numbers and the central concern of this book is the 'best' trajectory for the Australian population to 2045---and beyond. What population choice offers us the best chance of having a *civilised society* in 50 years from now, one where we live out long self-fulfilling lives in an attractive built and natural environment serviced by an efficient, responsive, mixed economy?

The following sections present and summarise the country's basic population policy options for population size and population stability.

Two approaches to population policy

The 1975 Borrie report distinguishes between positive and passive approaches to population policy (National Population Inquiry 1975). The former is seen as involving measures to achieve a particular population target or goal; a particular national total; a particular distribution; a particular structure or composition; a particular growth rate. The passive approach involves letting Nature take its course as it were, and determining which policy---particularly social and economic policy---is best suited to these natural demographic patterns. Passive policy is thus geared to serve demographic trends and demographic structures, not to change them.

The National Population Council's (1992) report sees population policy as having pro-active and responsive components. Pro-active policy corresponds to Borrie's positive approach and 'deliberately seeks to influence population size, location or characteristics' such as a decision to inoculate children against measles. Responsive policies, like Borrie's passive policies, are only reactive to the impact or foreseen impact of population, such as building schools where people are concentrated.

The main policy interest of this book is in population-influencing policy, not population-responsive policy. My preferred term here, *primary population policy*, is equivalent to the National Population Council's pro-active policy component and is concerned with influencing population numbers, composition and distribution. Primary population policies can be further classified as direct (e.g. abortion services) or indirect (e.g. child allowances).

Also, however, it is necessary to recognise that many policy and program options in the areas of economic, environmental and social policy can complement the use of population management to achieve high quality of life. Such *complementary policies* certainly have to be sensitive to population change but they go beyond being just responses to population change. They tackle issues that must be considered in parallel with population issues if high quality of life is to be achieved.

Putting this another way, achieving environmental, social, cultural and economic goals requires the combined use of population policies, complementary policies and a range of policies which have little to do with population matters.

Some principles relevant to formulating population policy

> We must have a population policy...Clearly population is one subject on which Australians have a wide diversity of opinion. The force of argument behind the various opinions should be properly assessed, analysed and presented to the community so that it can see the essence of each argument and the way it is dealt with in the population policy...Having a population policy will allow mainstream debate to proceed with less interference from the politically extreme and the racist fringe which now makes some facets of the subject very difficult to discuss. (John Burke in J86)

Jones Inquiry submissions and other sources suggest some guidelines or principles worth bearing in mind for developing population policy. For example:

. It is fundamentally important to distinguish between populations we *can* support and the population we *want* to support...happier, not larger; fulfilled, not coping.

. Population policy must be developed with an awareness of the interests of all ethnic groups including Aboriginals (J255).

. Population policy must be regularly revised (J1).

. Several organisations have carefully considered population policies (e.g. Australian Conservation Foundation) and these should be drawn on (J170).

. The target population will have to be within some 'feasible' range; it may then be possible to agree on some general target range (J177). Target populations cannot be achieved with high precision. Population inertia means it is simply not possible to stop population dead in its tracks when you have the right number. Indicative targets can be useful in planning for long-term change but they must be periodically reviewed (J175, 252).

. The short-term interests of individuals must not over-ride the long-term interests of the society (J220).

. If one agrees that there is an upper limit to Australia's population but takes no action because it is too hard to estimate then that limit is bound to be exceeded (J116).

. Though immigration is readily recognised as serving several widely accepted values, it tends to be forgotten (e.g. by National Committee 1994) that births also satisfy a rich spectrum of values (J177; National Committee 1994).

. The basis for population management must be a Commonwealth policy to stabilise population numbers at a precautionary and ecologically sustainable level and to be administered without discrimination on the grounds of ethnicity, colour, sexuality, beliefs, wealth, skills or age (J256, 165).

One policy which, in principle, is an option, is a return to the White Australia policy, but in practice this is neither a feasible nor socially acceptable option, for various reasons.

Immigration management must continue to be the main plank in Australian population policy. It is more responsive to government manipulation and more effective than fertility (and mortality) management (J177). But immigration should not be treated like a tap to be turned on when economic conditions are good and off when they are bad (J233).

Elements of a population management strategy

More concretely, many Jones Inquiry submissions suggest explicit policy measures. Some that are of interest but not necessarily practicable include:

. Any increase in population should be suspended while we rehabilitate degraded systems (J23) and deal with the consumption problem (J253). A breathing space of 10 years seems a good idea (J168). The population is already large enough to enable many values to be achieved and too large for some (J179, 139).

. An explicit policy of zero population growth is favoured by many submissions (J29, 36, 80, 215) as is the equivalent policy of stabilising the population (J57) at its present numbers (J99) or perhaps at what is achievable within 30 years (J58).

. Several submissions consider that the present population has already passed sustainable levels (J29) and some of these explicitly suggest reducing the present population (J39, 47). One suggestion that the total population in Australia should not exceed 30 million in the next 50 years also includes a composition target of 85% white people and more than 97% non-Moslem (J120).

People's views on population depend on the information they hold and on their self-interest (J128). To some, Australia's tacit population policies are leftovers from other eras modified by contemporary pressures from narrow interest groups such as business, ethnic lobby groups, environmentalists, defence interests, human rights interests, and economists (J86).

Some suggested population targets

> A population of 50 million is attainable by 2045 and will not put too much of a strain on our economy. (Tony van Kampen for Wide Bay Conservation Council in J202)

Several Jones Inquiry submissions suggest asking electors what Australia's target population should be (J22, 168). Electors' views on this matter are implicit in polls that show a high proportion of the population favouring reduced immigration. What is not clear is whether electors make the link between immigration and population growth. In practice, to be against immigration is to be against population growth.

Another Jones Inquiry submission proposes that a numerical population target 'will only excite noisy and unproductive argument with the likely outcome that the question will again be shoved back into the 'too hard' basket' (J194). Nonetheless, many Jones Inquiry submissions see a need for a population target (J69, 81), and suggestions therein for specific long-term target sizes range from less than 1 million to 180 million. Other suggested numerical targets include 8-12 million, 10-12 million, 12 million, 17 million, 20 million, 20-25 million, 25 million, 50 million, 67 million and 100 million (J170, 79, 254, 256, 138, 165, 181, 58, 130, and 20 respectively). Other suggestions for very large increases do not identify numerical targets (J153, 228, 217, 149; for example, the more people we have the wealthier we are (J248).

While there is general admiration for the Aboriginals' feat of sustaining themselves in Australia for 50 000 years (J127), no Jones Inquiry submission suggests Australia's population should be under 1 million, a population already proved to be sustainable in a hunter-gatherer society (Butlin 1983; J96).

Option: stability or ongoing growth?

> Knowing that our population will stabilise (or decrease) makes it more manageable and means we can start to take control of our own safety, freedom, health, education. The unquestioned ethic of endless growth has poisoned our thinking and sapped our ability to plan long-term. Amongst other foreseen benefits, a stabilised population would become more homogeneous within a few generations as the descendants of recent migrants blend into society. (Hinton Garland in J123)

Many Jones Inquiry submissions see value in stabilising population (J8, 19, 133). One expresses the hope that, at very least, it may be possible to get some community agreement about whether the ultimate aim is for a near-stationary population or for a constantly increasing population (J177). This would indeed be a minimalist population policy. As noted earlier, the prima facie case for an ultimately stable population is that an ever-growing population is not a feasible option in a finite natural environment (J234).

A more or less stable population is the de facto aggregate choice of resident Australians. Net immigration aside, the population will cease growing in 30-35 years (J230). We are in a *demographic transition* which it is in everybody's interests to accelerate (J145). It would have been an opportunity seized and an important anchor for debate in the Australian community if the Jones Inquiry had declared its position on this fundamental issue of population stability.

Assuming acceptance of the idea of ultimate population stability, what are the broad options for the size of a stable population? This question has to be considered in conjunction with the question of timeframes. If population stability is to be achieved within 50 years, and assuming fertility to remain at its current level, a little below replacement, net immigration (including refugees) would have to be fixed at less than 50 000 people per annum.

If the net immigration level is set at 50 000 per year, Australia's projected population in 2045 is about 23 million and almost stationary. If net immigration was reduced immediately to zero and held there, the population in 2045 would be about 20 million (J246). If net immigration levels are set and remain fixed at levels above 50 000 per annum, the Australian population will continue to grow, at least, into the late 21st century. Still, many combinations of stable populations of size greater than 23 million at a range of post-2045 target dates are possible.

What this discussion seeks to make clear is that we have the option to characterise the core of a (stable) population policy in terms of either a population size or an 'earliest stability' date. Setting one of these fixes the other. Additionally, setting a size and a target date sets the average rate of population growth over the period up to the target date.

Option: minimal or large increase?

> Population growth protagonists are carting the intellectual baggage of an earlier century. (Lon Eisenweger in J126)

Notwithstanding the size versus stability-date tradeoff, the Jones Inquiry submissions that make quantitative suggestions about population policy are invariably framed in terms of population size, not stability date. More commonly, submissions assert the difficulty of nominating and defending any explicit numerical population target for Australia (J179). What are these difficulties?

1. We lack the understanding to model what any population target would mean in terms of quality of life measures (see Chapter 5).

2. Different targets imply different bundles of quality of life achievements and there is no mechanism for ranking these bundles on a single quality of life scale.

3. The bundle of quality of life achievements associated with any particular population policy will be significantly modified by choices made in complementary policy areas (see next chapter).

What then are the practicable and more or less defensible options for a core national population policy? These cannot be set objectively or precisely but, to narrow this discussion, we could place the options along the spectrum between a conservative or minimal-growth option and a radical or high-growth option. The minimal-growth option is to plan to stabilise national population as soon as possible, implying a (more or less stationary) population target of c19 million by about the year 2030. The high-growth option is to plan for a significantly but not massively larger stable population than at present; say double the present population, implying a stability date of around 2070.

As presented in earlier sections, the weight of arguments (including public sentiment) against a massive increase in population (3...10...20...fold) is heavy and no argument weightier than simple ideological assertion is ever presented for such an option. As the population target is wound back towards something like twice the present population, the possibility of useful economic benefits has to be contemplated, at least. But this is an outer bound. It would be a wilful misreading of the arguments and of public attitudes to contemplate a long-term population for Australia larger than about twice the present population.

Option: population decrease?

> The social and economic effects of a falling population are impossible to predict but they would probably not be favourable. It would generate an unbalanced age distribution with a consequent greater load on the young and increase the difficulty of servicing a large public debt. (Rupert Myers for Australian Academy of Technological Sciences and Engineering in J241)

Under a policy of zero net migration, the Australian population would slowly decline from c2030. Population targets set at levels much below present numbers scarcely appear in contemporary discussions, which are basically about some growth versus no-growth. Reduction targets require zero or even negative net immigration (more people leave than arrive) and this is possible at least in theory. If, however, population is to be stabilised much below present levels, then the question of managing fertility rates to guaranteesub-replacement level fertility would also have to be addressed eventually.

As recently as 1970 there were only 12 million people in Australia, members of a rich and cultured society (J179). Recalling this should reduce the uneasiness which many are likely to feel at the thought of a reduced Australian population. We would not be alone; the Netherlands has had a policy of allowing her population to decline (Van den Brekel 1988 quoted in Young 1989).

One psycho-social argument for a small national (or world) population is that this would necessitate different styles of human interaction. In particular, we might value each other more. Because scarcity increases value, people in a population of 7 million would have a higher regard for each other than in a population of 37 million (J22).

There may in fact be more reasons to justify a smaller population than a larger one (J132). However, in this book I have chosen not to pursue this line of argument. While population reduction is a longer-term possibility, it does not have to be, indeed should not be, considered as an option at this time: it appears to have little political support; arguments for and against population reduction are poorly developed; and it offer a basis on which a diversionary attack on the central thesis of the book could be mounted. Most important, it will be time enough to consider the possibility of a declining population once the idea of a stationary population has been accepted and when steps have been taken to achieve such.

Conclusions

Given (a) a strong balance of argument against population growth (particularly rapid population growth), (b) uncertainty about the effects of population decline and (c) an inability to identify an optimal population level, I conclude that while there is no balance of argument for seeking any particular population level there is a balance of argument for seeking to avoid population change.

The Australian Government should therefore develop and carry out a population policy which has as its central objective the achievement and maintenance of a more or less stable population; that is, a population which, though inevitably fluctuating somewhat from year to year, does so within fairly narrow limits. Within this mission, the current policy-relevant boundaries for Australia's population options are for a near-stable population within several generations, somewhere in size between one and two times the present population. Components of such a population policy are elaborated within these parameters as follows.

The components of population policy

While immigration policy is the essential core of population policy, it is important to recognise the other measures that make up a fully comprehensive policy. Several Jones Inquiry submissions attempt their own lists of measures necessary for a population policy, as follows:

Example 1

. inform the public regarding the nature of the problem
. stop family reunions
. put a plan in place to deal with illegal immigration
. expand family planning
. offer free birth control
. examine the question of population dispersal (J162)

Example 2

. discount the 'populate or perish' exhortation
. stop immigration
. encourage family planning
. establish genuine decentralisation policies
. encourage responsible technical solutions to pollution problems (J11)

Example 3

So that Australia's population can remain within its carrying capacity, policy must:

. in the longer term, embrace nine principles of sustainability (including equity, quality of life, biodiversity conservation, minimal resource depletion, caring attitudes and regional interdependence);

. in the shorter term, reduce urban sprawl and cap local and regional populations;

. set immigration levels consistent with population stabilisation and humanitarian concerns (J205).

Example 4

. adopt a 'same or lower' population goal for 2045
. set up an education program to promote population control
. provide more family planning programs
. provide more money for Landcare
. encourage more recycling
. support more research and more skill training
. tighten environmental laws to make government and business more accountable for their actions (J221).

In the terminology adopted earlier, these lists suggest both primary (direct and indirect) and complementary policy components. My own conclusion is that a comprehensive primary population policy must have seven components or sub-policy areas, viz:

. immigration policy

. natural increase policy

. Aboriginal policy

. tourist and visitor policy

. overseas aid policy

. internal migration policy

. education policy

The list could have included a policy for other major structural changes occurring in Australia's population---our ageing population, changing family and household structures, the changing role of marriage (Curson 1991).

Important points to be considered in developing policy in each of the seven nominated areas are noted in following sections.

Immigration policy

The scope of immigration policy is well canvassed in the National Population Council (1992) report. This report accepts immigration as the core of active population policy; it accepts the legitimacy of migrants in skill, family and refugee categories, and correctly accepts that migration is not a palliative for demographic ageing. It also identifies other less central aspects of immigration policy such as settlement programs, border control and full cost 'user pays' policies for migrants and tourists. Policy interest here is primarily in the size and composition of any migrant intake.

Intake size

> Why does Australia continue to import the one and only threat to the earth's viability? (Suzanne Wellboon in J113)
>
> Except for a reasonable annual intake of refugees whose lives are in danger from oppressive regimes, migration should be halted with a view to achieving and maintaining zero population growth within the shortest practicable time. (N White in J106)

The Australian public has little concern for long-term population level per se, but it has stronger opinions on the main determinant of that level, namely short-term immigration rates. Chapter 3 noted the increasing and now high percentage of Australians wanting lower immigration (J177, 185; Betts 1993; Saulwick poll, *Sydney Morning Herald* 4 Nov 1991, p2). But what should the figure be? The 1994 *National Report* (p33) says that the target figure of 80 000 visas for 1992-93 was arrived at because of the widespread view that it was 'about right'; not a very scientific approach. At very least, it might be asked: how is it possible to specify an annual immigration target without having a population target? (J177). Certainly the public gets no say on immigration quotas (J175).

Provided the Total Fertility Rate remains constant and below replacement, there is an upper long-term population level implied by each level of constant annual immigration intake of constant demographic composition (assuming also that immigrant fertility approaches resident fertility). This is the population at which the net annual natural decrease in population (deaths minus births) equals the immigration intake. Note that the *rate* of population growth falls when the immigration intake remains constant in absolute terms. An 80 000 gross (equals 50 000 net) annual migrant intake implies a near-stable population of about 23 million at the middle of the 21st century.

Some suggested immigration targets

Because there is no objective way of setting the annual migrant intake, there is something to be said for considering the approach of debating *change* from 50 000 net per annum, the lower end of the post-war range. This is an alternative to trying to debate intake size 'cold' or from a 'zero base'. The question then is: Do we want to go up or down from this level?

A gross migration target of 1% of population was touted consistently in the post-war period but was never reached (J247). A return to this immigration target is suggested in one Jones Inquiry submission (J169). This would translate into a target of some 170 000 at the present time. Since the belief that we need immigrants to 'develop the country' has long passed (J71), this figure can be confidently taken as the extreme end of the candidate range. Another Jones Inquiry submission recommends reducing the gross migrant intake to 60 000 per annum and returning the 'skill points' below which applications to migrate fail to historically higher levels (J247).

The National Population Council (1992) identified a core intake of about 55 000 immigrants a year based on the categories of family reunion, refugees, employer nominations and migrants with business skills (J247). The 1988 Committee to Advise on Australia's Immigration Policies (the FitzGerald committee) recommended a 10-year planning frame for immigration to achieve some stability in annual numbers, something always made difficult because of the lack of any control over trans-Tasman population movements (J 247).

Another suggestion is to reduce immigration progressively so that the annual target for permanent immigration equals the previous year's permanent emigration (J256, 81). The target should be approached gradually to allow for appropriate long-term planning (J175, 191). This is equivalent to the policy of zero net migration favoured by several Jones Inquiry submissions (J170). Several submissions recommending zero net migration couple this with simultaneously phasing out incentives to have large families (see below) (J77). A stronger suggestion is to cut immigration to a trickle, perhaps 10 000-12000 'genuine refugees' (J17, 30).

Finally, at the bottom end of suggested intake levels is the idea that for environmental and economic reasons the immigration program should cease (J188). A variation on this is the suggestion that immigration should cease for 25 years, one generation (J220).

Immigration targets expressed in net terms identify an annual population increase and are useful for relating to long-term population targets or projections (J177). When the net level of immigration for the coming year is announced, it should be accompanied by a statement of the population in 2040 if that rate were to continue (J177).

To conclude, Australia should try to to stabilise its population as expeditiously as possible. This means starting now, not in a generation's time. The core of a demographically feasible and politically acceptable way of achieving a more or less stable population by the year 2045 is to restrict annual net migration to a figure somewhere between zero and 50 000. This will produce an approximately stable population of between c20 million and c23 million in 2045, depending on the choice and constancy of the net migration figure.

Net migration above 50 000 per annum will inevitably promote further population growth for several generations. Keeping net migration below this figure is the key to avoiding the problematic prospect of open-ended population growth.

The need for caution, and community concern about the social and environmental consequences of population growth, and a lack of evidence for economic benefits of population growth, all indicate that Australia should strictly confine its annual net migration to the lower end of the 0-50 000 range.

Intake composition

Jones Inquiry submissions suggest that there would be considerable community support for an immigration policy based on a commitment to take in a number of refugees and humanitarian immigrants in any year equal to the previous year's emigration level. This would be a generous and easily understood position.

Several Jones Inquiry submissions styrongly recommended that the debate over population numbers should not be confounded with debate over the ethnic composition of the Australian community (J206). Any discussion about limiting the proportion of Asians in the migrant intake has to be very damaging to the sense of security of Australians of Asian background who already live here (J170).

A large number of Jones Inquiry submissions asserted that, as far as possible, the selection of immigrants and refugees should be non-discriminatory. Of course, as pointed out in the Borrie report (p734) any immigration policy other than an 'open door' implies regulation and therefore discrimination in some sense, e.g. in terms of skills (National Population Inquiry 1975).

Some of the Jones Inquiry submissions wish to restrict immigration to political refugees and people joining their families in Australia (J7, 144). The world has political, economic and environmental refugees and, of these, submissions seem to favour political refugees (J191, 197). Other suggestions on migrant composition include weighting immigration towards refugee, humanitarian, and immediate-family reunion intakes (J58). This is in fact has become the case in recent years, with declines in immigrant skills and business categories. Any economic loss from giving preference to low-skill refugees as migrants (Jupp 1993) will have to be accepted as the price of a humane generous policy.

Other interesting suggestions which cannot be taken up here include the following: illegal migrants should be repatriated immediately and barred from further applications (J204); refugees do not necessarily need permanent residence (but see Piper 1992); and Australian citizenship should not be lightly granted (J37). Another Jones Inquiry submission suggests that employers would be less willing to lobby for an intake of skilled migrants and more prepared to train residents if they had to pay the migrant establishment costs currently met by the community (J24).

At some stage, it may become necessary to monitor the pool of Australians who live overseas but likely to wish to return here. Also, at some stage the question of developing a joint population policy with New Zealand will probably have to be dealt with.

Conclusions

Concerning the composition of the immigration intake, I accept the established principle that potential migrants should not be discriminated against on grounds of ethnicity, nationality, colour, gender, sexuality or beliefs. Notwithstanding, all immigration programs are positively discriminatory to the extent that they favour certain categories of people. Positive discrimination in immigrant selection should be made only for people identified as refugees under the United Nations definition; close family members seeking reunion with their Australian-resident families; or skilled in nominated skill-deficiency areas (an acceptance that the Australian economy no longer needs unskilled migrants).

Emigration policy

The loss in recent years through the departure of increasing numbers of highly skilled and educated residents (including recent migrants) has 'brain drain' implications. However, migration experts consider that the growing movement (especially to Asian countries) gives Australia substantial economic benefits in terms of the connections and networks that are being established (Hugo 1994). Nonetheless emigration policy options must be fully explored.

Natural increase policy

> If the Standing Committee believes that population stabilisation is the best approach... the (Australian Catholic Welfare) Commission suggests that informed free choice be promoted. It further suggests that the implementation of any population target(s) include policies which allow the promotion of the widest range of natural family planning options to enable parents to plan and control the size of their families. (Toby O'Connor 1994 for Australian Catholic Social Welfare Commission in J196).
>
> Freedom to have a family of three-four children if you wish it is a very important non-dollar quality of life item and we should seek to preserve that as long as possible by having zero migration. (Dane Thwaites in J96)

Australia's birthrate declined steadily from a lifetime average of 2.91 live births for each woman in 1965 to a low of 1.84 in 1988. Since then the birthrate has increased slightly to 1.91. Dr Lincoln Day, a demographer formerly at the Australian National University, predicts that a slow rise in the birthrates of most developed countries could continue under such social trends as greater emphasis on family and parenthood values and remarriage after divorce with accompanying desires for new children to cement new relationships (Mussared 1993).

The current drop in western fertility may be due to the fact that people realise they cannot give their children as high a standard of living as they themselves had and therefore opt for smaller families (Caldwell 1994; J22). Most Australians believe having fewer children increases their children's chances for happiness (J220). Conversely, 'child quality' is becoming an alternative to population growth as a focus in the population policies of other developed countries (Young 1989).

If we are to move to zero population growth and still permit immigration, the total fertility rate must be well below the replacement level of 2.1 live births per woman (J94). Similarly, a program to lower average fertility might preserve the freedom to have a family of three-four children (J96). Note, however, that forcing fertility too far below replacement could severely distort the age structure of the population (Young 1994).

