

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

**AUSTRALIA'S POPULATION
'CARRYING CAPACITY':**

ONE NATION - TWO ECOLOGIES

**REPORT BY THE HOUSE OF REPRESENTATIVES
STANDING COMMITTEE FOR LONG TERM STRATEGIES**

DECEMBER 1994

Canberra

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TERMS OF REFERENCE

INQUIRY INTO AUSTRALIA'S POPULATION 'CARRYING CAPACITY'

The House of Representatives Standing Committee on Long Term Strategies, chaired by the Hon Barry Jones MP, is required to report on 'matters, whether economic, social, cultural or structural, relating to the strength and well-being of Australia'. The Committee has agreed to conduct an inquiry into Australia's population 'carrying capacity'. The Terms of Reference for the inquiry are:

The population which can be supported in Australia within and then beyond the next fifty years, taking account of technology options, possible patterns of resource use and quality of life considerations.

The range of community views on population size and its political, social, economic and environmental significance.

The provision of a comprehensive information base on which future debates about population growth can be carried out without causing division in the Australian community, and including the provision of an accessible inventory of population research.

Policy options in relation to population, including the need for national, regional and local perspectives.

**House of Representatives
Standing Committee For Long Term Strategies**

Membership of the Committee:

Hon BO Jones (ALP, VIC), Chairman
Hon JDM Dobie (LP, NSW), Deputy Chairman
Hon DGH Adams (ALP, TAS)
Mr RDC Evans (LP, WA)
Mr CD Haviland (ALP, NSW)
MS MM Henzell (ALP, QLD)
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Introduction

The House of Representatives Standing Committee for Long Term Strategies was first established during the 36th Parliament, on 31 May 1990, to inquire into 'matters, whether economic, social, cultural or structural relating to the strength and well-being of Australia'.

The Committee has published four reports on aspects of Australia as an 'information society', on the social implications of people living longer but with shorter working lives, and on patterns of urban settlement.

Following the Committee's reappointment in the 37th Parliament, the Committee adopted terms of reference on 7 September 1993 for an inquiry into the workforce of the future, and on 22 February 1994 for an inquiry into Australia's population 'carrying capacity'.

The Committee was to consider, *inter alia* 'what sort of population level Australia can support in fifty years, and indeed whether we should be setting a population target'. The 'issue of population change brings into question environmental, economic and social issues'.

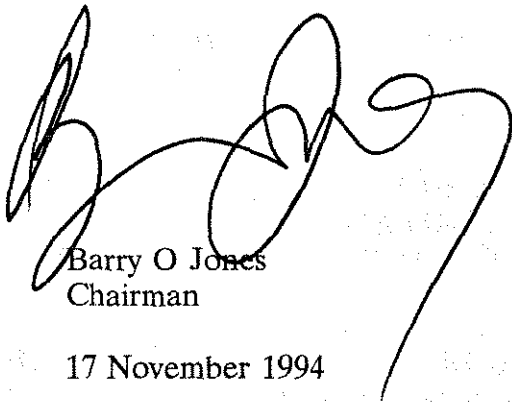
It is an indication of the degree of public interest in the issue of Australia's population 'carrying capacity' that the Committee has received over 270 written submissions from all over Australia since the inquiry was advertised on 26 February 1994.

Of the submissions received, over 90 per cent advocated population stability or lower population growth. Less than 10 per cent of submissions argue for an increase in population. On both sides, extreme views were expressed. On the population reduction side a few submissions argued that the present population should be encouraged to dwindle to as low as 7 million, 1 million, or until it equalled the estimated indigenous population of Australia before 1788. At the opposite extreme, figures of 80 or 100 million were cited as desirable possibilities.

While the overwhelming majority of submissions provided statements of opinion rather than analyses of the issues covered by the terms of reference, about 10 per cent of the total provided detailed analytical surveys of a range of economic, demographic, ecological or other scientific issues relating to Australia's population 'carrying capacity'. Of these, fifteen were from academics and scientists with an identified institutional affiliation, and others

were from Government Departments, scientific professional associations, policy research organisations, and environmental organisations.

While most submissions simply nominated population targets within what was seen as a desirable range, and did not attempt to provide any analysis of the factors that must be considered in an evaluation of national 'carrying capacity', there was recognition on the part of scientific and academic contributors, including the CSIRO, that any analysis which took account of a sufficient range of relevant factors would necessarily be extremely complex. In order to obtain more evidence on the range of economic and scientific issues which provide insights into the question of Australia's 'carrying capacity', the Committee examined some 23 witnesses representative of a wide range of expertise and community opinion. Five public hearings were held; in Canberra on 31 May, 28 June, and 20 September, in Melbourne on 29 July, and in Sydney on 19 August, 1994.

A large, stylized handwritten signature in black ink, consisting of several loops and a long trailing line.

Barry O Jones
Chairman

17 November 1994

Chapter 1

HISTORY OF POPULATION AND POPULATION DEBATE IN AUSTRALIA

Recent history of population growth in Australia

1.1 This chapter is based on Australian Bureau of Statistics data and projections and Submission 247 from the Department of Immigration and Ethnic Affairs. Its objective is to convey a sense of 'population inertia', the idea that population numbers cannot be changed quickly. For example, even with the introduction of aggressively pro-natalist programs and immigration programs of historically high proportions it would take more than a generation to double Australia's population.

1.2 The decisions which Australians make about population management today will not greatly change numbers in time for the centenary of federation but will determine population numbers and, equally importantly, population stability or the rate at which population is changing, in fifty years time.

1.3 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 1993 was 17.7 million, some three quarters of them living in cities with populations above 100 000. This compares with the population levels shown in Table 1.

1.4 The population growth rate for the 1992 calendar year was 1.06 per cent, compared with a growth rate of 1.25 per cent in 1991. The annual rate of population growth has been decreasing steadily since 1988 when it was 1.78 per cent.

1.5 The lower rate of growth in 1992 compared with 1991 was due to a decline in net migration to its lowest level since 1976. The term 'net migration' is defined as a measure of the net change to the population through permanent long term international arrivals and departures.

Table 1: Australia's population in selected years (million)

1881	2.3
1921	5.4
1961	10.5
1981	15.0
1991	17.4

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

1.7 Replacement level fertility is represented by a Net Reproductive Rate (NRR) of 1 and a Total Fertility Rate (TFR) of 2.1. However, a below-replacement level fertility will only result in a decline in population if the population has a regular age structure. In Australia where there is a large cohort in the adult ages, births continue to exceed deaths even though fertility has been below replacement level since 1975. Reasons suggested for this fall include increased female workforce participation, later marriage, access to contraception and abortion and high costs of housing and raising a family. The official response to the fall of fertility in the 1970s was that pro-natalist policies were ineffective and unnecessary.¹

The immigration program's contribution to population growth

1.8 Given a range in annual births of 20 000 and a range in annual net migration of 120 000 over the last decade, immigration intake has largely determined changes in Australia's rate of population growth.

1.9 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. Planned intakes for 1993/94 and 1994/95

¹ Dr Christabel Young, Department of Demography, ANU, Submission 177

are 76 000 and 86 000 places respectively. 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.

1.10 The objectives of the Migration and Humanitarian Programs are: reuniting Australians with their immediate family members, enhancing Australia's skill base, contributing business expertise and investment, and meeting Australia's international obligations in relation to refugees and displaced persons.

1.11 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 have been as given in Table 2.

Table 2: Components of population growth over the last decade

	Net migration gain	Short stay arrivals	Overseas student visas issued	Natural increase
	(000)	(000)	(000)	(000)
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	40.0##	3 210.4	41.6	139.3#
1994-95 est	51.0##	na	45.0##	139.3##

projected using base year 1992/93

DIEA internal working estimate

[The Department of Immigration and Ethnic Affairs Annual Report for 1993-4 noted that a total of 88,066 temporary residence visas were issued, an increase of 20 per cent].

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.

1.12 The 1993-94 Annual Report of the Department of Immigration and Ethnic Affairs noted that there were almost 67 500 people in Australia who had overstayed their visas this year.

Population projections

1.13 Before examining the benefits and disbenefits of populations of different sizes, Australia's feasible range of choices should be summarised.

1.14 *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 one per cent of population per annum (meaning 170 000 initially), Australia's population in 2040 will be 37 million and growing fast.*

1.15 Conversely, if fertility remains at its current level, a little below replacement, and immigration is set at the lower end of the post-War range (50 000 net per year), Australia's population in 2040 will be about 23 million and almost stationary. If fertility rates do not change, a net immigration of 50 000 per annum represents a 'population Rubicon' above which the Australian population will continue to grow for many decades.

1.16 If net immigration were to be reduced immediately to zero, the population in 2040 would be 19-20 million, having started to decline in 2027.²

1.17 With a continuation of fertility at 10 per cent below replacement (2.1 children per woman) and 30 000 net immigration the population will begin to decline between 2027 and 2040.³

1.18 Australia has the possibility of choice at present, through adjustments to its immigration program to bequeath to the people of 2045 anything

² Professor Jonathan Stone, University of Sydney, Submission 246

³ Dr Christabel Young, Submission 177

between a near-stable population some 15 per cent larger than at present and a rapidly growing population over twice the size of the present population. Professor Jonathan Stone made the point in evidence to the Committee that:

the population levels we will have in the middle of the next century are policy sensitive.⁴

Population distribution in 2045

1.19 The Australian Bureau of Statistics has modelled the State-by-State distribution of Australia's 2041 population under a range of assumptions with respect to mortality, fertility, overseas migration and interstate movement.⁵

1.20 With the possible exception of Tasmania, the population of every State and Territory is projected to increase throughout the 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.

1.21 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, with the total population rising from 6.0 million in 1993 to 7.9-8.7 million in 2041.

1.22 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 per cent) comparable to Tasmania where population remains close to its present half million.

1.23 Within the States, it is forecast that most immigrants will settle in the capital cities and there will be continued drift away from inland centres.⁶

⁴ Professor Jonathan Stone, transcript of evidence, 31 May 1994, p.4

⁵ Australian Bureau of Statistics, 1994, *Projections of the populations of Australia, States and Territories 1993 to 2041*, ABS Catalogue No.3222.0

⁶ Dr Christabel Young, Submission 177

The fastest growing centres of population, taken on current projections, will be the coastal areas of Queensland and New South Wales, metropolitan Sydney, Melbourne and Perth.⁷

1.24 In evidence to the Committee, Dr KB O'Connor of the Department of Geography and Environmental Science at Monash University pointed out that most population growth in Australia for the foreseeable future would mean growth of major cities. He argued that Australia's 'carrying capacity' would be:

determined largely by the nation's ability to provide an effective urban context that will foster the diversity of services and the gateway functions needed by firms participating in the global economy. In effect the upper bounds of population will be set by the capacity of our cities, as the distribution of employment will remain an important anchor for the distribution of population. Our 'carrying capacity' will depend on our ability and willingness to manage and re-shape our big cities.⁸ (See Table 3)

Table 3: *Distribution of national population major regional units 1971-1991, 30 June each year (% share of national population)*

Region	Census pop'n 1971	Census pop'n 1976	ERP* pop'n 1981	ERP pop'n 1986	ERP pop'n 1990	ERP pop'n 1991
Mega Metro	73	73	73	73	74	74
Major Regional Centres	9	9	9	9	9	9
Minor Regional Centres	2	2	2	2	2	2
Small Towns	3	3	3	3	3	3
Coastal Qld, NSW, Vic	5	6	6	6	7	7
Rest	8	7	7	7	6	6
Total (million people)	100 (12.694)	100 (13.474)	100 (14.921)	100 (16.032)	100 (17.037)	100 (17.250)

*ERP = estimated residential population

Source: ABS Census of Population and Housing, 1971 and 1976; ABS *Estimated Residential Population in Statistical Local Areas*, various State publications for later years

⁷ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

⁸ Dr Kevin O'Connor, transcript of evidence, 29 July 1994, pp.64-5

Historical background to the present inquiry

Pre Federation

1.25 Following the centenary of European settlement in 1888 and the emerging prospect of Federation, there was an optimistic and growing sense in the Australian colonies that this enormous country was destined for greatness in unity and that, hand in hand with agricultural and other development, the population would eventually grow to perhaps 100 million. The following contemporary observation quoted from the London *Spectator* of Australia Day 1888 illustrates this mood:

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 civilisation] 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.⁹

The early 1900s

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

⁹ 'Topics of the day. The next centenary of Australia', *Spectator*, 28 January 1888, p.112 in Powell JM, 1988, *An historical geography of modern Australia: The restive fringe*, Cambridge University Press, p.8

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...¹⁰

For twenty years the goal of building a 'great nation...hold(ing) a commanding place amongst the peoples of the world',¹¹ was unquestioned.

The 1920s

1.27 After the First World War there was intensive debate over the optimal and maximal size of Australia's population. The debate was generated in the wider Imperial context of 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 wanted.¹²

1.28 However, the Sydney University geographer T(homas) Griffith Taylor (1880-1963) argued, somewhat opaquely, on the basis of the limited data available then on Australia's soil and water resources that Australia could never support more than 65 million.¹³ Taylor also predicted that the population would be no more than 20 million by the year 2000. After a decade of stormy controversy, Taylor left Australia in 1928 and the population debate quietened down.

¹⁰ Report of The Royal Commission on the Decline of the Birth Rate and on the mortality of Infants, New South Wales Legislative Assembly 1904, quoted in Borrie WD, 1958, *The peopling of Australia*, George Judah Cohen Memorial Lecture, University of Sydney

¹¹ *ibid.*

¹² National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra; Pope D, 1987, 'Population and Australian economic development 1900-1930', in Maddock R and McLean IW (eds) *The Australian economy in the long run*, Cambridge University Press, Cambridge

¹³ Taylor TG, 1922, 'The distribution of future white settlement', *Geographic Review* 10(12): 375-402. Much later, Taylor reduced this estimate to 20 million, largely as a result of assuming that people were to be maintained at a much higher standard of living than in his earlier calculations; Taylor TG, 1937, *Environment, race and migration*, Toronto UP, Toronto; Powell JM, 1993, *Griffith Taylor and 'Australia unlimited'* The Macrossan Memorial Lecture, University of Queensland, May 1992, University of Queensland Press, Brisbane

1.29 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.¹⁴

The 1930s

1.30 During the depressed thirties, visions of an eventual 100 million Australians collapsed with the falling migration from Britain and declining fertility. Community hopes for great population growth were replaced by anxiety over possible population decline.¹⁵

The 1940s to 1960s

1.31 JB Chifley's Labor Government created a Department of Immigration in 1945 and appointed AA Calwell as the first Minister. A massive immigration program, drawing no longer just on 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.¹⁶ Calwell, who was a passionate champion of population growth, wrote in 1948:

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 and for all.¹⁷

¹⁴ Pope D, 1987, 'Population and Australian economic development 1900-1930', in Maddock R and McLean IW (eds) *The Australian economy in the long run*, Cambridge University Press, Cambridge

¹⁵ Borrie WD 1958, *The peopling of Australia*, George Judah Cohen Memorial Lecture, University of Sydney

¹⁶ Ibid

¹⁷ Calwell AA, 1948, *Immigration policy and progress*, Minister for Immigration and Information, Melbourne, quoted in National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

1.32 The remarkable aspect of the post-War situation was the support over a period of about 25 years of all major political parties for both the post-War immigration program and for the principle of population growth. RG Casey, later Liberal Minister for External Affairs and Governor General, wrote *Double or Quit* (1949), which helped ensure bi-partisan support for Calwell's migration policy. The population debate focussed on the appropriate rate of increase. The issue was how fast Australia's population should grow and what the annual rate of increase should be. An annual immigrant intake of one per cent of population was widely supported. The idea of an optimum population (essentially that maximising per capita real income) as debated in the twenties and thirties was forgotten in the euphoria of the post-War economic boom.¹⁸

The 1970s and 1980s

1.33 It was only after about 1968 that the whole basis of the post-War immigration program began to be questioned.¹⁹ 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'.²⁰ 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.²¹

1.34 *A National Population Inquiry* - the Borrie Inquiry - reflecting these concerns was begun in 1970 and reported in 1975.²² The terms of reference for the Inquiry included a study of the situation in countries with comparable socio-political structures to Australia, the study of contemporary population theories, including the concept of zero population growth, and the economic, sociological and ecological consequences implicit in these.

¹⁸ Dr B Birrell and Dr K Betts, Submission 179

¹⁹ Borrie WD, 1958, *The peopling of Australia*, George Judah Cohen Memorial Lecture, University of Sydney

²⁰ Borrie WD, nd, *Population policy in Australia: A preliminary review*, Australia's population and the future, Working Paper No. 20

²¹ National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

²² National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

The Inquiry was also to examine the growth potential of the population, the effect of variations in rates and patterns of that growth, the distribution of population with particular reference to the growth of major urban centres and the impact of technological advance on the use of available resources and the distribution of population.²³

1.35 Both the Inquiry and the government of the day in its response to the Inquiry cast doubts on the utility and feasibility of seeking an optimal level or optimal rate of growth of population. It was deemed more realistic to let population change result from action to achieve other goals relevant to the social priorities of the time, for example, to facilitate access to family planning services.

1.36 The recognition prior to the Inquiry of the threat of environmental degradation as a reason for concern over population growth was not reflected in the Inquiry report itself, one comment being that discussion of the environment therein was 'decidedly off-hand'.²⁴

1.37 This perception was to change dramatically over the following 18 years up to the publication of Australia's next major report on population management.

The 1990s

The National Population Council Report

1.38 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'.²⁵ 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.

²³ Borrie WD, nd, *Population policy in Australia: A preliminary review*, Australia's population and the future, Working Paper No. 20

²⁴ Priorities Review Staff 1976, *Report on the Borrie Report*, AGPS, Canberra

²⁵ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

1.39 On the relationship between population growth and economic growth, the report says that in the absence of economies and diseconomies of scale, population growth *per se* has only marginal long-run impacts on per capita GDP. It notes that knowledge of the existence of economies and diseconomies of scale is insufficient to be able to infer whether population growth *per se* enhances or reduces the productivity basis for economic progress. The report summarises past efforts at empirical modelling of the relationship between population growth and growth in output per head as having 'usually found a positive effect'.

1.40 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.

The NPC report acknowledges the existence of major external costs of population growth (costs not reflected in market prices) 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.

1.41 It acknowledges that population adds a significant component to growth of greenhouse gas emissions and to other related demands on natural capital. Urban population growth is acknowledged as having a negative influence on 'urban ecological integrity'.

1.42 The National Population Council recommended the adoption of 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'.

1.43 This concept of a population policy was elaborated as follows:

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.

1.44 The Council's recommendation for the adoption of a population policy was rejected by the Government:

This mainly reflected the view that the objectives of a population policy could be largely achieved by building on co-ordination and research within Government. The Government's approach also recognised that a range of other important initiatives, aimed at greater national ecological integrity and equity had been adopted, including the *National Strategy for Ecologically Sustainable Development* and the *National Greenhouse Response Strategy*.²⁶

Ecologically sustainable development strategy

1.45 Following the reporting 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.²⁷

1.46 These principles include:²⁸

- advancement of material and non-material well-being;
- intergenerational and intragenerational equity;
- protection of biodiversity and the maintenance of ecological systems;
- dealing cautiously with risk and uncertainty; and
- recognition of global dimensions.

²⁶ Department of Immigration and Ethnic Affairs, Submission 247

²⁷ Ecologically Sustainable Development Working Groups, 1991, *Final reports* (9 vols), AGPS, Canberra

²⁸ Ecologically Sustainable Development Working Group Chairs, 1992, *Intersectoral issues report*, AGPS, Canberra

1.47 The ESD process identified nine elements of a population policy consistent with ecologically sustainable development including that 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;

- consider the impact of various economic, environmental, social and cultural forces on the distribution of population, especially in the urban and regional development contexts;

- emphasise that the skills base of the population is more relevant to Australia's economic prospects than simple population size;

- 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; and

- a population policy should be co-ordinated with economic, environmental, health, education, foreign aid, social justice and cultural policies.

The Ahlburg Report

1.48 In 1994 the Government sponsored the an independent inquiry (the Ahlburg Inquiry)²⁹ to examine:

²⁹ In response to concerns about the proportional allocation of Australia's overseas aid budget, an independent inquiry into 'the nature and significance of the links between population and development' was commissioned by the Department of Immigration and Ethnic Affairs and undertaken by an American consultancy headed by Professor Dennis Ahlburg, Professor of Public Policy at the Center for Population Analysis and Policy at the University of Minnesota. The report was issued on 13 April 1994. Ahlburg D, Kelley A, Panayotou T, Montgomery M, Diamond I, Ruttan VW, Lloyd C, Mason A and Oppenheim Mason K, 1994, *Independent inquiry report into population and development*, Center for Population Analysis and Policy, University of Minnesota, Minn

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- (a) the nature and significance of the links between population growth, economic development and human well-being in developing countries;
 - (b) impacts of family planning on fertility; and
 - (c) the human rights implications of family planning programs. The report provided clearly endorsed Australian support for population programs in developing countries. The report also concluded that in some circumstances, unrestricted population growth is inimical to economic development.

Australian National Report on Population

1.49 The United Nations International Conference on Population and Development held in Cairo in September 1994 has provided the most recent opportunity to learn about Australia's policies and programs with regard to population issues. The Australian National Report on Population, prepared by a broad-based National Committee³⁰ was submitted to the conference as a statement of current government policy.

1.50 Thus the current official view of the relevance of a population policy and of the idea of an optimal population is conveyed in 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.³¹

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.³²

1.51 This Committee's Inquiry into Australia's population 'carrying capacity' is an attempt to consider some of the political, cultural, social and environmental issues left open under the prevailing policy conditions.

³⁰ National Committee, 1994, *Australia: National report on population for the United Nations international conference on population and development*, AGPS, Canberra

³¹ *National Report on Population*, p. 29

³² *Ibid*, p. 45

1.52 Professor Jonathan Stone, FAA, Challis Professor of Anatomy, at Sydney University, submitted to the Committee a paper similar to his keynote address to the symposium *Population 2040: Australia's Choice*, held in Canberra in April 1994 under the auspices of the Australian Academy of Science. The paper used projections made by Dr Lincoln Day and Dr Christabel Young of the ANU's Department of Demography and reflected views expressed at the Population Summit of the World Academies of Sciences in New Delhi in October 1993. Professor Stone also appeared before the Committee.

1.53 He presented an eloquent argument for stabilising population at 23 million in the year 2040, assuming that current levels of fertility persist and that immigration is set at the low end of the post-War range (50 000 net per year). He emphasised the fragility of Australia's soils 'continent-wide', and the fact that the continent's flora and fauna evolved in a low energy using environment. 'Every biologist...has been impressed by the energy-saving strategies of Australia's unique fauna; energy-inefficient species have not survived here'. '*Homo sapiens*...a large, energy-hungry mammal...the largest carnivores on the Australian continent' have not yet adapted to our environment.

1.54 Our cities have huge 'footprints' which cover large areas of non-urban land - the areas needed for water supply, waste disposal, energy production and farms for food supply. Contamination of the Hawkesbury River is attributed to population growth, as is the algal development in the Murray-Darling system.

1.55 Finally, given the evidence of world wide population explosion, Professor Stone urged that stabilisation of Australia's population by 2040, would 'align Australia with global policies endorsed by international bodies'.

1.56 Professor Stone conceded that the 'marvellous' urban civilisation of Western Europe had population densities, such as in the Netherlands or Switzerland, far higher than Australia's. He pointed out that these societies depended on the importation of non-renewable resources, especially energy and that the Netherlands had suffered a tremendous loss of species about 200 years ago. He also conceded that many problems such as river contamination were functions of management, not just population.

1.57 After questioning about the segmented nature of the Australian environment, with perhaps 10 per cent having soil and water quality

comparable to Western Europe, Professor Stone commented, 'I certainly do not wish to say...that Australia cannot, at least for some period of decades or even centuries, sustain a much higher population'.

1.58 Professor Stone's presentation emphasised interconnectedness: that Bangladesh's overcrowding and Australia's emptiness were all part of a continuum, and that Australia's arid geology was one central feature and the fertile area was anomalous. However, it could be argued that human activity had enhanced the capacity of small areas to produce a high quality of life: Hong Kong and Singapore were examples of small areas (admittedly with a larger energy, food and water 'footprint') supporting high population. The environmentally fragile Netherlands supports a productive, affluent and vibrant society with a population close to Australia's in an area barely 60 per cent that of Tasmania.³³

1.59 Circumstances alter cases. The outcome of the argument on population depends essentially on the starting point. Professor Stone's approach, persuasively argued, and with strong support in the scientific community, is a sophisticated neo-Malthusian schema, far more compassionate than the original. But, in Malthus' original work (1798), there was a rigidity in his predictions which was not borne out by later events and the political process needs to be sensitive, openminded and flexible. The same approach may be correct - but it ought not to be treated dogmatically, a position that Professor Stone might well endorse.

1.60 Professor John Caldwell, AO, FASSA, President of the International Union for the Scientific Study of Population, was Head of the Department of Demography at the Australian National University for 20 years and a consultant with the UN Conference on Population and Development in Cairo in 1994. He gave evidence before the Committee in September 1994.

1.61 Professor Caldwell pointed out that his predecessor as Head of the Department of Demography at ANU, WD Borrie concluded 'in his national population inquiry...that there was no reason to think that Australia could not support 50 or 60 million people comfortably'. Professor Caldwell could 'see no reason to dispute that view; perhaps we can support more'.

³³ Professor Jonathan Stone, transcript of evidence, 31 May 1994

1.62 Professor Caldwell pointed out that Australia's fertility is now less than long term replacement, and the total fertility rate of about 1.8 long term replacement is about 2.1. He continued:

I might add that most of the developed countries in the world, certainly Australia, employ in their projections the assumption that we will go back to replacement fertility. I think this is like the older beliefs that infertility transition would end up in replacement fertility. I think there is no genuine reason for it. In a world which is becoming even more attuned to both men and women being educated, to both husbands and wives working, there are many reasons why a proportion of women will not marry and will not bear children. As a result, I think there is a very good chance of fertility remaining below replacement level in Australia and in most other developed countries.

Incidentally, on that issue I should add that, given this, Australia's future growth rate after the next 20 or 30 years will probably be determined entirely by immigration.

This in many ways is very fortunate. It gives us the ability to turn immigration on or off as we see fit. I am inclined to think that we often make errors in this because I do not think there is a strong relationship between the immigration rate and the unemployment rate. Anyhow, by the time what the populace think about employment affects the immigration rate the rate of economic growth is usually changing again.

1.63 He also said:

I do not think population growth accompanied by growth in income as we have experienced it over the last few decades imperils the environment. In fact, it is the richer country that we have now attained that has allowed us to lock up many of our semi-tropical scarp forests in national parks, something that I would not have anticipated on this scale 30 or 40 years ago. I think it is our higher incomes that have allowed us to look after our land more.³⁴

The Stone and Caldwell papers epitomise contrasting views which provide a basis for continuing debate about population goals for Australia.

1.64 The Committee is troubled by the prevailing fatalism in many submissions which suggest that changing migration intake is the only variable in determining Australia's future population resource use, waste disposal and

³⁴ Professor John Caldwell, transcript of evidence, 20 September 1994, pp. 356-7

urban form. The almost universal explanation offered for contamination of river systems, for problems of waste disposal, and for excessive water use is identified as population growth alone, without any attempt to suggest more appropriate land management, developing new techniques in waste disposal and treating pristine water as a premium product.