The possibility of actively trading-off the immigration and natural increase components of population growth, while remaining within the population size limits suggested above, needs further consideration (J86). For example, the cost to government budgets of an Australian-born 'unit of human capital' is far greater than the budget cost of importing an equivalent 'unit' through the immigration program. Admissions could increase if fertility declined and vice versa (J98). Note also that having a significant immigration program may encourage people to bear several children (J95). Another suggestion is that Australians are keeping up their birthrate to avoid being outnumbered by migrants (J159). It is also claimed that immigration is an affront to Australian parents who have carefully limited their families (J220). It would certainly be inappropriate to try to reduce fertility further while immigrants can bring in any number of children (J177). And then there is the whole question of what to do if emigration from Australia falls.

Conventional wisdom says that it is impracticable and undesirable to attempt to limit baby numbers (J49); that people have the right to plan their own family size (J196). While directly punitive policies must be avoided (J41), there are several non-coercive methods for lowering the birthrate (J175). In terms of natural increase, there seems to be every reason to believe that population reduction occurs without active intervention as poverty reduction, education of women, aged care and other social goals are achieved (J255). Other extant suggestions for developing a fertility policy include the following:

. The government's role in fertility matters is simply to ensure 'maximum informed choice'. Currently we are a long way from this. Every child born must be a wanted child (J94). It does seem conclusive that maintaining maximum informed choice will eventually lead to population decline.

. Sex education and contraception availability require improvement. There is abundant evidence that the total fertility rate is largely determined by the percentage of couples using modern forms of contraception (J94).

. Consideration should be given to eliminating family allowances or stopping them after two children (J29, 40, 140). Tax and social security rebates that continue no matter how big the family convey the message that more children is better (J175, 158). However, one Jones Inquiry submission points out that legislation to remove government support for higher order births (currently 7.5% of all births) would have little effect (J177).

. There is a need for an education program to encourage all couples to limit their offspring to two children (J82, 256) or to have small families (J17, 37, 82).

. Australia should develop credible and reliable ways to ensure that people will be supported in old age even if they have no children (J128).

. There is a particular need for neonatal services that ensure the survival and health of the first child born (J128).

. It is important to provide alternative employment for girls and young wives so that early pregnancies are not 'something to do' or the easy way to gain status for girls without marked talents (J128).

. We should encourage ways of community living whereby a reduced number of children will still have playmates, will not be spoiled rotten, and will be accessible for many adults to enjoy their company (J128).

. A condition for participation in IVF (in vitro fertilisation) programs should be to have a maximum of two children (J170). Such programs should seek full cost recovery (J175).

. Abortion services should be freely available (J213).

Amongst the more extreme suggestions for developing a fertility management policy are that no child allowances should be given for extra children born to the unemployed (J89), and that every childless (and sterilised) couple who choose to be child free should be given a community award and $200 a fortnight until they are 45. Couples who have three children should be compulsorily sterilised and pay the government $200 a fortnight until they are 45 (J245).

Mortality policy

Further foreseeable decline in age-specific mortality rates will make the Australian population grow a little faster and age a little faster in coming decades (Hugo 1995; J177). Euthanasia is the only way to adjust the mortality component of natural increase. Though there may be some increase in euthanasia in coming decades in Australia, it is obviously socially unacceptable for euthanasia to be even contemplated as an active component of population policy.

Conclusions

Australians have a moral responsibility to minimise their contribution to the world's explosive population growth and runaway consumption of the world's natural resources. A non-coercive education program to encourage all couples to limit their offspring to two children should be developed. The Government's main role in fertility management is to ensure, as far as possible, with family planning services and sex education programs, that every child born in Australia is a wanted child. This can be summarised as a goal of maximum informed choice in child-bearing. A program to monitor progress towards this goal should be developed.

Aboriginals and population policy

> ...the bottom line for Aboriginal people is to what extent immigration jeopardises their quest for social and economic equity. (ATSIC Deputy Chairperson, Sol Bellear, at Bureau of Immigration Research Second national immigration outlook conference 1992)

It is incumbent on Australian society:

. to bring Aboriginal and Torres Strait Islander death rates into line with the rest of the community;

. to make family planning services available to all Aboriginal families seeking them;

. to satisfy Aboriginal aspirations for consumption levels similar to those of the rest of the community.

The latter goal would remain valid even if the community resolved to reduce average levels of consumption of goods and services as a means of reducing the quantity of residues to be processed by environmental sinks.

A program to monitor progress towards achieving these population-related goals of Aboriginal and Torres Strait Islanders should be developed and implemented as part of national population policy.

Tourist and visitor policy

Australia currently has 26 separate temporary entry visa categories through which the temporary residents program is managed. Unlike permanent migration, visa numbers here are not capped. It is widely believed the era of large-scale immigration is being replaced by a new era of short-stay population movements. Temporary skilled, business and professional migration into Australia is being promoted as a quicker and more flexible way of avoiding skill bottlenecks than permanent migration (Report of an interview with the Hon. Nick Bolkus, Minister for Immigration, *Weekend Australian* June 18 1994; Millbank 1994; ABC Radio talk by Dr J. Nieuwenheysen, Director, Bureau of Immigration and Population Research, June 20 1994).

Tourists have a very high standard of living (J256). The average overseas tourist in Australia spends 65% more per day than the average resident (McGlynn 1992). Tourism involves high per capita levels of energy expenditure (e.g. transport) and other forms of consumption (J190). With our very large projected increases in domestic and international tourism, a way of converting tourists and visitors to 'resident equivalents' must be devised and factored into overall population policy (J112). The impact and contribution of other groups such as overseas students, New Zealanders and temporary workersta, should be estimated, monitored and incorporated into Australia's population policy.

There is evidence that tourism degrades tourist attractions, making it a form of 'slow mining' perhaps. The domestic sector of the tourism industry is four times the size of the international sector and careful demand management of both sectors is needed (J247; McGlynn 1992). This could, in time, include encouraging tourists into 'enclaves' and imposing quotas on numbers of tourists and temporary visitors (J16).

McNicoll (1994) suggests that as illegal entry becomes a larger problem in Australia, as it probably will, the Australian public will become more willing to tolerate procedures to manage this, such as setting up a national register of legally employable aliens.

In 1993 three boats and 81 people arrived illegally on Australia's northern shores. In 1994 the figure till November was 12 boats and 522 people (compared with 29 boats and 520 people in the previous 5 years). Most of those who had already been refused refugee status in a country of first asylum under the United Nations Comprehensive Plan of Action were deported. Australia must act vigorously to ensure that screening processes in countries of first asylum are legitimate.

Conclusions

Australia is entering an era of large-scale short-stay population movements, the impacts of which are significant in comparison with resident impacts on the environment, the economy and the social fabric. These impacts must be managed in the context of an overall population policy.

An impacts monitoring and management program should be set up to ensure that changes in the natural attributes of important present and potential tourist attractions remain within acceptable limits.

Aid policy

> Economic growth is a very powerful contraceptive. (Des Moore in J21)
>
> ...contraception is the best contraceptive... (Jonathan Porritt 1994)
>
> Australia's migration policy is strongly discriminating in favour of those who get here and against the masses left behind. (W Kirsop in J215)

> Immigration is a much less cost-effective way of helping the world's disadvantaged than proper overseas aid. (Mark O'Connor in J197)
>
> To prevent...massive pressure on Australia to accept more immigrants,[we] need to put equal pressure on these countries to drastically reduce their population growth now. (G Williams for Tamworth Environmental Centre in J199)

The size and focus of Australia's foreign aid budget can be seen as a potential 'insurance' component of a national population policy. The National Population Council report (1992) distinguished two aspects of such 'insurance'. One is that an enhanced foreign aid program should support non-coercive family planning services and the other is that Australia should assist countries of the region to create a social and economic context favourable to fertility decline (National Population Council 1992). Without disagreeing with this conclusion, it is family planning aid, including programs for the education of women, which is most relevant to Australian population policy.

In particular, aid can be seen as a way of helping Indonesia and the Pacific island states to achieve their population stabilisation goals. This may one day prove valuable in reducing pressures for mass migration into Australia. One identified specific need is to provide funds for Indonesia's BKKBN National Family Planning Program (J94).

A significant increase in AUSAID (Australian Agency for International Development) funding of population programs is sometimes suggested (J17, 145). One way to achieve this is to reduce government expenditures on immigration and use the savings therefrom (J215). There are also economic and humanitarian reasons for involvement in population control in the region (Priorities Review Staff 1976). Several Jones Inquiry submissions acknowledge the importance of 'offshore aid' relative to 'onshore aid' (J24, 179, 181). Resettling people is only one means of helping them. The best method is to try to prevent the conditions that create refugees (J98).

At home, the parallel need is to initiate long-term strategic planning by demographers, family planning experts, Defence Department and Department of Foreign Affairs and Trade to minimise the threat of a possible tide of environmental refugees escaping sea level rise, climate change, nuclear accidents, erosion of arable land, overfishing and so on (J94). Strategies for coping with mass immigration, should it occur, are just as vital (see Scenario 4, Chapter 13).

Other submissions argue on inter-national equity or moral grounds for a large increase in foreign aid: the rich should give to the poor. The dimension of this proposal which relates, tenuously, to the question of Australia's population is that if a more populous Australia retained present or better incomes per head it would be in a better position to offer aid; that is, it would have more people contributing the same (or more) aid per capita.

Conclusions

Properly targeted foreign aid is the main way for Australia to reduce the likelihood of uncontrolled mass migration in coming decades. It is also a much more cost-effective way of helping the world's poor than increasing immigration from developing countries. Support for the education of women and for national family planning programs must be recognised as core components of the Australian aid program. This is not to deny the importance of aid directed to other aspects of economic and social development. Current programs for the education of women and effective non-coercive family planning programs in the Australian region, such as Indonesia's BKKBN National Family Planning Program, should be identified and strongly supported.

Internal migration policy

Movement between regions

There will always be a degree of internal migration as people follow jobs and lifestyle opportunities (Flood et al 1991; J234, 35). Recently, this has meant that different regions have markedly different rates of population growth (J247; Maher and Stimson 1994). Thus many parts of New South Wales have higher growth rates than Africa; Queensland has a population doubling time of 25 years and southeast Queensland has a population doubling time of 12 years (J127, 176). Conversely, many rural areas continue to lose population to the cities (see Chapter 2).

A recurring question in Australian politics is the extent to which it is feasible and desirable to attempt to influence natural trends in population movement. There are probably 100 small to medium towns which would gladly absorb another 1000 residents each (J20). Several Jones Inquiry submissions argue, on social and environmental grounds, that it is vital to of accommodate population growth outside the Sydney area (J87, 98). One recommends many towns of 150 000 people (J130).

Should the Commonwealth attempt to influence population distribution within Australia? (J137). The distribution of people and what they do are arguably much more critical factors than population size in determining quality of life (J66, 18, 272). Should an attempt be made to develop a long-term economic, social and environmental policy framework taking into account population growth and distribution in all regions of Australia? This is the heart of the challenge of ecologically sustainable development (see Chapter 12) (J26, 27, 222). The task is daunting. It would need extensive co-operation and participation from local and state governments for example (see below) (J210).

Most former attempts at decentralisation and closer settlement have failed (J18, 186). Nonetheless, it may be time to seriously examine the means and ends of decentralisation again (J172). Meanwhile, there may be a range of modest free-standing measures which could help, such as improved taxation concessions for those who live outside the major population centres (J145). The Borrie report supports the idea that facilities available to new settlers should also be available to internal migrants (National population inquiry 1975 p738). Making migrants stay in an area for a period is an idea that has long been abandoned (J247).

Probably the decentralisation issue is more appropriately dealt with in the complementary policy area of Settlement and Regional Planning (see Chapter 12) than as an aspect of population policy as such. This is an example of the fuzzy boundaries between population and other policies.

Population management within regions

Many state and local governments seem obsessed with increasing the populations of their jurisdictions without much thought for the implications in terms of social cost, quality of life or possible environmental degradation. Social technologies for making governments fully aware of these issues are required (J221).

Rapid or slow-but-large population change can impose heavy adaptation costs on regions; and regions will differ in the degree to which population change is economically, environmentally and socially beneficial or problematic. For example, within many regions the problem of managing urban sprawl remains out of control (J186).

One local authority, Douglas shire in north Queensland, wants to set a long-term population target for itself, implying a conclusion that the long-term net social costs of population growth outweigh the corresponding benefits. Flinders shire near Melbourne appears to have stabilised its population since stopping the release of new residential lots (Robertson 1994; Department of Housing and Regional Development 1995). Douglas and Flinders shires are in the vanguard; developing such local or regional population management strategies is a new and difficult task worthy of Commonwealth support.

Conclusions

The current major population movements between states and between regions within states are likely to continue. Such movements amplify and frequently dominate changes flowing from national population growth. Rapid population change can impose heavy adaptation costs on regions, and regions differ in the degree to which population change is economically, environmentally and socially beneficial or problematic.

Local authorities and regional groups of local authorities should be offered Commonwealth assistance to develop population management strategies within the context of national population policy. If there are obstacles to local and regional bodies setting population ceilings, these should be overcome.

Education policy

> Government needs to educate the public, and regulate and legislate to reduce both consumption and population growth. (Indra Esguerra in J253)

Education has been identified several times now as an important part of natural increase policy and Chapter 12 presents it as central to the issue of managing the consumption of goods and services (J253). Educating the public about the multiple links between population size and quality of life must also be recognised as a separate component of population policy along with policies for immigration, aid and so on.

Here, the power of television can be invoked. One Jones Inquiry submission suggests showing a series to be shown in Australia and elsewhere on the potential of different parts of the country for supporting human life. A series on how lost civilisations declined might open eyes (J128). Migrants need to be educated in Australian geography (J170). The impacts of land use change must be understood (J145).

More comprehensively, we need to develop a long-term strategy to make the public fully aware of population issues (J197, 253), a change which will take 10-20 years (J231). For example, at the most basic level, there is great ignorance of the dynamics of population growth (J253; Meffe 1994). Many people assume that zero population growth means that parents die when they have produced two children. They need to understand that zero population growth is compatible with each individual leading a long life and having lots of descendants (J170). Such lessons might be linked with publications from the Australian Bureau of Statistics summarising the implications for the long-term population growth of each year's immigration quota (K Betts Jones inquiry transcript 28 June 1994).

While it is not controversial to advocate educating people about the 'factual' links between population and various aspects of quality of life, it clearly involves *value advocacy* to promote the view that population growth is not virtuous but something to be avoided as much as possible (J230); that the need for large populations belongs in feudal times (J131); that population growth is a problem. Such value advocacy (equals social engineering when someone else does it!) is a widespread and legitimate activity in a democratic society (J121).

Currently, population issues generate little concern and even that little is muted by fear of racism taunts (J121, 191). An education program would have to work towards making population management a fashionable and non-taboo subject (J253). Racism can be countered by focusing on desirable behaviour, not on presumed ethnic traits (J170). Some attitudes to be changed are quite subtle (J128): for example, the Australian Bureau of Statistics talking of Victoria *suffering* a population loss (quoted in J234). Less subtle is the 'empty land' illusion, fostered by decades of high immigration (J24).

Conclusions

There is a great need for public education in population-related matters. Such education includes an understanding of Australia's natural resources, the demographic processes by which populations grow, stabilise and decline, and the arguments for and against population change. A national program of public education in population-relevant matters, addressed to both children and adults, should be instigated.

Overview of population policy

> My population policy would be to aim for zero population growth as soon as possible, which means discouraging any possible future increase in family size and reducing immigration intake to compassionate cases of refugees and family reunion. Hopefully that could result in a reduction of the present rate of population growth and attainment of ZPG before the middle of the next century. (Charles Birch in J261)

If Australia attempts to stabilise its population with all reasonable speed, then it will have an approximately stable population of c20 million by the 2030s. This does not imply a population policy incorporating a population target of 20 million. Rather, reaching a population of 20 million would be a *by-product* of a policy of rapid (demographically speaking) population stabilisation. A policy of measured (cf rapid) population stabilisation would yield a more or less stable (but larger) population by the 2040s. Anything beyond this would be 'slow stabilisation'.

There is little new or radical in a policy of rapid or measured population stabilisation. A recommendation for population stability was made by the US President's Commission on Population Growth and the American Future, in its 1972 Report:

> Recognising that our population can not grow indefinitely, and appreciating the advantage of moving now toward the stabilisation of population, the Commission recommends that the nation welcome and plan for a stabilized population. (United States President's Commission on Population Growth and the American Future 1972, p 192 quoted in National Population Inquiry 1975)

At about the same time the United Kingdom Population Panel concluded that, for several definable social and economic reasons, 'a stationary rather than an expanding population would be more advantageous...in Great Britain'. (United Kingdom Population Panel 1973, quoted in National Population Inquiry 1975).

Interactions between policy components

> Australia needs an integrated population strategy. (David Pope in J53)

This discussion of population policy has been based on the recognition that a range of actions today will each affect the size, composition and distribution of population tomorrow. A comprehensive population policy must make appropriate use of all the instruments that can help set future population. These have been collected under the headings of immigration policy, natural increase policy, tourist and visitor policy, overseas aid policy, internal migration policy and education policy. Simple, practicable starting points for developing each of these aspects of population policy have been presented.

Policies on matters where choices and options depend on the nature of population change (passive or reactive policy) are not viewed as part of population policy here. Nor are complementary policies (see Chapter 12) which strongly reinforce or negate the impact of direct population policies on quality of life.

Part of the complexity of developing population policy is the inevitability of interactions between various policy components; for example, the balance between the contributions to population growth of natural increase and immigration. If a much larger population is deemed desirable a debate should be opened up on what mix of (a) immigration policies and (b) pro-natalist policies is the best way of achieving this. Reducing government expenditures on immigration would allow a major increase in offshore aid, and so on.

Preconditions for better policy-making

A successful population policy requires:

. establishing the population as a central concern of a powerful agency or government department;

. a well-developed information system for testing, formally and informally, alternatives.

The following sections take up these two points.

Institutional arrangements

It would not be difficult to assemble a long list of failures and embarrassments in the formulation and administration of Australian immigration policy, going back to 1925 when Commonwealth Statistician CH Wickens identified a 'boa constrictor principle' of taking in great gobs of immigrants in good times and 'digesting' these in bad times. More recently, apart from the annual Cabinet drama of setting a migrant quota by a process of 'blowouts and cave-ins' there have been significant failures in administering certain components of the program; for example, the failure of the 'skills' program to deliver appropriately skilled people, the 'rorting' of the business migration scheme, increasing numbers of overstayers (Wood 1994). However, this book has not used such administrative failures as arguments against what is being (mal)administered.

Several Jones Inquiry submissions suggested new or altered institutional arrangements to define and co-ordinate more closely which population policies and complementary policies are together required to achieve a high quality of life. For example:

. Environment should be a senior portfolio (J175).

. A Commission should be set up to look at population questions, identify areas for development and rehabilitation (J187).

. We should set up a department like the 1970s Department of Urban and Regional Development but run it in collaboration with the states (J236). The states have more control over settlement and land management matters than the federal government and there is always a need for co-operation and co-ordination between spheres of government (J247).

. We need for an over-arching Ministry for the Biosphere (J165).

The Jones Committee has recommended establishing a Cabinet Committee on Population to take specific responsibility for population policy. It also recommended that immigration policy remains the responsibility of the Minister for Immigration and Ethnic Affairs. So, if the government rejects the idea of a Cabinet Committee, for some such reason as 'work overload' (or for no reason), the status quo will continue with the Minister for Immigration as the de facto and unenthusiastic Minister for Population (Long Term Strategies Committee 1994 p21.). Another (political) reason why the idea of a Cabinet Committee making population policy might be unacceptable is that this does not allow policy decisions to be reversed at a higher level if they turn out to be flawed.

My own view is that establishing a population policy that has several components and links to a range of complementary policies requires the formation of an appropriate administrative and policy-making unit within the Commonwealth public service. The unit would need strong disciplinary skills in demography and environmental science. It would need strong skills in other social sciences as well as economics. The days of analysing population questions in economic terms only are past.

But where should this unit be located in the bureaucracy? In answering that question, we have to acknowledge the spreading perception that immigration policy is a part of population policy and not a substitute for it. It would distort the relationship between population policy and immigration policy if this unit was placed in the present Department of Immigration and Ethnic Affairs.

One possible solution would be for the Commonwealth Government to appoint and appropriately support a separate Minister for Population committed to the balanced pursuit of all aspects of population policy. Realistically, a Ministry for *only* Population would be quite small and is most unlikely. However, such a Ministry could, for example, be added to the responsibilities of the Minister for the Environment, Sport and Territories or the Minister for Housing and Regional Development.

One problem with this approach is that it would invite policy conflict to have population matters and immigration matters administered by separate departments. This problem would remain in the air even if the 'Population Division' was in the Department of Prime Minister and Cabinet.

While it would raise political difficulties in many minds, the best solution in my view would be to bite the bullet and establish a new Department of Population incorporating the present Department of Immigration and Ethnic Affairs. Perhaps the name could be Population, Immigration and Ethnic Affairs---in that order---for an initial period.

Information support for policy-making

> All we have to go on is the research by the recently renamed Bureau of Immigration, Multicultural and Population Research, which rarely if ever concludes that immigration is anything other than a good thing. (Editorial, *Canberra Times*, 24 May 1995)

With its Clayton's population policy (policy by default) the Australian Government has had little need for many years for serious information to support the formation and assessment of policy alternatives. For example, the National Population Council, an important source of policy-relevant information, was abolished without apparent loss to the policy-making process in 1992 (J204).

Despite a recent favourable 'in house' review, the Bureau of Immigration and Population Research is widely perceived as having failed to confront issues of population growth and stability (Healy 1994; J175, 194). The Jones Committee recommended transferring the Bureau to the Department of Prime Minister and Cabinet. This Bureau lost its claim to be an independent research group within the Department of Immigration and Ethnic Affairs in December 1994 when Minister Bolkus substituted pro-immigration and friendly speakers for previously invited anti-immigration and critical speakers on the program of a conference being organised by the Bureau (Middleton 1994).

When the time eventually comes for the formation of population policy to be taken seriously, it will be necessary to re-think how best to compile and feed appropriate and legitimate information into the policy process. The ever-reliable Australian Bureau of Statistics might well be given an expanded responsibility for supplying demographic data including immigration data. The Department of Environment might be given expanded responsibility to build a system for monitoring quality of life on top of its evolving system for reporting on the state of the environment.

These two requirements, a full complement of demographic data (projections of population size, structure, location etc) and up-to-date information on measures and determinants of Australians' quality of life, are central to formulating population policy and are further discussed in the following two sections, 'Monitoring quality of life' and 'Demographic data'. The chapter's final section, 'Research tasks' collates some questions which, according to serious analysts, need better answers and which are amenable to formal study.

Monitoring quality of life

> Happiness comes from things money can't buy: autonomy, meaningful employment, self esteem, family and friends, quality leisure time and a sense of place and belonging. (LB Daniel in J204)

Despite the difficulty of identifying unambiguous causal links between population growth and the past and future quality of Australians' lives, many Jones Inquiry submissions suggest the fundamental importance of regularly updating an agreed range of indicators and measures of personal, social, environmental and resource-base well-being (J7, 9, 190, 12). These could be published in a yearly State of Australia report (J190). Doing this would at least tell us how we are travelling even if it could not tell us how to do better (see discussion of population-quality of life modelling in Chapter 5).

Only a few suggestions for indicators in Jones Inquiry submissions match the indicators that are already being monitored in Australia; most of their suggestions would need to have innovative measurement methods devised for them if adopted. The following selection illustrates the challenge of numerically capturing the breadth and the subtlety of the quality-of-life concept. Much work would have to be done to identify and then start measuring a sensitive and practicable set of national quality of life indicators (J190, 259).

Ideas for quality of life indicators
1. *Measures of access* including access to:
. public open space, green belts and reserves (very important to populations in metropolitan areas (J221));
. wilderness and quietness, undeveloped coasts (J215);
. extensive recreation areas (humans love space and love to preside physically over it (J163, 170);
. opportunities to enjoy nature, quiet natural areas, solitude, 'unformalised' places with unprescribed uses (J222, 250, 185);
. a variety of life forms and landscapes, unspoilt beaches and places of beauty without crowds (J250, 101).

2. *Measures of social cohesion and security* such as:
. degree of conflict over resource use and allocation (J222, 96);
. safety of the urban environment; uncrowded crime free streets;
. social isolation, disease, fear of rate increases in inner city areas where old and vulnerable people are present in large numbers (J244).

3. *Measures of housing and urban services quality* such as:
. percentage of people living in detached housing; with access to a garden as a place for privacy, tranquillity, family life, growing things (J177);
. homelessness, housing construction standards, light penetration standards (J170, 100, 234, 179, 204);
. availability of first home housing finance (J179);
. reliability of urban water supplies (J215);
. space for communal activities such as dancing (J170);
. extent of sewage treatment and disposal problems (J215).

4. *Measures of transport quality* such as:
. traffic congestion and pollution;
. journey to work times by public and private transport (J215, 179).

5. *Measures of community health* such as:
. nutrition levels;
. communicable diseases associated with increased international population movements (J242, 179, 204).

6. *Measures of employment opportunities* such as:
. access to paid employment;
. intractable unemployment (J215).

7. *Measures of the social richness of life* such as:
. satisfaction of basic needs (food, sex, safety), growth needs (self-esteem, self-actualisation) and cognitive/aesthetic needs (satisfaction of curiosity, feeling in control of one's environment) (J170, 220);
. lively social, artistic and cultural life (J204);
. degree of spiritual reverence for life (J204);
. having the freedom to produce one or two children, knowing they will inherit a stable, comfortable world (J204);
. access to a variety of human ethnicities and cultures; impact of immigration on the rate of homogenisation of cultures;
. loss of identity of country towns (J240)
. opportunities to refine the democratic system and civil liberties (J204).

8. *Measures of basic biological and physical parameters* such as:
. air and water quality;
. biodiversity losses;
. biodiversity concentrations;
. climate change (J223, 186, 234, 229).

These groupings are the quality of life aspects that people experience firsthand. Irrespective of the success of efforts to model links between population and quality of life, the acute policymaker will also try to monitor imaginative measures of diverse factors in the production and distribution systems; things likely to set quality-of-life possibilities. For example:

1. *Measures of industrial efficiency* such as:
. the amount of each industrial input remaining in and recovered from the environment after use;
. the environmental costs of exports (J73, 44).

2. *Measures of levels and efficiency of consumption* such as:
. heat used to warm homes;
. time spent driving a car;
. the percentage of used materials that are recycled;
. proportion of time spent in noisy place (Henderson 1991);
. lifetime consumption of electricity, water, petrol, landfill, imports (J197).
Question: How low can we get society's material throughput? (J250))

3. *Measures of resource use and availability* such as:
. changes in natural resources per head;
. forests remaining (J44, 234).

Comparing the above free-wheeling suggestions with the limited list of indicators in a 'state of the art' publication like Australian Bureau of Statistics (1994a) *Australian Social Trends* shows that the challenge of adequately monitoring quality of life is only just beginning (Australian Bureau of Statistics 1994a).

Demographic data

Australia is fortunate in having an organisation of the calibre of Australian Bureau of Statistics to provide demographers with most of the basic data they need to make population projections which, subject to the normal procedural uncertainties, are of high quality. Its comprehensive 5-yearly censuses are widely considered valuable (J205).

Nevertheless, perhaps full censuses should be held more frequently and processed more rapidly than they are now. Also, the Australian Population Association recommends a greater role for Australian Bureau of Statistics in providing a data base for the population debate (J205, 258). The Jones Inquiry found that Australian Bureau of Statistics was not able to provide demographic scenarios readily.

In recognition of the public's lack of awareness of the link between immigration and population growth, one Jones Inquiry submission suggests that the announcement of the net level of immigration for the coming year should be accompanied by a statement of the population in 2040, if that rate were to continue (J177); and by a statement of what the projected population would be under zero net migration; and, ideally, by an annual report on the costs and benefits of the year's migrant intake (J168). More generally, takinf up a 1992 recommendation of the National Population Council, a 'population report' might be tabled annually in Parliament (National Population Council 1992).

Research tasks

In a patchy way, Australia's scientific research is tackling many aspects of the question of population size. Research into short-run aspects of immigration by economists, sociologists, demographers and political scientists predominates however. Apart from a few demographers, social scientists have shown little interest in long-term population growth, due in part to a deficiency in suitable methodologies. Environmental scientists are only just beginning to show interest in the population question (Norton et al 1994; J259). Again, methodology for studying long-term issues is a problem.

On this point, a glaring deficiency in Australia's research capability is our limited expertise in foresight techniques and at some stage we must take the business of foreseeing the future more seriously (Slaughter 1993). The puny Commission for the Future, which could have been a force here, was recently stuffed back in the womb and reborn as a marketing research organisation!

Important unanswered questions

Sprinkled through this book are indications of topics on which further understanding and information would be especially useful in the population debate and on which we are unnecessarily ignorant. That is, given a fat purse, these topics would yield understanding and information when researched by the conventional methods of natural and social science. Without any pretence of being a total research program, this section collates some of these topics, although in no particular order. In the real world, research proposals invariably get trimmed and prioritised.

1. How can cause and effect be convincingly elucidated in systems where these are both smeared thin and separated in space and time? Population-environment links are of interest here but, more generally, this problem is a foreground challenge in the study of all complex systems.

2. Do we contribute more to land based marine pollution per capita than other countries? Are Australia's marine pollution sinks small or large? How big is the global marine pollution sink?

3. Can threshold values be calculated for the waste assimilation capacity of the environment; that is, values beyond which assimilation capacity starts to fall? (J209).

4. Intra-generational equity: What can be said about the distribution between interest groups of short-term costs and benefits from population growth? To what extent are the losers from population growth compensated? To what extent are the winners taxed? Is the current widening economic gulf between rich and poor in Australia a function of population growth? Does population growth bring about changes in the pattern (cf level) of demand?

5. Inter-generational equity: Similarly, to what extent does adjusting the rate of population growth in the short-term change the levels of short-term and/or long-term marginal net benefits (disbenefits) to the population of the day?

6. Will per capita stocks of natural, human and man-made capital be higher in 2045 with a population of 19 million than with a population of 37 million?

7. Why are current resource-efficient technologies either taken up slowly or not at all; for instance, energy-efficient transport and buildings? To what extent is this effect due to a failure to internalise the externalities of present technologies? (J190).

8. What attitudes do ethnic communities have towards population growth?

9. Are spatially concentrated populations more damaging to the total (cf local) environment than strongly decentralised populations? Is there evidence that improved environments have ever occurred with larger populations and, if so, under what circumstances? (Fincher 1991).

10. Considering economic, environmental and socio-cultural factors, what can be concluded in a generic sense about optimum city size? (J222).

11. What are the benefits and costs, and to whom, of the increase in international trade likely to follow population growth in Australia?

The 1992 National Population Council report lists 15 topics on which research is required and all of these remain relevant. Examples include income and wealth distribution effects of population change; longer-term balance of payments consequences of immigration; economic and other implications of temporary movements to Australia; and equity issues involved in funding public infrastructure and community services for new population.

The need for data bases

An unglamorous and neglected bulwark of a modern research community's infrastructure is its (computerised) data bases. Repeated measures of system attributes of interest, in space and time, are the raw material from which process understanding can, we hope, be extracted. Hand in hand with the need for factual data bases is the need for bibliographic data bases so that what is already known about processes and systems of interest can be readily determined. For example, the Office of Multicultural Affairs in Department of Prime Minister and Cabinet has been compiling a useful inventory of publications on multiculturalism in recent years. The Bureau of Immigration and Population Research has a data base on population research.

But building up rich data bases is an extremely expensive aspect of research and one for which governments and others are reluctant to pay. A good example at the time of writing is the woodchip debate which is hardening because the nation's native forests have not been properly inventoried and monitored for the values that the various protagonists recognise.

It would be an efficient part-solution to the research community's problem of inadequate data bases if researchers were involved in developing and given free access to Australian Bureau of Statistics data bases, and to successive versions of any data bases developed in Department of Primary Industries and Energy (by the National Resource Information Centre) and the Department of Environment, Sport and Territories (by the Environmental Resources Information Network), so that they could monitor the state of the environment and, eventually, quality of life.

CH 12. COMPLEMENTARY POLICIES

> Questions about Australia's population size can be usefully rephrased to ask what needs to be done to carry the current population or any future population. (JW Stocker for Commonwealth Scientific and Industrial Research Organisation in J259)
>
> Theoretically it would be possible to have a larger population but...less impact... [I]n practice we see an increase in per capita consumption rather than a decrease over time. (Peter Ridd, Michael Ridd & Russel Cumming for Australians for an Ecologically Sustainable Population, North Queensland in J210)
>
> Poverty, environment and population can no longer be dealt with---or even thought of---as separate issues; they are interlinked in practice and cannot be delinked in the formulation of policies. (GH Brundtland, World Commission on Environ. and Dev. 1987, quoted in J222))

To repeat a point from Chapter 11, a very wide range of policies can exacerbate or ameliorate the impact of population policy on quality of life. Getting these =complementary policies right is as important as getting population policy right (J62). Reinforcing the idea that population and other policies are interdependent, Jones Inquiry submissions 247 and 259 note the following:

. The international community, at the United Nations Cairo conference (1994), reached agreement that population issues cannot be considered in isolation from issues of sustainable development, gender equity etc (Communique from *United Nations international conference on population and development*, Cairo, 1994)

. The National Population Council report (1992) noted that it is necessary to co-ordinate population policy with policies such as urban affairs, education, aid (National Population Council, 1992).

. Norton and others (1994) conclude that there is little point in developing a population policy for environmental protection reasons without long-term ecological and social goals.

. Australia must establish general demographic goals to provide a framework for developing better policies in non-demographic areas (J98).

This chapter has been written to demarcate and explore areas of policy thought to strongly complement population policy. What are these? Since comprehensive environmental quality is vital to the achievement of high quality of life, and sensitive to population change, one way forward here is to equate complementary policy areas, one-to-one, with other (i.e. non-population) important determinants of environmental quality.

In Chapter 6 the overall impact of human activity on the environment was suggested, in addition to numbers of people, to be a strong function of:

. what each consumes;

. what technologies are used to produce and dispose of consumption goods; and

. the spatial arrangements of human activities and land use (J79).

Reflecting and extending this view, policies complementary to population policy are grouped and discussed in this chapter under four major headings:

1. Ecologically sustainable development.

2. Settlement policy and regional planning.

3. Education and social learning.

4. Technology assessment and adoption.

Ecologically sustainable development

> Population policy is not a powerful enough tool on its own to solve Australia's environmental problems...Alternatively, an expansive population policy can act against sustainability, reducing or eliminating the gains from better environmental management. (G McGlynn 1992)

While the concept of ecologically sustainable development is difficult and probably flawed (Cocks 1992; J215) it has become an 'idea in good currency' because it supposedly captures the ends and means of socially responsible resource management, particularly in the spheres of land use and choice of resource technologies. Indeed it has been a matter for complaint that Australia's submission to the 1994 International Conference on Population and Development failed to foresee an integrated national policy for sustainability (RM Douglas, background material submitted to Jones Inquiry).

Environmental damage is a piecemeal process. It is hard to measure because it may take place slowly over many years and each generation may be largely ignorant of what environmental assets have been previously lost (J234). Nonetheless, governments widely acknowledge that Australia does have major environmental problems, as the Decade of Landcare program (J220) has made clear, for example.

In its submission to the Jones Inquiry, the Commonwealth Scientific and Industrial Research Organisation said Australia can carry its present population---or a higher one---in an economically, environmentally and socially sustainable way only if the nation is prepared to change the way it does things; that Australia lacks the necessary knowledge and understanding to manage its current population efficiently at current living standards. Every extra person and every unit increase in consumption increases the need to rectify this situation (J259). The CSIRO timidly stopped short of the logical implication of this position, unlike several other submissions: the option of putting a population increase on hold until the present system is proved sustainable (J118).

The submission the Academy of Technological Sciences and Engineering made to the same Inquiry took more of a 'technological optimist' position:

> It is not possible for us to predict whether Australia will have the will and ability to solve the social and financial problems that would arise from a doubling of the population by 2045, including the finding of jobs and exports. We are confident though that the technological and engineering solutions will be well within the capability and capacity of the next generation. (Rupert Myers for Aust. Academy of Technological Sciences and Engineering in J241)

As already noted, this position can be parodied as: We can cope, via technology, with the problems we will cause ourselves by choosing to double population.

The Australian Conservation Foundation's suggested strategy for reducing Australian society's overall environmental impact is to stabilise population numbers; to protect life-support systems; and to develop a pro-environment economy (J256).

In practice, ecologically sustainable development requires focusing more clearly on such things as urban planning and design, infrastructure provision, resource management, environmental protection, pollution abatement, and the research, education and innovation to underpin these.

Various other guidelines have been suggested for helping Australians achieve an ecologically sustainable way of life. Thus, we should be trying to adopt a more pre-emptive approach in place of our present damage control approach to environmental management (J193). Preventive actions that are affordable now are likely to be unaffordable as remedial actions later (J209). It is almost certainly impossible to achieve further development without any environmental degradation (J197), but it may be possible to institute a system of limits to acceptable change in the resource base which would guide development towards areas where the cost in environmental terms is lower rather than higher (J256). In the end, tradeoff choices such as farms versus wilderness are ethical choices (J220).

More specific suggestions for moving towards an ecologically sustainable way of life in Australia include:

. Divert funds from the military budget to environmental matters (J211).

. Encourage small-scale local water conservation schemes (J213). Stop all construction of large dams for either urban or agricultural use (J256).

. Stop the clear-felling of native forests (J256).

. Encourage the development of organic farming systems which are the only way to reduce soil erosion in farming areas to acceptable levels (J265).

. Introduce new and more convincing methods of project impact assessment (particularly to assess tourist development projects). Indicators of sustainable urban development are further discussed in Deelstra (1995).

Various goals suggested for the ecologically sustainable development of urban areas (Gilchrist 1991; Dept of Housing and Regional Development 1995) include compact city forms; maximum public transport use; the regional co-ordination of city sizes; minimum waste outputs; subregional balances of workforce and jobs; maximisation of environmental assets; directing development to more environmentally benign locations; and improving capacity to adapt to change.

Several of these are presented further on as components of settlement policy rather than here as components of ecologically sustainable development policy.

Non-renewable resources policy

The question of how a society uses its non-renewable resources such as minerals is an important part of the sustainability debate (J230). Since our standard of living is linked to minerals production, it must eventually fall (or rise more slowly) because of the inevitable future decline in mineral production. Decisions on how much of our natural resources we want to export must be taken collectively, and not at the whim of short-term market forces (Robinson 1992; J44). If appropriate weight is given to the interests of future generations, current mineral production is probably excessive in volume and sold at prices that are too low.

The possible development of substitutes is the best reason for exploiting minerals as fast as it is profitable to do so. But, within very long time horizons, the feedstocks for mineral substitutes cannot themselves be minerals. Sustainability in the very long-term means switching to renewable resources for such feedstocks. Producing substitutes for minerals, based on renewable (and land-demanding) resources can thus be expected to reduce maximum high-quality-of-life population, not increase it (J230).

Soils and natural ecosystems are non-renewable resources, although rarely recognised as such. Our society has no mechanisms for considering how and how fast they should be used up.

Using economic instruments to ameliorate externalities

The use of appropriate economic instruments to improve environmental and socio-cultural aspects of people's quality of life is widely advocated (J21) by, for example, 'environmentalists' as well as the more economically inclined (J253), mostly because such instruments, in theory, force producers and consumers to recognise and meet the full environmental and social costs of their production and consumption. That is, they are made to internalise the external costs of economic activity. Options include the full-cost pricing of resources (e.g. water, timber), granting property and access rights, tradeable emission rights, regulations of various sorts and taxes (e.g. resource rent tax and land tax rebates on wildlife reserves (J250); Cocks 1992; Economic Planning Advisory Council 1992).

For example, recycled materials would be used more widely if the environmental cost of using new resources was made part of their price by, say, imposing a virgin materials tax (J204). But the full-cost pricing of water can only go so far in increasing water use efficiency and maintaining water quality. Regulations and standards are also needed (J222). The current technologies for reducing environmental impacts are too costly to use (J194). Full-cost pricing of products made with present technologies would help to overcome this.

While economic thinking has undoubtedly developed a powerful range of, as yet, little-used tools for tackling these problems (J21; Murphy et al 1990), note that practical economic instruments are not easy to develop and calibrate. Applying a 'portfolio' of such measures is more likely to succeed than concentrating on just one instrument (Tulpulé & Clare 1991).

In the meantime it does not clarify the inescapable choice of a population strategy today (even if that is choice by default) to say, as Clarke et al (1990) do, that if all resource prices were right, a population-immigration strategy would not be needed (Zarsky 1991). In theory, of course, immigration would be self-limiting at the point where an appropriate 'externality tax' on the marginal migrant equalled the gross benefit from migrating.

Conclusions

If the core of ecologically sustainable development (ESD) consists of the more conservative use of renewable and non-renewable natural resources, then this is bound to be much more achievable under low, not high population growth. That is, appropriate population policy can enhance our prospects for ecologically sustainable development.

This is a much stronger position than that taken in the 1992 report of the Federal Government's ESD working groups which accepted that population size and growth rate were important to ecologically sustainable development (see Chapter 1) but stopped short of saying anything about what these should be.

Looking at the link between ecologically sustainable development and population policy from the other end, it seems likely that some success in ecologically sustainable development would reduce the appeal of the important environmental quality and resource scarcity arguments for population stabilisation.

Settlement policy and regional planning

Settlement policy is basically concerned with influencing the pattern and size of urban centres across Australia, particularly through decentralisation. *Regional planning* is, or should be, basically concerned with pre-empting and ameliorating the adverse external effects of land use change and intensification in city regions and their hinterlands. It concentrates on the form of development within urban centres via, for example, urban consolidation and transport and infrastructure provision. It is carried out by regulating and guiding the location of land use change and by benefit-disbenefit assessment of individual development proposals (Cocks 1992; Dept of Housing and Regional Development 1995).

However, it must be accepted that under Australia's prevailing laissez faire attitudes to social management, there is little sympathy for the ideas of broad-brush settlement policy and strategy or of regional planning. Still, it is now 20 years since such philosophies were decisively rejected (J179). The time may well have come to re-examine the economic, environmental and socio-cultural benefits and costs of a pro-active national settlement strategy plus more regional planning; probably under the more fashionable guise of 'regional policies and programs' (Economic Planning Advisory Council 1990). In the cities, the National Housing Strategy's Agenda for Action provides a well-considered starting-point (National Housing Strategy 1992).

Consolidation policy

> It will be a sad day when medium/high density housing is the dominant form of development... The poor will be consolidated, the rich will not. (Evonne Moore in J234)

Urban consolidation as a planning strategy has both supporters and critics (J252, 177; Troy 1992; Long Term Strategies Committee 1992a). Claims made about urban consolidation and the reduction of urban sprawl at the edges of large cities include the following:

. Moves towards greater urban consolidation, supported by moves towards more rational infrastructure financing, will lead to direct savings in energy and water use (McGlynn 1992).

. Since growing cities tend to become multi-centred, transport costs do not rise as rapidly as they might otherwise (J259).

. In new housing developments, smaller blocks can reduce the cost of infrastructure, but most of the savings are in the cost of the land.

. Urban concentration raised public transport use only slightly because it makes only minor changes in patterns of movement (Seminar by Professor Peter Self, Australian National University, Nov 1994).

. City fringe residents over-run by urban spread can sometimes benefit from improvements in employment prospects and services (J205).

. Urban consolidation should be limited to less than 20% of the housing stock (J234).

. Urban consolidation must not be socially destructive; people should be able to walk to most of the amenities they need (J253). People tend not to mind consolidation if they can get out of the city readily and if the city has sufficient public parks for recreation (J223).

. Far from reducing urban water pollution, urban consolidation as practised in Sydney is concentrating it further (J155).

. Zoning plans must be defended. For example, buffers like airport noise zones should not be sacrificed (J85, 221). The case for urban consolidation is stronger when the alternative involves subdividing arable land (J58).

. The new types of high density housing becoming available may be more acceptable to larger numbers of Australians (J171).

Decentralisation policy

There are 'push' and 'pull' reasons for contemplating active decentralisation programs---that is, decentralisation to reduce the diseconomies of capital city growth and/or to realise unexploited potential for development in particular regions (Duchin et al 1993). Nonetheless, current thinking remains firmly against 'active' decentralisation involving direct programs to relocate growing populations (Taylor 1990; Vipond 1990). More subtle approaches such as the regional targeting of present programs are favoured (Taylor 1990).

Jones Inquiry submissions suggest some principles and constraints which might guide the selection of programs to encourage or discourage population growth in particular areas:

. Population should be dispersed among large towns/small cities up to 1-1.5 million for social, environmental and economic reasons. People do not want to live in the rangelands (J160).

. The Murray Darling Basin is already overpopulated and demonstrates why we do not need more people (J25). Relocating its population may be necessary to avoid worsening problems in some areas (J236).

. Each catchment's population should be set by how much water that catchment produces; i.e. no water should be transferred between catchments (J170).

. Population growth should be restricted or stopped in areas where environmental degradation is clearly out of control (J86). This would include much of New South Wales, particularly Sydney (J127).

. Since the marginal costs of meeting the basic needs of additional people (e.g. food, adequate clean water, clean air) varies between regions, most notably between capital cities and elsewhere, population growth should be restricted to lower cost areas.

. National population strategy should include a national settlement strategy based on an audit of sustainable environmental capacity for all regions (J9, 202).

. Government support for regional centres should be aimed at allowing these to maintain population (J234).

. One way to develop a population policy at state level is to stop recruiting migrants or interstaters (J58). Western Australia is actively encouraging regional development in an effort to limit Perth's growth and provide a better standard of living and services to regional communities (J252).

Notwithstanding this range of suggestions, it probably has to be accepted that future non-metropolitan population growth will be largely driven by employment opportunities associated with private sector initiatives and these are unlikely to be strongly influenced by government programs (Clare 1991). Even though it costs the community more to add people to Sydney or Melbourne, individuals are not charged the 'expansion costs' they generate and this is probably why large cities continue to grow (Wyatt 1989).