The need to have a population policy and to distinguish it from immigration policy.

1.65 Conclusion:

In population matters, Australia cannot rely on luck and chance factors. It must know where it wants to go. The explanation offered by the Government at the Cairo Conference on Population and Development (1994) that 'Australia does not have an explicit or formal population policy' in part because there would be a 'diversity of community views as to the character and objectives of such a policy' is at best an agnostic position, at worst an abdication of responsibility simply because the subject is difficult. However as we argue below, the Committee agrees that specific population targets - a particular figure to match a particular year - would be rigid and self defeating. Nevertheless, ranges of options should be explored and discussed.

1.66 Conclusion:

It was clear from the submissions to the Committee, media reports about the Committee's 'immigration enquiry' and public comment generally that *population* and *immigration* are regarded as virtually synonymous. They are not.

1.67 Conclusion:

In the Committee's opinion it is essential that Governments of whatever political persuasion understand that establishing a population policy is a *primary* goal and that setting immigration levels is a *secondary* consequence of the population goal. The cart must not be placed before the horse making population policy merely an undefined, inexplicit consequence of immigration policy.

Institutional arrangements, co-ordination and information

1.68 In the Committee's opinion, population policy and immigration policy are quite distinct areas, although the setting and execution of immigration targets year by year has very long term impacts on population.

1.69 The Minister for Immigration and Ethnic Affairs is in an invidious position: his Department is seen as having a client relationship with the large migrant community and with its multicultural implications. He or she, therefore might appear to have a conflict of interest between his or her client 'constituency' which he or she has responsibility for, and the broader community.

1.70 The Department is seen, rightly or wrongly, as being in the advocacy business in immigration matters and as lacking the necessary objectivity to determine population matters.

1.71 Nevertheless, the Committee thinks that it is unlikely that the present or future Australian Governments would appoint a separate Minister for Population with a supporting Department.

1.72 The Committee concludes that the most appropriate compromise is for the Government to appoint a Cabinet Committee on Population to be serviced by a small secretariat, including personnel from the Australian Bureau of Statistics, the Department of the Environment, Sport and Territories, the Department of Immigration and Ethnic Affairs, the Department of Social Security and chaired by a nominee of the Department of Prime Minister and Cabinet.

1.73 The composition of the Cabinet Committee would, of course, be up to the Prime Minister of the day, but the Committee suggests that it should be chaired by the Prime Minister and that its members should include:

The Treasurer

Minister for Foreign Affairs and Trade

Minister for Finance

Minister for Immigration and Ethnic Affairs

Minister for the Environment

Minister for Social Security

Recommendation 1: The Government should determine that population policy and immigration policy are quite distinct, with differing goals, although the long term consequences are inextricably linked, and immigration is a major instrument of population growth. The political and administrative responsibility for population and immigration must be separated.

Recommendation 2: The Australian Government should adopt a population policy which explicitly sets out options for long term population change, in preference to the existing situation where a *de facto* population policy emerges as a consequence of year by year decisions on immigration intake taken in an *ad hoc* fashion, such decisions being largely determined by the state of the economy in the particular year and with little consideration of the long term effects. Population policy is central to establishing national goals and must involve the Prime Minister directly.

Recommendation 3: The Government should establish a Cabinet Committee on Population, chaired by the Prime Minister, to take specific responsibility for *population* policy in distinction to *immigration* policy, to create a publicly assessable data base on population issues and publish material intended to improve the quality of public understanding and political debate on the subject.

Recommendation 4: Immigration would continue to be the responsibility of the Minister for Immigration and Ethnic Affairs.

Recommendation 5: A Commonwealth-State Ministerial Council for Population and Urban Affairs should be established and population placed on the agenda of the Premiers' Conferences.

Chapter 2

CONTINENTAL 'CARRYING CAPACITY': A COMPARATIVE ASSESSMENT

2.1 This Chapter provides basic information on the natural resources which set the operating parameters for Australian agriculture. It outlines the way in which the agricultural industry has evolved to use those resources and identifies some sustainability threats to and technological opportunities for agriculture. It explores the conceptual and empirical basis for measuring the Nation's human 'carrying capacity' and the role of the 'carrying capacity' concept in discussions of population policy. There has been some concern about the Committee's adoption of the term 'carrying capacity' in the title of its Inquiry, although it would have been more brutal to have referred to 'stocking rate'. Perhaps the inverted commas need to be understood and used whenever the term is used. But we thought that the term 'limits to acceptable change' was not much more than a euphemism and raised the further question: 'change to what'? Where the term 'carrying capacity' is used in this Report, it must be understood as being subject to limits which involve political, social, environmental, cultural and historical factors.

2.2 In physical terms the Continent of Australia may be conceived of as two highly habitable segments or 'islands' separated by an enormous 'sea' of arid and semi-arid landscapes of mainly salty and sandy soils occupying some 70 per cent of the Continent's 7.7 million sq km. The 'islands' are the south-west corner of Western Australia, and the Cairns-to-Adelaide seaboard. Tasmania is a third 'island'.

2.3 The 30 per cent of Australia with rainfall in excess of 250-300 mm per annum and annual water withdrawals of more than 1300 cu m per capita, contains over 90 per cent of the Australian population and most of the country's 750 000 sq km of arable land, comprising almost 10 per cent of the Continent. Arable land is defined as land having both soils and rainfall suitable for growing rain-fed crops. Arable Australia has almost the same area as France and the United Kingdom combined (787,000 square km), far more than Japan and Java combined. If 'arable' Australia had the population

density of France, it could hold 79.6 million people.¹

2.4 Even within Australia's 'ecumene', defined as the habitable area, the population distribution is enormously skewed with over 50 per cent living in Sydney and Melbourne alone and most of the rest in the other capitals. Of these, only Canberra and Hobart have populations of less than one million. These highly urbanised populations are scattered through the ecumene which has an overall average density of about 7 people per sq km, compared with 0.3 per sq km in the rest of the continent.

2.5 As the Table 'World Resources Data: Selected Countries' indicates, there are striking national variations between land area, resource use and population density. This is confirmed by the tables which follow.

Clarifying the idea of human 'carrying capacity'

2.6 In calling for submissions to the present Inquiry, the Long Term Strategies Committee recognised the existence of diverse ideas on the meaning of the term 'carrying capacity' but suggested that the most useful definition would be 'that combination of population, location and demographic characteristics which best serve Australia's national interests, and which allow individuals in the society to live long, self-fulfilling lives'.

2.7 This is a definition which equates population 'carrying capacity' with a 'best' or 'optimum' population in some sense and not with a 'maximum' population living under Malthusian conditions of mere physical survival, or even the maximum population which could be well-fed and well-watered. In the Committee's view it was important to work with a concept of 'carrying capacity' which recognised that many factors besides the availability of food, water and waste assimilation sinks need to be considered when discussing what Australia's population should be. In broad terms, these are the economic, environmental and socio-cultural factors which determine quality of life.

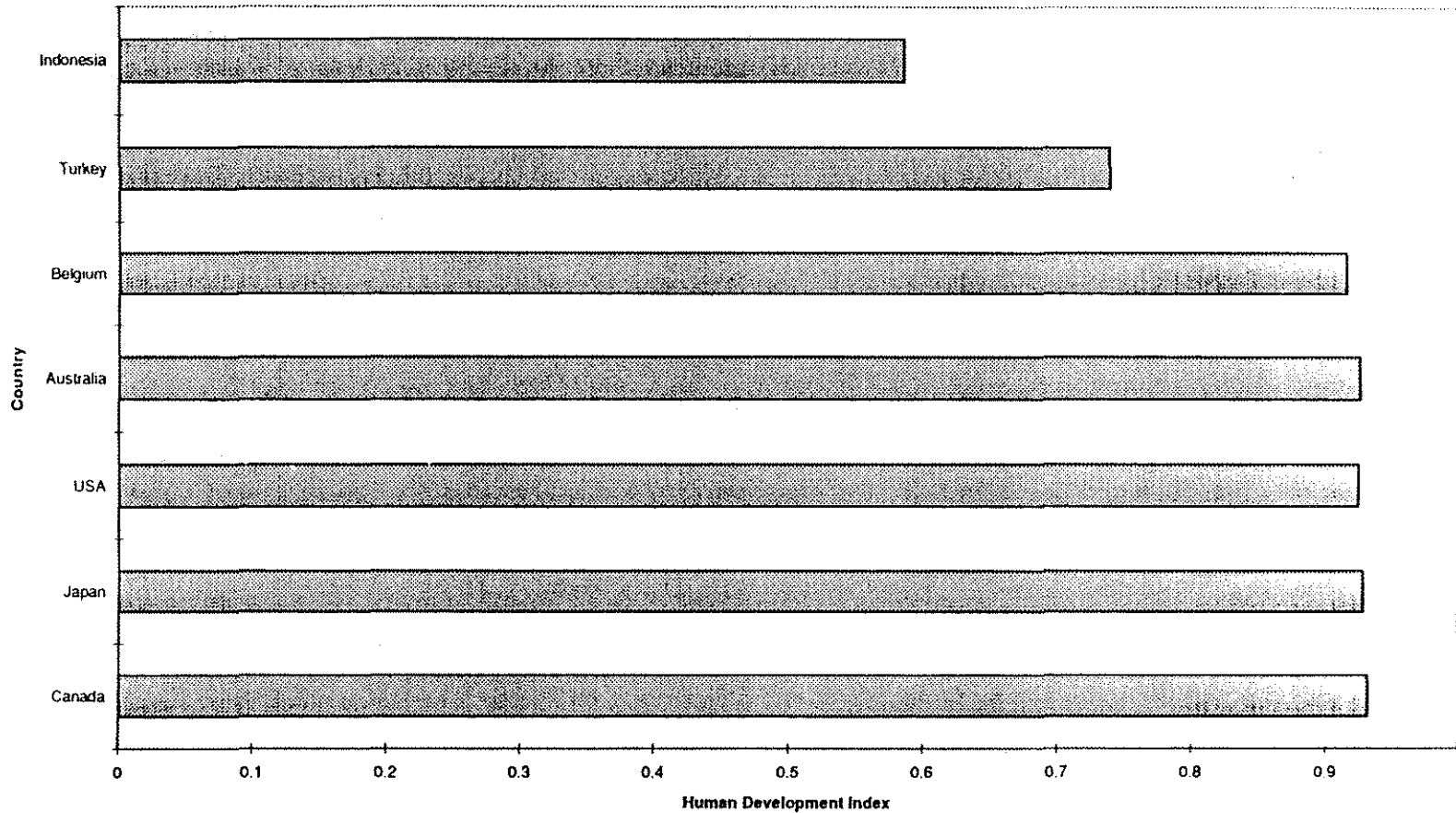
¹ If 'arable' Australia had the population density of the United Kingdom, it could hold 178.4 million, of Japan 247.5 million and of Java 750 million. The city states of Hong Kong (6 million people in an area of 1075 sq km) and Singapore (2.9 million in 639 sq km) are interesting examples of extraordinarily high population density with an improving standard of living. However these entrepots were the unique products of historical and geographic circumstances and are not appropriate models for Australia.

WORLD RESOURCES DATA: Selected Countries

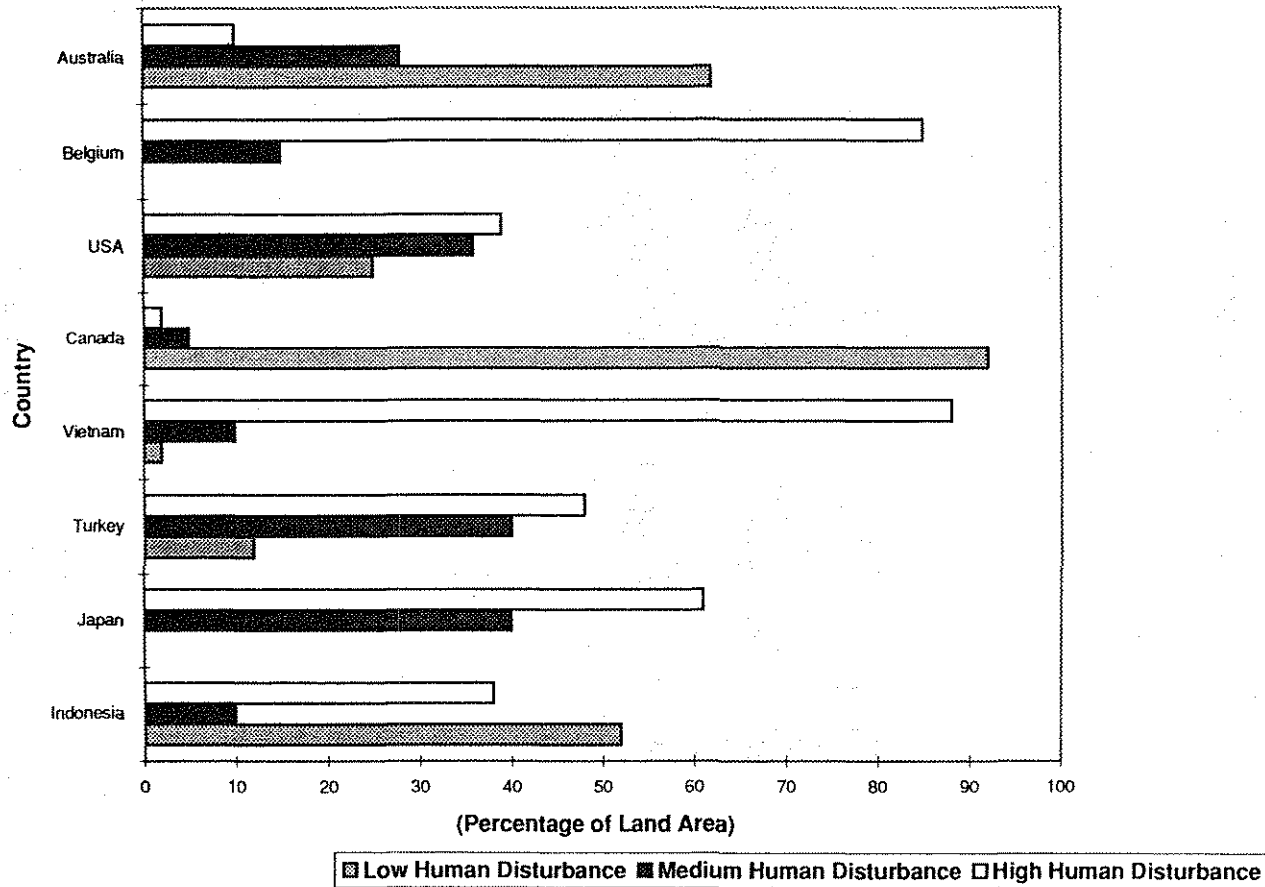
	Country							
	Indonesia	Japan	Turkey	Vietnam	Canada	USA	Belgium	Australia
Land area ('000 hA)	181,157	37,652	76,963	32,549	922,097	916,660	3,023	764,444
Population density (People per '000 hA)	1,074	3,319	774	2,178	30	281	3,311	23
Domesticated Land Percentage (%)	19	14	47	21	8	47	46	61
Cropland ('000 hA)	21,967	4,595	27,754	6,381	45,947	187,776	764	48,267
Urban Population (% of total population)	32.5	77.9	68.8	20.8	78.1	76.2	96.7	85.2
People in cities over 750,000 (% of total)	12.8	38.0	23.8	1.7	32.3	41.7	13.4	59.9
Population (Millions)	201.48	125.88	62.03	73.81	28.54	263.14	10.03	18.34
Percentage of Land Area as regions of								
Low Human Disturbance (%)	52	0	12	2	92	25	0	62
Medium Human Disturbance (%)	10	40	40	10	5	36	15	28
High Human Disturbance (%)	38	61	48	88	2	39	85	10
Agricultural Production Per Capita (Index: 79-81=100)	132	90	95	123	110	97	120	99
Renewable Water Resources								
Total (Cubic kilometres)	2,530.00	547.00	186.10	376.00	2,901.00	2,478.00	8.40	343.00
Per Capita ('000 cubic metres)	13.23	4.39	3.19	5.41	106.00	9.71	0.84	19.49
Annual Water Withdrawals								
Percentage of Water Resources (%)	1	16	12	8	2	19	72	5
Per Capita (Cubic Metres)	95	732	433	416	1688	1868	917	1306

Source: World Resources: A Guide to the Global Environment 1994-95 OUP, New York 1994

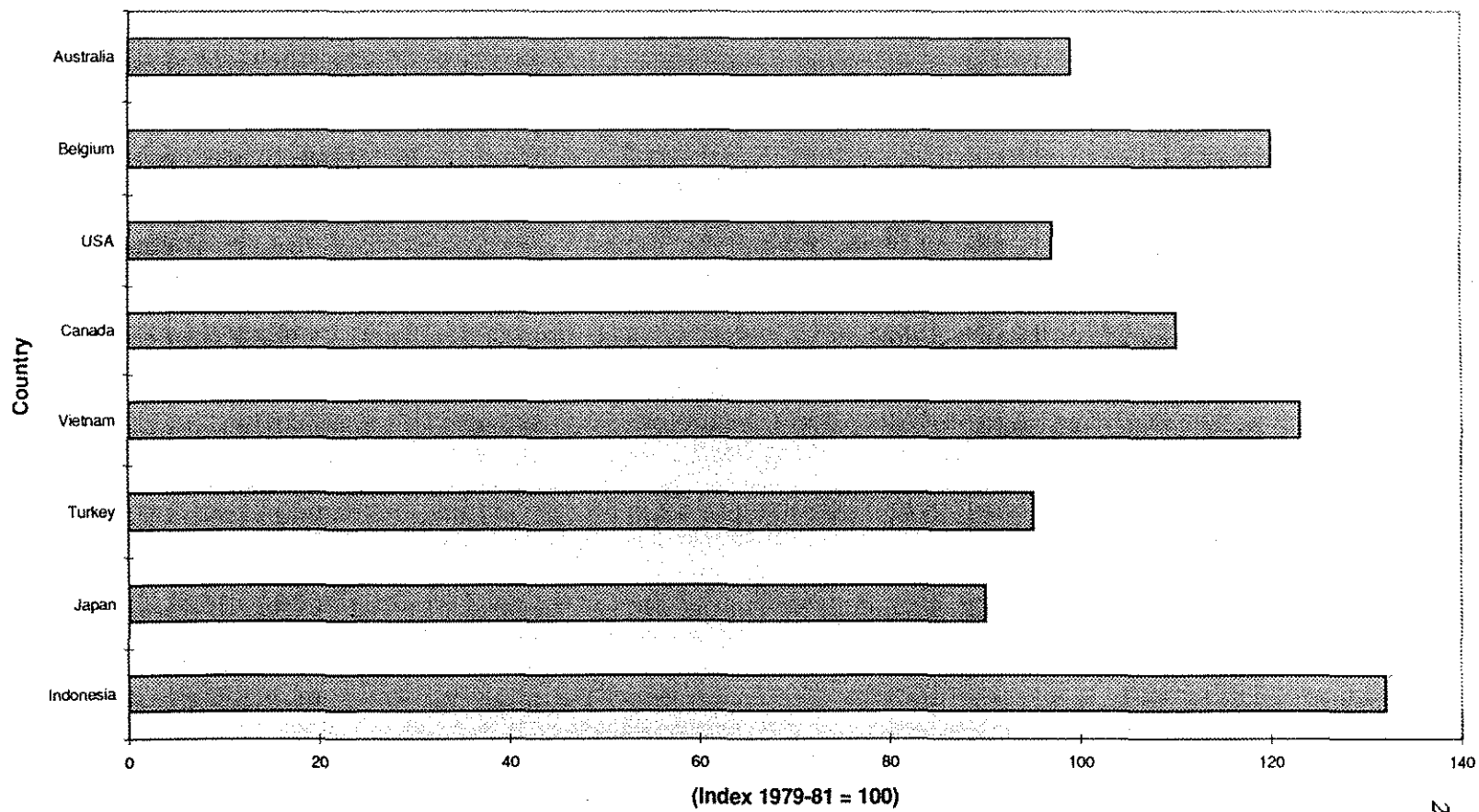
Human Development Index: Selected Countries: 1992
H.D.I. Factors = Education + Longevity + Real GDP per capita



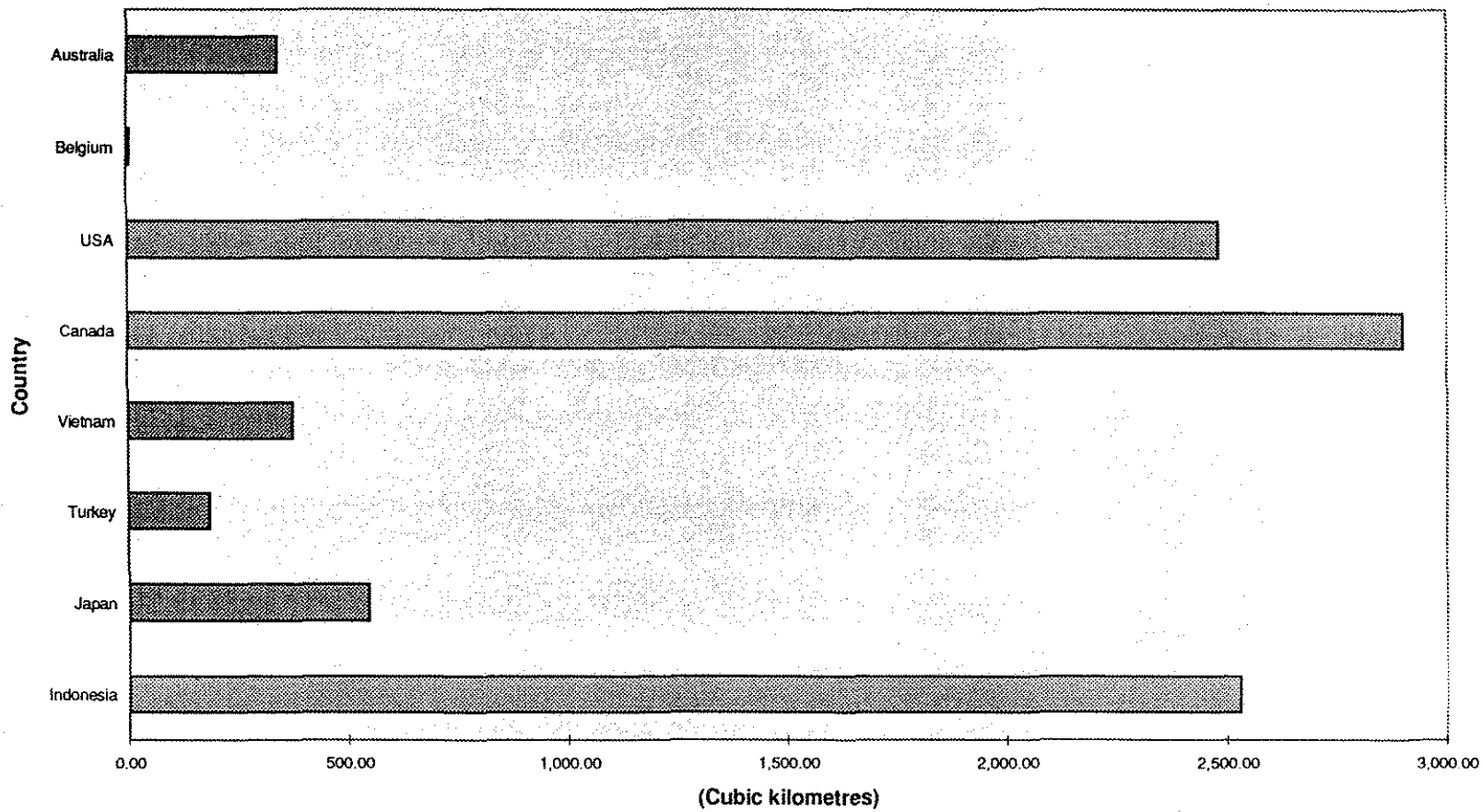
Land Area Classified by Human Disturbance: Selected Countries



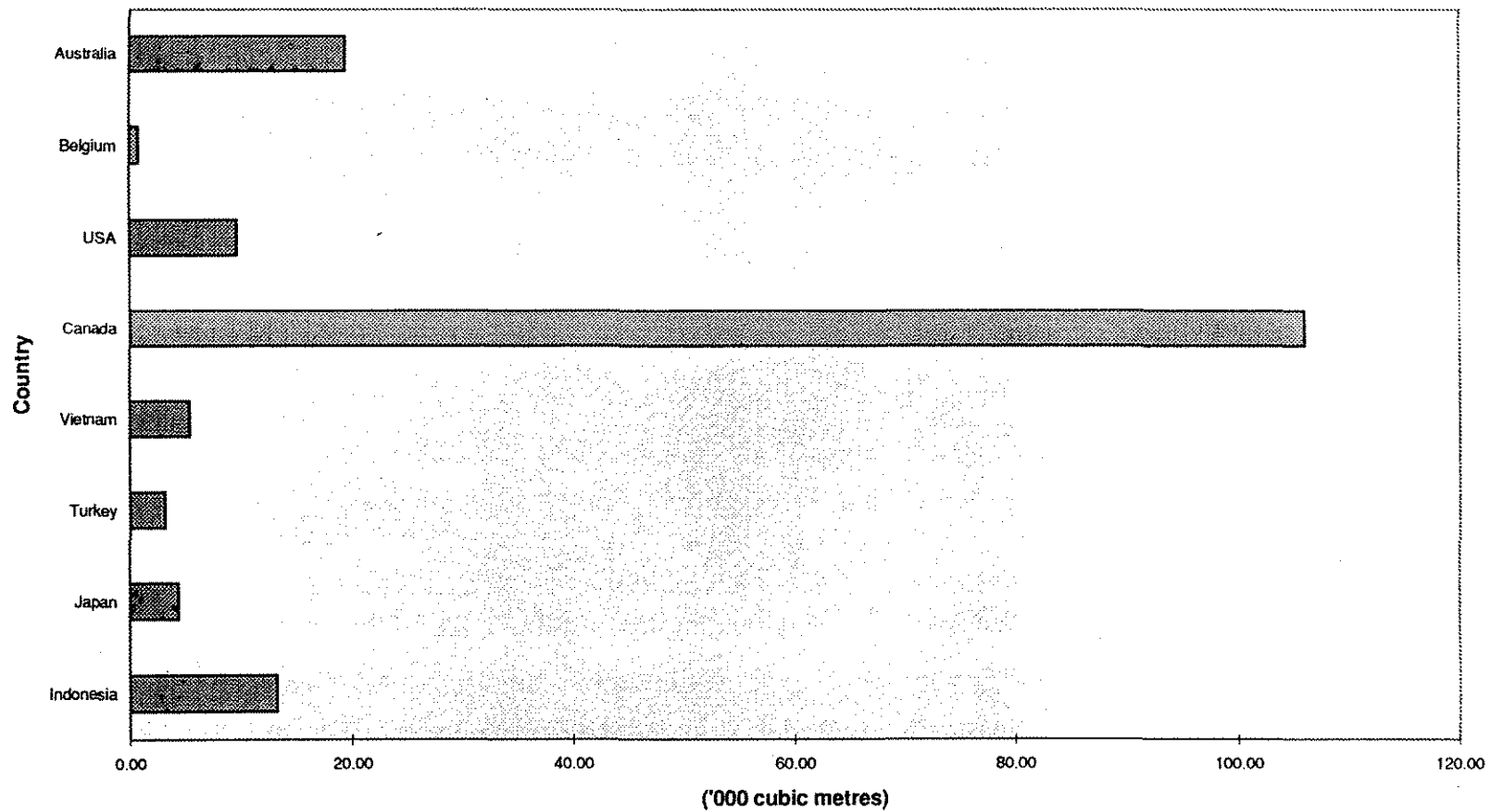
Index of Agricultural Production: Selected Countries