Conclusions

Current Federal and State Government urban and regional planning policies in fields such as decentralisation, consolidation, transport and infrastructure are either not working or non-existent (Seminar by Professor Peter Self, Australian National University, Nov 1994). The problems are almost certainly being exacerbated by population growth. Recent Commonwealth initiatives such as the Better Cities Program (Spiller 1993) are commendable but have yet to prove their worth.

Even if Australia already had a stable national population, it is my non-libertarian view that a good case could still be made for an *active* national settlement strategy (i.e. a practical application national settlement policy) and more regional and urban planning (Newman et al 1993). In this situation, a regional planning program and a national settlement strategy could anticipate and guide the regional population changes and regional land use changes caused by internal migration. They could also correct the adverse effects of past population changes and land misallocations and misuse. Regional planning and economic instruments of the 'user pays-producer pays' type should be seen as complements, not alternatives.

With a growing population, these strategic roles would retain a similar purpose but would become more difficult and, indeed, more necessary. Conversely, greater efforts to develop a national settlement strategy and enhance regional planning efforts could counteract some adverse consequences of population growth.

It is my working conclusion that there would be net improvements in the population's quality of life, subject to employment prospects between cities and elsewhere being similar (Beer et al 1994), if future population growth occurred mostly outside the main metropolitan areas, irrespective of whether the total population is growing or stable.

Education and social learning

Educating people in basic demography, fertility control techniques and the nature of population management were tasks nominated earlier as components of primary population policy. Beyond these, there are other teaching and learning tasks which, while not so vital to population management, would complement and help to legitimate a stabilisation policy of (if one is adopted) and make it easier to develop further generations of population policy. Nonetheless, the boundary between component and complementary policies in the teaching/learning area can only be described as fuzzy.

A meta-learning task

> Each community must learn how to nurture its own bioregion. (Lesley Inglis in J142)

A society characterised by population stability would, by definition, be of a type unfamiliar to Australians. If population stability is openly accepted as a policy goal, we will have to learn how to create and manage a type of society of which we have no experience. Also, it is quite possible that in 2045 Australia will be an appropriately populated country in a grossly overpopulated world. We have to foresee the implications of this situation and learn the best way to cope with it.

But to do this, we first of all have to learn, as a society (not as individuals), how to learn to do this; learning how to learn! This challenge---developing methodology for 'routinely' devising equitable and efficient social technologies (Cocks 1992) appears time and again throughout this book. Such 'social learning', society learning to manage itself, is also vital to the survival and flourishing of Australian society over coming *centuries* as distinct from *decades* and is taken up at some length in Chapter 13.

Some teaching tasks

Learning is an attack on the unknown. Teaching involves imparting what we value or already (think we) know. Complementary teaching tasks might include encouraging the idea of bequeathing a natural environment and resource base at least as good as the one we now enjoy (J230); discouraging adherence to the primitive touchstones of 'money buys happiness' and 'development at all costs' (J199); and teaching that ecological sustainability is fundamental to human survival (J256). We should also set up more job training to obviate importing skills from overseas (J256), a position endorsed by the Prime Minister in May 1994 in the wake of the *Working Nation* statement.

We also need public education about lower consumption lifestyles, and how to reach a better balance between consumption and the split in investment between productive assets, improved quality of life, and environmental quality (J259).

Consumption patterns

> Suppose the 'community'...considered that everyone should be able to have a four wheel drive, three or four children, a seaside holiday house, new decor every two years... (Mairi Anne Mackenzie in J250)
>
> Perhaps rather than setting a target in numbers, we should set a target of maximum consumption, i.e. ensure that even if the population continues to increase, that consumption remains stable... (Indra Esguerra in J253)
>
> Not only have Australians, per capita, doubled our food intake since 1967, we now eat more than three times the minimum energy requirement...(Christabel Chamarette for Western Australian Greens in J255)
>
> Few in Australia have much choice about how much energy and resources they consume. (Sheila Newman for Australians for an Ecologically Sustainable Population in J170)

It is acknowledged that, along with population size, high material consumption contributes greatly to the impact Australian society makes on the environment, and a reasonable initial policy goal would be to reduce growth in consumption as far as possible---while maintaining the standard of living (J233). This has learning and teaching components: learning how to reduce consumption per head while teaching people that they do not need to consume so much.

Jones Inquiry submissions make many suggestions for attaining lower levels of material throughput per head, confident that education can reduce both consumption and population (J253) and that a reduction in resource use need not decrease Australians' quality of life (J205).

Can such a goal be explored further? It has been suggested that if we are to achieve intergenerational equity we must begin by determining a level of affluence which we will not exceed (at least without first reducing population) (Weiss 1989; J226). If we are to achieve intragenerational equity, we must remember that most Aboriginal communities have legitimate aspirations for higher consumption levels. Other Jones Inquiry submissions argue that significant lifestyle changes are unachievable and that limiting population is the best approach to limiting pollution (J11).

Suggestions for managing consumption patterns include imposing capital gains tax on big homes (J26); encouraging people to grow more of their own food (J83); finding ways to reduce the number of motor vehicles (J88); tackling the difficult task of reducing advertising (J190); using the defence forces to demonstrate low-impact lifestyles (J198); encouraging more recycling (J211); discouraging low-density urban living which is an ecologically and socially destructive lifestyle (J251); and encouraging part-time work in tandem with convincing people that they do not need to consume so much (J253).

Conclusions

There is no reason to disagree with the common perception that increasing consumption per head and increasing population have comparable effects on many aspects of quality of life. Thus, reducing consumption per head is sometimes touted as an either-or alternative to stabilising population when seeking high quality of life.

However, it is difficult not to be sceptical about prospects for reducing consumption per head, with so many obstacles to that outcome---dominant values promote consumption, e.g. community admiration of affluence; Aboriginals and the poor are entitled to be raised to average community consumption levels; the power of advertising; and the lack of 'flags' that consumption is increasing and to warn us about the implications of such increases.

There is a major political problem with reducing consumption: it is in each economic sector's interests to promote the consumption of its own products. More generally, governments are committed to economic growth.

How else might choice of population policy affect education and social learning policy? One way, in principle, is that a policy of population stabilisation can free the education-learning system from having to cope with ever-increasing numbers of students so that more resources can be spent on improving educational quality.

Technology search and assessment

Some views on the social role of technology

> Historically, scientific and technological change...has been a massive magnifier of humanity's impact on the environment. Increasingly, however, science and technology are becoming a force to ameliorate the impact of industrialisation and population growth. (JW Stocker for Commonwealth Scientific and Industrial Research Organisation in J259)

> Two factors are accelerating the deterioration of the Australian environment: one is our increased technological ability to make demands upon it, and the other is the size of the Australian population...(JMB Smith in J62)

> ...the speed of technological change should not be exaggerated. Its implementation often involves overcoming social, economic and political constraints. Our present technology is one that involves heavy material demands on the environment; and it is difficult to see this changing radically for some decades at least. (Mark O'Connor for Writers for an Ecologically Sustainable Population in J197)

Technological optimism

> ...(technological fixes) to our problems lag by decades. (David Cooper in J91)

> The opponents of population growth take no account of the impact of technology and innovation on the nation's capacity to sustain a growing population...if farm productivity improves no faster than it has over the past 45 years, then by the year 2040 Australia will be sustaining a population of circa 150 million. (Ian Mott for The Growth Lobby in J251)

Technological optimists say humanity will always cope with its problems with the help of market forces and ingenuity (J241); because of their inventiveness, people can ignore the biological limits that affect other species (J179). While technological optimists are not automatically or by definition in favour of population growth, they do tend to comment on the contribution that technology might make with population growth than on what it might achieve for a stable population.

Technological optimism is widespread in the community; a common response to warnings about problems such as diminishing water supplies, declining productivity of agricultural land and increasing air and water pollution is to suggest that technology will cope with these (J134). The optimists' credo is that present and emerging technologies will continue to tackle environmental problems more cheaply and more successfully. Of course, having the technology to reduce environmental impacts does not necessarily mean that it will be used, especially if those impacts affect the environment at no cost to the perpetrator (J73).

Technology and environmental quality

Technological change can be seen as a major cause of declining quality of life and, at the same time, as a force with great potential to solve current quality of life problems and enhance future quality of life. For example, technological change has fuelled consumption but is now also decreasing the impact of consumption by increasing efficiency and reducing waste (J259). Thus technology may give us a breathing space to deal with the depletion and pollution of the natural environment (J44, 241). Another way of looking at it is to regard technology as out of control, causing problems which then have to be ameliorated with further technology.

Some views on technology and production

> Improved technology allows more output to be produced with less input. (John L Perkins in J169)

> ...improved productivity has achieved what it (by definition) set out to do---produce more goods with fewer employees (i.e. create unemployment). (Gordon E Hocking in J194)

> The introduction of new technology...will ensure that Australian agriculture will be able to supply the needs of (32 million) population and maintain export levels. (Rupert Myers for Australian Academy of Technological Sciences and Engineering in J241)

Over the past 50 years numerous technologies have been developed which allow us to produce the same output from less input. The trouble is that we do not use less input. Because of population growth, declining terms of trade and so on, we invariably use technology to produce much more output with the same input. Thus, technology has not been able to fulfil its promise of reducing pressure on natural resources and environments.

The immediate downside of technological change is that it commonly produces job losses and social disruption. As of now, we have little skill or enthusiasm for anticipating these impacts and attempting to ameliorate them.

Some views on technology and population

1. The role of technological change should be to allow a small population to function efficiently, not to accommodate the demands of a large and growing population (J177). Technology will reduce even further the need for large populations (J131). Even with better technology, more people will do more damage to the land (J93).

2. A small population with good information technology has access to the intellectual products of a large population. We must use modern technology to communicate and socialise with like minds from the global pool (J170).

3. Technological advances in transport and electronic communication will promote the substitution of short-term movements and electronic contacts (e.g. video phones) for permanent migration (J177).

4. In theory, technology might solve problems caused by population growth but pollution and habitat destruction might wipe us out first (J84).

The need for technology assessment and search

Opinions on technology's roles, like those above, are interesting and provocative but cannot be properly analysed in a sentence or two here. There is an extensive range of scientific literature on the social functions and impacts of technologies, including journals such as *Technological Forecasting and Social Change*. However, several policy implications readily suggest themselves.

A first policy implication of this diversity of observations is that Australia must take an active part in the developing field of technology assessment. Proper technology assessment involves the comprehensive evaluation of the full range of social, environmental and economic benefits and disbenefits of potential, new and problematic technologies (J73).

A second policy implication pertains to possibilities for technology search and encouragement. To what extent is it possible to set directions for Australian research (Australian Science and Technology Council 1990)? Some Jones Inquiry submissions are concerned that technology is used to ameliorate 'bads' rather than prevent them (J253). Can this tendency be reversed?

For example, what scope does technology have for reducing the consumption and waste of limited resources? Technologies to reduce environmental impacts already exist but many are too costly to use (J194). Or, as the space program shows, such technologies can be deliberately developed (J250). Should there be tax subsidies for introducing technologies that reduce environmental impacts? (J73). Can technology be guided towards enhancing product quality as an alternative to extending physical production? What role might technology play in moving us towards a steady state economy? (J256).

General comments on complementary policies

This chapter has briefly discussed four policy areas judged to be particularly worthy of attention at the present time for determining present and future quality of life: (1) the sustainability of current production and consumption activities; (2) management of land use change and intensification; (3) the quality of society's teaching and learning systems; and (4) technology guidance.

The goals of the first three of these are somewhat more likely to be achieved with population stabilisation than with population growth, either by reducing the magnitude of the task or releasing resources to meet it. Conversely, well developed policies in these areas could ameliorate some of the adverse consequences of population growth.

Note also that whether population is growing or stable, the achievement of policy goals in these areas (not to mention other areas like health care provision) is made easier by knowing what future populations are intended to be; that is, by having an *explicit* population policy.

Technology guidance is slightly different. Whatever the population policy, technology advances must be guided into serving it, by the use of market instruments, assessment procedures etc. Growing populations particularly need impact-amelioration technologies and stable populations particularly need labour-saving technologies. It is important not to put blind faith in technology as the way to solve problems, nor to see it as an excuse for not acting on all fronts.

The broad conclusion to emerge from this chapter's discussion is that *the achievement and/or maintenance of high quality of life requires the active development and use of the full range of primary population policies as well as complementary policies.*

CH 13. THE LONG VIEW---LEARNING TO ADAPT

Australia will still be here in a thousand years. (John Burke in J86)

What is adaptation?

An adaptation is a physical or behavioural change that enhances performance.

An *individual* member of a particular species is well adapted to its environment when it is highly likely to survive until it has reproduced and changed into post-reproductive form.

A *population* (the collected members of a species) is well adapted to its environment when it is highly likely to survive until it evolves gradually into a different population.

A *species* is well adapted to its environment when it is highly likely to survive within an evolutionary timeframe (Williams 1966).

In search of adaptive success

This chapter is written on the assumption that today's Australians want Australian society to survive, and to survive in a way that offers its members high quality of life, for at least the next thousand years or perhaps 'as long as the Aboriginals have lived here'.

This starting point accepts that expectations about *collective quality of life*, on one hand, and the probability of *total social breakdown*, on the other hand, are the two principal indicators to be considered in comparing and evaluating the prospective success of whatever alternative adaptation strategies are open to Australian society. To coin a catchphrase that combines both signals, the goal is *quality survival*.

Just as 'quality of life' emerged in earlier discussions as a difficult concept to deal with, so is 'total social breakdown'. Thinking for the moment of Australian society as a living organism, total social breakdown would mean *death*. We are talking here about changes in Australian society that would render it unrecognisable, e.g. a totalitarian order or a disorder of feuding warlords in an environment bereft of a collective social and physical infrastructure normally registered by life expectancy, maternal mortality, access to primary health care, clean water and sanitation, illiteracy, malnutrition, justice, oppression of women etc.

In this chapter then, we are interested in:

1. identifying and evaluating alternative long-term adaptation rules and strategies for Australian society; and

2. the role of population management in those strategies.

Our first step is to build a theoretical or conceptual framework for the expression and discussion of such issues.

Some theory

There are two fields of science which have produced theory relevant to the task of thinking about the quality survival of Australian society over centuries and millenia. One is the *management of complex adaptive systems* and the other is *ecosystem dynamics* or, perhaps, its near relative, *evolutionary ecology*.

Not much of a game really

Complex adaptive systems are like chess games with many players around a board where the pattern of squares is constantly changing, where you can take over any pieces you capture and a new player comes in every time a player is checkmated. Adaptation is a matter of learning to play the game better by constantly adjusting the rules that guide your choice of moves. Success is nothing more than staying in the game. There is no way any player can 'win'. The best you can hope for is to enjoy playing.

The concept of 'system' has arisen as part of humanity's efforts to make sense of the world it finds itself in. By definition, systems are networks of many isolable components or units continuously interacting with each other according to their own behavioural rules. Once discovered, the world turns out to be full of 'systems'! While components of any properly identified system interact with 'the rest of the world' (other systems), this interaction is muted compared with the intensity of interactions between components within that system.

The behaviour of *complex systems* is particularly difficult to predict when one or more of the interactions between their components is disturbed by factors outside the system (Waldrop 1992). All complex systems change into ever-different configurations of components and most have very large numbers of components. Predicting the future configuration of a complex system is difficult because it requires knowing accurately what the state of each component is (on-off, big-small etc) and all the behavioural rules which each component follows, even rules that have never been previously used. Even then, as suggested by chaos theory, the behaviour of complex systems may still be inherently unpredictable over periods long enough to be useful: for example, the difficulty of long-term weather forecasting (Glieck 1987).

A complex *adaptive* system is even more difficult to understand and make predictions about because the behavioural rules followed by one or more of its components are themselves in a state of flux. For all practical purposes, only the systems with living components---organisms or organisations of linked organisms---show adaptive behaviour. Living components have an *adaptive capacity* to create new behavioural rules for themselves and they act as though they are using this capacity to try to turn whatever happens to their advantage (Allen 1994; Holland 1975). Inanimate components like rocks and atoms have behavioural rules but no adaptive capacity.

Examples of complex adaptive systems include:

. Australian society in general---that is what the residents of Australia, and their organisations, think, say and do;

. sub-systems of Australian society such as its political economy;

. ecosystems where populations of species compete for living space in a physical environment that has three major components---earth materials (e.g. soil), water masses (e.g. water in the soil's pores) and an atmosphere;

. the world economy and world power structures; and

. the molecular biology of organisms.

Examples of complex systems that are not adaptive, insofar as the rules governing their behaviour do not change, are the cosmos, the weather and sub-atomic matter.

It is helpful to think of each adaptive component of a system as constantly playing a game with its environment---the rest of the system---in which it seeks to prosper (e.g. survive and reproduce) by constantly developing new behavioural rules, keeping the ones that pay off well and abandoning the others. The extraordinary difficulty of understanding complex adaptive systems comes from the fact that every one of the system's adaptive components is simultaneously 'trying' to do the same thing.

In general terms, the behavioural rules which adaptive components of a system generate tend to prescribe a behaviour that may benefit the adaptive agent if 'the rest of the system' behaves according to some particular prediction made by the adaptive agent---if predicted situation is A, then behaviour B may be successful. New forms of such rules arise 'spontaneously' or by the active combination of present rules.

Once a new behavioural rule has been tried out, the rest of the system feeds back an 'error' message or a 'success' message to the adaptive component. That is, the environment behaved either as predicted and the prescribed behaviour worked (success) or it did not (error). Behaviour that earns a 'success' message is reinforced, meaning 'more likely to be used again', and behaviour that earns an error message is tentatively rejected.

This 'trial and error/ trial and success' process is the common core of what is meant in different contexts by the terms adaptive behaviour, learning behaviour and evolution. *Biological evolution* is an example of adaptive behaviour by a group of organisms linked through generational succession. *Individual learning* occurs when an organism's behavioural rules alter during its own lifetime. *Social learning* occurs when organisations of organisms acquire new collective behavioural rules. *Social evolution* occurs when new organisations arise. **At some fundamental level, learning, evolution and adaptation are all the same**.

Even bacteria learn

All complex adaptive systems are constantly predicting the future. Even bacteria are 'predicting' in the sense that new genomes (behavioural rules embedded in genetic material), each of which would succeed in some possible future environment, are constantly generated and tried out. If a trial genome and an eventuating environment 'match', the trial genome can reproduce and becomes established.

Can complexity be managed?

Though science has made little progress in learning to predict the behaviour of complex adaptive systems, it has winnowed out various properties of such systems which provide some basis of understanding from which we might begin to manage them (Waldrop 1992, p145; De Greene 1994). For example, complex adaptive systems are invariably hierarchical---that is, they have many levels of organisation. We can identify 'systems within systems', 'systems within systems within systems' etc. Each system's building blocks, its sub-systems, sub-sub-systems etc, are constantly being reorganised within and between hierarchy levels as the system gains experience (called feedback).

The hierarchical method of organising complex adaptive systems is efficient in the sense that it economises communication (Boulding 1978) and allows specialist sub-systems to evolve. Specialist sub-systems can efficiently carry out tasks important to the system's survival but at the price of losing their capacity to cope with a variable environment. Specialist sub-systems are therefore protected by the rest of the system from environmental 'shocks' as though in payment for their specialist services---a relationship of mutual dependence. Upper levels of an hierarchical system develop behavioural rules which 'manage' the environments of the system's lower-level components. Although such components and their rules evolve unconsciously in 'natural' systems, anthropic or human social systems have an awareness, albeit limited and patchy, of how successful hierarchical systems survive and they consciously attempt to learn new and better behavioural rules.

What does it mean to 'manage' a complex adaptive system? For one thing, it means being able to keep the levels of some of its important characteristics within certain bounds. Recent thinking conceptualises this task as one of *adaptive management*, involving the development of a comprehensive set of *feedback policies* or *contingency plans*, one for each possible state of the system. Thus, the manager regularly monitors the values of the system's key attributes and then applies the appropriate adjustments to the system attributes under hir direct control---called *control variables* (Walters 1986). For example, under adaptive management the feedback policy or recipe for the rabbit-control task might be to initiate control measure X (poisoning, say) when population density reaches critical value Y.

So far we lack the methodology for routinely and systematically developing such feedback policies. One major difficulty is that controlled experiments on complex adaptive systems are either infeasible or extremely expensive. Feedback policies have to be developed on a 'learning while doing' basis. Present approaches to designing management guidelines for adaptive systems recognise that every management action can be chosen to learn as much as possible about the system, or to improve system performance or something in between. Actively adaptive management, in the style expounded by Carl Walters (1986), for example, seeks 'to establish some optimum, or at least reasonable, balance between learning and short-term performance'. Walters gives useful, but not rigorous criteria for when to probe.

The main point here is that while some very useful thinking has been done about adaptive system management, it is still very much more an art than a science and certainly not expressible as firm methods or recipes.

Ecosystem dynamics

Ecology (the study of ecosystems) and biological evolution (the study of the rise and fall of species), provide the archetypal examples of complex adaptive systems at work. The formal definition of an ecosystem is 'the physical and chemical environment of a community of organisms and all the interactions among those organisms and their environment'. Over time ecosystems change mainly in terms of the range and population sizes of species present but also in terms of the distribution and availability of the inanimate components of the ecosystem---soils, airbodies, waterbodies etc. For example, the number of representatives of a particular species either grows exponentially (i.e. at an absolute rate which increases as the population gets larger), 'crashes' or remains stable for long periods.

Ecosystem dynamics is the study of how ecosystems behave over periods long enough for significant changes to take place in the mix of species and the physical environment in which those species live. Ecosystem dynamics blurs into *evolutionary ecology* when we start to consider what happens over periods long enough for significant *genetic change* to build up in an ecosystem's populations. These disciplines ask questions like 'Which species, populations and communities are extinction prone?' 'Why?'. Obviously such questions can apply to the human population of Australia as well as to plants and animals.

A catch-all answer to that basic question is that a small population of a species of low genetic diversity living in an uncommon, highly variable environment is particularly prone to extinction. If that species has a short life-span, low fecundity and highly specialised needs (e.g. it depends on just one other species to spread its pollen) and capabilities (e.g. it can feed from only one flower species) then its probability of extinction is higher again. Humanity's long-term survival and increase in numbers is often attributed to a short-term ability to survive by flexibly drawing on a wide variety of resources in a wide variety of environments (Pimm 1991).

> ...if one feature sets humans apart from other animals, it is the breadth of the ecological niche we presently occupy. (Flannery 1994)

Ecologists use terms like stability, fragility, resilience, persistence and resistance to compare the survival prospects of different multi-species communities. By building these properties into mathematical models some extraordinarily interesting scenarios of how communities might change can be developed. It is much harder, though, to confirm that a particular real community has particular properties and will therefore evolve in a particular way.

Can Australian society be reasonably compared to an evolving ecosystem, changing as it adapts to an ever-changing environment? (Catton 1987). If so, some of the insights gained by the study of ecosystem dynamics and evolutionary ecology could help with the task of thinking about quality survival strategies for Australian society.