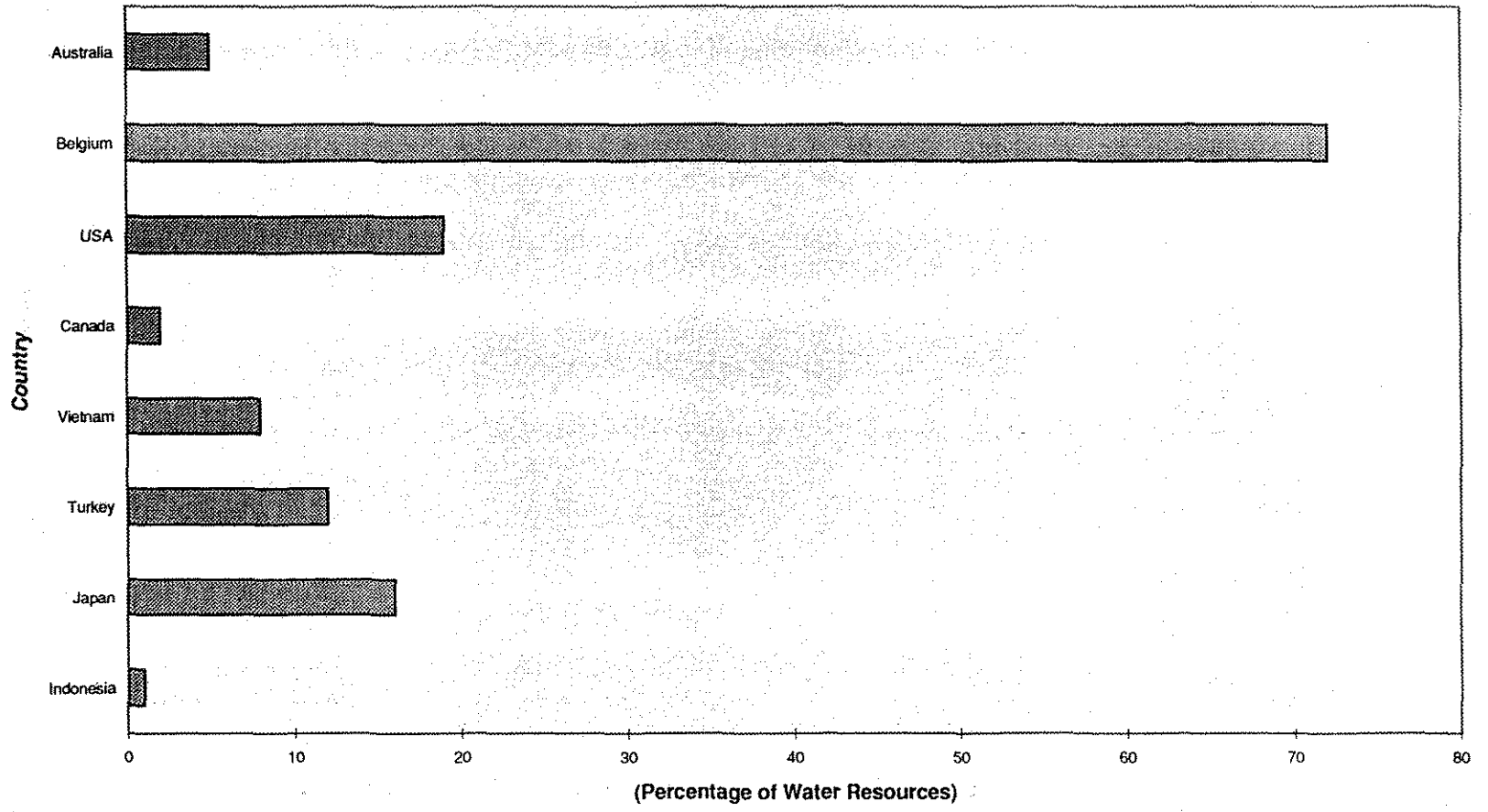
Annual Internal Renewable Water Resources: Selected Countries



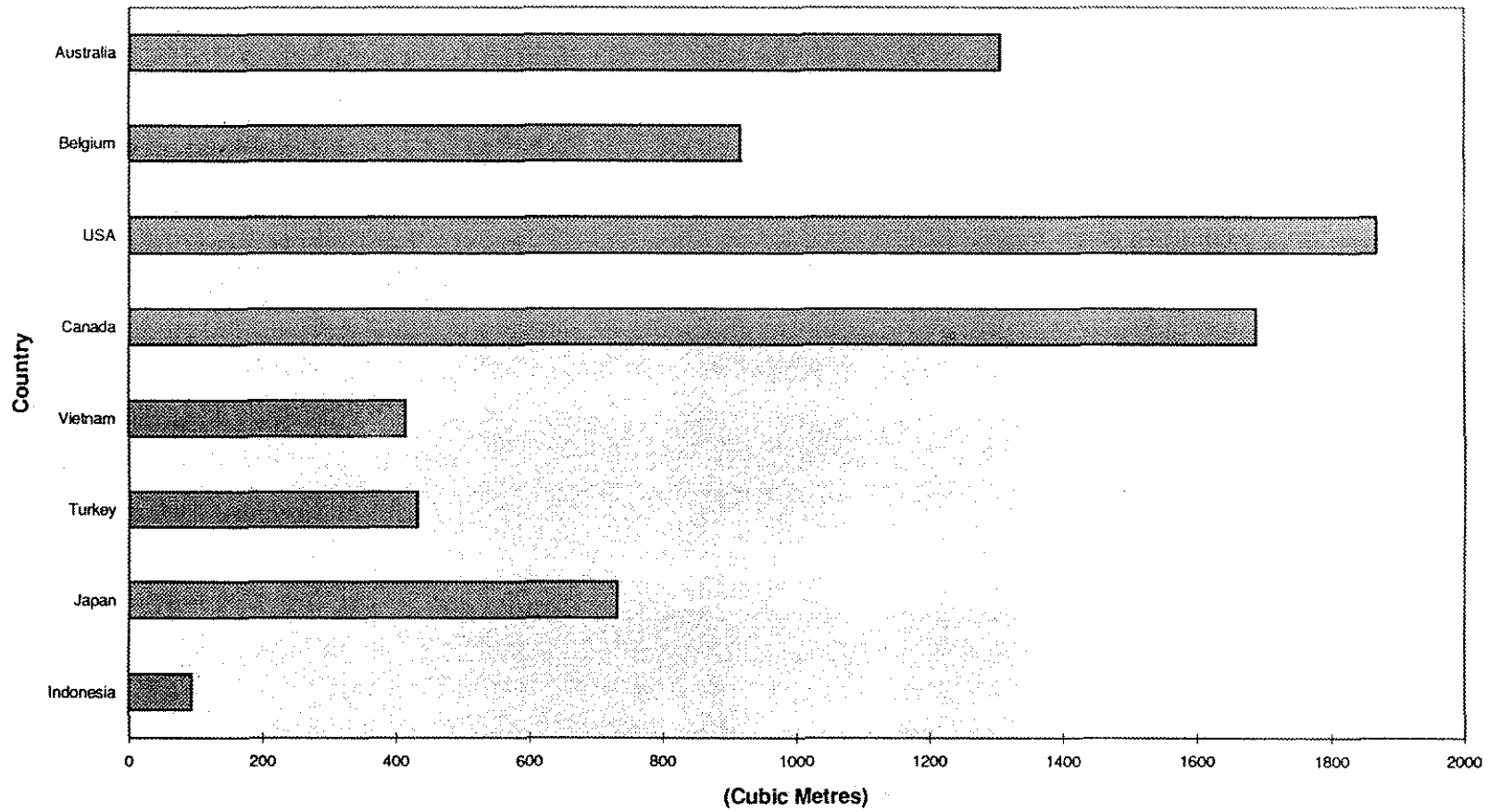
Annual Internal Renewable Water Resources per Capita: Selected Countries



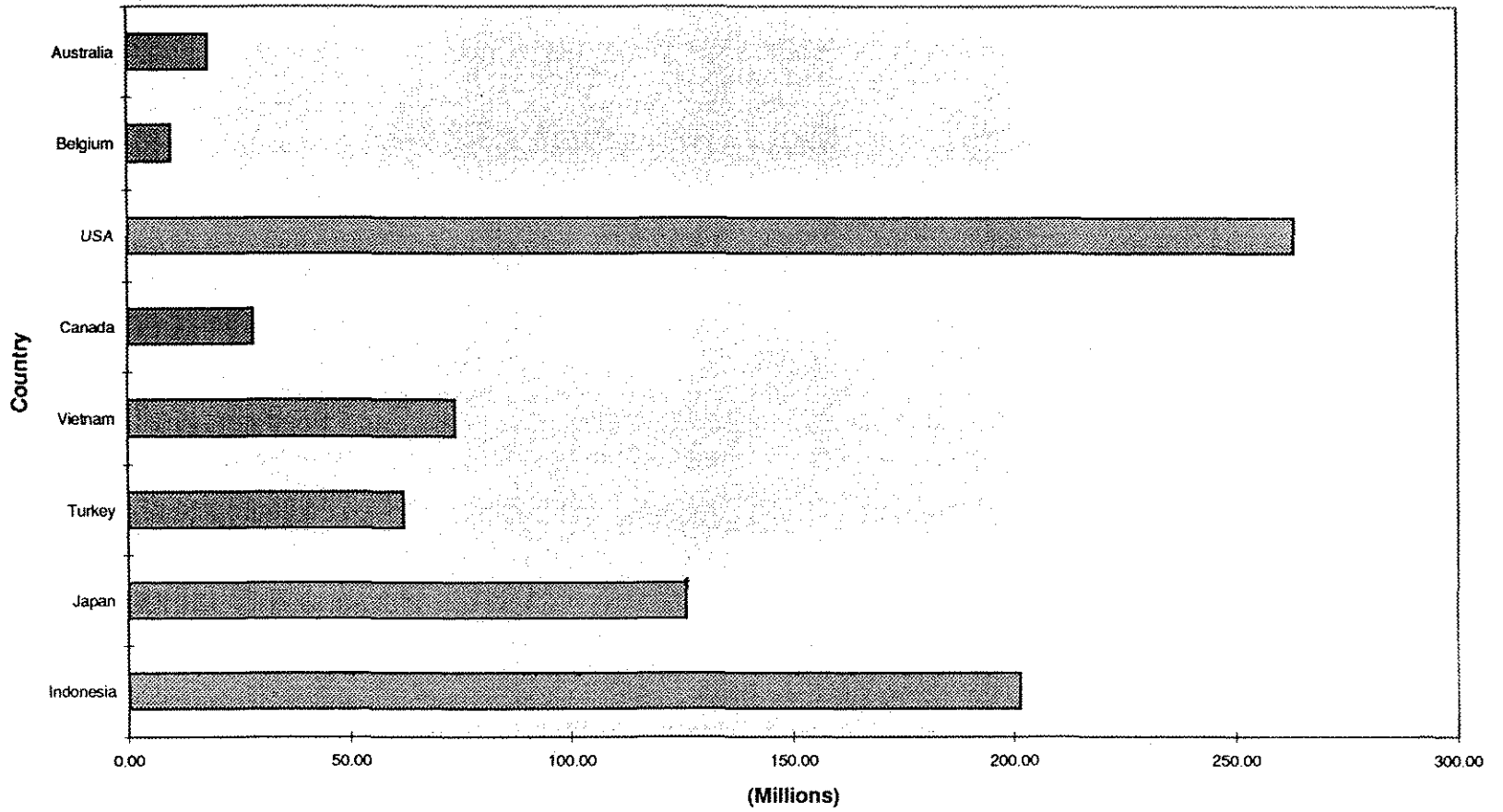
Annual Freshwater Withdrawals: Selected Countries



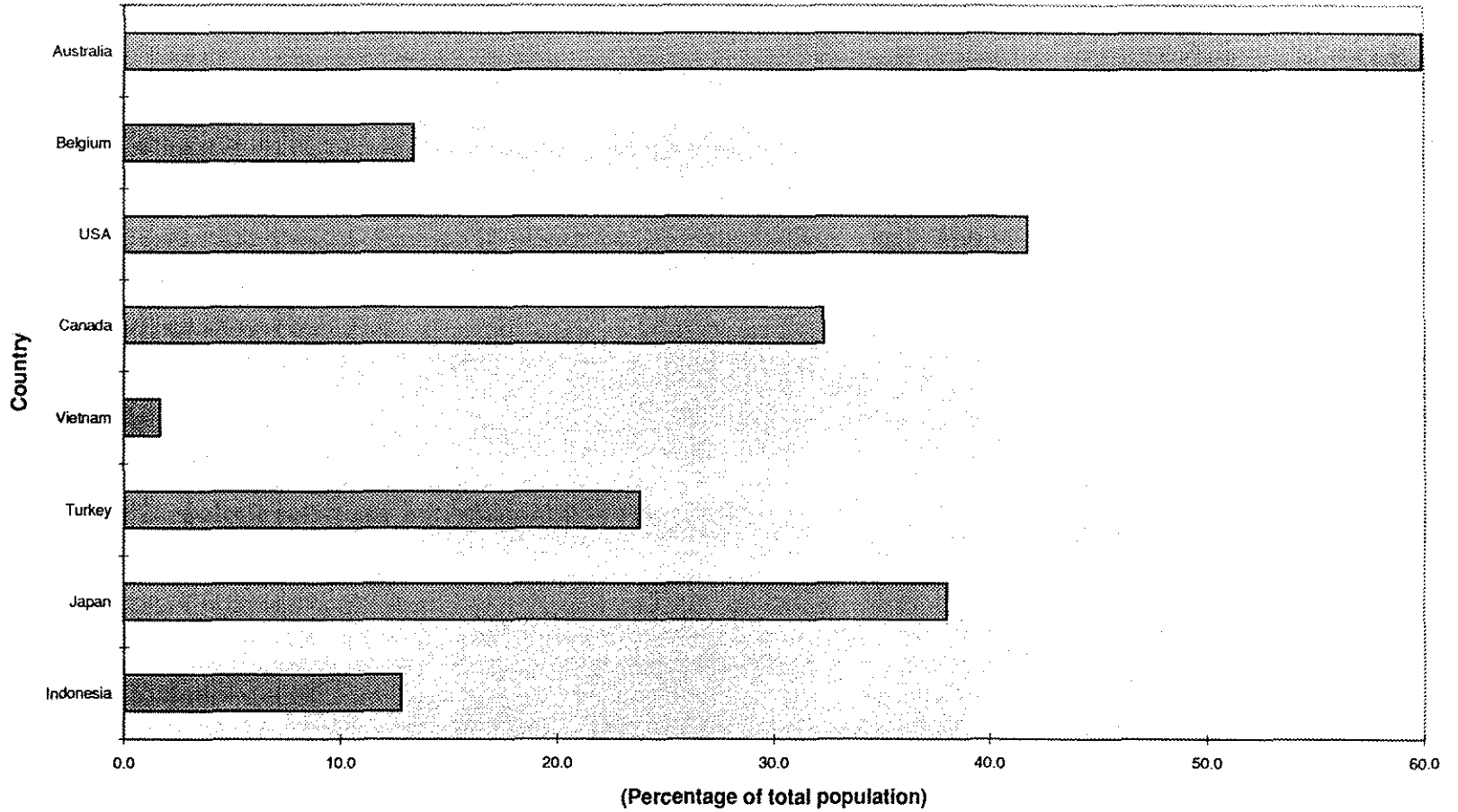
Annual Freshwater Withdrawals Per Capita: Selected Countries



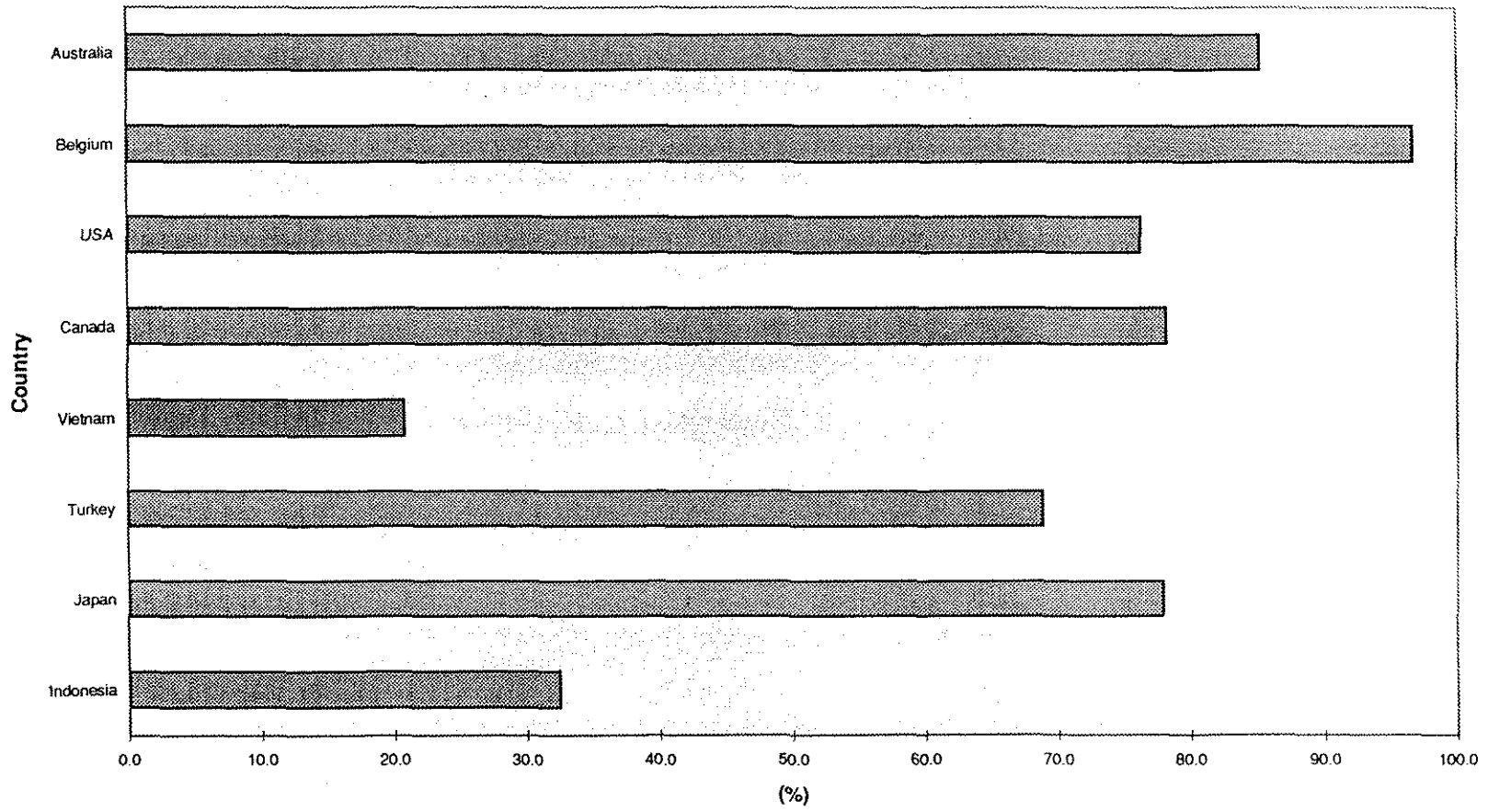
Population: Selected Countries



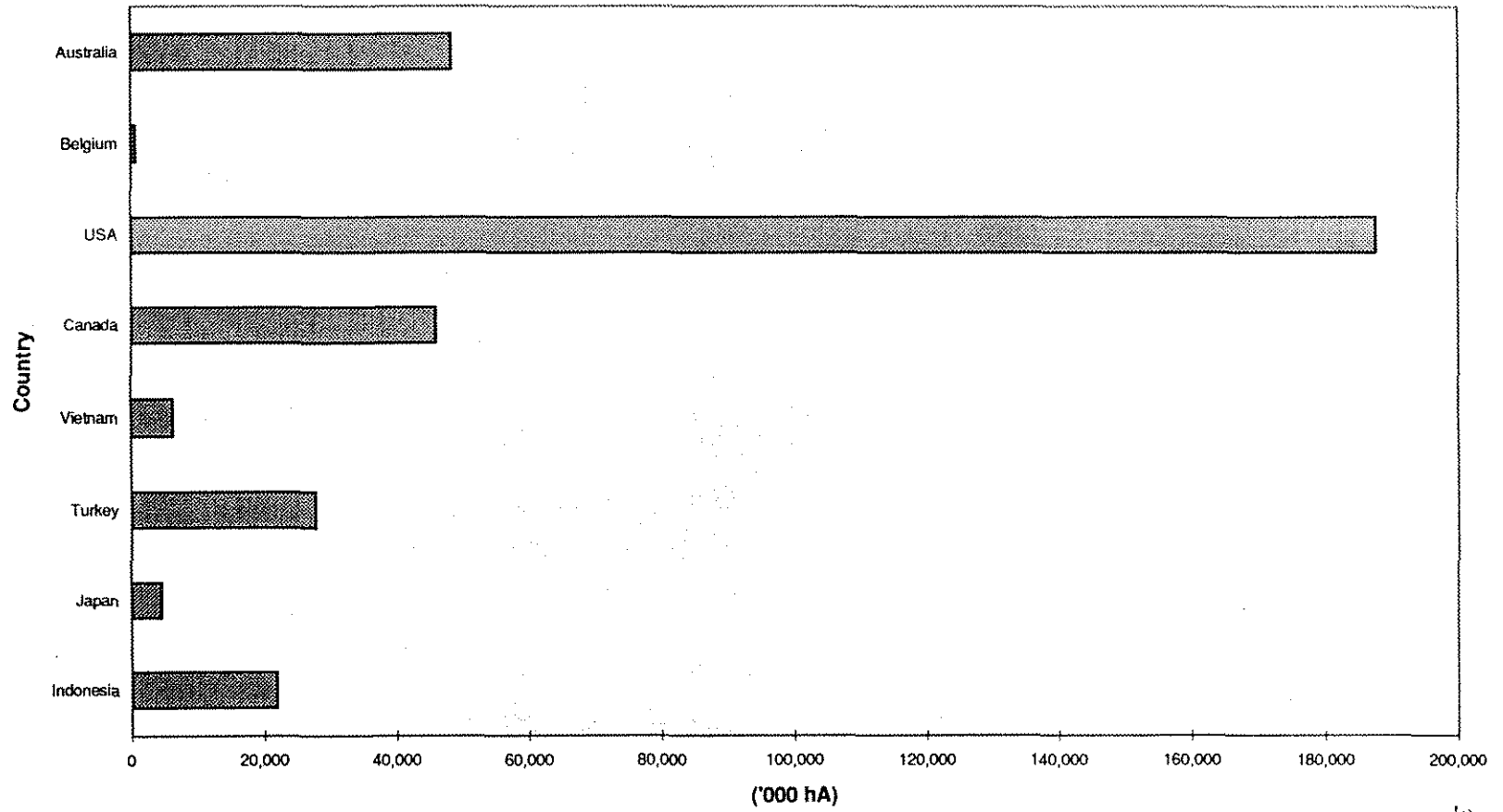
People Living in Cities with at Least 750,000 Inhabitants: Selected Countries



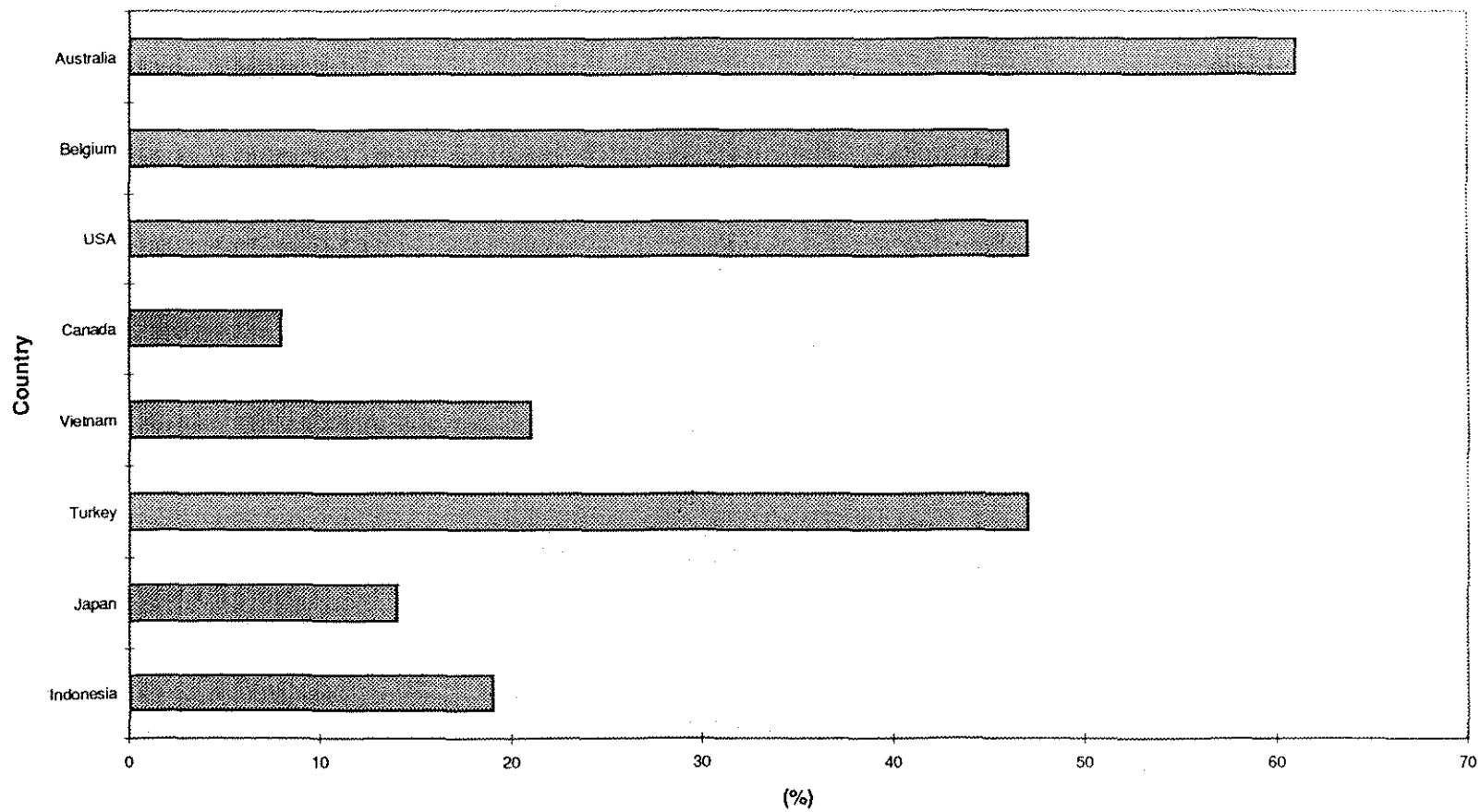
Urban Population as Percentage of Total Population: Selected Countries



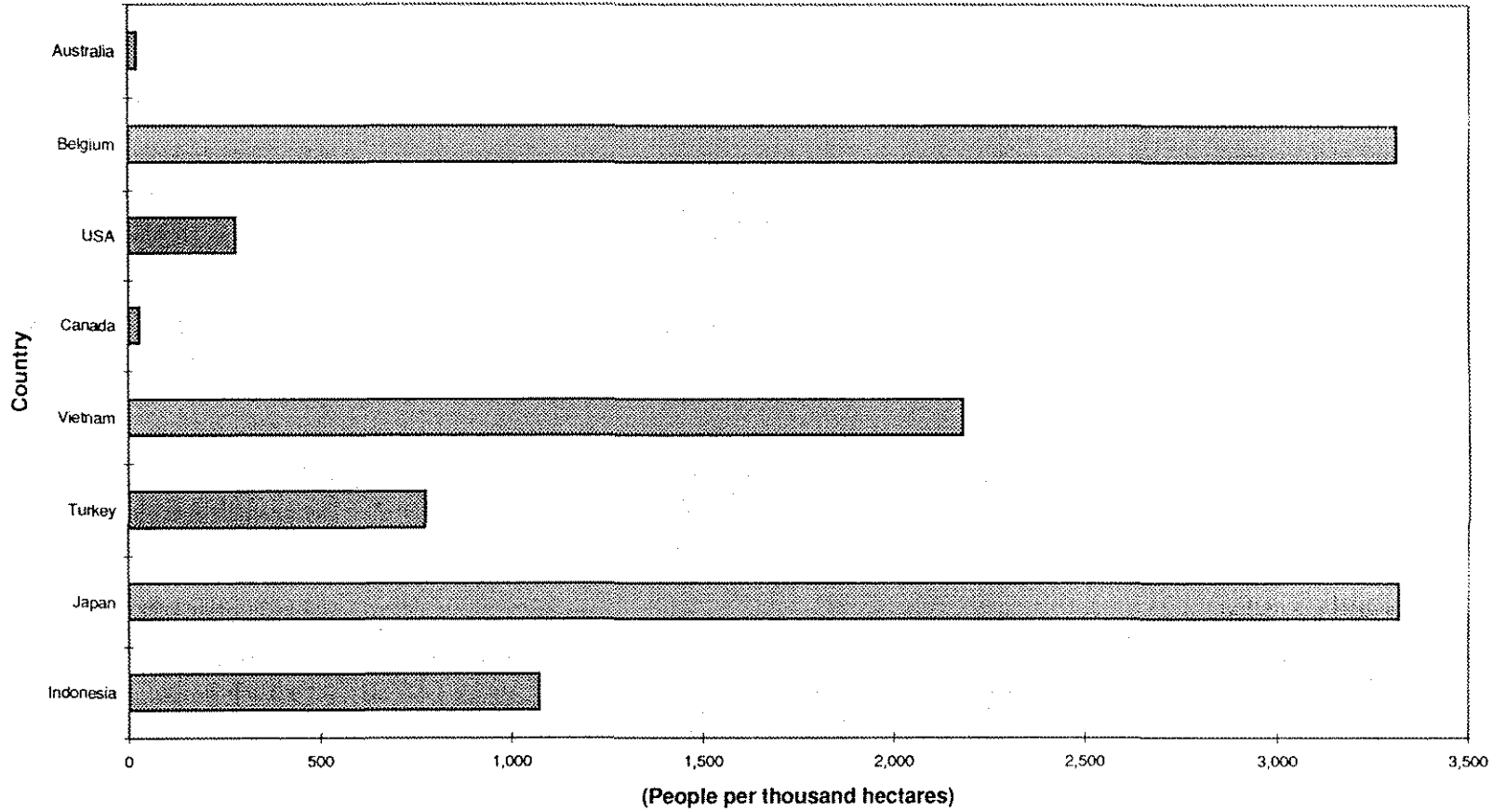
Cropland: Selected Countries



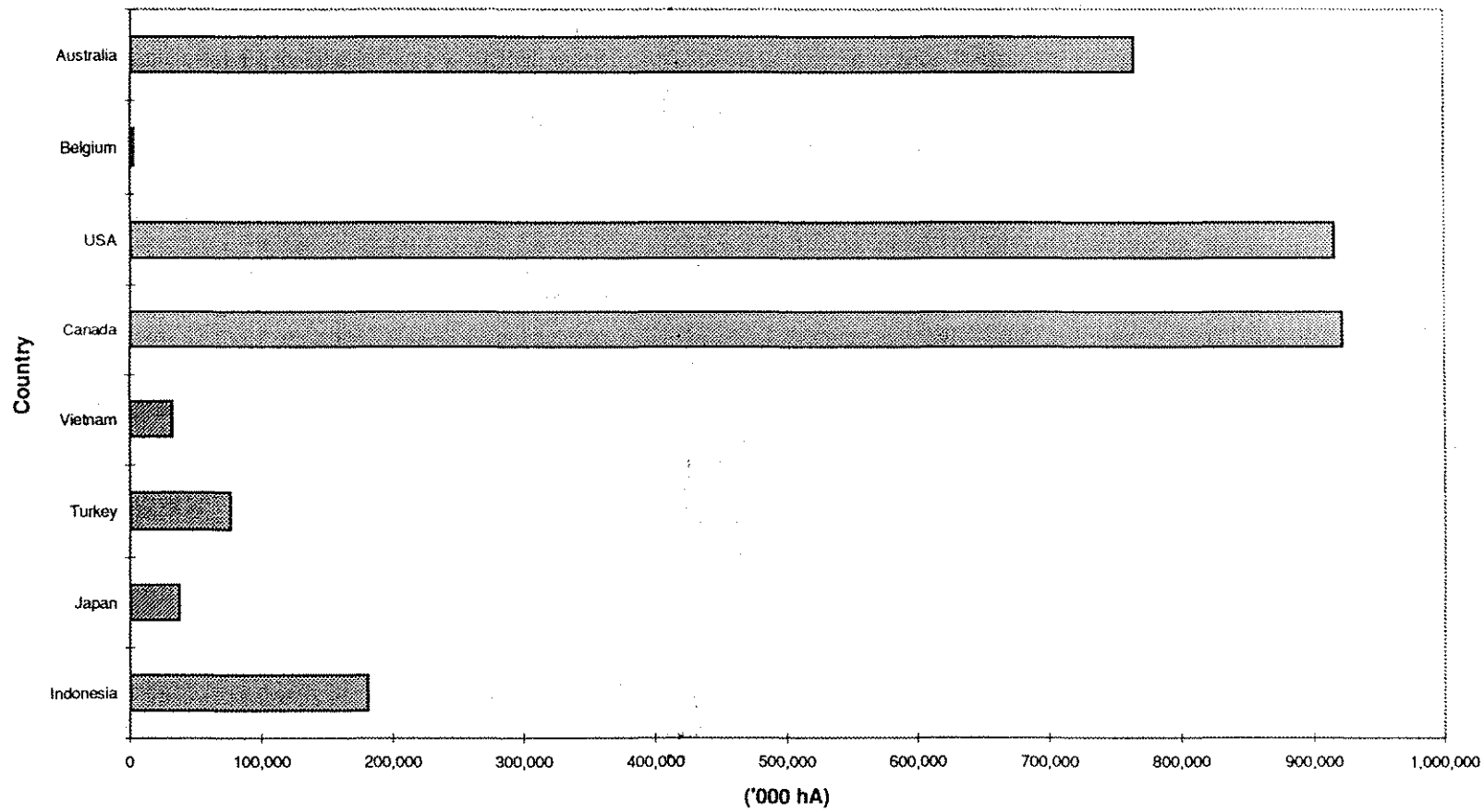
Domesticated Land as a Percentage of Land Area: Selected Countries



Population Density: Selected Countries



Land Area: Selected Countries



2.8 Discussions about Australia's population 'carrying capacity' have long been concerned with the question of whether the quantities of natural resources which Australia possesses imply any limit on the number of future Australians able to enjoy a high quality of life.

2.9 The origins of this question lie in attempting to resolve two contrasting perceptions, which, following Griffith Taylor, might be tagged *iron determinism* and *cornucopian possibilism*. 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.

2.10 Both of these perceptions seem to assume that a country's population is limited to the number of people who might be fed with home-grown food, and ignore the possibility of setting up a prosperous and secure economy which is not natural-resource based but trade-based; which feeds its people by trading non-food exports for food imports.

2.11 These views also seem to ignore the fact that, as the recent history of European agriculture shows, national food production is very strongly determined by the prices which farmers receive for their produce. To the extent that the production of other goods and services are 'traded off' against extra food production, larger populations can almost certainly be fed.

2.12 More recently, it has been argued that Australia's waste assimilation capabilities are a more useful indicator of limits to the Nation's population 'carrying capacity'. However, the extent to which population can increase without unacceptably polluting waste-processing resources does not have one single answer. The answer will depend on the extent to which consumption patterns simultaneously change and the extent to which consumption is exchanged for investment in reducing waste production per unit of consumption.

2.13 However, there is a parallel recognition that any quantitative estimate of 'carrying capacity' can only be made subject to a wide range of assumptions about how to measure quality of life and how such measures respond to a variety of factors. Apart from population size, these factors include where that population lives, what technologies and industries it has and the consumption/activity patterns of its members. The complexity of these poorly-understood relationships means that even serious attempts at

calculating 'carrying capacity' or optimum population can be little more than 'guesstimates'.

2.14 There are many aspects of quality of life which stand to be affected by population growth. The following section however concentrates only on those associated with traditional concepts of 'carrying capacity', namely food and water supplies and the ability of natural systems (airsheds, waterbodies, ecosystems) to process the residues from domestic and industrial processes.

Resource constraints on population growth

2.15 The 1991 National Population Council report estimated 50 million as a maximum 'carrying capacity' 'involving significant social, economic and environmental costs'. However there is reason to believe that the long-run supply and demand curves for most resources are fairly elastic.²

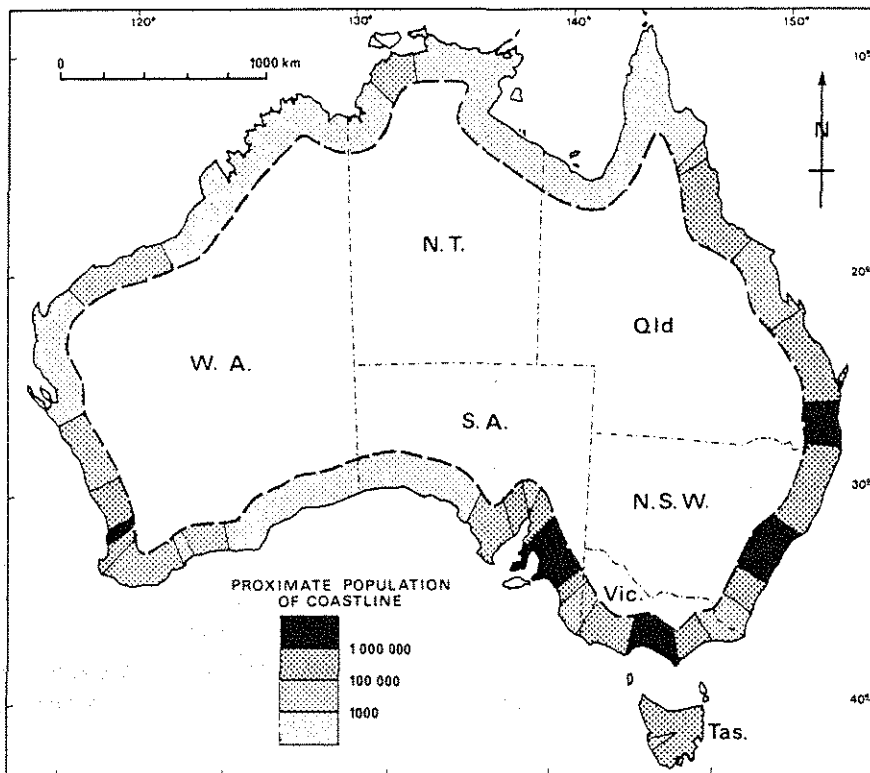
2.16 Reliable estimates accept that in subsistence terms Australia has the arable land to produce food for 50 plus million people. But, allowing a safety margin for the possibility of a run of bad seasons, we should regard 30-35 million people as the population 'carrying capacity' in terms of the food constraint. The concept of absolute constraints on population size imposed by the availability of certain natural resources is not particularly useful at least not over the range of population sizes being considered in this Inquiry. What does need to be recognised 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. Self-sufficiency is of course not the only strategy for achieving food security. However it is also difficult to be confident that food could be imported for such numbers under terms of trade implying real food prices akin to today's food prices. This would depend on levels of non-food exports and the supply and demand for food on world markets in a much more populous but still orderly world.

2.17 Quite clearly, it is technically possible to provide food and water to twice the present population, even if population growth is confined to present major population centres. The best known estimate of the number of people who might be fed by Australian farmers is the figure of 50-60

² Ridker R, 1973, 'The impact of population growth on resources and the environment', in Westoff CF (ed) *Toward the end of growth: Population in America*, Prentice-Hall, New Jersey

million calculated by Gifford and others. A recent revision of the Gifford paper comes up with a figure of 188 million and discusses the agricultural sector's response to rising population.³

MAP 1: POPULATION PRESSURE ON THE COASTAL ZONE



From Cocks and Walker, 1985. For each half by half degree gridcell overlapping the coastline, a figure has been calculated for the total number of people living within 150 km of the centre of the gridcell.

³ Henry L and Godden G, 1994, 'Robustness of estimates of Australia's population', Paper to Australian Agricultural Economics Society, 38th conference, Wellington; Gifford RM, Kalma JD, Aston AR and Millington RJ, 1975, *Biophysical constraints in Australian food production: Implications for population policy*, *Search* 6(6):212-23

Regional 'carrying capacity'

2.18 Just as some small countries can thrive without being self sufficient in resources, cities within a country rely on large hinterlands to provide their *food, water, recreation opportunities and so on*. There was much evidence to the Committee pointing out that 'carrying capacity' will naturally vary between regions. This can be taken to mean that the marginal costs of meeting the basic needs of additional people (eg food, adequate clean water, clean air) will also vary between regions; most notably between capital cities and elsewhere.

2.19 The bio-physical nature of the Continent, particularly its natural resources and its waste assimilation capacities, does not indicate the impossibility of an Australian population of 40 million by the middle of next century. Even in purely physical terms, trading resources we have in plenty for resources we have little of allows more people to be supported than would be possible in a closed economy. However knowledge about any possible physical and environmental limits to population in Australia is not a necessary condition for a population policy.

2.20 While it is a useful part of the process of defining a population policy to have estimates of the numbers of people who might be fed and clothed by Australian farmers, it is fairly clear that the Inquiry must use a concept of 'carrying capacity' which is determined by human **choice**, not one that is determined by the physical limits of the environment as is implied by the Inquiry title. In evidence to the Committee, Dr John Nixon of the Academy of Technological Sciences said that with increased population, it was important to provide suitable infrastructure to ensure adequate water supplies:

There will be a need for more funding of dams, and, perhaps, for pipelines and such. In other words, the availability of setting up that infrastructure is really going to lead the population increase, and...the population increase has got to be approved by the electorate.⁴

2.21 Ultimately, Australia's 'carrying capacity' is a function of choices, not environmental constraints, for example, whether to consume at present levels or at reduced levels per head, whether to develop output increasing or cost reducing technology.

⁴ Dr John Nixon, transcript of evidence, 29 July 1994, p.92

Some international comparisons

2.22 Just as it is not possible to infer how many people 'should' be living in Australia from a knowledge of the local soils, climate, or agricultural productivity, it is not possible to make such assessments 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.

2.23 In the present discussion 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.

2.24 What may be useful however is to identify parts of Australia which 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.

2.25 The soil-climate homologues for the 80 per cent 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.

2.26 Conversely, the better-watered 20 per cent of the Continent is capable of supporting 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. The immediate reasons for this are that Australian soils are infertile by world standards and the Australian climate highly variable. While Australia has a very high level of arable land per capita by world standards (2.8 ha versus a world average of 0.33 ha), the quality of Australian arable land is low and

big population increases would soon reduce our 'quality-corrected' area of cropland per head towards the world average.

2.27 A further reason is that Australian farmers, in recent decades, have not enjoyed price supports and subsidies in the same way as northern hemisphere farmers. Thus there is no reason, for example, to expect the density of the farming population of Gippsland to gravitate towards that of the Netherlands.

Australia's agricultural resources

Origins of Australia

2.28 The Australian Continent is essentially a tectonically tranquil broad platform with a long low 'mountain range' along the eastern margin. It began to drift away from the ancient southern continent of Gondwana about 125 million years ago.⁵ It is both the lowest (average height of 330 m) and flattest of the continents; to travel hundreds of km without significant change in landform is common.

2.29 Because there has been little uplift of the land surface to rejuvenate streams so that they actively erode the landscape (streams run faster in steeper country), ancient terrains from Tertiary times (between one and 70 million years ago) remain, though deeply leached of the soluble minerals needed for plant growth.

2.30 Soil and water for plant growth are the two resources on which any nation's agricultural industry fundamentally depends. The following sections briefly describe Australia's soil and water resources and compares them with those of other countries.

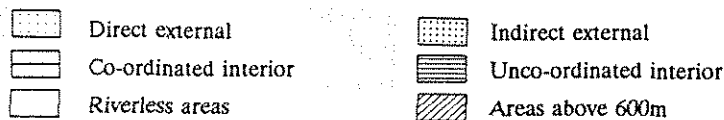
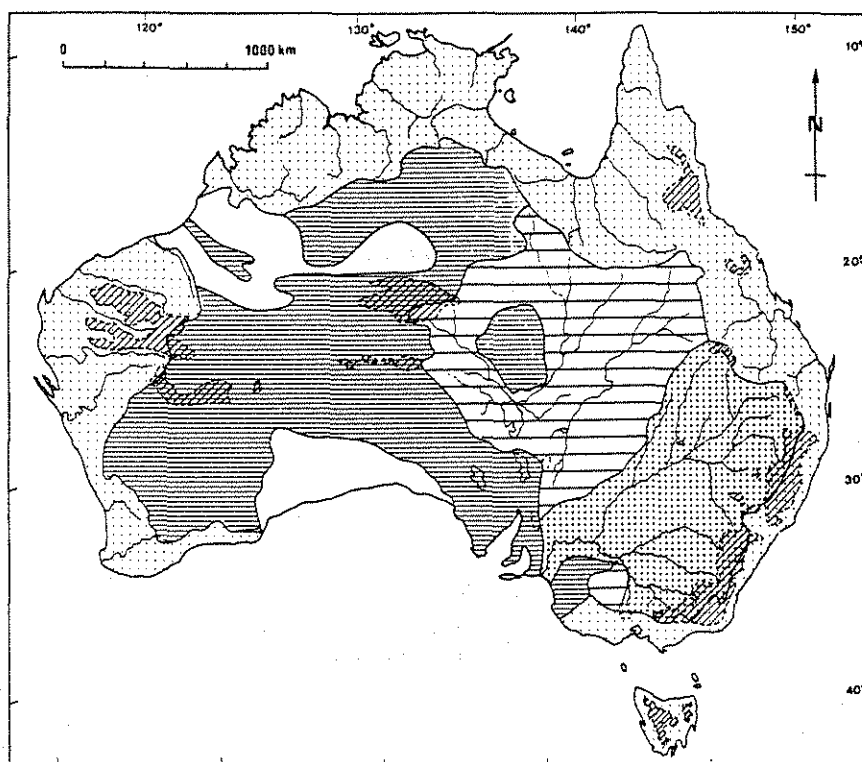
Rainfall and runoff

2.31 Australian agriculture uses water from two sources - rainfall, and water stored in underground aquifers across the Continent. Rainfall over the

⁵ Ollier, CD, 1986, 'The origin of alpine landforms in Australia', in Barlow, BA, (ed) *Flora and fauna of alpine Australasia*, Commonwealth Scientific and Industrial Research Organisation and Australian Systematic Botany Society, Melbourne

Continent is related mainly to latitude which correlates with the paths of low-pressure systems. The northern part of the Continent experiences a predominantly summer rainfall sucked in by low pressure associated with heating of the tropical part of the Continent. In the south rain is largely associated with low-pressure cells striking the Continent from the west in winter.

MAP 2: A MINIMALLY DRAINED CONTINENT



Adapted from Mabbutt and Sullivan, 1970. Less than a third of the Continent drains directly to the sea.

2.32 Many Australians believe that this country receives the lowest average precipitation over its land surface of all the continents. Although the 'driest continent' by this definition is technically Antarctica, one third of Australia may be defined as arid in that it receives an average rainfall of less than 250 mm per year in the south and 350 to 380 mm in the north. Rainfall here does not exceed evaporation in any month of the year. Extremely arid country does not support perennial vegetation; only plants with a life cycle short enough to be completed on a single fall of rain can persist under these conditions. There is no generally accepted functional (plant-growth) criterion for distinguishing arid from semi-arid country.

2.33 Another third of the Continent must be regarded as semi-arid, meaning 'not arid but receiving insufficient rainfall to grow rain-fed crops'. The potential evaporation rate of water at any place is determined by available solar energy and thus by latitude. Plants die if they cannot get sufficient soil-water to satisfy evaporative demands on their leaves and keep cool. Because of regional differences in potential evaporation rates (2.8 m a year in Alice Springs, 0.5 m in Tasmania), rain-fed crops require more than 750 mm mean annual rainfall in the north but a third of this in the south.

2.34 As well as having extensive areas of low rainfall, Australia's precipitation is also extremely variable from year to year by world standards. If average variability of rainfall is expressed as a percentage of mean annual rainfall, it is only the Top End and the south-east and south-west coastal rims which have less than 20 per cent variability; most of the arid zone has greater than 30 per cent variability and the Pilbara over 40 per cent.⁶

2.35 Low rainfall means that many streams carry little water considering the area they drain. The Murray-Darling system, for example, has about 1.5 per cent of the runoff per unit area of China's Yangtze River. Because Australia is the flattest Continent, rivers are slow-flowing and have long stretches without tributaries. From the Queensland border to where it joins the Murray at Wentworth the Darling has no significant tributaries and if it were not that the river runs in a clay channel it would probably be lost in the sands of a desert as are some rivers in central Australia.

⁶ Leeper, GW, (ed), 1970, *The Australian environment* (4th ed.), Melbourne University Press, Melbourne

2.36 Australian rivers deliver fairly small quantities of water and sediment to the coast but carry high loads of dissolved salts. This is because water quality in rivers is highly dependent on water quantity; high flows come from surface runoff (rather than from groundwater) which has the dual effect of mobilising sediment (creating turbidity) and diluting salty groundwater baseflows. Groundwaters tend to be salty because they are commonly stored in marine sediments laid down in former oceans.

2.37 About 65 per cent of all surface runoff occurs on the 21 per cent of the land surface around the northern edge of the Continent from Brisbane to the Kimberleys (the fraction of rainfall running off is closely related to total rainfall). Runoff varies markedly with season over most of Australia, the ratio of peak season flow to trough season flow commonly being hundreds of times the same value for typical European and North American rivers. The difficulty in using this northern runoff is that it occurs intermittently following high-intensity storms.

2.38 When they flood, Australia's inland rivers can rise quickly in response to intense tropical rainstorms despite their large flat catchments. At other times, especially in the lower parts of the Murray-Darling system or round Lake Eyre, impending floods can take several weeks to arrive. Again, flood flows in Australian rivers are a much higher multiple of average flows than are flood flows elsewhere.

Underground water

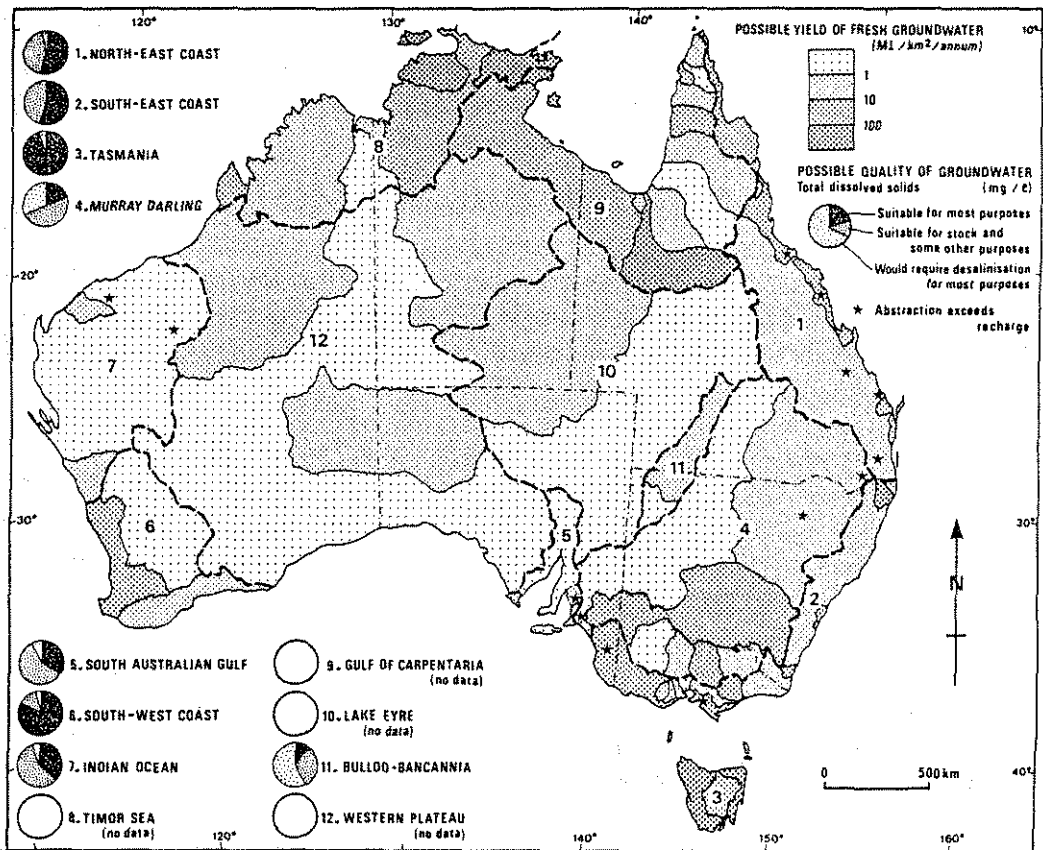
2.39 The paucity of permanent surface water serves to emphasise the major role played by (under) groundwater in sustaining agriculture, mining and settlement in Australia. Groundwater occurs in near-surface aquifers (porous layers) covering about a quarter of Australia as well as in deeper sedimentary basins covering two-thirds of the Continent and provides about 14 per cent of all water used for human activities. In area terms, human activity in about 60 per cent of the country is almost totally dependent on groundwater and elsewhere it is used to supplement surface-water supplies.⁷

2.40 There are large untapped groundwater resources in Northern Australia and Tasmania where recharge from rainfall is at present occurring.

⁷ Jacobson G and Lau JE, 1983, 'The importance of groundwater for Australia - a national perspective', in *Proceedings of the International Conference on Groundwater and Man*, Sydney, Australian Water Resources Council

In the low-rainfall parts of Australia groundwater is largely a fossil (non-renewable) resource, albeit a very large one. However, despite massive reserves, pressures which drive artesian water to the surface are declining in large areas, particularly in the Great Artesian Basin (covering much of inland New South Wales and Queensland) where, commonly, water has to be pumped up a further half-metre each year.

MAP 3: GROUNDWATER RESOURCES OF AUSTRALIA



Adapted from Department of Resources and Energy, 1983. The shadings give an estimate of average yield per sq km in each of 12 drainage divisions and circles give estimates of the quality of that groundwater.