For example, is the Australian population likely to crash, stabilise or grow? What ecologists can confidently assert is that, like any other growing animal population, Australia's human population of Australia will eventually stop growing and either stabilise or go into decline, rapidly or slowly. What cannot be predicted at all well is when growth will stop for one reason or another (J222). Almost certainly, the Australian population is not in equilibrium with its environment (J90, 218). A cautious judgement about where we are on the population growth curve could avoid an over-run of carrying capacity (J261). For example:

> Prima facie, an ever-growing population is not a feasible option in a finite natural environment. (Evonne Moore in J234)
>
> Societies are living systems and growth is natural up to a point of maturity where levelling off occurs. Permanent growth is cancer. (Norman Poulter in J221)

One Jones Inquiry submission attempts to interpret Australian society in the terms used by professional ecologists when studying species populations in plant and animal communities (J220). For example, the level of imports represents how much of our *habitat* or living space is, in effect, in other lands. Countries such as Singapore and Japan have a high population density but their habitats extend beyond their territorial boundaries (J127). Complex adaptive systems have many niches. A niche exists when an organism with particular capabilities and needs has a chance to survive. Jobs in human societies are equivalent to *niches* in natural ecosystems.

Observations drawn from exploring the ecosystem metaphor include:

. The likelihood that resources from other lands will continue to be available must be taken into account when discussing Australia's population; e.g. oil supplies.

. In the wild the jobless would die. We continue to import people even when there are not enough niches for those already here. The shortage of niches is expressed in Australia's below-replacement birthrate.

The distinguishing characteristics of human societies which have allowed them to apparently override ecological rules include their ability to modify the environment, their ability to appropriate resources from other species' habitats, and compassion (we feed those occupying poor niches).

The submission concludes that the existence of political choice limits the usefulness of the ecological concept of carrying capacity when the task is searching for human population targets.

Despite a few useful attempts by the Ecological Society of Australia (e.g. Nix 1972), we have not learned as much as we might of the lessons ecology has to offer policy-makers. Whether policy-makers would be interested is of course a horse of a different colour. A useful starting-point for bringing ecosystem theory to bear on the future of Australian society would be to organise a highly publicised colloquium of the country's best ecological brains, each attempting to view our society as an evolving ecosystem with particular reference to the human population over coming centuries. Are we a small population of a species of low genetic diversity living in an uncommon, highly variable environment? Have we developed resource acquisition strategies which are evolutionarily harmful (Heinen and Low 1992)? Is our society fragile, resilient, persistent, stable etc?

Social learning

There are two major differences between ecosystems containing large numbers of humans and 'natural' or 'undisturbed' ecosystems. One is quantitative and the other is qualitative. Quantitatively, humans have evolved behavioural rules which, relative to other species, involve mobilising and redirecting very large quantities of energy (e.g. fossil fuels) at very high rates. Whether the last history of the world will show this to have been a fatal mal-adaptation we do not know. Qualitatively, the human capacity for social or collective learning is present in only the most rudimentary form in other species; for example the hunting behaviour of a pride of lions or a wolf pack.

In social learning a population finds out by trial and error whether some recurring problem can be solved or avoided by a new form of collective behaviour---for example, that establishing a land titles register reduces conflicts over land ownership. Humans, as individuals and as populations, have the power to reprogram themselves, to reconfigure their behavioural repertoire, within a single generation.

<u>...versus human evolution</u>

The idea of adaptation through social learning is less familiar than that of adaptation through biological evolution, and it is best clarified by drawing out several comparisons between the two:

1. In social learning, speech and writing provide the analogue of genes in biological evolution. With social learning, information can be transmitted without a generation gap which means that adaptation can be speeded up.

2. Bright new ideas which spread from person to person are the analogue in social learning of mutations in genes and crossovers in chromosomes. They have been given names such as *memes* by Dawkins (1989) and *culturgens* by Wilson (1975).

The meme concept is evocative rather than precise but, from the plethora of memes that begin life, a few are somehow selected to grow into *ideas in good currency* (Chapter 3 referred to Donald Schon's thinking about how government policies change). However, as in biological evolution, most bright ideas do not survive. To quote Dunn (1971), who anticipated some of Wilson's and Dawkins' thinking:

> Like biological mutation, human 'idea mutation' does not always generate relevant ideas. Those idea inventions or behavioural innovations that are not consistent with the interplay between operating environment and operating goals tend to lose force. Those that promote a convergence between environment and social goals are reinforced.

Social goals

Dunn's reference to *social goals* flags a critical difference between biological evolution and social learning. It is what writers like Sartre (1948) and Camus (1946) have identified as the 'existential burden'. By this they mean that humans have to consciously choose the goals they want their behaviour to achieve. In this book I am suggesting *quality survival* (indefinite survival of the society plus high quality of life) as an overarching long-term social goal for Australia. The difficulty with this imperative is that it carries with it little idea of whether the chosen goals will lead us up an evolutionary blind alley---as has been the case for most species changing through biological evolution.

The immediate problem with a social goal of quality survival is that it is not operational in the sense that we lack criteria for checking whether quality survival is being approached. Or, rather, the survival component of that goal is not operational. Measuring whether people are leading long healthy self-fulfilling lives doesn't seem impossible, but what of measuring survival prospects? Do high survival prospects equate with developing a capacity for social learning which maximises the probability of a smooth transition to a new society, whatever it may be---without without violence, hunger, disease and other sources of misery?

Taking a different tack, perhaps the goal of social learning for survival is nothing more than to become better at social learning. This is what confers the flexibility to adapt quickly when strange and unforeseen problems threaten group (national) survival. Maintaining options and increasing richness of choice are fundamental to successful goal-seeking. The history of evolution suggests that a wise society is prepared to sacrifice a good deal of visible efficiency for future flexibility (e.g. Common and Perrings 1992). Evolution favours entities that can adapt to change, and it eliminates those that cannot (Allen 1994). *Adaptation is good; adaptability is better.*

So, to recapitulate: social learning is the foremost process by which modern societies adapt to their environments. This process has similarities to and differences from phylogenesis or biological evolution.

Social technologies: a powerful concept

> The solution of social problems lags behind technology because we have not organised the same sharp search for ideas to deal with them. (JR Platt 1966)

An idea whose time has come still has to be executed. Sometimes the means will be obvious, perhaps nothing more than allocating more funds to already-established programs. At other times execution will require the invention of one or more *social technologies*, built around *ideas for implementing ideas.*

In *The city in history*, Lewis Mumford (1961) points out that although the technical foundations of the industrial revolution were the exploitation of the coal mine, the vastly increased production of iron, and the use of the steam engine, the large-scale use of these technologies depended upon the invention of new forms of corporate organisation and administration. These inventions, what I call *social technologies*, following Geoffrey Sawer (I have lost the reference), included the joint stock company, the limited liability investment, the delegation of administrative authority under divided ownerships and the control of production through budget and audit.

It is easy to think of dozens of such *social inventions* (John Platt's name for them): the alphabet, standard time, credit cards, the research and development team, pay-as-you-earn tax, debt-for-nature, the Constitution, policy instruments such as transferable fishing quotas, milk quotas and so on (Platt 1966). The 'Torrens' land-title system is a highly successful Australian social technology that rests on the fact that the state guarantees the information in the titles register book.

Rules and roles

Social technologies appear in various guises. Some work, metaphorically, by creating roles for people and then issuing stage directions for playing those roles; think of the legal system. Such *social technologies are practical applications of ideas for structuring classes of directed interactions between people and parties*, 'rules of the game' if you prefer. They are institutional changes in the sense of either changing these rules or setting up new 'games'.

In a large class of social technologies known as *decision-support systems*, the emphasis is on ideas for collecting and processing specified information to reach some useful conclusion, such as public participation in land-use planning. A further large group is what Ian Lowe (1988) calls 'social mechanisms for handling the results of technological change', (e.g. road rules), but equally large numbers have a minor or no technological trigger (e.g. the Federal Constitution). Others are specifically designed to exploit new material technologies (e.g. teleconferencing, credit cards).

The commonplace observation that technological change is a social process is confusing. The *diffusion* of a new (material) technology through a community is what comprises a social process (and social technologies may well be devised to make use of new (material) technologies), but the new recipe should not be mistaken for the feast.

All social technologies are recipes developed to solve a social problem, meet a social need or achieve a social objective. Some are developed for profit, others by government acting in the public interest. One misunderstanding that should be pre-empted, however, is that social technologies are just another name for *social engineering*. Social technologies work *with* people's desires and tendencies; social engineering tries to *change* them. If there are worries that social technologies might condition or indoctrinate people in unacceptable ways, the solution is to establish clearly just what people's rights are and ensure that these are respected, not to take the attitude that a society can never attempt to change its members' values and attitudes.

Frequently, a material technology spreads without any corresponding development of new social technology. Consider the example of land-information systems. These 'replacement' technologies are essentially computerisations of the land ownership registers in each state. They have been taken up enthusiastically in all states because they allow lands department officers to do exactly what they were doing previously, but much more quickly and much more accurately. Just as information technology is a major part of the total technological effort, social technologies that make significant use of information technologies are becoming an idea in good currency (e.g. electronic mail).

The idea of social technologies is powerful and extremely useful, and one of the central questions of this chapter, taken up later, must be whether it is possible to deliberately create successful social technologies. *Flowering social technologies are the marks of a learning society* (Cocks 1992).

Some history: 200 years of social learning

> Tim Flannery says:
>
> It is ignorance of the past that dooms each new wave of immigrants to the 'new' lands to be future eaters. So certain are they of their superiority; so sure are they of their ability that they do not think to learn from those who have gone before them, nor do they take the time to read the signs of the land until disaster has overtaken them. (Flannery 1994)

Returning from theory to reality and as a launching pad for thinking about the long-term future of Australian society, this section briefly concentrates on the social learning experiences of post-1788 Australian society (that is excluding the adaptation to Australia by pre-European Aboriginal populations over 50 000 plus years). The ever-unfolding story of how the Aboriginals adapted to (and were moulded by) the Australian continent and forever changed its flora and fauna through firestick farming and by their hunting techniques, including the introduction of the dingo, is fascinating but deserves nothing less than the extensive, perceptive treatment given it by Tim Flannery in 'The future eaters' (Flannery 1994).

It is helpful to start by putting the Australian environment into a global context. Apart from size (the sixth largest country in the world) and location (isolated in the southern oceans), Australia's outstanding natural attributes are a dry climate and a geologically ancient land surface. Taken together, these factors have produced a resources complement which, by global standards, is noteworthy in at least the following ways (Cocks 1992):

1. A climate characterised by low variable rainfall and strong climatic gradients between coast and inland, droughts and floods.

2. Generally unproductive soils---infertile, shallow, stony and salt-prone. Over much of the country, tightly coupled natural ecosystems evolved which ensured little loss of the limited available nutrients.

3. Limited occurrences of perennial surface water and snowfields.

4. A long varying coastline abutting a biologically diverse but commercially unproductive continental shelf.

5. A featureless landscape with little mountainous terrain.

6. A rich and unique complement of native plants and animals.

7. Limited areas of (a) natural grassland and (b) relatively unproductive forests.

Some of the land use implications of this situation have been that intensive settlement has been possible over only a modest fraction of the country; large-scale forestry activities have not been possible; intensive agriculture has been possible only in the wetter fringes of the country; the coastline and inland waters have become the foci for recreation activities; ground transport systems have been slow to develop over the country's long distances and have been of poor quality; the production of minerals for export has been and continues to be an important economic activity; and methods of adapting European agricultural systems to the Australian environment have had to be developed *de novo*.

Some spectacular historical misjudgements

Because European settlers had to learn to understand the Australian environment from scratch, it is inevitable that they should have misjudged certain consequences of various land management practices. Among the more spectacular of these were misjudgements about:

1. Long-term livestock-carrying capacity and crop yields in inland areas (Campbell 1966); the impact of introducing feral animals (particularly rabbits and foxes) on pasture and range productivity and on native mammals (Ratcliffe 1947; Rolls 1969).

2. The effects of introducing exotic plants destined to become weeds. One thing that we have learned is that exotic plants can remain *in situ* for decades and then explode across the landscape. *Mimosa pigra* slumbered in the Darwin botanic gardens for more than 80 years before running wild (Braithwaite et al 1989).

3. The unforeseen consequences of excessive timber clearing---e.g. salinisation, erosion, woody regrowth, species extinction. WE have learned that an abundant species can disappear with startling rapidity; localised species occurring over only limited areas are in particular danger, as are species occupying specialised habitats (Woinarski & Braithwaite 1990).

4. The effects of uncontrolled irrigation; e.g. the salinisation of soil and water as rising water tables carry the salt of ancient marine sediments upwards (Peck et al 1983).

5. The susceptibility of bare soil to water and wind erosion.

6. The risks and consequences of floods and fires (Luke & McArthur 1978).

Such technical misjudgements explain a great deal about Australia's changing land use patterns since white settlement. While many individuals have paid dearly for their own mistakes, the social costs of individual mistakes have dwarfed the private costs in many cases. Salinisation in the Murray Darling Basin, the source of a third of the country's agricultural production, is a national disaster as well as a disaster for farmers forced off their land.

Passing judgement

In judging a people's adaptive success, consider the fact that colonists confront a more challenging task than an established society does when circumstances change. Against that, they may find virgin resources, such as minerals and lightly grazed pasture lands, awaiting easy exploitation.

So, how well have post-1788 Australians adapted to their environment? How well are they using their island continent today? How far have they moved towards a society with good survival prospects and members who lead long, healthy, self-fulfilling lives? Within the perceptions of times past, they have made reasonably good use of the opportunities presented by Nature:

. The population is sensibly concentrated in pleasant, medium-sized, relatively unpolluted cities in the subtropical to cool-temperate regions.

. After a late start, the continent's great mineral wealth is being efficiently exploited (Duncan 1987).

. Maximum use has been made of limited timber resources, running down native hardwood supplies, but building up high-yielding softwood plantations (Resource Assessment Commission 1992).

. Australian farmers have achieved major status as world suppliers of wool, meat and wheat, developing numerous innovative technologies along the way (Donald 1988).

. At least in the south, the little available surface water has been comprehensively harnessed (Day 1988).

. Major natural features such as the Barrier Reef and the rainforests have been protected from single-valued exploitation. The national parks system is extremely well developed by world standards (Australian National Parks and Wildlife Service 1988).

However, even the optimists admit today's Australians have not learned how to use, productively and sustainably, the wet-dry tropics, the drier, droughtier rangelands or the nutrient-poor continental shelf. Their temperate and subtropical crop-pasture systems are massively threatened by soil erosion, salinisation and acidification. Sectors of the country's small fishing industry face closure thanks to overfishing, and much of the 70% of Australia classified as rangelands supports ever-declining stock numbers.

Notwithstanding, it is widely believed that if these changes are heeded as warnings and opportunities to be grasped, such difficulties will be overcome. Such optimism has its place. It is important nationally, just as it is personally, to have a positive view of oneself and one's achievements.

In the realm of social organisation, Australia is now one of the world's oldest democracies; it ranks seventh in the world for the UNDP's Human Development Index covering life expectancy, literacy and per capita income; it is an intellectually and culturally exciting country (in my opinion). But it is also a violent and greedy country; it has dismally failed to deliver social justice to the Aboriginals; and it is failing to cope with a growing disparity and polarisation between rich and poor.

Nonetheless, by world standards Australians have used their resources to build a prosperous and pleasant society. Presently we will ask how well they have set themselves up to survive the next millenium.

Innovative social technologies

The Australian social learning experience has led to some particularly successful social technologies. Examples in the field of natural resource management include:

1. The Torrens land-title system, named after its developer, which eliminates conflict over land ownership because the state guarantees the information in the titles register book.

2. The Victorian Land Conservation Council, a government body that for many years allocated that State's public lands amongst interest groups with relatively little conflict (Land Conservation Council 1988). Its success rested on wide consultation and open decision making.

3. The Great Barrier Reef Marine Park Authority, which has balanced Commonwealth, state and local interests to successful manage this 300 000 sq km World Heritage area (Kelleher & Kenchington 1982).

4. The national park system (Australian National Parks and Wildlife Service 1988)

In other areas innovative social technologies have been rare since the basic wage (1907) and votes for women (1902). Perhaps the 1980s wages accord and rural adjustment schemes for helping debt-ridden farmers to leave agriculture might qualify. Aboriginal land rights have given indigenous Australians some recognition of their unextinguished claims to the continent but in this we have trailed far behind the rest of the New World.

Some futurology: Australia in coming centuries

An 1888 exercise in futurology

There is every reasonable probability that in 1988 Australia will be a Federal Republic, peopled by 50 millions of English speaking men, who, sprung from the same races as the Americans of the Union, will have developed a separate and recognisable type...
[But that type of civilization] will, we venture to think...approximate much more closely to the Italian than the American type---that is, it will be democratic, but not hard. The early Americans *were* men of austere temper, who led, on an ungrateful soil, lives of permanent hardship...The Australians, we conceive, with more genial and altogether warmer climate, without Puritan traditions, with wealth among them from the first, and with a habit of communion with Europe, will be a softer, though not a weaker people, fonder of luxury, and better fitted to enjoy art...

The note of discontent which permeates the whole American character will be absent and, if not exactly happier, they will be more at ease. All Australian development will be affected by that difference, as they cease to be British, German and Irish, the man of the new type which will gradually be born the distinctive and separate "Australians", will be as distinguishable in England as are Americans, and also distinguishable from them.

The typical Australian will be a sunnier man. (*London Spectator*, Australia Day 1888, quoted in Schreuder 1988)

Imagine Australia in a position to employ a celestial management consultant to advise us on how to approach the challenge of ensuring the long-term quality-survival of Australian society; someone out of *Hitchhiker's guide to the galaxy* perhaps. Consider what follows as possible extracts from such a consultant's report. In the manner dear to such, we look at client Australia's SWOT---that is, her Strengths and Weaknesses, Opportunities for and Threats to achieving quality survival; and at what these might mean in terms of plans and strategies and their outcomes.

External threats and opportunities

Before noting some major global contingencies that could seriously complicate or enhance Australia's search for quality survival, what (we should ask) important---meaning survival-relevant---considerations are more likely to change a little than a lot.

The human gene pool will change only slowly over coming centuries. Even if biodiversity is being lost and climate is changing, major vegetation formations around the world will switch only within time frames measured in centuries. Physiographic landscapes and seascapes will continue to change significantly only in geological time, measured in millions of years. Other less certain candidates as 'order parameters' might include long-wave economic cycles and world hegemony cycles (De Greene 1994).

Beyond such stable background elements, most aspects of Australia's external environment can be assumed to have the potential to change sufficiently to demand adaptive responses, defensive or opportunistic, from Australian society. Questions about the world which have answers vital to Australia's prospects for quality survival in the long term, (i.e. key uncertainties) include (Goldsmith 1994):

1. Will the world's human population peak at the currently predicted level of 10 billion plus around 2075?

2. As the world fills with people, will increasing interaction between humans and animals such as rodents, send more diseases like AIDS across the inter-species barrier (Gibbon 1993) and send world population into decline? Will medical science be able to stay ahead of the development of drug-resistant strains of micro-organisms?

3. Will the greenhouse effect turn out to be more disruptive than anything so far imagined? Will there be metre-plus rises in sea level? Will there be big temperature-rainfall-storminess changes in large parts of Australia? Will world food supplies match rising population (MacKenzie 1994)? Will Australia be forced to accept, in one way or another, perhaps millions of environmental refugees?

4. Will background pollution levels in the world's oceans begin to rise? Will the biosphere continue to be able to absorb anthropogenic residues at current and foreseen rates? If not, how will it react? (J223).

5. Which parts of the world will descend into social chaos? Or develop a prosperous stability? What are the prospects for world war? For regional wars? With or without nuclear weapons? Which people will remain in poverty? Will Australia be forced to accept, in one way or another, perhaps millions of war refugees?

6. Which people will be great traders? In what goods and services?

7. We have seen not only a long-term rise in living standards since the industrial revolution but also a long-term decline in raw materials and commodity prices (J169). In an age when manufactured products and information are the goods and services in demand, will the world want to buy Australia's food and mineral exports at profitable prices?

8. Will energy costs ever soar again as they did in the 1970s? Will an emergence of nuclear fusion technology make energy costs plummet? Will nuclear reactor accidents force Australia to accept millions of displaced people? Will increasing human appropriation of the world's annual production of newly-photosynthesised plant material lead to some catastrophe we cannot foresee? (Vitousek et al 1986). Will persistent biodiversity loss turn out to be of more than spiritual significance?

9. Will there be a world government? If so, how much power will it have? Will it regulate total energy consumption in developed countries like Australia? Will nation states disappear? What might replace them? What other forms of global social organisation might arise? How far will multinational companies be able to dictate the use of Australia's rich mineral and energy resources? In general, what will be the limits to Australia's or any other country's sovereignty? (Stephen 1995).

10. Will capitalism remain the dominant economic paradigm? What alternatives could emerge?

11. What are the prospects for and implications of a worldwide religious revival?

12. How will the world's transport and communications network change? What people will be information rich? Information poor? What information will flow in this network?

13. What will the pervasive new material technologies be? How will their benefits and disbenefits be distributed? Will technology development be socially guided?

Even though Australia is a medium-sized country in world affairs, its diplomatic standing may well allow it to exert a disproportionately large influence on the way these questions get answered in the fullness of time. Rosenau (1970) has used the idea of societies as adapting entities to study the interdependence between a country's foreign and domestic affairs (Rosenau 1970). Nonetheless we are largely 'future takers' when it comes to the bio-physical and socio-economic nature of the world in coming centuries, just as we are 'price takers' in international commodity markets today.

Notwithstanding, without descending into a naive Panglossian view of the world, most changes in Australia's external environment will contain opportunities as well as threats. Most commonly, these will be opportunities to export goods and services to other countries in the throes of their own adaptations. Obversely, there will be opportunities to import not only useful market goods but ideas for social experiments and for material and social technologies with adaptive value.

The challenge facing an Australia seeking quality survival is to develop scenarios (plausible futures) around alternative answers to these and another multitude of globe-wide questions with survival implications. Only then can we, through intelligent government, begin the task of delineating national options and developing flexible strategies (conditional responses) which, whatever happens, offer the hope of survival at worst and quality survival at best.

Best-case and worst-case world scenarios

A best-case scenario for the world as a stage for Australia's development in the 21st century and beyond could plausibly include:

. no major wars, famines or pandemics;

. few major natural disasters;

. no uncontrolled mass movements of people;

. strong world markets for Australian-style exports;

. full global collaboration in tackling major national and international problems;

. the widespread development of humane democratic societies accepted as legitimate by their citizens;

. widespread access to a high-quality global communications network loaded with massive quantities of quality information;

. universal literacy and high life expectancy;

. the emergence of new social technologies which prove extremely successful at reducing partisan conflicts in pluralist societies; and

. massive falls in the rate of degradation of the natural resource and amenity base, including biodiversity, earth materials, water and air resources.

A worst-case scenario of what the world could do to Australia in the 21st century could include:

. Australia conquered militarily; the imposition of a puppet totalitarian national government that tolerates the emergence of a large, uneducated, unhealthy and unhappy feral underclass;

. frequent epidemics of new and old unmanageable diseases, affecting humans, domestic livestock and native fauna;

. frequent, extensive droughts;

. major permanent changes to prevailing regional climates;

. the arrival of 200 million environmental refugees and unwanted immigrants;

. the permanent collapse of world commodity prices and world trade arrangements;

. widespread access to a high-quality global communications network loaded with quiz shows and opportunities for gambling and global shopping sprees;

. total control of the Australian economy by multinational corporations and foreign banks with no regard for working conditions or declining quality in the natural resource and amenity base, including biodiversity, earth materials, water and air resources.