2.41 Groundwater pollution is a problem in many countries, usually caused by leaching (dissolution and through-drainage) of fertilisers or animal wastes in recharge zones. In Australia, this could soon become a problem where groundwater moves quickly through highly porous aquifers, for example around Perth and south-east South Australia, and could become a long term problem in inland basins where turnover rates are low and recharge areas are not farmed intensively.

Water storage

2.42 Cities, industry and irrigated agriculture all need large quantities of water to be stored in dams so that regular supplies are available through periods of variable rainfall. There are problems in Australia for managing water resources by damming rivers to allow flow rates to be matched to user needs because:

- water resources are not near population concentrations;
- good dam sites are scarce due to flat topography and porous soils;
- even if the average flow is the same, because of the large year-to-year flow variability in Australian rivers, a dam here needs to be about 11 times larger than a dam reliably delivering the same water in the United States; and
- over the Continent, evaporation losses from dams are generally high. As reservoir size increases, the larger the evaporation loss in relation to volume stored and there is a maximum size above which a dam cannot usefully store water.

The only advantage that the Australian environment possesses for water storage is that of a comparatively long life for dams because of the low rate of geological and man-made erosion and thus of siltation.

River management issues

2.43 Due to landscape disturbance in their catchments, most rivers in the more densely settled parts of Australia probably carry a lot more sediment today than in pre-European times. This sediment gets deposited in dams where it shortens their effective storage life or accumulates in coastal lakes and estuaries.

2.44 Eutrophication (the fertilisation of rivers and lakes by runoff from farming areas where fertilisers have been applied) is widespread, except in northern Australia. Such additional nutrients promote algal growth which in extreme cases leads to total transformation of riverine and inshore ecosystems. Coral reef systems are at particular risk because corals normally thrive only in low nutrient conditions (nutrient 'deserts'). Eutrophication is hard to control because it is usually caused, unintentionally, by the actions of many people over a wide area of catchment.

2.45 Changes to flow regimes associated with river regulation, particularly the reduction in *moderate* floods, release of cold water and rapidly fluctuating water levels have had a significant effect on native aquatic biota.⁸ For example, warmwater fish have been replaced in the lower reaches of the Murray-Darling system.⁹

The character of Australian soils

2.46 Covering the physiographic surface of the Continent is a thin skin of soils, the most basic of all natural resources. They have been formed from bedrock by a variety of wind, water and 'deep weathering' processes. While there are no classes of soils unique to Australia, certain soil types do occur much more commonly here than in northern hemisphere continents. This results from the long period of geological stability of the Australian Continent, the small extent of recent glacial activity, the flat terrain and the dry climate. These include unconsolidated sands (about a third of the Continent), saline (chloride-affected) and sodic (sodium-affected) soils, hard-setting soils, soils low in nutrients and organic matter, cracking clay soils and soils with abrupt changes in texture with depth.¹⁰

2.47 The only soil map of the Australian Continent is drawn at a scale of 1:2 million which is still detailed enough to substantiate the common observation that Australian soils are indeed infertile, shallow, stony and salt-prone. For example, most Australian soils can store very little water, a serious weakness where plants are so vitally dependent on soil-water

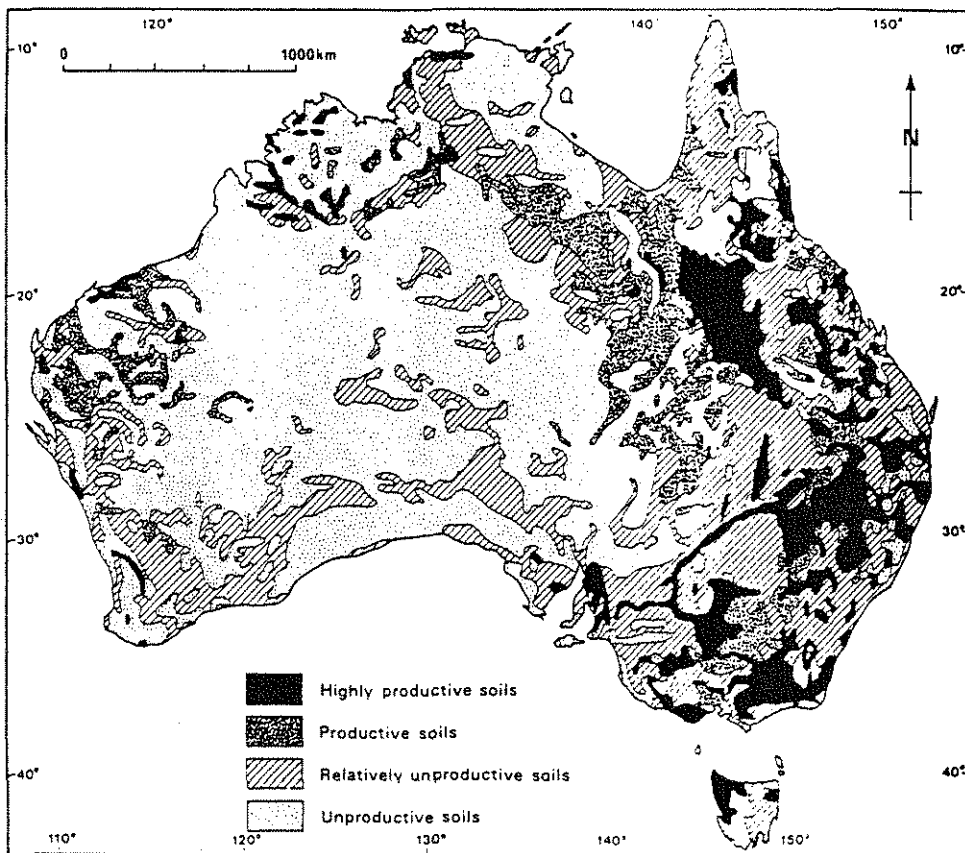
⁸ Walker KF, 1985, 'A review of the ecological effects of river regulation in Australia', *Hydrobiologia*, 125:111-29

⁹ Pigram JJ, 1986, *Issues in the management of Australia's water resources*, Longman Cheshire, Melbourne

¹⁰ Lindsay AM, 1985, 'Are Australian soils different?' in Dodson JR, and Westoby M, (eds), *Are Australian ecosystems different?* *Proc. Ecol. Soc. Aust.* 14:83-97

reserves to carry them through from one chancy downpour to the next. Less than 10 per cent of the country has reasonably productive soils and lots of this area lies in climatically unfavourable areas, that is to say, in areas unfavourable for agriculture.

MAP 4: INTRINSICALLY PRODUCTIVE SOILS



Adapted and interpreted from Northcote and others, 1960-68.

2.48 There are large areas where, in spite of deep soils and good rainfall, tree growth is poor because of nutrient deficiencies, eg the low scrubs of much of Cape York Peninsula (870-2100 mm rainfall) or the scrubs of the Henty peneplain in south-west Tasmania (2500 mm rainfall). Northcote and Skene estimate 5.3 per cent of Australia to be saline and 32.9 per cent to be both saline and sodic. Sodic soils are often highly erodable.¹¹

2.49 The quantity of phosphorus available for growing plants is extremely low in most Australian soils other than those developed on younger basalts or basalt-derived alluvium. It is not surprising that superphosphate fertiliser has twice been a decisive material in Australian agricultural history. It was applied to wheat in the early years of the century after yields had fallen dramatically, even in the fertile Victorian Wimmera, and was soon used universally. Thirty years later it was introduced as top-dressing on pastures of European clovers and high-grade grasses, imported into southern Australia to replace the native grasses that were adapted to nutrient poor soils. In arid areas of Australia, soil nutrients are concentrated in the upper few centimetres and hence, if these are eroded, plant production is reduced drastically.¹²

Overview of Australian agriculture

2.50 Australian agriculture is more highly specialised than that of most other countries. In the 19th Century large quantities of agricultural commodities were produced for export to the markets of Europe rather than for the small local market. Large export markets could only be found for a limited range of products which would not deteriorate during transport to European markets. The lack of cheap labour further restricted the range of commodities to those which could be produced using little labour. Even today 80 per cent of Australia's agricultural output consists of wool, wheat, beef, sheep-meats, sugar, butter and milk; these seven commodities are produced on highly specialised farms which seldom produce more than three or four commodities.

¹¹ Northcote KH, and Skene JKM, 1972, *Australian soils with saline and sodic properties*, Soil Pub. No. 27, CSIRO Australia

¹² Charley JL, and Cowling SW, 1968, 'Changes in soil nutrient status resulting from overgrazing and their consequences in plant communities of semi-arid areas', in Rowley, I (ed) *Proc. Ecol Soc. Aust.*, 3:28-38

2.51 The actual commodities produced in any particular part of the Continent are chiefly determined by the availability of moisture and, in the period of the year when precipitation occurs, temperatures. Australia can be divided into three major agricultural zones:

- the high-rainfall zones of Western Australia, Victoria, South Australia, Tasmania, New South Wales and Queensland;
- the wheat-sheep zones of Western Australia, Victoria, South Australia and New South Wales-Queensland. The bulk of our major farm exports, wheat and wool, are produced in these zones. Wheat is mainly produced where the growing season is five to seven months; varieties capable of giving high yields in areas of high rainfall have not been developed and the topography and winter waterlogging of much of the high-rainfall zone (650+ mm) makes cultivation difficult. Beef and lamb are important too, products of improved pastures, ie fertilised and sown to productive species of grasses and clovers. In eastern Australia, these zones also contain the major irrigation schemes of the Murray-Darling Basin which produce most of our cotton (a rapidly growing export), rice and soft fruits; and
- the enormous pastoral zone or rangelands where wool (in the south and east) and beef are the dominant products. The useable portion of the south of the Continent with a growing season of less than five months supports sparse cattle and sheep grazing (southern pastoral zone).¹³ North of the Tropic of Capricorn the whole of the Continent is used for sheep and (mainly) cattle grazing, except for isolated areas on the Queensland coast (Queensland high-rainfall zone) which are used for dairying, or for producing sugar or tropical fruits.

2.52 In addition to the agricultural zones where the type of production is determined by the natural environment, 12 000 sq km of land are irrigated by water conserved in large reservoirs constructed by the various State governments.

¹³ Davidson BR, 1967, 'The comparative profitability and efficiency of agriculture in different regions of Australia', *Review of Marketing and Agricultural Economics* 35 (4):179-206

2.53 In the last 30 years the volume of Australian agricultural production and exports has doubled but the area of land farmed has increased by only 16 per cent. The total number of all types of farms in Australia declined by 15 per cent to reach 174 000 over the period 1957-8 to 1981-2 (this figure, by 1987-88, had dropped to 127 000). Over the same period, average farm size increased by 24 per cent to reach 2800 ha and the rural workforce decreased by 19 per cent to 389 000 (and is still much the same). Fewer people are working bigger farms more intensively.¹⁴ The area sown to pasture has doubled; sheep numbers have fluctuated but are at present about the same at 149 million as in 1957-8. Beef cattle numbers have also fluctuated and are at present about 24 million.

2.54 The major change in broadacre agriculture between the late 1950s and the late 1980s has been the near doubling, from a base of 100 000 sq km (half wheat, half other crops) in area cropped, to 180 000 sq km.¹⁵ The reason for this is that cropping has been more profitable relative to livestock production and there have been significant technological advances in crop agronomy, wheat breeding and machinery capacity. Expansion has generally been into regions of lower, more variable rainfall (less than 350 mm per annum), implying lower, more variable returns. Also, there has been a marked *intensification* of cropping in more favoured areas of temperate and subtropical Australia. In the subtropics there have been large increases in area of summer crops such as sorghum, sunflower and soybeans.

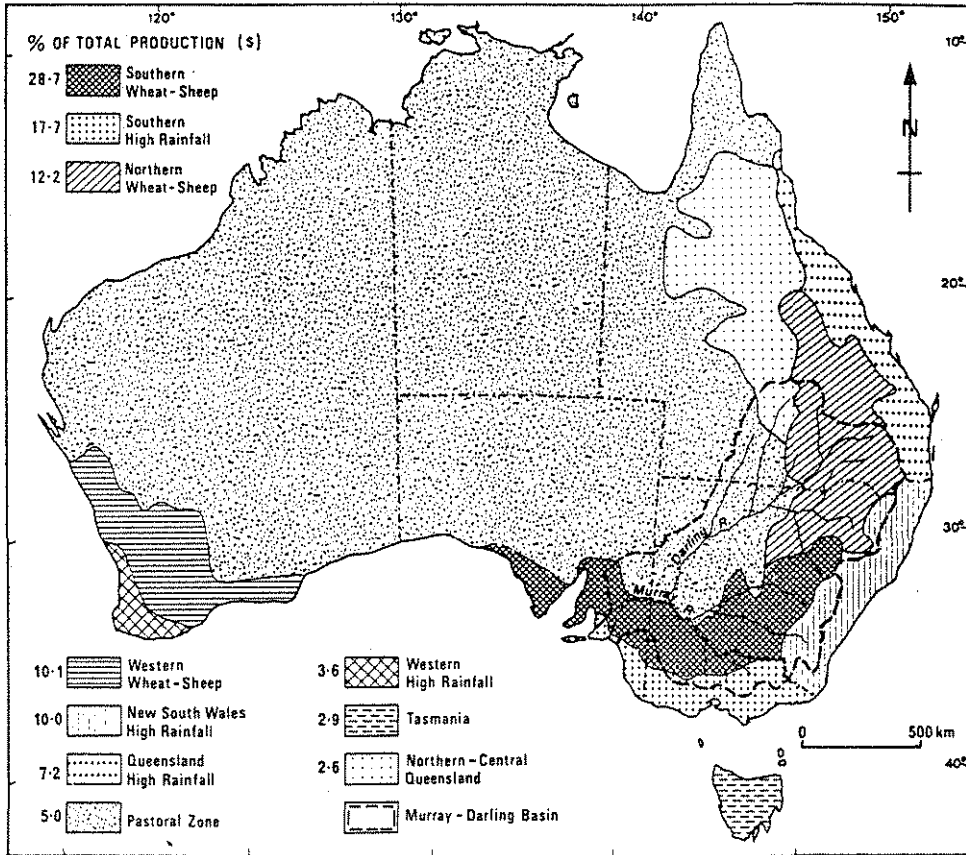
Major agricultural regions of Australia

2.55 The following sections describe land use and selected land management issues in the major agricultural regions of Australia, namely the Murray-Darling Basin, the Western Australian wheat belt, the high-rainfall zones and the pastoral zone.

¹⁴ Reeves TG, Mears PT, and Ockwell AP, 1986, *Pasture/crop/animal systems in temperate and sub-tropical Australia*, Standing Committee on Agriculture, Technical report series No. 16, CSIRO, Melbourne

¹⁵ Australian Bureau of Agricultural and Resource Economics, 1989, *The economics of chemical use in Australian agriculture*, Submission to the Senate Select Committee on Agricultural and Veterinary Chemicals in Australia

MAP 5: MAJOR AGRICULTURAL ZONES



The Murray-Darling Basin

2.56 The catchment of Australia's most extensive river system occupies about a seventh of the Continent and produces about a third of Australia's total output from natural resource based industries. It supports 10 per cent of the human population, a quarter of the nation's cattle and dairy farms, about half of its sheep and cropland, and almost three-quarters of its

irrigated land.¹⁶ It includes large parts of the northern and southern wheat-sheep zones and part of the southern high-rainfall zone, the three most productive farming areas in the country.

2.57 Cropping intensity has been increasing steadily in recent years in all except the wettest and the driest parts of the Basin, viz the dry rangelands of the Western Division of New South Wales and south-west Queensland and the cold wet Southern Tablelands/Southern Highlands. Expansion rates in recent years for areas sown to wheat in the Basin have been highest in north-western New South Wales and the western Darling Downs. In northern New South Wales and Queensland, where both summer and winter crops are possible, four crops (two summer, two winter) in five years are regularly achieved. Also, in limited areas of Victoria (eg parts of the Wimmera), there are a significant number of farmers who have sold all their livestock, often removed fences and established high-intensity cropping systems.

2.58 The economics of irrigation schemes in the Basin have been strongly challenged by a number of authors. Bruce Davidson in *Australia wet or dry* (1969) draws attention to the massive infrastructure cost, including channels and dams, for example, associated with setting up irrigation schemes, and argues that using the same capital to extend and intensify dryland farming in southern Australia would have been far more beneficial to the national economy. Furthermore, at the time Davidson published this view, the subsequent problems of soil salinisation and silting up of dams in irrigation areas had not emerged. It seems unlikely that any more large irrigation dams will be constructed in the Murray-Darling Basin; the task facing us now is to keep the existing schemes viable.

The Western Australian wheat belt

2.59 Agriculture is the most extensive land use in the south-west corner of Australia. Inland, the light soils were developed rapidly after the Second World War, using large machinery to clear the bush for cultivation. The agricultural system is based on winter-growing annual crops and pastures. The crops are mainly wheat or other cereals, and the pastures carry sheep,

¹⁶ Crabb P, 1988, 'Managing the Murray-Darling Basin', *Australian Geographer*, 19(1):64-88

and occasionally cattle. Farms are large, often more than 1000 ha, and production per unit area is low by international standards. This low production is associated with low-rainfall, short growing seasons, and low fertility of the soils. Phosphorus fertilisers, and, on sandy soils, some trace elements must be applied to maintain yields.

High-rainfall zones

2.60 Agriculturally speaking, the high-rainfall zones, range from the sugar lands of Cairns to the superfine Merino country of southern Tasmania.

2.61 The intensively farmed parts of the Queensland high-rainfall zone comprise the wet tropics of Cairns - Ingham, the Atherton Tableland, the Burdekin, Mackay - Proserpine and Bundaberg - Maryborough. Apart from the recently deregulated sugar industry, the backbone of the north Queensland economy, they supply fruit and vegetables to much of eastern Australia, particularly in winter. The range of crops which are beginning to be grown in a small way (eg coffee and tea) or experimentally is large and prospects for the Queensland high-rainfall zone are excellent. Soil erosion (because of steep slopes and intense rainfall) is a potential problem in large areas and an actual problem in many banana and pineapple plantations, even those on well-structured kraznozom soils with a great capacity to accept water.

2.62 Elsewhere in the high-rainfall zone, farming systems are well-established. Livestock production based on productive improved pastures is particularly important.

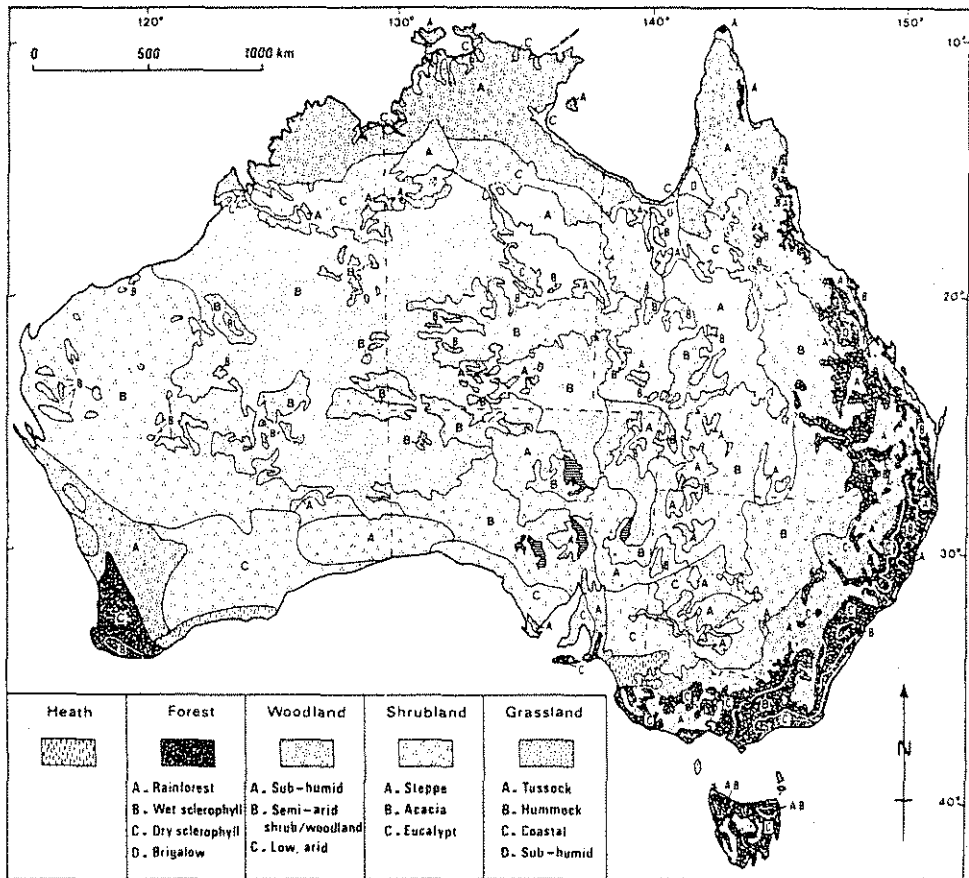
The rangelands

2.63 Most of Australia, 82 per cent, has a population density of less than one person per eight sq km and qualifies as sparsely populated. Most of this area can be further described as *rangelands* or pastoral zone meaning it is largely used for grazing sheep and cattle on the native shrublands, grasslands and wood lands. In this sea of pastoralism, occasional islands of mining, urban and tourist activity appear. Climatically, the sparselands include the central arid zone, its surrounding semi-arid zone and the wet-dry tropics (five months wet, seven months dry) of northern Australia.

2.64 The pastoral industries are organised into very large management units; the average size of sheep properties is 210 sq km and cattle properties

are much larger, averaging 2500 sq km. Practically all of the country's more than 4000 pastoral properties are held on long term leasehold tenure, either by absentee investment companies or family owned and operated enterprises.

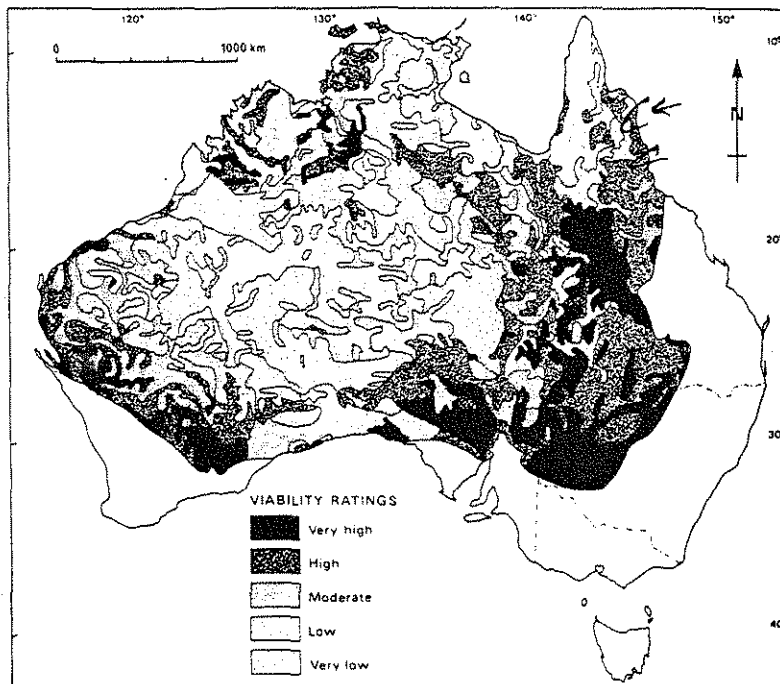
MAP 6: SIMPLIFIED VEGETATION MAP OF AUSTRALIA



Adapted from the map 'Vegetation of Australia', by RM Moore and RA Perry, in Moore, 1970. This map is twenty years old but is still one of the best simple representations of the main features of the Australian vegetation.

'Carrying capacity' of the rangelands

2.65 The advent of pastoralism initiated a downward trend in the amount of standing vegetation across the rangelands. The degree of loss can be roughly inferred from trends in stock numbers over time. In all districts where this has been studied, stock numbers rise rapidly to a high peak following settlement. A rapid decline to about a quarter of peak numbers then occurs, generally in a drought period. Subsequently numbers stabilise at about a third to a half of their peak value, but this stable value is maintained only by the development of additional watering points which have the effect of increasing the area available to stock. In the Western Division of New South Wales, the great drought of 1901-02 brought sheep numbers down from 13.5 to 3 million. Since then, sheep numbers have varied between 2 and 5 million, never reaching the old totals.

MAP 7: VIABILITY PROSPECTS FOR PASTORALISM

From Cocks and others, 1986. This map was produced by expressing the expert judgements of an experienced rangelands scientist about the viability of a handful of areas as a set of rules which were then applied to all the rangelands.

2.66 Large lightly stocked properties are probably the only way in which short term economic survival and long term 'carrying capacity' can both be ensured in the rangelands. Without these prerequisites, eventual degradation due to overgrazing is likely, given the cautious rate at which most graziers destock going into a drought. While land administrators have the power to regulate grazing intensity on any area of land, Australia has yet to find a truly successful way of preventing overstocking.

The impact of land degradation on agricultural resources

2.67 Degraded land is land which has unintentionally lost part of its value for one or more purposes because of human induced changes to its bio-physical character. For example, tree clearing on land intended for cropping or improved pasture does not necessarily constitute degradation even where this reduces the land's value for forestry; degradation arrives with the subsequent unintended accelerated erosion and declining yields due to decreased water and nutrient availability.

2.68 While degradation can take many forms, from loss of soil structure to the presence of pesticide residues, it is widely recognised that soil acidification in crop-pasture systems and soil erosion and salinisation of agricultural and pastoral land following devegetation of some sort, for example by overgrazing, or tree clearing, are this country's paramount land degradation problems. The other important problems described in this section are those caused by weeds and feral animals. The only national survey of land degradation to be completed (in 1975) shows over half of our agricultural and pastoral lands in need of remedial treatment for some sort of degradation.¹⁷ This is, without doubt the most widely quoted environmental indicator ever produced in Australia.

Salinisation

2.69 Dryland salinisation is largely a consequence of rises in salty water tables following the widespread destruction of native woodlands and forests for agricultural purposes.¹⁸ These deep-reaching natural pumps historically

¹⁷ Woods LE, 1983, *Land Degradation in Australia*, Department of Home Affairs and Environment, AGPS Canberra

¹⁸ Mulcahy MJ, 1978, 'Salinisation in the southwest of Western Australia', *Search*, 9:269-72

have kept water tables down by transpiring water directly from subsoil and weathered/jointed bedrock to the atmosphere. The cropping and pasture systems introduced following clearing cannot evaporate and transpire all rainfall entering the soil, nor can they use local groundwater to the same depth as the tree vegetation they have replaced.

2.70 The immediate costs in terms of production losses associated with dryland salinisation and the subsequent costs from the triggering of other forms of land degradation are enormous (estimated at \$65 million per annum for the riverine plains of the Murray-Darling Basin alone).¹⁹ Since dryland salinisation problems develop slowly, it is important to make every effort to look decades ahead and try to determine the potential severity and extent of the problem. There are no economic treatments available.

Acidification

2.71 While not such a massive hazard as erosion and salinisation, the slow acidification of soils under improved pastures in south-eastern and south-western Australia is threatening to reduce both crop and pasture productivity over large areas. The problem is really only just emerging as significant acidification can take up to 50 years to develop and many of these pastures are only 30 years old.

2.72 The problem is centred on 70 000 sq km of pastures using subterranean clover and superphosphate fertilisers. While these two form the cornerstone of southern Australian agriculture, their obvious immediate benefits have tended to mask the fact that, very slowly, they make the soil more acid. Problems of soil acidity may appear as any of several plant nutritional disorders caused by excessive or inadequate amounts of various elements. There are no economic treatments for soil acidification in extensive agricultural systems.

Weeds

2.73 In Australia, compared with other places for which data is available (Britain, New Zealand, United States), exotics do not form a particularly high proportion of the total number of species of resident mammals, birds

¹⁹ Murray-Darling Basin Ministerial Council, 1988, *Salinity and drainage strategy*, Discussion paper No.1, Murray-Darling Basin Ministerial Council, Canberra

and some plant families.²⁰ However, it is the competitiveness of exotics, not the total number of species, which is important.

2.74 In establishing themselves, exotic plants have been greatly assisted by the major disturbances of the landscape accompanying the expansion of settlement; stable, diverse ecosystems are harder to invade. Soil disturbance for example, along road verges, or on ploughed fire breaks is of particular importance in the spread of exotic species. Disturbances through agriculture, pastoralism, increased bushfires, mining, infrastructure development and urbanisation have created conditions more familiar to exotic than to native species.

Feral animals

2.75 The European rabbit has been the most destructive of all introduced animal species. Spreading from the south since its introduction in about 1859, it may finally have reached its northern limit of colonisation around the Tropic of Capricorn where feed supplies during the spring to autumn breeding season become too unreliable.²¹ Apart from baring the soil to erosive forces, the great, and as yet unrealised, threat of the rabbit is in preventing tree and shrub regeneration. Other significant populations of feral animal pests include, buffalo, brumbies, donkeys, goats, pigs, foxes and cats.

Prospects for Australian agriculture

2.76 While higher prices would undoubtedly still draw forth expanded supplies of agricultural produce from most agricultural regions of Australia, the fundamental long term challenge facing agriculture everywhere except in the high rainfall zones will be to maintain production rather than increase it. On the one hand, the extensive margins of agriculture under current climatic conditions have been reached and, on the other, land is being lost to agriculture through degradation and other causes. Technology has allowed labour costs to be reduced and will allow productivity in many areas

²⁰ Kitching RL, 1986, 'Exotics in Australia and elsewhere', in Kitching, RL (ed), *The ecology of exotic animals and plants: some Australian case histories*, Wiley, Brisbane

²¹ Parer I, 1987, 'Factors affecting the distribution and abundance of Rabbits (*Oryctolagus cuniculus*) in Queensland', *Proc. Roy. Soc. Qld.*, 98:73-82

to continue to improve slowly and counterbalance the 'slow mining' of the resource base. Where the balance comes in the next few decades is problematic. In the much longer term, it seems inevitable that production will not be maintained without the development of conservative new production paradigms.

2.77 While agricultural productivity from a variety of enterprises continues to improve in the high rainfall zones of the east coast and the far south west, and land degradation is less of a problem than elsewhere, these zones are also the zones of highest population growth. Urbanisation and the accompanying intensification of peri-urban land use will, under present land allocation processes, remove a significant fraction of high rainfall land from production.

2.78 **Conclusion:**

The Committee recognises that there have been dramatic improvements in the quality of land management in the past 20 years and that great opportunities still exist for even further improvement, giving us some grounds for optimism.

2.79 **Conclusion:**

The Committee recognises the sharp contrast between the 'carrying capacity' of 'arid' Australia and 'arable' Australia, while conceding that the two are interconnected and that each of our major cities has a huge 'footprint' from which its resources are drawn.

2.80 **Conclusion:**

The Committee considers that CSIRO's I = PLOT formula (in which I is 'impact', P 'population', L 'lifestyle', O 'organisation', T 'technology') is a valuable conceptual tool, with its recognition of the importance of the *organisation* of space and technology as determining factors in the quality and form of human settlement.

Chapter 3

CHALLENGING MYTHOLOGIES ABOUT POPULATION AND QUALITY OF LIFE

3.1 The preceding survey of Australia's agricultural resources, agricultural systems and clarification of the relationship between agricultural resources and 'carrying capacity' can be used to reassess the validity of some common assertions which have featured in recent debates on population.

1. 'Australia has one of the world's most serious shortages of water'

3.2 Water-poor countries are somewhat arbitrarily defined as those having less than 100 cu m of runoff per head per annum. On this basis, Australia is one of the better endowed countries in the world for water. What that calculation overlooks, however, is that much of Australia's water resources are not where the people live. As noted in Chapter 2, about two thirds of all runoff is in the northern fifth of the country and it is difficult to store water cheaply because of a lack of good dam sites, and because of the high variability of rainfall.

3.3 Nonetheless, quite clearly it is technically possible to provide water to twice the present population, even if population growth is confined to present major population centres. However, the real marginal cost of supplying domestic water will rise with population growth.¹

3.4 What is not clear is whether Australians would want to pay this price or even realise what that price is.² Components of this price include expensive infrastructure for inter-basin transfers; loss of water for agriculture and, less so, to industry; and loss of recreation values and conservation values via reduced river flows.³

¹ Dr John Nixon, transcript of evidence, 29 July 1994

² Stanger G, 1991, 'Water: A Sustainable Resource?' in, Smith, JW, (ed) *Immigration, Population and Sustainable Environments: the limits to Australia's growth*, Flinders Press Adelaide

³ The irony is that this Report, with its apparent buoyant confidence about the availability of water, was being prepared at a time when parts of Australia were suffering from the most severe drought for 50 years was not lost on the Committee. However, it underlined the point that although Australia is, overall, the world's driest occupied continent, our urban areas have continued to use water at a very high rate. At the worst period of the drought, only Sydney imposed any restrictions on watering gardens. Recycling water appears to be very low on State government priorities.

2. 'Australia is basically just a big desert unsuitable for human settlement'

3.5 It is true, as indicated earlier, that extensive pastoralism is the only viable agricultural land use for about two thirds of Australia. Nonetheless, modern societies employ people in many occupations besides agriculture and arid or semi-arid regions can support large populations provided, amongst other things, that water supply problems can be solved. Los Angeles is a case in point. Many large mining centres around the world are located in low rainfall areas. Alice Springs has access to major groundwater supplies and, conceivably, could grow into a major tourist cum sunbelt retirement city.

3.6 What this assertion is reflecting is the idea that, to the extent that population is supported by local primary industry, it would not be possible to locate large numbers of people in the rangelands. Expressed in this way, the practical value of the assertion in discussions of population questions may simply be to confirm that high density subsistence populations are not an option for most of the rangelands.

3. 'Environmental degradation, for example salinity and blue green algae in the Murray-Darling Basin is due to population size and rate of growth'

3.7 This assertion follows at once from the well known 'I = PAT' relationship first proposed by Anne and Paul Ehrlich which suggests that the impact of human activity on the environment (I) is the product of three measures; number of people (P), what activities they engage in (A) and what level of technology (T) they make use of in carrying out those activities.

3.8 Hence, according to the I = PAT relationship, doubling (say) the population would also double the impact of humans on the environment provided they all carried on the same activities using the same technologies. But it is unlikely that a doubled population on a fixed area could physically carry out the same activities as the original population, so in order to predict the impact of population doubling one would need to first predict the new population's activity patterns. In technical terms there are interactions between the terms in the relationship.

3.9 Except in some very carefully specified situations, the PAT relationship cannot be used to predict the environmental impact of any combination of people, activities and technologies. This is because there have been no operational (useable) suggestions forthcoming as to how to measure the levels of people, activities and technology in such a way that their product predicts or describes impact on the environment. A plausible general measure of environmental impact has also, to date, eluded scientists interested in these matters. Thus, in a strict sense, there is no empirical scientific basis for asserting that environmental degradation is directly related to population size.

3.10 Despite the mathematical difficulties associated with the PAT relationship, it provides a useful starting point for discussing the role of population size in environmental degradation. A looser form of the PAT relationship hypothesises that environmental impact is a non-specific function of P(people), A(activities) and T(technology). That is, it is changes in these three things which largely determine changes in impact and hence degradation.

3.11 While this hypothesis remains untested under conditions that would allow it to be used to predict the consequences of population growth in Australia, it identifies three factors which have the potential to influence environmental degradation if managed appropriately.

3.12 One can then begin to ask questions about the relative sensitivity of environmental degradation to small changes in each of the three factors, or whether there might be other unrecognised factors as important as these three. It can be assumed fairly confidently that the direction of impact of population on environmental degradation is that more is worse, ie increasing population increases environmental degradation, other things (meaning A and T) being equal. Similarly, it can be assumed that the higher the energy component of an activity pattern the higher the environmental impact. As far as technology is concerned, the impact will be higher from technologies with high residues or high inputs per unit of output. Probably it is not possible to conclude that one of the three PAT factors is overwhelmingly more important than the others.

3.13 Are there other important determinants of environmental degradation not recognised by the PAT function? One factor is recognised in the $I = f(\text{PLOT})$ variant of the PAT function, suggested in the CSIRO

submission to the Inquiry. The PLOT function suggests that environmental impact of a human population is not only determined by population (P), technologies used (T) and lifestyle (L) but also by the form of social organisation (O).⁴ The challenge of measuring social organisation is formidable but, once again, the PLOT function offers a starting point for thinking in cause-effect terms about managing environmental degradation. For example, the Netherlands has a population density of 368.5 persons per sq km while Haiti's figure is 249.2. However superior social organisation in the Netherlands means that the impact of its much higher population density is less than the impact of a comparable population in Haiti.

The Murray-Darling river system

3.14 Another way to look at population degradation links is on a region-by-region basis. There is a common view that land degradation is a symptom of over-population, but the plausibility of this assertion depends on the location and type of degradation under discussion. For example, the problem of blue-green algae outbreaks in the Murray-Darling river system is partly due to increasing inputs of phosphates in sewage as the Basin's population rises and partly due to the use of phosphate fertilisers at levels determined more by technology choice than by the Basin's population. The CSIRO submission to the Committee noted that:

although Australia does not face...under current projections, any absolute biophysical limits to continuing population growth...resource and infrastructure issues, especially regarding water and energy use and waste disposal, are matters that already require more attention.⁵

The Academy of Technological Sciences also argued, in its submission to the Inquiry that strategies and programmes:

were already in place to address the major natural resource degradation issues at State or Commonwealth level or through the Murray Darling Basin integrated programmes...These programmes address problems such as soil erosion, soil salinity, algal management, management of the riverine environment, drainage, revegetation and nature conservation.⁶

⁴ CSIRO, Submission 259

⁵ CSIRO, Submission 259, p.8

⁶ Academy of Technological Sciences, Submission 241, p. 7

3.15 It is hard to argue that the undeniable degradation of Australia's extensive agricultural and pastoral lands producing export crops and livestock is solely the result of national population growth. Would farm outputs and exports (and hence degradation) fall if we had a smaller population? Probably not. In other words, it is the A (activity) and T (technology) factors not the P (people) factor which lie behind land degradation in the pastoral and wheat-sheep zone.

3.16 There has also been considerable land degradation in the higher rainfall parts of Australia where most of the national population growth has also occurred. But this has been not so much degradation of agricultural land as degradation of recreational lands, airsheds, natural ecosystems and coastal and marine waters. Farmlands have a much higher value per ha in the high rainfall zone and therefore tend to be better protected.

3.17 In summary, more people nationally means more people in the higher rainfall areas and more degradation of non-agricultural resources there. In the pastoral and wheat-sheep areas, more people nationally makes little difference to the local populations, land use activities and production technologies used. That is national population growth is not immediately responsible for degradation of pastoral land but is indirectly implicated in the degradation of non-agricultural land.

4. 'Loss of biodiversity and deforestation is directly related to population size and rate of growth'

3.18 As pointed out in the CSIRO submission to the Inquiry, the most ruthless devastation of Australian forests occurred in the 19th century when population increases were comparatively limited (ie when the population rose from 2 to 5 million).⁷ Biodiversity is a current term used to describe *the variousness of life forms and the variety of ways in which that life is organised into ecosystems*. Loss of biodiversity is a reference to the fact that many plant and animal species have become extinct in Australia since European settlement.

3.19 Loss of habitat - transformation of the places where plants and

⁷ CSIRO, Submission 259, p.13

animals live - is well recognised as the main cause of biodiversity loss. All land use intensification causes habitat loss, including urbanisation and the laying down of infrastructure. Land use intensification is strongly associated in peoples' perception with population growth.⁸ It is also strongly associated with the development of agriculture and forestry. For example, the loss of many mammal species in the rangelands has paralleled the spread of pastoralism, an activity supporting only sparse human populations. The causal relationship between these two factors is complicated by associated factors such as the decline of Aboriginal 'firestick farming'.

3.20 There can be little doubt that continuing population growth in Australia will lead to further local extinctions of plant and animal species, particularly as much population growth is in areas of above-average biodiversity. The extent to which local extinctions evolve into continental extinctions will depend on numerous factors, many poorly understood, including the area of initial distribution, degree of specialisation and value of the species' habitat type for human use.

5. 'The Aboriginals have provided us with the only successful model of sustainable land use for the Australian Continent'

3.21 Undoubtedly, through 'firestick farming' and, probably, by hunting the Continent's megafauna to extinction, the Aboriginals changed the resource base and associated land use profoundly during 50 000 years of pre-European occupation. Nevertheless, there is no reason to believe that, in the absence of European settlement, Aboriginal society would not have persisted for another 50 000 years. By any definition theirs was sustainable land use.

3.22 While the pattern of European land use has changed frequently over 200 years, a high proportion of the country remains in some form of agricultural production. To this extent, the European model of land use can be adjudged 'sustainable to date'.

3.23 What the assertion is attempting to highlight is the very serious doubts many people, including many agricultural scientists, have as to whether

⁸ Submissions 190, 234, 25

Australian agriculture, particularly in the rangelands, the irrigation areas and the wheat-sheep zone, can remain viable indefinitely. This question is complicated by some technological advances which ameliorate degradation of the resource base and may continue to do so.

6. 'Immigration counters the otherwise inevitable and undesirable ageing of Australia'

3.24 Australia still has a relatively youthful age structure.⁹ 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 today to about 42 then and the dependency ratio (people under 14 plus people over 65 per 100 people of working age) from 50 to 64-66. Demographic analysis shows that immigration at any feasible level will not significantly change these projections.¹⁰

7. 'A larger population would allow Australia to better defend itself'

3.25 An argument traditionally advanced during previous periods in the history of the population debate (see Chapter 1) is that Australia must encourage population growth to deter hostility from other nations.¹¹

3.26 The standard rebuttal to this argument is that modern warfare depends on the availability of sophisticated weapons rather than the large numbers of infantry obtainable only from a large population. Sweden and Israel are small-population countries regarded as having well-developed defence capabilities. Nonetheless, it should be noted that if the cost of modern defence systems is somewhat independent of population size, then a larger population implies a smaller defence cost per head.¹²

⁹ Dr Katherine Betts and Dr Bob Birrell, Submission 179

¹⁰ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

¹¹ Submissions 169, 179, 184, 20

¹² McGlynn G, 1992, 'Population and Australia's resource endowment' in National Population Council, *Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

3.27 Perhaps the strongest point to be made on the defence issue is that neither the White Paper on defence in 1976 nor the Dibb Report of 1987 argue we need more people for defence.

8. 'People's quality of life is as high in Australia as anywhere in the world'

3.28 Unlike temperature or distance there is no standardised 'objective' way of measuring a people's quality of life.¹³ To this extent, there has to be widespread agreement on how quality of life is to be measured before this assertion might be tested. Even then, it is probable that the necessary data for making that measurement will not be available.

3.29 Nevertheless, some qualitative observations on comparative quality of life between countries can be made. Quality of life can be suggested as having three broad dimensions - economic well-being, environmental well-being and social well-being. The alternative, adopted here, reserves the term *quality of life* for the combination of environmental and social well-being and reserves the term *standard of living* as a proxy for economic well-being. It will also be taken here that comparisons between countries should concentrate on quality of life for city dwellers, cities being where most Australians live.

3.30 Urban environmental well-being or quality has many dimensions including air and water quality. Well accepted indicators of social well-being include infant mortality, life expectancy, literacy and crime rates.

3.31 As a generalisation, Australia invariably ranks near the top of international quality of life 'league tables' irrespective of the particular quality of life index being calculated. While the assertion that people's quality of life is as high in Australia as anywhere in the world cannot be 'proved', it would appear difficult to refute.

¹³ Pacione M, 1982, 'The use of objective and subjective measures of life quality in human geography', *Progress in Human Geography*, 6:493-514

9. 'Quality of life for Australians, especially urban Australians, has deteriorated with population growth'

3.32 There have been many studies of regional well-being in Australia during the 1970s and 1980s¹⁴ but few which have compared regional well-being over time. Nor have there been formal studies of people's subjective impressions of how the quality of their lives has changed over time.

3.33 This leaves two sorts of evidence which might help decide whether quality of life for urban Australians has deteriorated over time. One is informal and anecdotal evidence based on people's experiences and the other is more 'objective' but partial measures of aspects of quality of life.

3.34 Amongst the latter are such things as indicators over time, by city, of air and water quality, crime rates, disease rates etc. A recent major collection of factual environmental information by the Australian Bureau of Statistics shows just how little monitoring of environmental measures has been undertaken in Australia.¹⁵ Studies which seek to understand such changes in causal terms, for example, the role of population growth have not been done.

3.35 Turning to the other sort of evidence, the informal and anecdotal, submissions to the Inquiry are a rich source, but validity or representative quality of the perceptions contained in them is impossible to evaluate. Here, there are many references to environmental problems of urban areas, particularly the metropolitan areas of Sydney, Melbourne, Perth, Adelaide and Brisbane.

10. 'People's quality of life improves (deteriorates) with population growth'

3.36 Unlike the previous assertion which is about past changes in the quality of people's lives in Australia, this assertion suggests that future population growth stands to markedly change the quality of people's lives, for better or for worse depending on the speaker.

¹⁴ See Sorensen T and Weinand H, 1991, 'Regional well-being in Australia revisited', *Australian Geographical Studies* 29(1):42-70

¹⁵ Castles I, 1992, *Australia's environment: Issues and facts*, Australian Bureau of Statistics, Cat. No. 4140

3.37 Scientifically, the only way of looking ahead like this is to build models of the purported relationships between population level, environmental variables and other aspects of socio-economic development, what has been called 'popqol' modelling.

3.38 The hope being raised by 'population = quality of life' modelling is that if positive and negative impacts on appropriate quality of life indicators under different population scenarios, for example, a doubling of population could be modelled, through time, in convincing detail. This would provide government with a basis for taking a firm policy position with respect to population management.

3.39 Reviews of attempts in other countries to undertake this type of modelling show that it is subject to considerable difficulties. For example, such models can be highly sensitive to assumptions about parameter values and it is difficult for such models to incorporate all possible government responses to a growing population and a deteriorating environment.

3.40 To date, there have been no attempts at dynamic modelling of population - quality of life links in Australia. However, experience with tools which could be used for this purpose is slowly growing. Meanwhile, taking a quantitative approach, it cannot be concluded with any confidence that people's quality of life will markedly improve or deteriorate with population growth.

3.41 In more qualitative terms, it is interesting to note that there are practically no suggestions of how quality of life might actually improve with population growth. While there are many ways in which the intensification of land use which accompanies population growth can be argued to impair quality of life, the reverse is rarely or never argued.

11. 'People's standard of living improves with population growth'

3.42 For want of a better measure, standard of living or economic well-being is commonly taken to be measured by gross national or domestic product per head, ie average capacity to purchase market goods and services.

3.43 While there is no dispute with the proposition that Australia's gross national product (GNP) will rise in concert with increasing population, the extent of the rise in GNP per head is a matter of debate.

3.44 For example rising average GNP per head can conceal wide variations between individuals; in particular, there may be sectors of the population experiencing declining real incomes even as average GNP per head rises. Economists rebut this observation (which is really about income distribution) by pointing out that in principle, and provided the transaction costs of doing so are not excessive, a rise in average GNP per head allows the losers in this situation to be compensated by the winners in a way which makes everyone better off.

3.45 Notwithstanding, much research has explored the population - GNP link, particularly through the use of econometric models of the economy.¹⁶ For example:

Nevile (1990) models per capita income to be insensitive to population growth between annual rates of 1.1 per cent and 1.6 per cent and suggests it could be much lower outside (both above and below) these limits;¹⁷ and

CIE (1988) modelling suggests GDP per capita could be 4.5 per cent higher in 2030 with net migration of 125 000 compared with GDP per capita under zero net migration.¹⁸

3.46 These studies focus on the economic consequences of population growth in the short to medium term. Economics has little to say about the economic benefits of population growth in the long term.

¹⁶ Wooden M, 1994, 'The economic impact of immigration', Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

¹⁷ Nevile J, 1990, *The effect of immigration on Australian living standards*, AGPS, Canberra

¹⁸ Centre for International Economics, 1988, 'The relationship between immigration and economic performance', in *Committee to Advise on Australia's Immigration Policies 1988, Immigration: A commitment to Australia - Consultants' reports*, Australian Government Publishing Service, Canberra

3.47 At a more theoretical level, work has been done which demonstrates that, subject to a range of assumptions, immigration is likely to increase average income per capita. Given that these assumptions (which include efficient resource pricing) do not fully hold in the Australian economy, such results can only be suggestive.¹⁹

3.48 Taken together, theoretical and econometric studies seem to suggest that population growth through immigration generally confers positive economic benefits on the Australian population, although the size of these measured effects is quite small.²⁰

3.49 It may of course be that population stability confers even larger economic benefits on the population than population growth. Probably the most important contributor to sustained growth in income per head is productivity growth achieved through technical change. These benefits are largely effected through investment. Whereas population growth requires investment in schools, houses, factories etc to provide for a growing population, a stable population makes it more likely that productivity-raising investment will occur. 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.²¹

13. 'In terms of population, Australia is at bursting point already'

3.50 This assertion is suggesting that a small increase in population would trigger a large and widespread decline in quality of life for most Australians.

3.51 It is difficult to think of a plausible scenario in which this happens. Even if population growth is one of a number of factors causally related to declining quality of urban life, in the Australian situation, small population changes stand to induce small changes in quality of life. What concerns

¹⁹ Institute of Public Affairs Submission 21; Clarke HR and Ng Y-K, 1993, 'Immigration and economic welfare: Resource and environmental aspects', *The Economic Record*, 59(206):259-73

²⁰ Wooden M, 1994, 'The economic impact of immigration', Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

²¹ Dr Alan Hall, Submission 230

more people about population growth is the cumulative effect of many small increases in population.

3.52 Scientists who study the way in which natural and social systems react to disturbance certainly recognise that there are situations where a small event triggers a large reaction. It is up to those who support the 'bursting point' assertion to suggest what such triggers might be in an Australian context. Debate could then focus on whether the necessary pre-conditions for 'bursting' exist.

3.53 Populations around the world regularly experience sharp declines in quality of life due primarily to war, natural disaster, famine or pestilence. Of these, only natural disasters are familiar to Australians and while the other calamities are always possible, it is difficult to see why their probability of occurrence would change with a small population increase.

Chapter 4

THE NEED FOR AN INFORMATION BASE IN THE POPULATION DEBATE

4.1 This Chapter addresses terms of reference 3 and 4.

- (3) The provision of a comprehensive information base on which future debates about population growth can be carried out without causing division in the Australian community, and including the provision of an accessible inventory of population research.
- (4) Policy options in relation to population, including the need for national, regional and local perspectives.

4.2 The population debate would make more progress, or at least move to different ground, if people had ready access to a range of relevant data which is already available. The need for a better informed community to lift the quality of the population debate is confirmed by examination of the submissions to the Committee. The views expressed are relevant and sometimes passionate, but rarely based on statistics, so that sweeping assumptions are made, both optimistic and pessimistic, without objective evidence to support them.

4.3 In addition to empirical information obtainable by routine processes of monitoring or data collection, there are a number of research questions, mostly difficult, which need to be vigorously pursued for the same reason. This Chapter discusses varieties of information in the categories needed for a more objective population debate.

Collectable data

4.4 Apart from the inescapable necessity for a full complement of demographic data (projections of population size, structure etc), informed debate on the population question needs up-to-date information on measures of the quality of life of Australians, and on indicators of the size and condition, by region, of the natural resource base on which quality of life directly and indirectly depends.

Monitoring quality of life

4.5 Anticipating current moves in Australia towards regular state of environment reporting and social trends reporting, the Committee suggests that key indicators of quality of life should be collected and published quarterly or annually by the Australian Bureau of Statistics

4.6 Despite the difficulty of identifying strong causal links between population growth and the quality of Australians' lives, quality of life indicators remain an important element in attempts to evaluate the spectrum of complex relationships between human populations and the environment.

4.7 Evidence to the Committee has identified some fifty factors perceived as important in determining Australians' quality of life. These may be grouped into measures of:

- biological and physical factors such as clean air, clean water and high biodiversity;
- access to recreational areas such as public open space, green belts and reserves, wilderness, natural areas, unspoilt beaches and places of beauty without crowds;
- resource use and availability such as changes in natural resources per head, land clearance, logging and land degradation;
- the environmental costs of industry;
- social cohesion and security, personal safety, crime rates, measures of housing quality and quality of urban services and amenities;
- infrastructure quality such as traffic congestion, sewage disposal problems and journey to work times;
- consumption levels; and
- community health and education such as communicable diseases and nutrition levels.

4.8 While suggestions for measures under these headings are useful indicators of the range of perceived gaps in the available hard data, they cannot be said to constitute a sufficient set of quality of life indicators.

4.9 The paucity of fundamental data on matters basic to aspects of the population question, was highlighted by several expert witnesses to the Inquiry's hearings. These matters included demographic data (evidence from Dr Christabel Young, Dr Bob Birrell, and Dr Katharine Betts), resource data (evidence from Dr Howard Dengate, Dr Roy Green, Mr Barney Foran), and economic data (evidence from Professor David Pope).

4.10 State of environment reporting is an area where Canadian achievements are respected. Environment Canada published a state of environment report in 1986 (Bird and Rapport, 1986) as part of that country's commitment 'to secure for current and future generations a safe and healthy environment and a sound and prosperous economy'. Subsequent work from Environment Canada sought:

authoritative, easy-to-use indicators by which to measure...environmental performance and progress towards sustainable development.

4.11 An Indicators Task Force established in Environment Canada to lead and co-ordinate a National Environmental Indicators Project developed a preliminary set of 43 indicators in 18 issue areas.

4.12 Canada's use of issue areas to scope the range of indicators to be included in a national state of environment report offers a practical precedent for those addressing the same task in Australia. The implied 'rule' is 'if resources do not allow the development of indicators for all aspects of the environment relevant to quality of life, concentrate on indicators of matters of widespread community concern'.¹

4.13 Effective state of environment reporting and social trends reporting will need a well-developed organisational infrastructure including technologies such as land information systems.