Domestic values and issues

Certainly the external environment is going to provide future Australians with numerous adaptation challenges, but what of the internal environment? What are some of the domestic trends, driving forces, activity patterns, values, technologies (material and social) and contingencies particularly likely to affect Australian society's survival prospects and/or quality of life? Recapitulating from earlier chapters, these trends might include population growth and settlement patterns (the trend to urbanisation will continue); trends in domestic food production; the industry mix; trends in energy consumption; land use change and intensification; income levels; preferred wealth forms (e.g. natural versus human versus built capital; forms of built capital); propensities to consume and save; the investment mix; lifestyle and time use preferences; perceptions of equity and inequity and the importance attached to those perceptions; and perceptions of the role of government, e.g. in taxation levels, market regulation, value reinforcement.

Of all these transcendent determinants of quality-survival, the most fundamental is the last: people's perceptions of the role of government. Government is the basic vehicle for the expression of a society's collective will as distinct from everyone's individual wills. If 'the people' want it, all the other things on the list can be managed collectively to a greater or lesser extent; or they can be left to be determined solely by socially unconstrained or unmoulded expressions of individual will. Alternatively, the management of these issues can be thought of as some of the 'levers of choice' society can pull to guide its own evolution towards quality survival.

Strengths and weaknesses

What are some of our historically accumulated and revealed strengths and weaknesses waiting to perform a part in determining which way the quality-survival play unfolds? This question can be looked at in terms of the quantity and quality of the stocks of different sorts of capital (capital equals assets available for beneficial use) which Australian society brings to this task---institutional, human, natural etc. Discussion is unavoidably brief and little more than suggestive.

Locational capital

The strengths and weaknesses conferred by location cannot be changed from within but they do eventually change as the world changes. Australia's physical isolation protects it from many global problems, but also makes it costly to interact with the rest of the world. Economically, our relative location has improved with the emergence of east Asia as the so-called engine of world economic growth.

Location in the world is more than just geographic. It includes our place in the world community, our allies, our enemies and our influence. The signs here are quite propitious at the moment but of course this could change rapidly.

Natural capital

Many experts believe we have inadvertently and advertently brought the agricultural resource base into a state of slowly and inexorably declining productivity; at least outside the country's limited zone of high rainfall. That could cause very major problems at some stage if the population increases by tens of millions.

Nonetheless, we do retain much of this country's extraordinary complement of natural capital as presented to European immigrants in 1788 (see above). This means we have the settings and the resources to support an abundance of lifestyles, open space recreational activities and primary production activities. Nurturing such diversity of opportunity is fundamental to consolidating both adaptability to change and quality of life.

Human and intellectual capital

The basic resource here is 18 million people, 1 million of them unemployed and therefore immediately available to help in the pursuit of national goals. Amongst the employed, we have innovative and efficient primary producers, clever scientists and engineers and a bureaucracy which sometimes invents successful institutions like the Great Barrier Reef Marine Park Authority. We have a public that is becoming more aware of the need to balance production and protection when we use natural resources.

Many of course are alienated by a society that seems to have no need of them and cannot offer worthwhile life paths. Conversely, very large numbers, for whatever reason, have a great love for Australia, a tremendous resource if it can be harnessed.

Australian society is very 'technologically literate'---it has the scientific and engineering expertise to support the rapid diffusion and adoption of promising new technologies and, for its size, it creates a disproportionately large number of new technologies. However, as measured by numbers of scientific and engineering graduates and by government support for strategic research it is doubtful whether this intellectual capital is being maintained, much less augmented.

Built capital

Despite current problems in maintaining and extending urban infrastructure, we have sizeable supplies of moderate to good quality housing, offices, shops, factories, infrastructure networks and machines. The social learning challenge that built capital presents is knowing the difference between when to maintain it, when to let it run down, when to upgrade it and when to abandon it.

Social and institutional capital

I am using the term *social and institutional capital* to cover those systems of organisations and their social technologies which allow Australian society to function, more or less smoothly, within acceptable limits; for example, government, the education system, the national innovation or research system, the defence system, the justice system, the financial system, the market system and the social learning system.

Paramount amongst and ultimately managing all of these is government. However, although *government* chooses between today's options for collective action, the *social learning system* is what generates new options (social technologies, systems of organisation etc) for collective action tomorrow---that is, over coming decades and centuries. Here then, we comment further on the strengths and weaknesses of government and of the social learning system as institutions for taking Australia into the future.

Government

Our democratic system of government has so far ensured that we have not squandered social energy on domestic physical conflict. But the very system which ensures social stability seems incapable of pre-empting (anticipating? forestalling?) or even seriously debating problems and, moreover, tends to overreact when it does eventually respond to them. The reason has been neatly diagnosed as a 'pluralistic stagnation' wherein competing interest groups continually nullify each other: whatever is proposed by one group commonly conflicts with the interests of some other organised group and is therefore vigorously opposed (Marsh 1983). Contributing to the 'log jam' in many cases is the obdurate unwillingness of contending parties to compromise, to moderate their demands. The proposals that threaten only a diffuse and unorganised public interest (Wilson 1980) are the one with the best chance to succeed!

The other side of the social stability coin is 'social myopia'. Our society has a great capacity for establishing machinery for responding to visible, immediate personal threats such as bushfires. It has much greater difficulty in responding to 'slow' problems such as deterioration in the quality of life where causes and effects are often separated in space and time (McNicoll 1994).

Social myopia, exacerbated by pluralistic stagnation, is not just an Australian problem. Can any pluralistic democratic society decide what it wants and then set out to achieve it? This book assumes so. It assumes that the primary task of the political process is to identify all that is collectively desired and to negotiate contributions to whatever actions meet those desires (Buchanan 1987).

What if this apparently simple ambition is not achievable? Is it that social goals (problems) are never achieved (solved), only transmuted? Is it that there is never enough *social energy* for anything more than coping? Tawney sees progressive societies as those where life is hard enough to be a challenge (all carrot and no stick makes a fat donkey), but not so hard that there is no energy left over for investing in institutional development. Perhaps the physical environment is potentially manageable but not the social environment---at least with the intelligence we have. Have we been given just enough intelligence to guess that our intelligence is insufficient? As JBS Haldane (1949) observed, the world may be not only 'queerer than we suppose', it may be 'queerer than we can suppose'.

By world standards, Australia is a country with weak central government. The organisational difficulties incurred by the Constitutional division of responsibilities in the Australian federation have proven formidable obstacles to a co-ordinated approach to national problems. *Co-ordination* means agreement on their respective actions by several parties. Indeed, the need for greater co-ordination of policies and action on resource and environmental problems has been recognised in numerous policy areas. The National Conservation Strategy of Australia (Dept of Home Affairs and Environment 1983), for example, recommended, as a priority national action, the need to 'strengthen co-ordination of action in and co-operation between the Commonwealth and the states and among the states on living resource issues of national significance'.

The extant system of State-Commonwealth ministerial councils (e.g. Environment Council, Council of Nature Conservation Ministers, Agricultural Council, Forestry Council, Fisheries Council, Water Resources Council), with its supporting system of standing committees and working groups, is an excellent social technology for achieving maximum inter-government co-operation on resource matters within the limits of the Constitution---but this is not very much. To achieve more, we must await some cunning new social technology which is politically acceptable and yet allows us to bypass entrenched constitutional impediments. *New political structures are the highest form of social technology.*

On a brighter note, the potential 'strength' of Australia's federal system of government is that it provides a ready-made social laboratory in which different states can try out different social technologies and the whole country can then benefit from adopting the more successful of these.

The social learning system

Australia's social learning system seems to match the model proposed by Donald Schon (1971, 1974) and described in the theory section above. To wit, significant changes in the way society is managed follow the emergence of *social technologies* which allow newly widespread *ideas in good currency* to be put in train. The sometime change in Australia's (non)population policy was put forward in Chapter 3 as a forthcoming example of Schon-style social learning.

It is very difficult to judge how well our social learning system has served us and whether it is a strength or a weakness in the complement of social capital with which we face the future. Obviously Australian society has not foundered, we are still here, but could we have done better with a more directed and planned system than the present laissez faire system? More to the point, would we do better in the future with a better organised social learning system?

Social learning theory suggests that, if this question is being seriously asked, we should try out alternative social learning systems to see if the choices become clearer. We certainly would not want to change the present system of social learning radically on a whim. But, never fear, such change would not come easily.

Before completing this chapter with a brief excursion into the realms of plausible futures, we pause for a short discussion of how Australian society might go about improving its capacity for future social learning. This is a topic discussed at some length in my book *Use with care* and I draw on that discussion here.

Improving the capacity for social learning

> The loss of the stable state requires that we shift from the rational model to a model of learning, both personal and public. Our concern, then, becomes not only that of finding right answers or solving problems but of developing continuing processes by which problems can be solved and answers found. (DA Schon 1974)

> Goal convergence is the test for successful adaptive behaviour. (ES Dunn 1971)

Can Australia, *as a society*, learn better how to learn? One major difficulty is that because social, technological, and now natural environments are changing so rapidly, behaviour rules based on successful past experiences are likely to be irrelevant or even misleading (De Greene 1993)---basing farming decisions on past rainfall records may already be an example. This trend stands to continue or even accelerate; Alvin Toffler's 'future shock' is essentially about the increasing transience of our individual experiences of things, people, ideas, organisations and places (Toffler 1970).

The question of social learning strategy is too big to explore fully here, but some of the core tasks that such a strategy demands include:

. Setting and regularly updating explicit operational goals considered crucual to the long-term quality-survival of Australian society. At the broadest level, we can divide these into long-term quality of life goals and survival goals. Notwithstanding, these two sorts of goals may turn out to be more complementary than competitive.

. Learning how to generate ideas for new social technologies to solve problems, exploit opportunities, reduce weaknesses and consolidate strengths.

. Developing a political framework so that alternative approaches to solving major social management problems can be seriously debated, tried and compared; one with implementation, monitoring and evaluation components (Mercer 1991).

Because these tasks are continual, they must be managed consistently by socially-sanctioned subsystems or organisations. For example:

1. An *appreciation system*, to use Geoffrey Vickers' (1968) term, that identifies which tacit or explicit goals of the society are not coming any closer or, more urgently, are retreating. These can then become the focus for the learning process.

2. An *options system* for identifying present social technologies that could ameliorate particular problems, or (if there are none), for developing new candidate social technologies.

3. An *implementation system* for selecting and applying one or more of the candidate social technologies.

4. A *monitoring and evaluation system* to check progress and begin the learning system over again when progress is unsatisfactory. Formal *program evaluation* of the type that Australian governments are now introducing is an attempt to do this: for instance, do public housing programs work?

Such a set of systems is nothing more than thoughtful trial and error characterised by a willingness to acknowledge it as such and a willingness to own up when you have made a mess of it. *In Australia, there is little overt recognition that changes in social organisation are essentially experimental.* Unfortunately, our confrontationist political system does not allow a minister to declare a new program, say to encourage soil conservation, as experimental, even though the history of soil conservation is one of failed experiment.

Components of a social learning system

. an **appreciation system** for identifying priority threats and opportunities and hence social goals

. an **options system** for identifying and/or building candidate social technologies

. an **implementation system** for applying selected social technologies

. a **monitoring and evaluation system** for checking progress

An appreciation system

Is it possible to be more specific about how we should aim to promote long-term quality of life and/or long-term adaptability? Perhaps building up substantial capital per head---call it societal capital---in each of the natural, built, human and social categories is a necessary condition for allowing individual Australians to satisfy their physical, intellectual, social and spiritual wants and needs in diverse and richly fulfilling ways. Being 'capital rich' allows us to draw off a 'dividend' for 'consumption' yet still leave enough for capital maintenance and capital growth.

Continuing this line of argument, perhaps building up substantial societal capital is also the key to adaptability, to having an adaptable society. A capital-rich society has the resources to divert experimentally into solving problems/ grasping opportunities as they arise without jeopardising its prevailing activity patterns. There is a danger here of course: simply possessing divertible resources does not mean that they will be used for adaptive purposes. Nero fiddled while Rome burned.

While it is illuminating to see how important the 'capital building' goal is to achieving quality survival, the insight is very general. Difficult decisions about balance within and between capital categories and about consumption-investment balances must still be made; equity issues have to be resolved. For example, are there obvious deficiencies in today's complement of social capital? Can future needs for particular forms of social capital be foreseen? How far ahead?

While society is regularly caught napping by the totally unforeseen (AIDS is a good example), the fact is that almost all major problems (and opportunities) are identified by someone well before they become threatening (are lost). The Greenhouse effect has been foreseen for decades by scientists. Rachel Carson wrote *Silent Spring* in 1969. Agriculture departments in Australia have been warning about soil erosion for more than 100 years. And so on. Capital requirements for emerging problems are usually flagged well in advance if flagging systems are established.

Potentially, Australia has one clear advantage over many countries when it comes to setting national goals to take us towards quality survival. We have no national obsessions about the type of social capital we wish to build up (e.g. military power) and no crippling problems (e.g. famine, ethnic conflict) to exert a claim on available capital or to forever preclude capital accumulation. Unfortunately, the very richness of our choices seems to carry its own power to paralyse decisive and strategic action, like a child at the lolly counter.

> A society which encourages the pursuit of immediate satisfactions and short-term goals has an air of futurelessness, an atmosphere which contributes to social problems, abuse of resources, environmental degradation and a deep feeling of individual helplessness. (Cohen & Polunin 1990)

This is not the place to make lists of particular goals conducive to quality survival, although some could be routinely developed around earlier lists of threats, opportunities, strengths, weaknesses etc. One generic goal that warrants specific mention is to ensure that future generations continue to have contemporary experience of a wide range of possible lifestyles to evaluate. This range would include variations on what is seen as 'the good life' today. What the present generation can do is ensure that future generations are at least exposed to the possibilities for social organisation. The choice is then up to them. Living in high-stress mega-cities must never become our only option.

An options system---designing social technologies

In *The step to man*, John Platt (1966) discusses the problem of deliberately developing social technologies, or social inventions. He points out that we have many organisations searching all the time for new inventions and combinations of them to solve technical problems. The research and development teams of industrial and government laboratories do nothing else and every few years new technologies change our social structure and our ways of living and working.

But we have no corresponding organisations that spend all their time searching deliberately in this way for new inventions and combinations of ideas for solving social problems. There is no national laboratory with full-time research and development teams assigned to come up with ingenious ideas about how to improve social organisation and communication and interaction, let alone how to set them in motion. The main reason why our procedures for solving social problems lag so far behind our material technology may be simply that we have not organised the same deliberate search for them.

We would gain a major benefit, merely by establishing such an organisation, in making the idea of social technologies familiar and recognised as the *class* of solution needed for middle-sized social problems. *To know that one is looking for something called a social technology is, in itself, a flying start.*

The first task of an organisation set up to develop social technologies for ameliorating major social problems would be the meta-task of learning how to do just that. There are no textbooks. An inductive search for patterns in successful present social technologies would obviously be worthwhile. For example, it is clear that many resource-management problems stem from just a few classes of causes, including ignorance of consequences (e.g. rabbit introduction), delays between cause and effect (e.g. dryland salinisation), externalities (e.g. pollution) and open access to resources (e.g. fisheries decline) (Costanza 1987).

It would be important not to let such an organisation fall into the hands of any single established discipline such as applied systems analysis, political science, public administration, law, economics, sociology, sociobiology, environmental sociology (Encel 1982) or social psychology. These disciplines would each have something to offer in the way of useful precedents, but none has a sufficiently broad conceptual framework for the task being set. *One of the strengths of the social technology concept is that it is not associated with any particular discipline.*

Some design principles

It is not possible to anticipate the details of any potential procedures for designing social technologies, but the search and design principles behind those procedures might well include, for example:

. developing separate technologies for small parts of large problems---the 'adaptive muddling' principle (Lindblom 1959);

. exploring the possibilities for blending present social technologies into new integrated technologies---the 'belt and braces' principle (Hollick 1984);

. developing immediately acceptable procedures---'instant carrot'. Things like the alphabet, the credit card, standard time, penny postage were successful because it was in the immediate interests of people to adopt them---the 'instant feedback' principle;

. making maximum use of non-monetary values to motivate people, and of avoiding solutions based on just throwing money at the problem---the 'leather medal' principle;

. harnessing self-interest to pursue public interest---the 'invisible hand' principle;

. viewing the problem from many perspectives---the 'alternative realities' principle (Checkland 1981);

. keeping alert for relevant social technologies emerging in other societies (more design support than a design principle). Corollary: Do not unthinkingly import political, social and economic ideas from other cultures in the hope that they will transplant successfully.

. redistributing resources among the stakeholders---the 'power sharing' principle;

. acknowledging that public interest extends beyond immediate stakeholder interests---the 'beyond pluralism' principle.

. evaluating the need for new institutions. I tend to think that it will seldom be possible to change embedded social procedures without changing the leading institutions. That is, it is not enough to change the rules, or even the game---the players must also change, for the psychological reason that a new organisation is free of accumulated baggage (obligations, animosities etc.) and has a potential force for change. Thus, one candidate component when designing a new social technology must always be a new institution. As Donald Schon (1974) has said, the structure of government is perpetually out of date, a 'series of memorials to old problems' (the 'new broom' principle). Reorganisation does, however, carry the danger of 'institutional memory loss' if carried out too frequently---there is no-one around who knows how things used to be done.

Other principles such as robustness, flexibility, minimalism suggest themselves. It is clear that too little is known about the dynamics of institutional behaviour to approach the meta-design task analytically. However, our present purpose is not to be exhaustive, but to make the point that designing social technologies may be amenable to systematic analysis.

An implementation system

The essence of experimentation is to try several ways of doing something and select the most successful. The implementation phase of solving problems in a learning society would involve simultaneously initiating several (usually) parallel programs, each focusing on a different social technology capable of ameliorating the problem or exploiting the opportunity.

In practice, because few bureaucrats grasp the concept of social technology, programs are normally designed intuitively. Also, the idea of simultaneously trying out more than one approach to a social problem, while not unknown, is unusual. 'Pilot' programs are more common. For some problems the states and territories adopt different approaches and comprise a natural laboratory. That is not enough, however, and we need new ideas for making active experimentation acceptable. Experimenting with social technologies is a vital part of social learning.

A monitoring and evaluation system

The need to *monitor* and formally *evaluate* all new social technologies (the 'but did it work?' principle) seems obvious enough. The difficult parts of a monitoring program lie in setting values for indicator variables at which ameliorative action will be triggered; so-called *backoff* and *threshold criteria*.

Fundamental to learning from a mistake is recognising and admitting it. While a Maoist approach of public self-criticism might not be the social technology we are seeking, *our adversary system of government means that mistakes have to be denied and this makes self-delusion easy*. A vigorous intelligentsia remains our best safeguard for ensuring that the successes and failures of emerging social technologies will be identified and evaluated. Social critics like Hugh Stretton and Donald Horne, to name but two, are necessary. Unfortunately, today's thin intellectual atmosphere is not conducive to deeply informed critiques of social processes. The searing winds of economic fundamentalism have frightened too many potential social critics into staying indoors.

Strategic rules and principles

Improved social technologies are the key to middle-level social learning but they do not provide guidance at a strategic level to those managing a learning society. The higher need here is to build up a complement of strategic decision rules and guidelines for advancing the long-term quality-survival of Australian society, such as:

1. Develop a community appreciation of the quality-survival task as being one of successful social learning within a complex adaptive system.

2. Treat all views sceptically, even democracy. The future must be faced without any attachment to any aspect of the present culture (Cohen & Polunin 1990).

3. In thinking about what the future might hold, imagine first what will not change.

4. Capacity does not equal necessity. Just because something is possible, it does not follow that it should be done.

5. Treasure diversity.

6. Beware of the (wo)man who has found the truth.

7. Acknowledge that managing a society is much more than managing the economy of that society.

8. Beware of the slow variables that alter quietly but usher in great changes once past some threshold value (e.g. Perrings 1995).

9. Recognise that changing institutions too rapidly leads to a loss of institutional memory of what works.

10. Learn the lessons of history, recognising their real but limited relevance to coping with or exploiting the future.

11. Build up per capita levels of natural, social, human and built capital to form the basis of adaptive survival and of high quality of life.

12. Be prepared to experiment with social technologies to increase our understanding of how the social system might react when it is disturbed.

Plausible futures: four scenarios

Brief as they are, preceding sections of this chapter do form a platform for some simple scenarios for coming generations of Australian society. The short definition of a scenario is 'a plausible future', in the sense that the future is linked to the present by a chain of discrete cause-effect steps, of which each step of is plausible (Godet 1991). Here, we seek plausible pictures of what Australia could be like in 50 to 100 years---we do not have enough pages to build 1 000-year scenarios.

Scenarios of social change are driven by two types of change agents. One is irresistible outside forces, either natural like climatic extremes or social like foreign invasions. The other is internal social choices whereby, through individual decisions or active political (collective) decisions, changes are made in the mix of consumption goods, services and investments in various forms of social capital (Stretton 1976). Working through each choice brings the society to a junction at which further choices emerge.

A natural way to develop scenarios for Australia through the next century or so would be to develop some world scenarios and then develop some Australian scenarios within each of these. As introduced above in the discussion of external threats and opportunities, such global scenarios would involve different mixes of contingencies in the areas of climate, trade and markets, world population and quality of life, social order and sovereignty, technologies and the functionality of natural systems etc.

A brief outline of four scenarios is all that space permits here. In three of these we will assume what was earlier described as a best-case scenario for the 'rest of the world' in the coming century and concentrate on the domestic consequences of alternative domestic policies flowing from three different visions of the sort of Australia we want for our (great) grandchildren. In the fourth, we will assume that Australia is flooded with large numbers of illegal and unwanted immigrants.

Since it is a basic premise of this book that population policy is an important determinant of quality of life, it makes sense to develop the three domestic scenarios around the different consequences of aiming to have a large, medium or small population (relative to the present population) by the middle of the 21st century.

But population size is not an end in itself. Along with type of government, type of economy and other 'big' options, population policy makes an important contribution to what ultimately matters---quality survival. However, rather than identify numerous combinations of society's options for quality survival, we will assume that, apart from population policy, only three extreme approaches to managing Australian society are possible:

1. Growthism: A strongly focused pursuit of high economic growth in a society committed to minimal government.

2. Stabilisation: A strongly focused pursuit of sustainable development in a society committed to strong central government.

3. Autarky: A strongly focused pursuit of economic self-sufficiency and national sovereignty in a society committed to strong regional and local government.

Combining even just these three approaches to social management with each of three approaches to population management would give nine scenarios to explore. This cannot be attempted here and we will follow through the three most plausible combinations of one population policy with one approach to social management. Fairly obviously, a society committed to growth is likely to be committed to a large population; autarky and a relatively small population go hand in hand, as do stabilisation and a population goal of about present numbers. These are the combinations on which we will build our three 'domestic' scenarios. They have much in common with earlier attempts at scenario construction for Australia made by Walmsley and Sorensen (1988), and Kasper and others (1980) for example.