¹ Environment Canada, 1991, *A report on Canada's progress towards a national set of environmental indicators*, SOE Rpt. 91.1, Environment Canada, Ottawa. Walker J and Cocks D, 1992, 'Development of a national state of environment reporting system', Discussion paper prepared for Commonwealth Environment Protection Authority by CSIRO Institute of Natural Resources and Environment, Canberra

Demographic data

4.14 Australia is fortunate in having an organisation such as the Australian Bureau of Statistics (ABS) to provide demographers with most of the basic data needed to make population projections which, subject to the normal procedural uncertainties, are of high quality. The importance of comprehensive five-yearly censuses is emphasised in submissions and the possibility of more frequent censuses raised by the Queensland Conservation Council.²

4.15 The Australian Population Association recommends a greater role for the Australian Bureau of Statistics in providing a data base for the population debate, including the possibility that censuses be processed more rapidly than is the current practice.³

4.16 The Australian Bureau of Statistics was unable to provide the Committee with a supplementary projection updating existing population projections from 2041 to 2045, when requested, without charging a fee of \$4,300 to cover 'clerical and computer costs'. The Committee suggests that the Bureau explore the possibility of developing packages which make such tasks straightforward and inexpensive. The Committee understands that the ABS is operating under a regime of tight financial restraints but expresses concern that such vital information cannot be made available as a free public good to a Committee of the House of Representatives and this raises disturbing public policy implications.

4.17 In recognition of the low level of public awareness of the link between immigration and population growth, it was suggested in evidence to the Committee that 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.⁴ More generally, following a 1992 recommendation of the National Population Council, a 'population report' might be tabled annually in Parliament.⁵

² Queensland Conservation Council, Submission 205

³ Queensland Conservation Council, Submission 205, and Australian Population Association, Submission 258

⁴ Dr Christabel Young, Submission 177; Dr Katherine Betts, transcript of evidence, 28 June 1994

⁵ National Population Council, 1992, *Population issues and Australia's future: environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

4.18 In the interests of informed debate, a user-friendly low-cost capability for generating demographic projections under diverse assumptions about immigration, fertility, population re-location etc should be freely available to those seeking it.

4.19 **Conclusion:**

It is important for achieving ongoing informed debate on population matters that the proposed Cabinet Committee on Population publish regular reports on the long and short term population implications of current immigration and fertility rates, and on trends in a range of population-sensitive standard of living and quality of life indicators.

Recommendation 6: An annual or biennial Population Report covering demographic trends and trends in population-sensitive standard of living and quality of life indicators should be presented to Parliament. It may be possible and appropriate to incorporate such reports into the regular State of Environment reports being planned by the Department of Environment.

Recommendation 7(a): An appropriate agency, perhaps the Department of Environment's State of Environment Reporting Unit or the Australian Bureau of Statistics should be directed to establish a public domain demographic modelling facility primed with regularly-updated information on population changes.

Recommendation 7(b): That the Bureau of Immigration and Population Research be renamed as the Bureau of Population Research and transferred to the Department of Prime Minister and Cabinet to service the proposed Cabinet Committee on Population.

Data sources

4.20 A range of data bases relevant to such tasks as the assessment of regional population 'carrying capacity' and the impact of possible climate

change are already in existence.⁶ These include computerised bibliographic data bases such as HERA (Australian Heritage Commission), Streamline (LWRRDC) and others in the Australian National Library's OZLINE system; bibliographies of numerical data bases such as NDAR (National Resource Information Centre) and Landsearch (Commonwealth Land Information Support Group) and systems of numerical data bases such as those maintained by NRIC (National Resource Information Centre) and ERIN (Environmental Resources Information Network). Information collected from a diverse range of data banks could be co-ordinated in a project to develop a comprehensive national *Population Information System*. Such a system would have two components; one allowing easy access to the relevant parts of existing systems, and one developing digital data bases specific to the needs of the population debate.

4.21 The Bureau of Immigration and Population Research is compiling an inventory of population research. Evidence to the Committee is critical of the narrow focus of the Bureau's research programs.⁷ It is the Committee's view that Bureau of Immigration and Population Research is attempting to broaden the range of topics and participants in its research program. This may not be sufficient to dispel existing perceptions that the Bureau's research lacks objectivity on immigration issues.

Research questions

4.22 In a patchy way, scientific research is taking place around Australia on many aspects of the population size question. Research into short run aspects of immigration by economists, sociologists, demographers and political scientists predominates however. Monash University's Centre for Population and Urban Research has recently begun publishing *People and Place* to provide an outlet for empirical research on population matters. Apart from a few demographers, there has been little interest from social scientists 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. Again, methodology is a problem.

⁶ Bureau of Meteorology, Submission 235

⁷ Dr Bob Birrell, Dr Katherine Betts, transcript of evidence, 28 June 1994; Dr Christabel Young, transcript of evidence, 19 August 1994; Dr Rodney Spencer, transcript of evidence, 29 July 1994

4.23 Institutions where useful research into population - environment links is being carried out include:

- . Murdoch University, Perth
- . Australian National University, Canberra, particularly the Centre for Resource and Environmental Studies and the Northern Australia Research Unit
- . Deakin University (Rusden)
- . Griffith University, particularly the School of Australian Environmental Studies
- . University of New South Wales
- . Flinders University of South Australia
- . CSIRO Division of Wildlife and Ecology
- . CSIRO Division of Water Resources
- . Environmental Resources Information Network, Department of Environment, Sport and Territories
- . National Resource Information Centre, Department of Primary Industries and Energy

4.24 The 1992 National Population Council Report lists 15 topics on which research is required and all of these remain relevant.⁸ Examples include:

- . income and wealth distribution effects of population change;
- . longer term balance of payments consequences of immigration;
- . economic and other implications of temporary movement to Australia; and
- . equity issues in funding of public infrastructure and community services for new population.

4.25 The research Report (August 1994) commissioned by the Bureau of Immigration and Population Research points to the lack of hard data in many areas that are central to the population environment resource use debate and refers to the 'hard challenge of decision-making in the face of irreducible uncertainty'. As they point out 'there is often a much greater

⁸ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

amount of concern raised regarding the gross size of the population compared with the question of per capita environmental load' but we lack evidence to reach firm conclusions. 'The question of whether ecological limits to economic activity exist, and if so, which limits are closest or most crucial, cannot yet attract any sort of consensus'. The Report suggests six areas of research, none of which have been attempted (for example the impact of tourism on the environment) and where there are instrumentalities with the capacity to undertake the research and interested client Departments. The information base in this crucial area is woeful.⁹

4.26 In addition to the need to collect data on such basics as resource availability and quality of life components as outlined in the first part of this Chapter, there are a large number of 'process understanding' research questions which need to be answered in the interests of a more informed analysis of population policy options.

Recommendation 8: The Cabinet Committee on Population should have its own research budget of at least \$1 million annually, to fund independent scientific research programs designed to facilitate more informed evidence-based analysis of population policy options. This should include support for institutions pursuing the emerging discipline of future studies.

⁹ Norton T, Dovers S, Nix H and Elias D, 1994, *An overview of research on the links between human population and the environment*, Centre for Resource and Environmental Studies, Australian National University, Canberra; CSIRO, Submission 259

Chapter 5

WORLD POPULATION GROWTH AND AUSTRALIAN POPULATION POLICY

World population prospects

5.1 This section draws on the work of Professor John Caldwell, Professor Amartya Sen and presentations by other distinguished demographers to the 1994 United Nations International Conference on Population and Development.¹

5.2 For most of the world's history the total fertility rate has been between six and seven births per woman per lifetime. Mortality over the years has been correspondingly high and population growth rates across the millennia close to zero.

5.3 In modern times a number of factors have operated to raise potential births (better diets, early weaning and others) and lower mortality rates (better public health measures, medical advances and others) and the result has been greatly increased population growth rates.

5.4 From the late 18th century total fertility rates began to decline in one European country after another, beginning with the United Kingdom. Causes for this are a matter for debate but include the recognition that children are more of an economic burden than an economic benefit and acceptance of deliberate fertility control.

5.5 The world as a whole had a total fertility rate of about five 40 years ago. It is now around 3.4, a decline of one-third. But in this 40 year time-span mortality declined steeply as global life expectancy climbed from a little over 45 to almost 65. The result of these countervailing forces was that the annual rate of population growth climbed over those four decades from around 1.7 to 2.1 per cent in the late 1960s and is now back to 1.7 per cent again. But, because of the rise in the base population, the annual increment has risen from around 45 million people in 1950 to over 90 million today

¹ Sen A, 1994, 'Population: Delusion and reality', *New York Review of Books*, Sep 22:62-71; Caldwell J, 1994, 'The course and causes of fertility decline', IUSSP Distinguished lecture series, United Nations International Conference on Population and Development

and will not peak until later in the present decade.

5.6 Nevertheless, the global fertility transition is well under way and promises a stationary or slowly growing population of between 8-11 billion people a century from now. Beyond that, perhaps from the end of the 21st century, a slowly declining population is foreseeable, perhaps reaching our present numbers again two or three centuries hence. Such scenarios assume no massive increase in death rates due to war, famine or pestilence. Yet it is problematic whether 11 billion people can and will be provided with the means to live in even frugal comfort.

5.7 On the other hand, over the years 1980-1992, people in low income countries (which are commonly high population growth countries) experienced growth in GNP per head of 3.9 per cent a year. In evidence to the Committee on the matter of food supply Professor John Caldwell of the ANU noted:

Food supply in the world is keeping up with population growth. If some of the world's population is inadequately fed, it is not because of our inability to produce more food; it is because of their inability to buy more food. This is a question of general economic development.²

Table 4: *Indices of food production per capita*

	1979-81 Base period	1991-93
World	100	103
Europe	100	102
North America	100	95
Africa	100	94
Asia	100	122
Asia including India	100	123
Asia including China	100	139

Source: FAO, *Quarterly Bulletin of Statistics*

² Professor John Caldwell, transcript of evidence, 20 September 1994

5.8 Nor is there serious evidence in historical data that world food production per capita is declining. Table 4 shows the worldwide trend in food output per capita to be upward as is the trend in all regions except Africa. The largest increases in per capita production are actually taking place in those parts of the world with the largest absolute increases in population, ie India and China.

5.9 The predictions of Thomas Malthus (1766-1834) in his famous *Essay on the Principles of Population* (1798) concerning the relationship between population and food supplies have so far been unproven. He argued that population tends to increase at a geometric ratio (each generation can double up) while the means of subsistence only increases at an arithmetic ratio (incrementally), and that the only constraints to population growth were famine, war, disease, infanticide and the 'vicious practice' of contraception. When Malthus wrote, world population was probably 800 million. He ignored the impact of technology in agriculture, especially food production.³

5.10 Neo-Malthusians have argued that with world population at 5.6 billion and serious problems of water supply, inadequate soil for farming, and loss of wood for fuel and building, Malthus' predictions are starting to look more relevant. Nevertheless, a scenario in which the world copes with a doubling of population, at least in the sense of being able to feed an ultimately stable population is not without plausibility. It is a scenario which says little about other quality of life considerations.

Relevance of world population growth to Australia

5.11 Australia explicitly supported the position at the 1994 United Nations International Conference on World Population and Development in Cairo that all countries have a responsibility to stabilise their populations as quickly as possible (and the need for all countries to develop population

³ Chadwick MJ, 1994, 'Visions of a sustainable world: Ethical evaluations or political programmes', in Graham-Smith F (ed) *Population-the complex reality, A report of the Population summit of the world's scientific academies*, The Royal Society and North American Press, Cambridge

policies).⁴ However, population growth via immigration (Australia's way) is commonly seen as not being in conflict with this injunction, being more 'population transfer' than population growth.

5.12 The primary relevance of the world population outlook to Australia is that it provides a context within which Australia can formulate its own appropriate population policies.

5.13 Notwithstanding the position taken by Australia at the Cairo Conference, it can still be reasonably asserted that because any feasible population growth in Australia would be insignificant globally, Australia should make its population decisions without reference to the world situation. This position is strengthened to the extent that it is accepted that world population is coming under control quite rapidly as living standards around the world rise. In 20 years women from less developed countries have moved from having 6.0 to 3.7 children and it is likely that a projected world population of 8 billion in 2025 will have to be revised down.⁵ The implication is that Australia need not be overly influenced by the spectre of massive world population growth when deciding its own population policy.

5.14 During its public hearings, the Committee sought witnesses' views on the complementary questions of what quality of life is it feasible to strive for in Australia and what Australia's obligations to the rest of world might be. All witnesses specifically asked the question, accepted that Australia had some sort of obligation to refugees looking for somewhere to settle. On quality of life goals several witnesses (for example Dr Christabel Young and Ms Fay Sutton) stressed the importance, and feasibility under limited population growth, of retaining traditional aspects of the Australian way of life.

5.15 The Committee concluded that while each nation ultimately has responsibility to manage its own environment, economy and population, Australia also has a responsibility to help other nations do these things. What is at issue is just what constitutes a program of responsible and

⁴ Submissions 215, 246, 94; The world's scientific academies, meeting in New Delhi in 1993, said that the world population goal should be zero population growth within the lifetime of our children. The Australian Academy of Science was a signatory to this declaration; Graham-Smith F (ed), 1994, *Population: The complex reality*, The Royal Society and Fulcrum Press, Cambridge

⁵ Des Moore, Submission 21

effective assistance. Candidate components of an assistance program include immigration, managing Australia's contributions to global pollution and various forms of foreign aid.

Australia's role as a global citizen

5.16 The following sections discuss effects on and perceptions in other countries of a major population increase in Australia, namely our image, global pollution, access to global resources, international food supplies and aid levels.

5.17 It would be in line with the philosophy of the UN world population program to limit population growth in Australia.⁶ On this point, the Committee notes pledges now made by the Australian Government at the United Nations International Conference on Population and Development in Cairo in September 1994. Australia has become a signatory to documents which agree to the formulation of national strategies and programs to address population and development problems as an integral part of its sectoral and overall development and planning process. The Government has agreed to monitor progress towards its population goals.⁷ If these are not expressible in measurable form then they cannot be meaningfully monitored.

5.18 The argument, pushed as recently as the 1960s that in a time of rising world population Australia with its open space ought to pursue an open door policy to migration, encouraging friendly mass migration rather than facing invasion and occupation, is now a mere historical relic. It has nothing to recommend it and is no longer being advanced. In addition, encouraging mass migration from Asia would have a trivial effect on its population pressures but would impose insupportable burdens to the Australian economy. To put the situation in perspective - Australia's total population is equivalent to China's annual increase.

Global pollution

5.19 What has Australia's population to do with global pollution? Australians, on average, are great contributors to global pollution,

⁶ Professor Jonathan Stone, Submission 246

⁷ Submissions 55, 94

particularly atmospheric pollution but also land-based marine pollution. The former is already a matter for imminent international regulation and marine pollution is sure to follow.

5.20 One specific area in which Australia has an international responsibility is to reduce its emissions of greenhouse gases. Australia, amongst the world's highest per capita producers of greenhouse gases, is committed to reducing national CO₂ emissions by 20 per cent by 2005.

5.21 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 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).⁸ The whole matter of trade effects of population growth is one which would benefit from further research.

Global food strategy considerations

5.22 Inquiry witness Dr Howard Dengate argued that Australia is, through its exports, already feeding 50 million and clothing 300 million people in other countries. This is self-interest rather than generosity of course, ie we do not export food and fibre at a loss. The calculation is based on subsistence conversion factors such as 250 kg of wheat per person per year.

5.23 Nevertheless, there may be advantages in terms of world food strategy for Australia to remain a major food exporter rather than to use 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 to the extent that the geographical spread of food exporting countries narrows.

⁸ McGlynn G, 1992, 'Population and Australia's resource endowment in National Population Council', *Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

Foreign aid considerations

5.24 Professor Roger Short FRS, FAA, of Monash University, in evidence, suggested that a large component of Australia's foreign aid budget should be directed into programs which will fairly directly reduce fertility rates in less developed countries, particularly Indonesia and other countries to Australia's north and east.⁹ These include programs for the education of women as well as family planning programs.

Core geopolitical considerations

5.25 It is clear that there is a strong feeling that Australia should meet its responsibilities as a global citizen. However, on balance, approaching this through high immigration and population growth has limited benefits and some significant environmental and economic 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.

5.26 Apart from a definite willingness to accept refugees in generous numbers, the Committee believes that Australia should discharge its responsibilities to an overpopulated world through a large and well-targeted aid program. Should it need to do so, Australia is in a strong position to defend this stance.

5.27 In the wake of the 1994 Cairo World Conference on Population and Development, in the view of the Committee Australia should articulate a comprehensive policy on national and global aspects of the population question.

Recommendation 9: That the Australian Government continue to make it clear that Australia's contribution to assisting the problems of global overpopulation will be a combination of aid, expertise and example, pointing out that reduced fertility rates have a close relationship with encouraging education for girls and women and with rising levels of prosperity. In addition, Australia must improve its efforts to reduce the impact of global pollution, particularly the emission of greenhouse gases.

⁹ Professor Roger Short, transcript of evidence, 29 July 1994

Aid policy

5.28 The size and focussing of Australia's foreign aid budget can be seen, potentially, as providing an 'insurance' component within a national population policy.

5.29 The 1992 National Population Council report distinguished two aspects to such 'insurance'. One is a clear role for an enhanced foreign aid program to support non-coercive family planning services and the other is to assist countries of the region in the creation of a social and economic context favourable to fertility decline.¹⁰ Without disagreeing with this conclusion, it is family planning aid, including programs for the education of women here, which is most relevant to Australian population policy.

5.30 Conclusion:

Properly targeted foreign aid is the main way in which Australia can 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 towards other aspects of economic and social development.

¹⁰ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

Chapter 6

WHAT SUBMISSIONS SAY ABOUT POPULATION SIZE

6.1 This Chapter addresses the second of the Committee's terms of reference, namely 'The range of community views on population size and its political, social, economic and environmental significance'. Community views have been sought through submissions to the Inquiry and the examination of selected witnesses at public hearings. In this Chapter the Committee considers the range of arguments offered in relation to the issue of Australia's population size. Views put forward in submissions emanate from a wide variety of perspectives and these have been grouped for clarity under the headings of environmental, economic, socio-cultural, and other general arguments relating to population size which overlap two or more of the other categories. The Committee's conclusions about each group of arguments are summarised at the end of each group.

6.2 Although views contained in the submissions come from a variety of perspectives, many contain overt or inherent assumptions about the need to continue or enhance the *quality of life which Australians currently enjoy*. Most submissions see the purpose against which to argue for population growth (or decline) as being the 'well-being' or welfare of some combination of human populations - present and/or future.

6.3 Many aspects of a population's well-being are recognised in the totality of submissions. They can be broadly grouped into, environmental, socio-cultural and economic 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.

6.4 There is also considerable agreement, both implicit and explicit, amongst submissions that the broad parameters of the society within which high quality of life for individuals is to be sought include:

- a liberal democratic system of government;

- an ecologically sustainable system of production and consumption, ie one which very strongly protects the future amenity and productive values of natural resources such as biodiversity, air, water and earth materials; and

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

Environmental arguments about population size

Some starting points

1. Environmental indicators

6.5 Much evidence to the Inquiry is concerned with the relationship between population growth and its perceived effects on either natural or urban environments in Australia. There are many shared assumptions (which may well be culturally determined) about what constitutes a high quality environment and which may be generally listed as clean air, clean water, access to 'unspoiled' natural areas including beaches, a clean, safe, uncongested and efficiently planned urban environment. Environmental problems are generally perceptible where these and other aspects of a high quality environment are seen to be threatened.

2. Causes of environmental problems

6.6 Environmental problems are perceived as having multiple causes including population growth, population distribution, personal consumption patterns, the industry mix and types of technologies used.

3. Points at issue

6.7 For the present Inquiry, 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.

6.8 Clearly, if population growth is believed to be only one minor cause of the nation's environmental problems or 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 weakened.¹ Evidence to the Committee on these issues contained widely divergent views. Witnesses to the Inquiry who tendered evidence linking population growth with environmental degradation included the Australian Conservation Foundation, Australians for an Ecologically Sustainable Population (AESP), Dr Howard Dengate, and the CSIRO. The CSIRO submission stated, for example that:

The human impact on the environment is a function not only of population, but also of lifestyle, organisation and technology...Any rise in population will increase the necessity and urgency to do what already needs to be done to enhance Australia's population 'carrying capacity'. Resource and infrastructure issues, especially regarding water and energy use and waste disposal, already require more attention if Australia is to achieve an ecologically sustainable way of life. If these issues are not adequately addressed, Australia can expect further degradation of land and water resources in certain regions of the coastal zone and on inland river systems, compromising its quality of life - even at current population levels.²

6.9 On the other hand, in his evidence to the Committee, Mr Des Moore of the Institute of Public Affairs (IPA), argued that the basic flaw in the arguments of those he termed 'population and resource pessimists' was that they:

adopt essentially static rather than dynamic analyses. They do not allow for the virtual certainty that changed circumstances will more often than not bring their own solutions to problems.³

4. *Geography of environmental problems*

6.10 Evidence to the Committee contains many references to environmental problems of urban areas, particularly the metropolitan areas of Sydney, Melbourne, Perth, Adelaide and Brisbane.⁴

6.11 There is particularly widespread concern over environmental problems in Sydney and the impact of these on quality of life.⁵ Water quality is the

¹ Des Moore, Submission 21

² CSIRO, Submission 259

³ Des Moore, transcript of evidence, 20 September 1994, p.337

⁴ Submissions 223, 209, 103, 254, 95, 131, 201, 18

⁵ Submissions 129, 15

most commonly cited problem and the ongoing degradation of the Hawkesbury-Nepean system is suggested as being a foretaste of the problems which will arise elsewhere with population growth.

6.12 Environmental problems of peri-urban areas, within half to a day's drive of major urban centres are particularly noted in coastal areas, for example, Coffs Harbour, Lake Macquarie, New South Wales Central Coast, northern New South Wales and southern Queensland, lower Hunter Valley, Sunshine Coast, far south coast of New South Wales, Redland Bay.⁶

6.13 The two coastal environmental problems most prominent in submissions are the treatment and disposal of sewage and coastal ribbon development.⁷ These perceptions are compatible with the recent report on coastal zone management by the Resource Assessment Commission.⁸

6.14 Submissions identified many environmental problems in rural areas, particularly agricultural areas and, even more particularly, the Murray-Darling Basin.⁹ Recurring examples of rural environmental problems include:

- . land degradation;
- . biodiversity loss through habitat destruction; and
- . declining rural water quality.

6.15 In the short term at least, it is difficult to attribute such problems directly to population growth. However, there are rural environmental problems induced by city growth. Growing cities have impacts (footprints) far beyond their immediate boundaries including the conversion of soil nutrients to sewage, creation of protected water catchments and overcrowding of peri-urban and rural recreational settings.

⁶ Submissions 160, 223, 151, 85, 179, 119, 156, 201, 205, 50, 142, 220, 24

⁷ Submissions 85, 21

⁸ Commonwealth of Australia, 1993, Resource Assessment Commission *Coastal Zone Inquiry Final Report*, AGPS, Canberra, 1993

⁹ Submissions 25, 9

City size and consolidation arguments

6.16 The effects of immigration on urban environmental problems has been of concern at least since the 1977 *Green Paper on Australian Population*.¹⁰ This report stated that reducing immigration would allow infrastructure spending in cities to focus on maintaining and upgrading existing infrastructure rather than building new infrastructure. It also mentioned the (still-present) problems of overuse of natural recreation areas near cities and overloading of water supply and waste disposal systems.

6.17 Evidence to the Committee suggests that there is a perception among residents of big cities, in particular cities with a population above 1-2 million, have congestion and pollution problems which can result in reduced quality of life for many.¹¹ Sydney is seen as the model for what will happen elsewhere in Australia if population grows markedly.¹²

6.18 Some of the higher per capita costs of managing larger cities can be defrayed by managing people to live at higher densities. Indeed this is a common suggestion from town planners. However, higher densities bring their own costs. For example, the replacement of vegetation with hard surfaces increases runoff, raises mean summer temperatures and reduces local biodiversity. High density living in inappropriately planned circumstances has been perceived as a negative in some evidence to the Committee, while the prevailing Australian urban settlement pattern of the low density suburb was not without its problems also.¹³

6.19 Overall, urban consolidation is likely to be part of Australian society's response to population growth. This will save something on infrastructure costs but will need to be sensitively managed if it is not to reduce lifestyle options for large numbers of people. However, the Committee does not regard the possibility of collateral urban consolidation as a major argument against population growth.

¹⁰ Australian Population and Immigration Council, 1977, cited in McGlynn G, 1992, Population and Australia's resource endowment in National Population Council, *Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

¹¹ Submissions 11, 1

¹² Submission 155

¹³ Dr Christabel Young, transcript of evidence, 19 August 1994

6.20 Population densities at which congestion of roads and airspace is recognised are culturally determined. Some evidence to the Committee, particularly from the big cities, argues that congestion is unacceptable now and, given the inability of governments to cope with present problems, likely to get worse with city population growth.¹⁴ With regard to this issue, the 1992 National Population Council report concluded that diseconomies associated with congestion were likely to increase as metropolises expand.¹⁵ On the other hand, there is evidence that trip times are not increasing as rapidly as anticipated, perhaps because of the emergence of multi-centred cities with each centre being somewhat self-contained. In evidence to the Committee, Dr Kevin O'Connor of Monash University said:

People talk about the quality of life in non-metropolitan centres. They completely ignore the quality of life in metropolitan centres. There are a large number of people who live in the suburbs who are 10 minutes from their work. They have matched up a suburban job and a suburban house...They have a very good quality of life...Quality of life means different things to different people. I think my data suggests that the majority of people think that the quality of life is actually superior in the larger cities. They have voted with their feet.¹⁶

Pollution arguments

6.21 Evidence to the Committee suggests that there is community concern about urban pollution problems which appear to impact more heavily on residents of the larger cities. Problems referred to include both air quality (because the effectiveness of dispersion of air pollutants is negatively correlated with city size), and water quality (because of intensification of land use in fixed-size, fixed-throughput water catchments).

6.22 The CSIRO submission refers to the fact that the need to control photochemical smog is a significant negative factor to be considered in the further development of Sydney and Melbourne.¹⁷

¹⁴ CHANGE, Submission 9

¹⁵ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

¹⁶ Dr Kevin O'Connor, transcript of evidence, 29 July 1994, p.70

¹⁷ CSIRO, Submission 259

6.23 The Committee received a considerable quantity of evidence on a range of matters relating to pollution problems in both urban and non-urban environments throughout Australia. Specific issues referred to include; waste disposal, public health (including mental health), visual and recreational amenity degradation, and habitat and biodiversity loss.

6.24 In a strict sense it is doubtful if the goal of ecological sustainability can be met if this term means that the capacity of natural systems to continue to function as at present is to remain unimpaired. It is not even clear how to measure changes in the functional capacity of natural systems in many cases.

The Committee's conclusions about environmental arguments

6.25 Although evidence to the Committee makes it very clear that the widespread subjective experiences of people living in Australia's major cities are that the quality of their physical environment has been declining in recent decades in parallel with population growth, there is only patchy data available describing changes in the quality of the physical environments. What little hard data there is suggests that there has been little or no improvement in the physical quality of average urban lives.¹⁸ There has been almost no formal modelling of links between population levels and environmental quality.

6.26 Outside urban areas it is well documented that the quality of the resource base on which primary production depends has been degrading and continues to degrade in many places, particularly in the wheat-sheep zone and the rangelands. There is no empirical evidence and no modelling studies which suggest that this degradation is causally linked to national population growth.

Demographic arguments

6.27 Several submissions from demographers identify an optimum population as being not only of the right size and stable (zero population growth) but as having a fairly regular age structure, thus avoiding the social and economic upheaval resulting from rapidly increasing or decreasing

¹⁸ Castles I, 1992, *Australia's Environment Issues and Facts*, ABS, Cat. No. 4140

numbers in successive age cohorts. Other suggested attributes of a demographically optimal population are low birth and death rates.