The following sections, very briefly, discuss factors that could lead Australian society to adopting each of these scenarios or, in the case of the uncontrolled migration scenario, having it imposed from outside. Each scenario is also discussed in terms of its possible implications for the peak social goal of quality survival. Remember at all times, though, that scenarios are not predictions or forecasts; there is no reason why Australia's realised future should not contain elements from different scenarios. Figures 13.1-13.3, taken from Walmsley and Sorensen (1988), depict plausible areas of population growth with low, medium and high population and economic growth scenarios over coming decades.

Fig. 13 Areas of population growth under three scenarios
Fig. 13.1 Low population and economic growth
Fig. 13.2 Medium population and economic gorwth
Fig. 13.3 High population and economic growth

Source: Walmsley and Sorensen 1988

1. High population growth and strong economic growth

A growth scenario follows from an assumption that a collective decision is taken to massively increase the size of the Australian economy over the next 50 years and to give this national goal a much greater weight in national decision-making vis-a-vis other goals than it currently enjoys. Because gross domestic product per head appears to be largely insensitive to population size, high population growth would almost certainly be an important component of any strategy to achieve this goal.

Possible origins

How might such a collective decision emerge in Australian society? It would require elevating to 'good currency' status ideas such as:

. High growth will allow us to avoid national stagnation (J169). We must seek promotion to the first division in the league of world economies.

. We must believe in the power of self-regulated market economies to provide rising standards of living for rising populations (economic possibilism).

. We must make every effort to create a technocratic growth culture. The paramount function of technological change is to secure market advantage. We must be technologically optimistic. New technologies will emerge to solve the problems of rapid growth (J170).

. We must be environmentally optimistic, believing in the environment's capacity to absorb the impacts of increasing human activities.

. We must believe in the power of market instruments to control environmental problems. One Jones Inquiry submission forecasts the widespread adoption of social marginal cost pricing by 2045; governments will be forced to internalise the vastly expanding set of externality costs that have caused so much social concern at the end of the 20th century (J239).

. Big is better; any increase in any human activity is good (growthism). A bigger population means that manufacturers can reap economies of scale, government has a stronger voice in world affairs and the defence forces can be enlarged.

It would be a task of the education system to reinforce such ideas in the national culture.

Aspects of implementation

The 'growthism' scenario implies that the populationists in Australian society will convincingly win the debate with the stablists and the reductionists. A high growth scenario implies immigration of at least 100 000 per annum. The single most important management decision associated with that choice relates to settlement options. Thus:

. Do we manage the distribution of population at all or let it concentrate, as now, in a handful of sprawling big cities?

. Do we try to turn Melbourne and Sydney or Sydney and Brisbane into mega-cities that are world-class economic dynamos and amongst the handful of gateways into the global information society?

. Do we try to divert population into a string of well-planned compact coastal cities? Or try once again, through massive investment, to promote regional growth centres? (J228).

A 'northern development' version of this scenario envisages putting 40 million people in the Geraldton-Perth-Esperance corridor and watering them by pipeline from the Kimberleys (J228). The person who made this suggestion admits that it might be difficult to get migrants willing to develop the north or redevelop declining agricultural areas. A comparable idea of populating the Ord Valley in the Kimberleys with subsistence farmers (J170) has overtones of 'controlled mass migration' and a degree of convergence with Scenario 4 (Uncontrolled mass migration).

The high controlled growth scenario will include an active search for major development projects such as a nuclear power industry (J248); a high-speed ground transport system linking all major settlements between Cairns and Adelaide; increasing the productivity of Australia's nutrient-poor continental shelf with fertilisers; major water desalinisation projects; new irrigation projects; and a continental network of natural gas pipelines.

More generally, views will emerge about which sectors of the economy can be most profitably expanded, particularly through exports: for example, by concentrating on marketing new technologies, particularly in southeast Asia, by developing heavy and light industries, by exporting language and tertiary education, management methods and tourism (J229). Energy and materials consumption will be limited, if at all, only under strong, widely-supported international agreements.

On the socio-political front, both taxes and government spending will be low; defence spending and spending to improve the performance of business will both be priorities. Deregulation and privatisation will be complete. Working hours will be long for those with jobs. Education will be directed to the service of the economy. Social policies will be conservative, with a strong bias towards individualism.

Fish-hooks...

What could go wrong under the high growth scenario? The most likely fish-hook is irreversible environmental and resource degradation. The cost of ameliorating collateral degradation might wipe out the material gains of high economic and population growth. Alternatively, degradation might not be treated and ordinary people might begin having short, nasty and brutish lives. Another pessimistic perception is that doubling population will eliminate food exports, leading to a currency devaluation. Worse, the local poor starve while exports continue (J170).

The high growth road might be the slippery dip to economic serfdom. This could happen if the economy comes to be dominated by a few very large companies, not necessarily multinationals, able to threaten governments with investment strikes and worse. Modern economic theory does not offer the same comfort as neoclassical theory, with its fairytales of price-taking competition in the service of the consumer. Modern economic ideas suggest that, in unregulated markets, positive feedback mechanisms are likely to allow larger companies to grow relentlessly at the expense of smaller companies (Waldrop 1992).

...and allurements

And what might be the particular satisfactions of living in a high growth society, apart from some prospect of greater material comfort? Perhaps a sense of seeking out and grappling with a panoply of material challenges? Living in a fast lane society? A 'can do' society? Try as I might to be receptive to the possibilities, I cannot see either quality of life prospects for the average Australian or social survival prospects being enhanced in a growth scenario.

2. Sustainability and population stabilisation

> All our effort should be in getting society running sustainably before we contemplate increasing the number of people living here. (Mairi Anne Mackenzie in J250)
>
> I would like my grandchildren to live in a clean and sustainable world. (Connie Barber in J32)
>
> We must concentrate on the stage beyond growth where 'quality of life' is the aim. (David Cooper in J91)
>
> The growth phase for Australia is over. (Ross Blick in J75)

A stabilisation scenario follows from an assumption that Australian society adopts a collective goal to stabilise national energy consumption; the rate at which material resources pass through the production-consumption-disposal system; the rate at which land is converted from less to more intensive use; and the total stock of matter tied up in (man-made) capital and consumer goods. Some depletion and dispersal of materials (pollution) is inevitable of course, and the goal of minimising pollution per unit of output would be very important in a stabilising or steady-state economy (see Chapter 4).

Because energy and material throughputs and land use conversion are all strong functions of population size, a policy to expeditiously stabilise population would almost certainly be an important component of any strategy to stabilise the economy in a steady-state sense (Daly 1982).

Possible origins

How might such a collective decision emerge in Australian society? It would require the elevation to good-currency status of ideas such as:

. To achieve quality survival, it is necessary to plan, not leave the future to the marketplace. The wide range of socio-cultural and environmental problems and challenges facing Australia are best tackled by a balanced combination of population, educational, economic and regulatory instruments and by the intelligent use of appropriate technologies.

. A stable population and a steady-state economy are important conditions for achieving high quality of life.

. Population stability would help Australia to adapt to a rapidly changing external world and to environmental and social change at home.

. Long-term survival requires the conservative use of non-renewable resources.

. High personal consumption is socially irresponsible, both nationally and internationally.

. Stabilising domestic consumption makes it easier to fund generous family planning aid programs in the third world (J215).

Australia is already in transition from a declining industrial age to an emerging post-industrial era, as evidenced, for example, by the growth of the service sector of the economy. Thus we are seeing value shifts such as the increasing importance of information relative to travel and physical transport, services replacing goods and quality of life interests replacing material possessions. The directions of such changes can be foreseen more clearly than their size (J239).

The paramount social function of technological change is to reduce throughput (reduce inputs, outputs, residues). Ideas in good currency such as these would be reinforced by the education system.

Aspects of implementation

A near-stable population could be achieved within a generation or so, primarily by reducing net immigration to a low level. Although this scenario would not require the continuous construction of new urban settlements, internal migration would still be a powerful force and would require a settlement policy compatible with population stabilisation and with internal migration; for example, such a policy would need a range of policy instruments to discourage the further growth of capital cities and encourage the growth of regional centres.

A stabilising or conserver society would be strongly committed to contributing to global environmental management tasks such as managing global climate change, stratospheric ozone, marine pollution (J48). Compliance with greenhouse targets could reduce Australians' standard of living both directly and by reducing coal exports (J226).

A stabilising society might still wish to play the role of major world food supplier, especially if it no longer figured as a major destination for immigrants (J123). The challenge would be to do this without shortening the working life of the agricultural resource base. This would mean, amongst other things, no more alienation of prime agricultural land. A long-term goal for Australian agriculture would be to remain in the food supply business indefinitely (J215).

Significant resources would be devoted to developing new social technologies---for example,in fields such as conflict resolution, education and the management of the diffusion of new material technologies.

Economic activities based on providing services, including information, would probably be favoured by a stabilising society, because of their low materials needs and their good prospects in global markets.

A new generation of politically and socially legitimate means of controlling throughput and land use change would have to be developed. Regulation would be part of this suite as would a wide range of economic instruments. Markets for allocating resources would be more competitive.

Taxes would be quite high and would include wealth and inheritance taxes, energy and throughput taxes and a variety of environmental damage taxes. Entrepreneurs would be charged the full social cost of using community resources. The challenge would be to ensure that industry could survive and still pay its way. Matching high tax takes, government spending would also be high, particularly in pursuit of social justice and socio-environmental quality.

Working hours would be shortened by a combination of job-sharing, capital accumulation and technological advance. The education system would then have to view teaching 'quality leisure' skills as a focal task.

Examples of national projects appropriate to a stabilising society might be to develop an extensive system of large national parks representative of some hundreds of types of ecosystems; to develop a national system of 'alternative' power sources (windfarms, solar farms tidal races etc); and to eliminate the disposal of sewage and ship-based marine pollution in Australian ocean waters.

Fish-hooks and allurements

Without attempting to foresee the technology mix and the industry mix late next century, we can assume that this scenario would move the country into an era where decades of increasing capital accumulation per head have produced a society where:

. most people still work but take a greater part of their reward for work as quality leisure time spent on a variety of pursuits including travel, outdoor recreation, cultural activities, hobbies and a rich family/social life (J48, 230);

. past levels of investment in social infrastructure have created high social incomes, meaning that the basic needs (food, shelter, health services, education) of both rich and poor are met. Wants, as distinct from needs, would be more modest than in 1995;

. more profits would be invested in protecting and conserving natural assets;

. declines in social and environmental quality of life in Sydney and other major cities would be halted and reversed.

What could go wrong under the stabilisation scenario? One possible problem is that a socially and economically successful Australia with a stationary population might be judged selfish by an increasingly desperate world community for not opening its doors to immigrants from overpopulated countries. A version of scenario 4 (below) could result.

Another is that business might be unwilling or unable to thrive in an environment where it had to meet all the external costs of its operations.

3. A smaller self-sufficient population and economy

> To globalise the economy by erasure of national economic boundaries through free trade, free capital mobility and free, or at least uncontrolled migration, is to wound fatally the major unit of community capable of carrying out any policies for the common good. That includes not only national policies for purely domestic ends, but also international agreements... (Herman E Daly, 'Farewell lecture' after 6 years in the World Bank, 1994)

A self-sufficiency scenario follows from an assumption that a collective decision is taken to limit the total value of imports to the current level or less, and to encourage import-replacement industries; to eliminate exports of primary products from areas suffering significant loss of natural capital; to reduce the rate of loss of amenity capital; and to extend the working life of natural resources by using them less intensively---for instance, by substituting low yielding organic and 'clean green' mixed farming technologies for high input monocultures and specialist enterprises.

Possible origins

The 'big ideas' behind this scenario are:

. It is far more important for a society to be flexible than efficient.

. The present population of Australia is so rapidly degrading the resource base and the environment that quality survival is in doubt and will probably stay doubtful unless population numbers and per capita consumption levels are reduced. This risk is unacceptable.

. The Australian economy is in thrall to the world economy and the best way of retaining economic sovereignty is to markedly reduce economic transactions between Australia and the rest of the world (J170; Mosley 1993; Daly 1993). Further subordination of economic policy to the wishes and preferences of financial markets is not an acceptable option (Argy 1995).

. Energy costs and hence transport costs could well begin to rise strongly again in coming decades. This development would impose great pressures on an economic system with high domestic transport costs and a dependence on the long-distance export of bulk materials (e.g. coal, wheat) and the production of energy-intensive materials (e.g. aluminium).

. Australians have a duty to the rest of the world to 'live simply that others might simply live'.

. immigration makes a major contribution to Australia's balance of payments problems (Joske 1989).

Aspects of implementation

This is a 'land hungry' scenario in which the per capita demand for land rises because each person is placing a large (if light) footprint on the landscape. Since the stock of land in the settled areas of Australia is essentially fixed, we can assume that this scenario implies a parallel requirement for a somewhat smaller population.

Population would be slowly reduced by adopting anti-natalist policies and a policy of near-zero gross migration. An extreme version of this scenario has Australia supporting less than 1 million people in the very long term (J208).

Agricultural exports would be reduced from those large parts of the Murray Darling Basin and south-western Western Australia already suffering from soil salinisation, acidification, compaction etc. Outside the high rainfall areas, crop yields would be reduced by a combination of less frequent cropping and the lower yields of organic farming methods. Conversely, production and exports from some high rainfall agricultural enterprises (e.g. wine and tropical fruits) might expand. The rangelands cattle industry might be closed down (J145). Native forests would only be logged only lightly and selectively; domestic and export timber would be produced in plantations. Water transfers between major basins would be avoided. All land would be state-owned and all land uses strongly regulated and taxed under site-rating principles.

More foreign exchange would be earned by a 'quality' tourist industry that presented Australia as an international land and marine park, offering ecotourists open spaces, wilderness and access to a unique flora and fauna (J16, 90). Further strategies to earn significant foreign exchange in the form of dividends from overseas investments might also be developed.

For managing imports, two initial goals might be to limit their total value to the current level or lower, and to encourage import-replacement industries. Import levels might be controlled by a mix of sales tax (McNamara 1995), primage, duties and transferable physical and dollar import quotas, particularly on imports of 'close substitutes, luxuries and quasi-luxuries' (Mishan 1993). International capital flows would be taxed. Ways of limiting imports produced by environmentally damaging methods would be sought.

Social organisation under this scenario would be strongly bioregional. The central idea of bioregionalism is greater regional self-sufficiency, which goes hand-in-hand with national self-sufficiency and stronger regional government.

Under this scenario, each of a comprehensive set of perhaps twenty bioregions would have its own regional government; state governments would have a minimal role. Each region would have a degree of self-sufficiency, perhaps within explicit regional population targets or ceilings. Some bioregions might be largely in Aboriginal ownership. Individual regions would be encouraged to develop individual responses to social problems and opportunities and mechanisms for sharing such individual experiences would be sought.

Land requirements per person would rise under a self-sufficiency scenario for various reasons including more wind farms and solar farms; more timber plantations; more land devoted to producing renewable substitutes for non-renewable mineral resources; more native forests committed to light selective logging; widespread ownership of hobby farms and rural retreats; more dedicated (single use) water catchments; more parks, reserves and wilderness areas; more low-intensity agriculture; more urban forests and garden cities; more sites for urban water re-use; and more 'half acre' urban residential blocks supporting low-energy houses, productive gardens and solar, water collecting and sewage composting technologies (Trainer 1991).

The self-sufficient economy would have to be highly innovative and make maximum use of technologies that allowed small but profitable production runs and flexible re-tooling. Efficient sectors of heavy industry, like aluminium smelting, might well continue to flourish after being subjected to comprehensive social benefit-cost analysis. However, the broad economic strategy would be to meet limited material needs as efficiently as possible and concentrate development in the tertiary and quaternary sectors. *Amenity rights* (Mishan 1993) would be widely adopted for managing socially unprofitable industries.

The national government would retain strong control over international affairs including defence and trade. Domestically, it would set frameworks and minimum standards in diverse policy areas (e.g. in employment, in environmental matters) within which regions could develop autonomously. The encouragement of massive decentralisation would be a national budget priority. Internationally, Australia would actively defend its protective stewardship of a fragile land acknowledged to be a major part of the world's heritage.

In terms of personal values, great emphasis would be placed on individual self-fulfilment and modest consumption levels. Education would be largely de-institutionalised. In terms of lifestyle, cities, neighbourhoods and jobs would be designed or redesigned to reduce motorised local travel. But domestic tourism and foreign travel would be strongly encouraged.

Every attempt would be made to develop strong community values. Perhaps neighbourhood communities would have stewardship responsibilities for particular non-urban areas. A well developed honours system for recognising community service would go some way towards replacing the present community adulation of financial achievement (and with it, the pursuit of economic growth).

Golden age or premature post-industrialism?

The all-important question about this scenario is whether a country which deliberately foregoes gains from trade and conventional economic growth must necessarily decline into a nation of vulnerable peasants with poor prospects for quality survival. For example, there is no doubt that being unable to import specialised equipment, if it came to that, would greatly increase the cost of providing many goods and services. Would national savings be sufficient in a smaller, more frugal society to finance productive investments locally rather than from international sources? The tag of 'premature post-industrialism' (Walmsley and Sorensen 1988) warns us that the type of society being described here requires high prior per capita accumulation of social, built and human capital.

The tide of conventional economic wisdom is running so strongly against the idea of self-sufficiency and a relatively closed economy that it is difficult to find professional economists willing to attempt a disinterested analysis---just as it was difficult to find economists willing to put the case against economic fundamentalism in the 1980s. The most important thing to bring to this scenario is an open mind.

Politically, a strongly regionalised society could self-destruct through a process of 'balkanisation' with individual regions developing delusions of national grandeur. Fortunately, unlike the 'old world', Australian regions have never been isolated long enough, and now never will be, to develop the cultural differences necessary to fuel such energy-wasting deconstruction.

A self-sufficient Australia could be a very civilised country if people had adequate time and opportunities for quality leisure after meeting basic needs and simple wants. Certainly the society would not be closed in a cultural sense. Modern telecommunications, foreign travel, large numbers of tourists and a multicultural society would all act to keep it fully aware of and participating in the world's affairs.

4. Uncontrolled mass migration

A scenario in which coping with the consequences of uncontrolled mass migration becomes the central issue of political concern could arise in various ways:

. an accident in Java's emerging nuclear power industry which forces millions of 'boat people' to flee to northern Australia;

. the mass movement of refugees from a civil war in Indonesia, Hong Kong (post-1997) or China or indeed any major conflict anywhere;

. a worst-case greenhouse scenario in which sealevel rises by 1-2 metres, creating millions of environmental refugees in Southeast Asia and the Pacific (Doos 1994);

. colonisation following successful military invasion by any of a number of regional powers;

. global agreement that all people have the right to live and work where they choose; a unilateral commitment by Australia to 'free trade' in people;

. unpoliceable numbers of overstayers from a massive tourist industry;

. a breakdown in Australian border security after domestic civil unrest.

<u>Population becomes an incubus</u>

While Australia could and would probably successfully resist any armed invasion short of nuclear attack, it is unlikely that any mass movement by unarmed civilians would be stopped by force. This acceptance would trigger the scenario under consideration. One Jones Inquiry submission suggests that in 50 years there will be 32 million people living in the southeast corner and 8 million former Indonesians in the northwest corner of the continent (J239).

Northern Australia would be the gateway for mass migration but, just as today's migrants are attracted to the big cities, in this scenario arrivals would quickly place pressure on the physical and social infrastructure of the state capitals and coastal Australia from Cairns to Adelaide.

In an attempt to avoid the shanty towns and unbearable slums of today's third world metropolises 'invaded' by their own rural populations, Australia might resort to building caravan cities serviced with power, telecommunications, water, sewerage, buses and hypermarkets where food coupons could be used (the Soweto model?). Eventually, it might be possible to add health and education services to these basics. Apart from 'taking in each other's washing', there would be few additional jobs. Downward pressure on unskilled wages would be heavy.

There could be three main consequences of this scenario for quality survival:

1. Social conflict. This scenario would set Australia up for intense social conflict in the short run and 'tribal' warfare in the long run (Hollick 1992; Homer-Dixon 1994).

2. Capital widening, not deepening. Taxes would have to increase to finance more public spending on basic support and infrastructure for new arrivals. There would be few savings available to finance those other investments which would lift or even maintain quality of life for the previous population. The balance of payments effects of reduced food exports would damage import-dependent aspects of quality of life.

3. Resource degradation. As larger and larger numbers of new arrivals and their multiplying descendants over many decades joined the productive and consuming classes, the pressure on productive and amenity resources would mount. In the worst case these would eventually be exhausted, precipitating social chaos.

Comparing scenarios

It has not been possible, in the available space, to develop scenarios of Australia's future at all elaborately. Nevertheless, the three 'voluntary' scenarios sketched out above span much of the range of what is demographically foreseeable; each is combined with a somewhat extreme vision of a 'sympathetic' form of social organisation from laissez faire individualism (large population) through liberal interventionism (medium population) to autarkic communitarianism (small population).

The reason for sketching out scenarios beyond the demographic is that having a particular population is not an end in itself but a gateway to or partial determinant of a comprehensive way of life for future Australians. One way or another, we have to choose which demographic path to start down and a view of where that path might lead in other respects is an important part of choosing.

Failing to determine a path will be tantamount to choosing a scenario with a demographic and social organisation core closer to the high growth scenario than the stabilisation or self-sufficiency scenarios. This is because Australia's population is currently growing rapidly and the short-term political pressures for this to continue seem to be stronger than any countervailing pressures. Also, a high rate of conventionally-measured economic growth is the avowed aim of both the main political parties. More, there appears to be little political will to take the necessary measures to move the economy towards 'sustainable development'.

The idea of actively reducing population and pursuing economic self-sufficiency would currently be regarded as ludicrous by most people and their political representatives. Nevertheless, it is a reference point for discussion, worthy of more elaborate development than has been possible here. One can envisage a scenario of scenarios in which Australian society is successively guided, over coming centuries, by a growth vision, a stabilisation vision and then a self-sufficiency vision. Growthism is the 'trend' scenario, stablism is the scenario that follows from acting on the current sustainable development rhetoric, autarky is the leap into the future.

Even if the three 'voluntary' scenarios had been developed more elaborately, it would still be difficult to nominate criteria for choosing between them. Each has at least one outstanding concern attached to it:

. Growthism could lead to a society characterised by public squalor, a shit of an environment and bitter social polarisation.

. Stablism could bog down in a slough of pluralistic stagnation.

. Autarky could produce an internationally vulnerable society of 'high tech' urban peasants.

Illegal mass migration, the core of scenario 4, could be superimposed on any of the three domestic scenarios (as could a range of other external threats). This would create a society obsessed with just one thing---trying to avoid social conflict while meeting the most basic needs of an exploding population. There would be no surplus social energy for improving quality of life.

As developed here, our scenarios are too skeletal to think seriously about choosing between them. All we can offer are several questions relevant to such thinking: What do we hope to gain that we do not already have? Could any part of our quality of life be improved by having a larger (smaller) population? (J210). What is the point of saving Australia if the Australia we have to create in order to save Australia is not worth saving? Can we ensure that the range of options facing and perceived by future generations is rich and diverse?

The next century is going to be a difficult one. Is it possible somehow to pursue the best in each scenario? If Australians could be guaranteed very high quality of life coupled with a 50% chance of social breakdown within the next 1 000 years, what would they choose?

Conclusions

Even though discussion of Australia's long-term future is methodologically difficult and surrounded by uncertainty, it is a discussion which Australians have to have; and yet it is a discussion which Australians have signally failed to have. Today's enormous problems, as measured by media attention (like the balance of payments), will almost certainly turn out to be eddies on the river of history. Some time we must get round to deciding where the river itself is going and whether it needs diverting.

This chapter makes only a small contribution to that discussion. It includes four assertions which, I believe, could be useful in more extended discussions of Australia's long-term future than has been possible here:

1. *Quality survival* is a useful brief description of a suggested overarching long-term social goal for Australia, even though we do not have anything like accepted criteria for measuring either quality of life in a diverse society or the probability of that society lasting 50 000, 5000, 500 or even 50 years.

2. The *adaptive behaviour* model is an excellent way of looking at the survival of societies. Intelligent trial and error has to be society's basic strategy for improving things. The chapter acknowledges that the adaptation of a European human population to the Australian environment is more a process of *social learning* than one of biological evolution. Key learning experiences since European settlement are identified and discussed, particularly those to do with how natural ecosystems respond to disturbance. A conventional judgement would be that Australians have learned to use their resources to build a prosperous and pleasant society.

3. Developing and experimenting with new *social technologies* is the basis of the social learning process. Social technologies are procedural theories for addressing social needs and problems and for converging on explicit social goals. The term covers all those bright ideas which help people to interact more equitably and efficiently. Society can and must teach itself to design social technologies as efficiently as it now develops material technologies.

4. *Scenarios* are no more than plausible futures but can be a good way of seeing beyond short-term issues and forces as determinants of the quality survival of society. Their role is to help society make strategic choices of ends and means.

The three 'domestic' scenarios sketched out in the chapter do seem to capture strongly contrasting but internally coherent combinations of population targets and alternative approaches to social organisation. These are:

1. A large population guided by principles of laissez faire individualism.

2. A medium stabilised population guided by principles of liberal interventionism.

3. A small population guided by principles of autarkic communitarianism.

While the point could have been made more comprehensively, particular philosophies of social organisation do seem to match particular attitudes to population. Even if this is not quite so, there seems little doubt that policy on population growth/stabilisation/reduction stands to have a marked effect on the realisation of different philosophies of social organisation.

A fourth scenario was chosen to exemplify social change driven by irresistible outside forces. Illegal mass migration was looked at here because of our interest in population numbers, but it could have been nuclear war and nuclear winter, or the challenge of living in a world with 10 billion people in it...or many others.

A pervasive conclusion from this chapter's exploration of Australia's long-term future is that thinking about and planning the future stands to produce a somewhat better future than chewing gum.

CH 14. TAKE-HOME MESSAGES

The core message of this book is that a much better case can be made out for Australia to adopt an explicit population policy centred on 'stabilisation within a generation or so' than can be made for the present tacit policy of doubling population every few generations. The postscript to that message is that a choice between these alternatives is (still) ours to make.

A third policy of actively reducing population could possibly be superior to a stabilisation policy but the book has not explored this option in any depth because, in terms of what is politically possible, a policy of stopping population growth will have to be widely accepted before debate on reducing population size can seriously begin. Meanwhile, I would not want to lay myself open to any specious charge of being politically irrelevant.

The politics of population policy bring little credit to the major political parties. Both act as though they care mostly about gaining of immediate political power and little for the long-term well-being of the Australian people. Immigration is the cause of population growth and the political parties have come to the conclusion that, in the short term, they can gain more votes than they lose by maintaining a strong immigration program. They conspire to ignore the strong likelihood that the population growth they are generating as a by-product of immigration is having and will continue to have severe adverse consequences for the quality of life of most present and future Australians.

This scenario cannot be proven any more than any other assertion about the foreseeable consequences of collective action. However, it is a perception widely accepted by the Australian public and can be plausibly supported by tracing and teasing out the option-degrading consequences of the land use change and intensification which inevitably accompany population growth in city regions.

Certainly there is a range of complementary policies in education, technology, ecologically sustainable development and regional planning which could ameliorate these effects if vigorously applied, but there is little sign of that happening---for instance, consumption per head continues to rise. Unless there is a political sea change, today's best bet is that continuing population growth will worsen quality of life for ordinary metropolitan Australians in terms of such things as living costs, pollution, congestion, everyday freedoms, activity opportunities and social conflict. And without significant (presumed) compensatory changes in other factors such as rate of growth in GDP per head.

In fact, urban quality of life emerges from the present book's analysis as the single most important issue in the population debate. It is therefore important to monitor closely Australians' quality of life so that it can be modelled and projected into the future as well as providing a much-needed improvement to the factual base underlying this core debate. That is, while working conclusions about policy have to be drawn from present knowledge, the debate must become better-informed.

The traditional arguments in favour of a significantly larger population are that it improves our defence capability and our economic well-being. While being quite willing to look generously on these, and to accept that they may once have been persuasive, my reading of these arguments brings me to the working conclusion that they are worth little.

The international implications of population growth in Australia are not so clearcut. While our immigration program significantly helps the world's disadvantaged, the costs of settling immigrants decreases our capacity for giving offshore aid. However, it does not follow that we would increase off-shore aid if we decreased immigration. What is clearer is that bringing people from low-consumption countries to a high-consumption country like Australia increases the rate at which the world's resources are consumed, degraded and polluted.

Psychologically, there is a big difference between a decision to stabilise numbers and a decision to keep growing, be it either slowly or rapidly. Reaching a population plateau should be viewed as reaching a development threshold, not as hitting a barrier to growth---just as reaching adulthood allows a person to grow in non-physical ways (J250). Conversely, with such a lack of discernible benefits from population growth and such uncertainty over its possible 'worst case' consequences, caution suggests a holding strategy of minimal national population growth over coming decades.

For the much longer term, over centuries not decades, Australians must find and focus on a rich but clear collective social goal such as quality survival---that is, indefinite survival of an acceptable social framework plus high quality of life for individuals.

The quality-survival task is presented as one of successful social learning within a complex adaptive system. Of the broad strategies available here, growthism (rising population and economic growth) is ultimately impossible while stablism (stable population and a steady-state economy) may just allow us to survive as a society and lead long, healthy self-fulfilling lives as individuals.

What the debate is not about

The population debate is so easily and so frequently side-tracked that a last useful thing I can do for the reader is to recall, from what has gone before, the common red herrings to be gracefully declined when offered.

1. The debate is not about whether we could cope with a much larger population.

If a 'world government' decreed that Australia's population was to double by 2045 or reach 100 million by 2100, I have no doubt that we, as a society, would make a pretty good fist of feeding, clothing and educating the population and that we might well be a reasonably civilised harmonious society. The price we would have to pay would probably include losses of freedoms, amenities and opportunities to do things we value.

But that is not the point. As things stand, we do not have to 'cope'. We have the comfort of deciding for ourselves whether life would be better or worse with a much larger population. Nonetheless, we would be wise to have contingency plans for a greatly increased population in case we have to 'cope' with such.

2. The debate is not about whether Sydney, Brisbane and Melbourne are good cities to live in.

By world standards they are. The debate is about whether they will be better or worse cities to live in if they are allowed to grow. Nor is the debate about whether Australians could live reasonably satisfying lives if these cities doubled in size. They might well. The debate is about whether they could lead better lives if these cities did not double in size.

3. The debate is not about past migration

The fact that post-war immigration has been generally judged a success (although no-one asks 'What if it had not happened?') is only marginally relevant to whether substantial future migration is in the country's best interests. Economic, social and environmental parameters have changed dramatically in the interim.

4. The debate is not about individual migrants, each of whom is a person to be respected and valued for their contribution to Australian society. It is most certainly not about whether migrants should be encouraged to return from whence they came.

5. The population debate is not about multiculturalism; the multiculturalism debate is about multiculturalism. Positions in the population debate and the multiculturalism debate have no logically necessary correspondences.

For the record, this book takes no position on how migrants and migrant communities should be treated by government, apart from subscribing to the principle that they should be treated equitably and in ways that minimise the possibility of ethnic tension.

6. The debate is not about whether we should have a markedly smaller population than at present. The option of allowing the population to decline may be an issue in 20 years, but not now.

7. The debate is not about any 50-year population target greater than 40 million. This population is the extreme limit of what would be politically feasible to impose on the community without risking massive social unrest.

8. The debate is not about how many Australians could be fed with home-grown food, sometimes called the national carrying capacity. The answer here is 'a moveable feast' and gets bigger and bigger as you presume smaller and smaller calorific intakes and greater and greater emphasis in the economy on diverting resources into single-minded food production. When obtained, the answer is not an 'instant population target' but one modest input to analysis of the population question.

9. The debate is not about whether environmental problems should be tackled by population management or by more direct means. This is not an either-or question and, like all problems, should be tackled by an appropriate mix of all available instruments. Stopping migration cannot, by itself, ameliorate our current problems; but it could reduce the rate at which they become exacerbated and new problems arise.

10. The debate is not about identifying an 'optimum' population. No plausible, defensible method for doing this has ben proposed or is foreseeable. Nevertheless, various population trajectories are available, and we must choose amongst these, either actively or by default.

What the debate is about

What the debate *is* about is whether we want or do not want, need or do not need a much larger population; whether we have any choice; whether recent population growth has jeopardised Australians' quality of life; whether there is any evidence that further population growth would reverse or exacerbate this.

Examples of particular propositions worth debating further include:

. Unless Australia alters its current settlement strategy, population increases are likely to take us beyond maximum acceptable population -- in some regions at least.

. Population growth will reduce per capita shares of/access to those unique natural goods, like snow-fields, beaches and recreational rivers, which not even the most prosperous economy can create.

. Population growth is likely to increase the daily pollution and congestion problems most Australians experience.

. Population growth will have only a modest impact on (a) the availability of land for primary production and (b) the area of land supporting amenity and service resources.

. Population growth will have little direct effect on the in situ productivity of natural resources valued for primary production.

. Population growth is likely to lead to an unacceptable degradation of the natural resources used now for tourism and extensive recreation.

. Population growth will increase Australia's difficulty in meeting its share of global environmental targets such as those for production of greenhouse gases.

. Population growth will have little impact on the rate of exhaustion of non-renewable (mineral) resources.

. The impact of population growth on environmental quality will depend on how vigorously we develop and apply social technologies for environmental planning and management.

Beyond debate

While the population debate will and should continue, we already have sufficient arguments and an obligation to stop talking long enough to make some firm policy decisions. The most frustrating aspect of the population policy debate is that the middle road running through it would be reasonably satisfactory to all the main players. But, like an electron that does not have quite enough energy to make a quantum jump into the next orbit, we seem destined to go round in circles carrying the present non-policy until some unpredictable trigger forces a change.

This middle way, based on an explicit goal of eventual population stabilisation, is to set annual net migration (including refugees) 'permanently' somewhere below 50 000; then, depending on the figure chosen, population will plateau within a generation or so somewhere between 19 m and 23 m.

Properly presented, with conviction and commitment, this policy would be generous enough to satisfy most immigrationists and restrained enough to satisfy most stablists; and it would restore our international credibility as a country that was not only willing to preach the virtues of population stabilisation to others but to act itself. It would remove the prevailing community uncertainty over this most fundamental of determinants of Australia's long-term future; and, at any time, in the light of new information and emerging events, we would still be free to reassess all options.

Immigration policy is certainly its keystone, but a comprehensive population policy needs to have a position on each of the sets of policy variables that could significantly affect the size, demographic composition and distribution of the population. Although identifying these has to be somewhat arbitrary, it is my conclusion that a comprehensive primary population policy should have six components or sub-policy areas as well as an immigration component. The suggested policy thrusts of these extra components are: eliminating 'unwanted' births; meeting Aboriginal aspirations; factoring tourist/visitor numbers into population policy; concentrating generous aid to the world's disadvantaged 'offshore'; upgrading local and regional population management policies; and educating the community in population matters.

I anticipate the day when a responsible government begins building an inclusive and integrated population policy around such.

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APPENDIX 1: JONES INQUIRY SUBMISSIONS

1	Frank Hunt
2	James Young & Mary Lee
3	Jack Forward
4	JB Douglas
5	W Pye
6	Jack Yancey (for Concerned Citizens for the Environment)
7	Brian Newell
8	Keith Bremner
9	JG Mulford (for Coalition of Hawkesbury & Nepean Groups for the Environment
10	RJ Bailey
11	Julian Yates
12	Colin McQueen
13	DJ & MM McDonald
14	PB Gould
15	David Hughes (for Stop Environmentally Wrecking Everyone's River)
16	Ron Lord
17	Wendy Gleen
18	Richard Simpson
19	Maggie Bolitho
20	BC Melville (for Council for Christian Union)
21	Des Moore
22	George Lines
23	Graham Chittleborough
24	Paul Roberts
25	Jack Seekamp
26	David Baggs (for Hills Environment Forum)
27	Rosalie Schultz

28	Peter Tod
29	Judith Cousins
30	Olive Johnston
31	Stephen Taylor
32	Connie Barber
33	Peter Stewart
34	Susan Nancauon
35	AG Colley
36	Glen Marshall
37	Anne Mellady, Vladislav Zhukov, Zelma Peterson
38	Desmond Milligan
39	Campbell Aitken
40	T Sauer
41	JC & E Ridd
42	Michael Holland
43	Lynn Howard
44	Bob Whiteway
45	DH Brading
46	D McNeil
47	Gerard Cafe
48	Lew Spratt
49	Janet Devlin
50	B & S Thatcher
51	B & J Engris
52	Graham Calley & Denis Hansen
53	David Pope
54	Dianne Proctor (for Family Planning Australia Inc)
55	Winifred Barnell
56	Robert Taylor

57	Marcus Beresford
58	Geoff Hyde
59	Patricia Dimmock
60	BJ Ferguson
61	Bob Whitworth
62	J Smith
63	Marion Donworth
64	B Thatcher
65	Stuart Mead
66	Jim Walmsley & Tony Sorensen
67	Mark McGrouther
68	Margaret J Brownscombe
69	Keith Brownscombe
70	Terence Anderson
71	M Jessop
72	Terence Fowler
73	Ruth Burlakov
74	G, T, A & K Cranney
75	Ross Blick
76	AK Mann
77	Heather Luvis & David Haselgrove
78	J Short
79	John Leary
80	Jim Dimo
81	David Griffiths
82	Heather Cooper
83	Alan D Dimmock
84	Margaret Mackay
85	Judy Cousins (for Jewells Total Catchment Management Group)

86	John Burke
87	B Krockenberger (for STEP Inc)
88	Ian Jeisman
89	Eric Claus
90	Paul Spencer
91	David Cooper
92	JF Cahill
93	Valerie Garth
94	RV Short
95	Angela Gurton
96	Dane Thwaites
97	Don Owers
98	Lincoln Day
99	Clive Moy
100	Marjorie Gray
101	G & E Dunstone
102	Colin Watson
103	R Hammond
104	P Bembrick
105	Richard Mitchell
106	N White
107	D Byrne
108	Brenton Smith
109	K & J Tomholt
110	Betty Korber
111	Lorraine K Rogers
112	Jackie Foggitt (for Inbound Tourism Organisation of Australia Ltd)
113	Suzanne Wellboon
114	Heather Stewart

115 Judy & David Kelly

116 H Wiseman

117 N McNeil

118 Les Cowper

119 Herbert Fenn

120 Darius Janiak

121 CVB Neser

122 Ian King & others (for Ex-members of the 7th Division, 2/33 AIF)

123 Hinton Garland

124 Scott Honeysett

125 Denis McCormack & Rodney Spencer (for Australians Against Further Immigration)

126 Lon Eisenweger

127 Helen Black (for NSW Branch of Australians for an Ecologically Sustainable Population)

128 Valerie Yule

129 Joan Carey

130 DP & A Cameron

131 Richard Ostle

132 Geoff Preece (for Central Coast Branch, Australian Conservation Foundation)

133 Margaret OH Walker

134 CH Tyndale-Biscoe

135 Dudley Marrows

136 GL Kesteven

137 Ron Webster (for Blackburn Uniting Church)

138 Scott Morrison

139 Peter Snelling

140 AL Lindley

141 PD Carter

142 Lesley Inglis

143 John Bentley

144 Jan Tendys

145 HN Dengate

146 Valerie Garth

147 Diana Evans

148 SH Allen

149 Marion Gledhill (for NSW Family Support Services Association)

150 Allan V Dicker

151 Lyn Stephens (for Dudley Progress Association)

152 James Gerrand (for Australian Humanists)

153 Clifford F Boyd (for Australian Independent Alliance)

154 R Jurgenson

155 Elspeth Murphy (for M.O.S.E.S.)

156 Susie Chapman (for Sunshine Coast Environment Council)

157 JS Neville & others (for Citizens Against Unsustainable Populations)

158 Roger Lilley

159 Lionel Young

160 Kaye Stannard

161 C Short

162 Robert Wolcott

163 Mike Barron

164 KG Steadman

165 J Sealby

166 Joy Hafey

167 Gael Paul

168 JD Pashley

169 John Perkins

170 Sheila Newman (for Australians for an Ecologically Sustainable Population)

171 Peter Myers

172 Ann Rayner

173 Anthony Scott & Nicki Taws

174 Ray Jackson (for Aboriginal Deaths in Custody Watch Committee)

175 Keith Adkins

176 J Casteleijn

177 Christabel Young

178 Jacqueline Henrion

179 Katharine Betts & Bob Birrell

180 FPC Blamey

181 Alan H Magnusson

182 Philip Spark

183 AE Jackson

184 Hugh Milne

185 Barbara Guest

186 Otto Mueller

187 Gwenyth L Curtis

188 Elizabeth Musgrave

189 James Gerrand (for Australian Humanists)

190 David Hall

191 Sandra Kanck

192 Esme Wood

193 Ian M Jones

194 Gordon E Hocking

195 David Kitson

196 Toby O'Connor (for Australian Catholic Social Welfare Commission)

197 Mark O'Connor (for Writers for an Ecologically Sustainable Population)

198 Hellen Cooke

199 G Williams (for Tamworth Environmental Centre)

200 Des Ritchie (for Sunshine Coast Environmental Council)

201 RF Coffey (for City of Wanneroo)

202 Tony van Kampen (for Wide Bay Conservation Council Inc)

203 John GN Gray

204 LB Daniel

205 Nichola Hungerford (for Queensland Conservation Council)

206 William J Lines

207 N Redwood

208 Christopher Watson

209 David Wake (for Coalition for Wanneroo's Environment)

210 Peter V Ridd, Michael Ridd & Russel Cumming (for Australians for an Ecologically Sustainable Population, North Queensland)

211 Harry Johnson

212 Graham Caldersmith

213 DN Everingham

214 May Leatch (for Coalition Against Welcome Reef Dam)

215 W Kirsop

216 Alan Rich

217 WS Cummings

218 Jeff Spargo

219 PT Muldoon (for City of Lismore)

220 M & RD Graetz

221 Norman Poulter

222 Tom Baker (for Monaro Conservation Society)

223 Jennifer Goldie (for Australians for an Ecologically Sustainable Population)

224 James M Thomson

225 Lorna Wright

226 Garry Hopkins

227 Robert Story

228 Rick Brown (for Council for the National Interest)

229 Tad Soroczynski

230 Allan Hall

231 Neal Hardy

232 W Gibberd

233 Henry Teltscher

234 Evonne Moore

235 JW Zillman (for Bureau of Meteorology)

236 DV Duntley

237 R Stephenson

238 W Sorby

239 RDM Cotgrove

240 G & J Greenland

241 Rupert Myers (for Australian Academy of Technological Sciences and Engineering)

242 Adrian O'Loughlin (for Australian Institute of Environmental Health)

243 John Pagan (for Fairfield City Council)

244 David Larkings

245 James Adams

246 Jonathan Stone

247 Vincent McMahon (for Department of Immigration and Ethnic Affairs)

248 Craig Isherwood (for Citizens Electoral Councils of Australia Group)

249 Olive Langham (for Melville Environment Group)

250 Mairi Anne Mackenzie

251 Ian Mott (for The Growth Lobby)

252 Colin Barnett (for the Western Australian Government)

253 Indra Esguerra

254 Astrid Herlihy

255 Christabel Chamarette (for Western Australian Greens)

256 Fay Sutton (for Australian Conservation Foundation)

257 Laurie Brereton (for Department of Transport)

258	Ross Barker (for Australian Population Asociation)
259	JW Stocker (for Commonwealth Scientific and Industrial Research Organisation)
260	Lois O'Donoghue (for Aboriginal and Torres Strait Islander Commission)
261	Charles Birch
262	Peter Marston & Margaret Dwyer (for Action for World Development(NSW Inc))
263	Martin Bray
264	Lyndria Cook
265	Graham Kelleher (for Great Barrier Reef Marine Park Authority)
266	IR Lantzke
267	Department of Employment, Education and Training
268	AM McLachlan
269	GHM Wallace
270	FE Trainer
271	Leila W Huebner

APPENDIX 2: DEMOGRAPHIC TERMINOLOGY

(Adapted from Frejka T, 1973, *The future of population growth: Alternative paths to equilibrium*, Wiley, New York.)

Age composition (of the population): the fraction of the population in each of a comprehensive set of age groups (e.g. 1-5 years old, 6-10 years old).

Age-specific death rate: the fraction of an age-group population that dies each year.

Age-specific fertility rate: the average number of children per year born live to women of a specified age group.

Crude birth (death) rate: the number of births (deaths) per year per thousand opening population.

Crude rate of natural increase: the difference between crude birth rate and crude death rate.

Expectation of life at birth: the average length of life of a group of simultaneously newborn babies subject to the age specific death rates prevailing at the time of their births.

Gross reproduction rate (GRR): the average number of female children born live to a hypothetical woman who, throughout her life, has children at the age-specific fertility rates ruling at the time of her birth. Gross reproduction rate can be calculated from total fertility rate by multiplying it by the fraction of all births which is female.

Long-term arrivals: people arriving from overseas with the intention of staying in Australia for one year or more.

Long-term departures: Australian residents who intend to stay temporarily overseas for one year or more and visitors leaving after a stay of one year or more.

Net immigration (over a period): the difference between permanent plus long-term arrivals and permanent plus long-term departures.

Net reproduction rate (NRR): the average number of female children born live to a woman who (a) has children at the age-specific fertility rates ruling at the time of her birth and (b) is subject to the age-specific death rates ruling at the time of her birth. An NRR of 1.0 is referred to as *fertility at replacement level*.

Permanent arrivals: people arriving from overseas with the intention of settling permanently in Australia.

Permanent departures: Australian residents who, on departure, say they do not intend to return to Australia.

Population (of an area): the total number of all individuals alive at a particular time.

Stable population: one with constant levels of fertility and mortality and hence with a constant rate of growth and a fairly constant age structure. In keeping with common usage, I have used this term as shorthand for *stable stationary population* (see next definition).

Stationary population: one with constant and equal levels of fertility and mortality, so it has a zero rate of growth and a constant age structure. Thus stationary population is a special case of a stable population.

Total fertility rate (TFR): the average number of children born live to a hypothetical woman throughout her life who has children at the age-specific fertility rates ruling at the time of her birth and who does not die before the end of her child-bearing years. A TFR of 2.1 is referred to as *fertility at replacement level* because, taking account of the proportion of female births and the probability of a woman dying before the end of her child-bearing life, this is the (approximate) TFR at which an (Australian) woman will just replace herself in the population.