6.28 While demographers might have a view of what constitutes 'an optimal population', it has to be remembered that this is a value judgement, just as much as when economists argue 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.

6.29 The myth that immigration is an effective tool for either permanently or in the short term reducing the average age of the population has been punctured by simple demographic analysis. Australia still has a relatively youthful age structure and the population will continue to age slowly for some decades.¹⁹ The Committee, as does the Government, accepts that immigration is an inappropriate tool to counter demographic ageing, if indeed demographic ageing is a problem.²⁰

6.30 Overall, the Committee agrees that there are useful economic and social net benefits from having a population with a fairly regular age structure and notes that a regular age structure is a benefit associated with a stationary population.

Socio-cultural arguments relating to population size

Inter-generational equity and social justice considerations

6.31 Issues raised in the evidence include:

- . the extent to which population growth produces an irreversible loss in natural resources and the extent to which this is offset by increases in man-made capital;
- . the extent to which man-made capital is likely to be accepted as a substitute for lost natural capital; and

¹⁹ Dr Katherine Betts and Dr Bob Birrell, Submission 179

²⁰ Department of Immigration and Ethnic Affairs, Submission 247

the extent to which the possibility of climatic change stands to affect the rate of loss of natural capital.

6.32 One suggested principle for helping balance inter-generational interests is to try to leave resources and the environment in the condition in which they were inherited.²¹

6.33 An example of an inter-generational issue comes in a submission from the Aboriginal and Torres Strait Islanders Commission. It suggests that high population growth will not be good for Aboriginals to the extent that they may then have a smaller voice in a larger population and may lose land, regarded as spiritually or culturally significant, to development.²²

6.34 A second line of ethical argument starts from the position that humans have no right to threaten the existence of other species of animals through their actions. To the extent that population growth disturbs and destroys habitat, the main cause of species decline, population growth, is unethical.²³

6.35 The question of identifying the full range of benefits and disbenefits associated with city growth, and which groups these impact on, is a very difficult one. The Committee concludes 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 resulting from population growth.²⁴

Economic arguments about population size

6.36 Some submissions discuss ways in which immigration in the short term and population growth in the longer term might affect a range of indicators of economic well-being. The overall emphasis in these is on refuting the supposed economic benefits of population growth in general and of immigration in particular. To some extent this effort is misplaced, at least

²¹ Dr Alan Hall, Submission 230

²² Submissions 170, 260, 174

²³ Dr Alan Hall, Submission 230

²⁴ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

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 had little of an analytical nature to say about the long term costs and benefits of population growth.²⁵

6.37 The following sections do not include discussion of the relationship between population growth and what many see as the single most important indicator of economic well-being, gross domestic product per head. That is because this issue has been already discussed in relation to the assertion that people's standard of living improves with population growth (Chapter 3).

Economies of scale arguments

6.38 'Economies of scale' associated with the long production runs needed to supply goods to large populations are sometimes argued to confer significant economic benefits and to be dependent on increasing population.²⁶ However, recent work using the ORANI model of the economy suggests that, while real, such economies of scale are likely to be very small.²⁷

6.39 The existence and size of scale economies and, conversely, diseconomies across various sectors of the economy is problematic.²⁸ Some emerging production technologies (see below) for example are less scale-sensitive than the technologies they are replacing.

²⁵ For example, Committee to Advise on Australia's Immigration Policies 1988, *Immigration: A commitment to Australia*, Report of the Committee to Advise on Australia's Immigration Policies, Australian Government Publishing Service, Canberra

²⁶ Dr John Perkins, Submission 169; Norman NR and Meikle KF, 1985, *The economic effects of immigration on Australia, Vol. 1*, Committee for the Economic Development of Australia, Melbourne

²⁷ Peter MW, 1992, Some economic consequences of changes in the size and composition of the Australian population: Immigration, ageing and scale economies, in National Population Council, *Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

²⁸ Dr Alan Hall, Submission 230

6.40 It can also be pointed out that economies of scale are a function of market size rather than population and can therefore be gained by an increase in consumption per head or by producing for export markets.²⁹

6.41 The arguments concerning economies of scale may qualify slightly the conclusion of the National Population Council in 1992 that, based on indirect evidence about population and growth, some positive scale effects have been found.³⁰

City size and consolidation arguments

6.42 CSIRO 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.³¹ However, it does need to be noted 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.

6.43 The size-income per head relationship is important in relation to forecasts that population growth in Australia will continue to be concentrated in the major cities.³² 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.

6.44 Income per capita is higher in cities for reasons which include more specialised services, the presence of company headquarters, more employment opportunities and hence higher participation rates.³³

6.45 In evidence to the Committee, Dr Kevin O'Connor of the Department of Geography and Environmental Science at Monash University, said that American and European evidence suggested that:

²⁹ Dr Alan Hall, Submission 230 and Australian Conservation Foundation, Submission 256

³⁰ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

³¹ CSIRO, Submission 259

³² Dr Katherine Betts and Dr Bob Birrell, Submission 179

³³ CSIRO, Submission 259

there are major gains in productivity with increases in size; that bigger cities basically have more complicated tasks, hence they pay people more...so income levels or production per head, productivity, is higher in bigger places than in smaller places.³⁴

On balance of evidence tendered to the Committee there appear to be economic advantages associated with large cities.

Balance of payments arguments

6.46 Academic research suggests that recent immigration has not adversely affected Australia's current account deficit.³⁵ Some submissions, however, argue that population growth is most likely to impact in coming decades on Australia's balance of payments via the manufacturing, agriculture, minerals and tourism sectors. Larger domestic markets could both decrease the availability of agricultural produce for export and increase imports of manufactured goods and, presently, oil. Only a small proportion of the workforce is in export industries and therefore a big increase in population stands to add more to demand for imports than to supply of exports.

6.47 The result of declining food exports, without a substantial improvement in non-food productive efficiency, would necessarily be a fall in non-food living standards. This improvement would be necessary, not to improve living standards, but to prevent them from falling.³⁶

6.48 This scenario ignores the possibility of compensating adjustments occurring in the economy in response to these processes.³⁷ For example, increased demands for imports might drive up the push to produce primary products for export. 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.

6.49 Basically, what is being recognised in 'balance of payments' arguments is:

³⁴ Dr Kevin O'Connor, transcript of evidence, 29 July 1994, p.86

³⁵ Professor David Pope, Submission 53; Junankar PN, Pope D *et al*, 1994, *Immigration and Australia's external account balances*, Australian Government Printing Service, Canberra; Centre for International Economics, 1990, *Immigration, trade and capital flows*, AGPS, Canberra

³⁶ Dr Alan Hall, Submission 230

³⁷ Des Moore, Submission 21

(a) an impact on our ability 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; and

(b) possibilities for and problems hidden in countering this impact.

6.50 Overall, balance of payments arguments must be regarded as suggesting that population growth is a potential problem but that this is not clearly demonstrable either for the shorter or the longer term. In evidence to the Committee, Mr Des Moore of the Institute of Public Affairs said:

the future of agricultural exports depends on a number of things, including relative export prices for agricultural and manufacturing or mining products, as well as agricultural policies of overseas countries...The difficulty of reaching any even reasonable conclusion on what is going to happen in these very important areas illustrates the difficulty of making firm government planning or research decisions about longer term requirements.³⁸

Capital stock and 'crowding out' arguments

6.51 A related group of arguments tendered in submissions concern the capital displacement effects of population growth. As population grows, the share of income available for consumption after making provision for investment sufficient to maintain a constant per capita income falls rapidly. It rises as such growth decreases. Short term population growth is thus likely to put downward pressure on Australia's ability to equip its workforce and upward pressure on the need to raise overseas funds.

6.52 It is also evident 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.³⁹

6.53 The 1992 National Population Council report came to a somewhat different conclusion. In the long run an expanding population will produce expanded output at historically comparable per capita levels which will be

³⁸ Des Moore, transcript of evidence, 20 September 1994, p.340

³⁹ Wooden M, 1994, The economic impact of immigration, Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

saved at historically comparable rates. Hence the economy will have the capacity 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'.⁴⁰

6.54 Another aspect of the capital displacement issue under circumstances of population growth, concerns the effect on technology levels. Standards of living are determined not by economic growth *per se* but by improvements in productivity. Productivity is partly determined by the levels of technology embodied in the economy's capital stock and this is likely to be higher under population growth than under a stable population. This is simply because population growth is likely to raise the proportion of the capital stock which is of recent date. Thus the average level of technology embodied in equipment will be more advanced.⁴¹ This effect is not likely to be large under most circumstances.

6.55 Overall, it may be concluded that a limited period of rapid population growth is likely to lead to small declines in productive capital, productivity and in infrastructure per head in the short term. In the longer term these effects would be likely to be ameliorated. These effects would be reduced or exacerbated depending on such associated factors as changes in technology levels and in skill and employment levels in the additional population.

Government budget arguments

6.56 There is wide agreement amongst contributors 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.

⁴⁰ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

⁴¹ Priorities Review Staff, 1976, *Report on the Borrie Report*, AGPS, Canberra; McGlynn G, 1992, *Population and Australia's resource endowment in National Population Council, Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

6.57 There is also agreement that it is expensive for State and Federal governments to provide the infrastructure to establish migrants on arrival. Academic research does however suggest that, in the longer term, immigration generates government revenues which more than repay government expenditure on establishing migrants.⁴²

Labour market arguments

Unemployment arguments

6.58 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.

6.59 Despite the argument that unemployment has steadily worsened during 20 years of high immigration, formal studies suggest no causal relationship between immigration and unemployment, even in recessionary times. Not only is it claimed that immigration does not cause unemployment but also, although not without challenge, 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.

6.60 These benign economic attributes of immigration are based on competent applied econometric studies.⁴³ Yet basic economic analysis encourages scepticism. 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 resident Australians, in the last two recessions unemployment rates amongst recent migrants have risen to over 30 per cent.

6.61 In conclusion a reasonable working hypothesis is that while the labour supply/demand effects of immigration more or less cancel each other out, it

⁴² Wooden M, 1994, The economic impact of immigration, Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

⁴³ Pope D and Withers G, 1993, 'Do migrants rob jobs? Lessons of Australian economic history 1861-1991', *Journal of Economic History*, Withers G and Pope D, 1985, *Immigration and unemployment*, *Economic Record* 61 (173):554-63

cannot be argued that economic growth, partly fuelled by immigration, increases unemployment. Conversely, unemployment may be exacerbated during periods of recession by continued high immigration. In evidence to the Committee Dr Bob Birrell of Monash University made the point that according to current Australian Bureau of Statistics projections for the next seven years, *without high migration there would be 0.75 per cent growth per annum in the working age population. With a high immigration rate (of 100 000 per annum) there would be 1.2 per cent potential workforce growth.*⁴⁴

Wage level arguments

6.62 Foster and Baker (1991)⁴⁵ detect only a small uncertain effect from immigration on wage levels. The Committee acknowledges that there are no accepted causal arguments relating immigration to declines in real wages in recent years.

Skills arguments

6.63 It can be argued that the population's level of job skills is more relevant to Australia's economic prospects than simple population size.⁴⁶ In evidence to the Committee Professor David Pope argued that in times of high unemployment Australia's immigration program should be 'tailored to stress skills and capital retained in Australia', Professor Pope argued that with respect to Australia's migrant intake:

As I see it, the composition is flexible. It cannot be divorced from what we perceive the economy and the unemployment situation to be.⁴⁷

6.64 Output per head following population growth through migration will tend to rise if the level of productivity of the migrant work force is higher than that of the resident work force. 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,

⁴⁴ Dr Bob Birrell, transcript of evidence, 28 June 1994

⁴⁵ Foster W and Baker L, 1991, *Immigration and the Australian economy*, AGPS, Canberra

⁴⁶ Throsby CD, 1992, Population policy and ecologically sustainable development, *Proceedings Second International Immigration Outlook Conference*, Bureau of Immigration Research, Melbourne. 27-33

⁴⁷ Professor David Pope, transcript of evidence, 28 June 1994, p.31

although this is less likely to be true of more recent immigrants.⁴⁸ In general, existing research supports the hypothesis that immigration has not acted as a substitute for the training of Australian-born workers.⁴⁹

Living cost and distributional arguments

6.65 Population growth through immigration is recognised as spawning a range of 'winners and losers' in economic terms. Apart from the immigrants themselves (mostly winners), groups sometimes identified here include big-city residents, entrepreneurs meeting immigrant demands for goods and services and taxpayers who meet the public costs of establishing migrants and employees.

6.66 In terms of other distributional effects, there is a perception that the burden on government of providing new urban infrastructure for an expanding population has reduced the rate of replacement and upgrading of old infrastructure. Similarly, city growth imposes different costs on different groups (both geographically and socio-economically) in terms of loss of services and costs of accessing services.

6.67 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.⁵⁰ Both departing and remaining city residents may thus be incurring external costs generated from this form of population growth. The relationship between immigration levels and patterns of internal migration need further study.

6.68 Most of the above points are couched in terms of the distributional effects of immigration, but whatever the source of population growth there appear to be more external costs than external benefits imposed on the existing population by additional numbers.

⁴⁸ Wooden M, 1994, 'The economic impact of immigration', Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

⁴⁹ Mr Des Moore, Institute of Public Affairs, Submission 21; Wooden M, 1994, 'The economic impact of immigration', Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

⁵⁰ Murphy et al, 1990, *Impact of Immigration on Urban Infrastructure*, AGPS, Canberra

Resource and amenity dilution arguments

6.69 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. However, as natural capital becomes an ever smaller part of the total capital used to produce Australia's wealth this argument loses force.

6.70 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.

Economic stability arguments

6.71 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 give additional stimulus to investment in housing and other population-related activities. At the very time immigration is most likely to be a net stimulus to growth, the requirement of effective macro-economic policy is 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, immigration is a dependent variable rather than an initiating cause of growth.

6.72 Traditionally, policy has aimed at cutting back migration 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.⁵¹

⁵¹ Priorities Review Staff, 1976, *Report on the Borrie Report*, AGPS, Canberra; National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

Inflation arguments

6.73 Foster and Baker (1991)⁵² conclude 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.

The steady-state economy

6.74 Several submissions advocate a transition to a steady-state economy, one characteristic of which is a stable population. The basic point which these submissions make is that in a steady-state economy public and private resources can be invested in improving the quality of life of the existing population instead of always having these resources stretched to meet the additional needs of an increasing population.⁵³

6.75 The idea of a steady-state economy has been the subject of academic research and interest for some time. In 1972, for example, 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.⁵⁴

Assessment of arguments about the economics of population size

6.76 The evidence submitted to the Committee addresses a wide range of economic issues seen as being affected by population size. These include GDP per head, balance of payments, inflation, wages, employment, government expenditures, production and marketing costs, living costs and capital accumulation. Even the *prima facie* evidence is difficult to interpret. While average per capita incomes have risen in concert with population growth in recent decades, there must be considerable doubt about whether those incomes have been properly corrected for external environmental costs, or what the distributional or the displacement effects have been. The Committee adds the cautionary note that low food prices have been a contributing factor to excessive pressure on land.

⁵² Foster W and Baker L, 1991, *Immigration and the Australian economy*, AGPS, Canberra

⁵³ Submissions 211, 154, 61, 255

⁵⁴ Coombs HC, 1972, 'Matching ecological and economic realities', *Economic Record* 48(1):1-17

6.77 There is even less evidence as to the effects on economic indicators of long term population growth. Little in the economics literature and nothing in submissions addresses 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 comprehensively identifying the full spectrum of benefits and costs associated with a marginal increase in population. We cannot say for example, whether per capita stocks of natural, or man-made capital will be higher in 2045 with a population of 19 million than with a population of 37 million.

6.78 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.

6.79 Over the shorter term, in the period leading to 2045, the available research leads to the fundamental operational conclusion that macro-economic and individual indicators of economic welfare will be unresponsive to variations in net immigration levels, at least in the low to moderate range.⁵⁵

Committee's overview of population-size arguments

6.80 This Chapter has presented arguments from submissions and other sources about the environmental, economic and socio-cultural benefits and disbenefits of major population growth by 2045. As a general comment, arguments have not been developed systematically and are supported by limited and patchy data only. Certainly it would not be possible from material available to the Committee to develop cases for and against populations of different sizes and rates of change at different dates under environmental, economic and socio-cultural headings.

⁵⁵ Foster W and Baker L, 1991, *Immigration and the Australian economy*, AGPS, Canberra; Wooden M, 1994, 'The economic impact of immigration', Ch 3 in Wooden M, Holton R, Hugo G and Sloan J (eds) *Australian immigration: A survey of the issues*, Bureau of Immigration and Population Research, AGPS, Canberra

Chapter 7

OPTIONS FOR A POPULATION POLICY

7.1 This Chapter addresses the Inquiry's fifth term of reference, 'the need for a national rather than a segmented approach to reach objective decisions on future policy, including regional variations and other matters'. It begins by discussing, at some length, what Australia might be like in 50 years depending on what political decisions are made now with respect to managing population size and choosing a target 'style' of economy.

7.2 While the four scenarios presented cannot possibly cover all possibilities, they illustrate the fact that policy choices can be made today which may not make much difference to the quality of life of Australians in 1995 but which will lead to dramatically different opportunities for our grandchildren. These 'plausible futures' provide a context for identifying broad options for Australian population policy later in the Chapter.

Plausible futures

7.3 There is little doubt that the obsessive focussing of the population debate on short term immigration policy has hobbled strategic thinking about what is demographically possible and culturally, socially and politically desirable for this country in fifty years time. Another factor obscuring debate is the belief that the wide range of socio-cultural and environmental problems and challenges facing Australia are best tackled by economic and regulatory instruments and by the intelligent use of appropriate technologies. Typically, rather than seeing population management as yet another tool in this repertoire, it is regarded as an exclusionary alternative to other instruments and thereafter ignored. For example the submission from the Department of Immigration and Ethnic Affairs quotes Fincher (1991) to the effect that population is not the main cause of environmental degradation and lowering immigration would be a less effective response to same than pricing or regulatory options.¹

7.4 The short definition of a scenario is 'a plausible future'. For example, the Committee's 'reference scenario' may be a plausible picture of what Australia could be like in fifty years. Scenarios of social change are driven

¹ Department of Immigration and Ethnic Affairs, Submission 247; Fincher R, *Immigration, urban infrastructure and the environment*, AGPS, Canberra, 1991

by two types of change agents. One is irresistible outside force, either natural - like climatic extremes - or social - like foreign invasion. The other agent of change is internal social choice whereby through market decisions or active political decisions, changes are made in the mix of goods, services and investments.² The working through of each choice brings the society to a threshold at which further choices emerge.

7.5 For the present Inquiry, the primary role of the various scenarios offered is to highlight values and issues which could otherwise be overlooked but which need to be considered in any proper balance sheet comparing the costs and benefits of Australia's alternative demographic options.

Four scenarios

7.6 The following sections present selected social, economic and environmental aspects of these scenarios. There is however no reason why an unfolding future should not contain elements from more than one scenario.

1. High population growth, strong economic development

7.7 The high growth scenario is based on the assumption that a collective decision has been taken to massively increase the Australian population over the next 50 years. Exploring this scenario centres on how and how well we might cope and what problems might emerge.

7.8 How might such a collective decision emerge in Australian society? It would require the emergence to dominance of values and perceptions such as:

- we must actively seek to create a technocratic growth culture;
- we must be technologically optimistic. New technologies will emerge to solve the problems of rapid growth;
- we must believe in the power of market economies to provide rising standards of living for rising populations (economic possibilism);

² Stretton H, 1976, *Capitalism, socialism and the environment*, Cambridge University Press, Cambridge

- . we must seek promotion to the first division in the league of world economies; and
- . big is better.

7.9 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. These include:

- . unrestricted growth of the State capitals;
- . conversion of Melbourne and Sydney into mega-cities functioning as world-class economic dynamos;
- . a string of well-planned compact coastal cities; and
- . regional growth centres.

2. *Stabilisation and sustainability*

7.10 National objectives and goals compatible with this scenario include such things as stabilising population, maintaining quality of life, conserving resources for long term benefits.

7.11 Values and perceptions standing to promote a choice to stabilise Australian society include:

- . the perception that Australia is already becoming a post-industrial society, eg as evidenced by the growth of the service sector of the economy;
- . an emphasis on developing material technologies which reduce throughput (reduce inputs, outputs, residues);
- . a willingness to devote significant resources to developing new social technologies for example, in fields such as conflict resolution, education and management of the diffusion of new material technologies;
- . a decline in existing high rates of material consumption;

- the increasing importance of information relative to travel and physical transport, services replacing goods and quality of life interests replacing material possessions;
- a wish to continue as one of the world's 'food bowl' nations. 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; and
- a belief that population stability would facilitate Australia's efforts to adapt to a rapidly changing external world and to environmental and social change at home.

3. *A smaller self-sufficient population*

7.12 The ideas behind this scenario are:

- that the present population of Australia is rapidly degrading the resource base and the environment and will probably continue to do so unless population numbers and per capita consumption levels are reduced; and
- that 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.

7.13 Under this scenario, population would be slowly reduced by adopting anti-natalist policies and a policy of near-zero gross migration.

4. *Uncontrolled mass migration*

7.14 This situation could be imposed on Australia either militarily or via an avalanche of illegal immigration. This scenario presupposes part or complete abrogation of Australian national sovereignty.

Choosing between scenarios

7.15 It is not possible within the bounds of a single inquiry to develop population-based scenarios of Australia's future at all elaborately. Nevertheless, the four scenarios, three 'voluntary' and one 'involuntary', sketched out above span much of the range of what is demographically

foreseeable and add a few associated aspects of future social organisation in keeping with the demographic core of each scenario.

7.16 The reason for sketching out scenarios which go beyond the demographic is that having a particular population is not an end in itself but is 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. Alternatively, population policy always needs to be developed in conjunction with social, economic and environmental policy, a perspective further developed in the next section.

7.17 Failing to choose a path actively is tantamount to choosing a scenario with a demographic core closer to the high growth scenario than the stable population scenario. This is because the *status quo* is that Australia's population is currently growing rapidly (doubling every 30 to 40 years) and the short term political pressures for this to continue seem to be stronger than any countervailing pressures.

The society - environment - economy triangle

7.18 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. This includes playing an appropriate international role as well as adopting appropriate domestic programs and policies. Indeed it is the special responsibility of the Long Term Strategies Committee to alert governments to the implications of emerging socio-economic trends and contingencies.

7.19 Throughout the Inquiry, three policy areas have emerged as central to achievement of high quality of life. These are:

- 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.

7.20 Population policy is a component of all of these policy areas, although perhaps not a major component of economic policy. Therefore it is an integral part of managing for the well-being of Australian society. This pervasiveness of the population dimension is both a strength and a weakness when the scope of an Australian population policy is being discussed. To quote McNicoll (1994)³:

Public policy making is a kind of moveable feast. Sets of issues become conjoined, seen by government as requiring coordinated attention, while other 'neighbouring' issues are conceptually detached, seen as allied elsewhere or left wholly aside...Components of what could potentially be an Australian population policy are instead decided on in other policy arenas. They are not plausibly to be shaken loose in some overall reconfiguration of the make-up of public policy.

7.21 While recognising that historical inertia militates against the adoption of a population policy going beyond the strictly demographic, the Committee believes that it has a responsibility to recognise and comment on the constellation of issues closest to the emerging policy focus of population size and stability.

7.22 To avoid any misunderstanding, it needs to be clearly stated that the Committee does not see population management as a sufficient instrument in itself for achieving high quality of life. Quality of life is a 'three legged stool' requiring ongoing development of wide-ranging environmental, economic and social policies. What is being inquired into is the role and content of an active or direct population policy within that broader policy mix.

The need for a population policy

7.23 Having a population policy, at least by default, is an existential choice. A country must have an implicit or explicit population policy.

7.24 The Borrie report in 1975 rejected two extreme Australian responses - 'populate or perish' and the 'zero growth' thesis which assumes little or no

³ McNicoll G, 1994, 'Institutional Impediments to Population Policy in Australia', paper presented to the Conference of the Australian Population Association, Canberra, September 1994

link between population size and national security - as 'shibboleths that greatly over-simplify the real situation'.

7.25 The 1992 National Population Council 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.

7.26 The key recommendations of this report included the need for Government to develop a 'constructive' population policy which *inter alia* sought to improve co-ordination in government, had policies directed at the whole population and involved a precautionary approach to environmental issues, but which did not involve setting an optimum population number.

7.27 The Government did not adopt a formal population policy following the 1992 National Population Council report on the grounds that a population policy could be largely achieved by better co-ordination within government programs and better recognition of population issues within other strategies such as Ecologically Sustainable Development, Better Cities, National Housing Strategy.⁴

7.28 This policy position was reinforced in Australia's official submission to the 1994 Cairo conference on population and development.⁵

...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.

7.29 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 which can be accepted by most people.

⁴ Department of Immigration and Ethnic Affairs, Submission 247

⁵ National Committee, 1994, *Australia: National report on population for the United Nations international conference on population and development*, AGPS, Canberra

7.30 At its broadest, population policy is concerned with all demographic characteristics of the Australian population over time. But the core issue of population policy is population numbers and the central concern of this Inquiry is what, if anything, can be said about quantitative objectives for Australia's population in 2045.

7.31 This Chapter presents and summarises the basic population policy options emerging from the Inquiry with respect to population size and population stability. It also elaborates several less central but nonetheless important components of a comprehensive population policy.

Two approaches to population policy

7.32 The 1975 Borrie report distinguishes between positive and passive approaches to population policy. 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; or a particular growth rate. The passive approach involves letting nature take its course as it were, and determining the policy - particularly social and economic policy - which is best suited to these natural demographic patterns. Policy is thus geared to serve demographic trends and demographic structures, not to change them.

7.33 The National Population Council's 1992 report sees population policy as having pro-active and responsive components.⁶ Pro-active policy corresponds to Borrie's positive approach and 'deliberately seeks to influence population size, location or characteristics'. Responsive policies, like Borrie's passive policies, are only reactive to the impact or foreseen impact of population. The attitude that population growth is something to be reacted to and accommodated is seen in the Department of Transport submission to the present Inquiry.⁷

7.34 The primary policy division which this Report recognises is not dissimilar to the Borrie and National Population Council views but goes somewhat further. What might be called *direct population policy* is equivalent to the National Population Council's pro-active policy component

⁶ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

⁷ Hon L Brereton, Minister for Transport, Submission 257

and is concerned with influencing population numbers, composition and distribution.

7.35 Also however, many submissions make suggestions about policy and program options in the areas of economic, environmental and social policy which might complement the use of population management in the achievement of high quality of life. Such *complementary policies* certainly have to be sensitive to population change but, more than this, they address issues which must be considered in parallel with population issues if high quality of life is to be achieved.

Principles relevant to formulating population policy

7.36 It is the Committee's view that there are a number of guidelines or principles worth bearing in mind during the development of population policy:

Within the demographically and politically feasible range, population policy must distinguish between populations we can support in terms of basic needs and populations we want to support in terms of quality of life;⁸ and

The basis for population management must be a Commonwealth policy to stabilise population numbers at a level which is precautionary and ecologically sustainable and to be administered without discrimination on the grounds of ethnicity, colour, sexuality, beliefs, wealth, skills or age.⁹

7.37 While immigration management must continue to be the main instrument of Australian population policy, immigration should not be treated like a tap to be turned on when economic conditions are good and off when they are bad.

Stability or ongoing growth?

7.38 The notion of a population target contains some implication of population stability, such that population numbers will remain in the vicinity

⁸ Dr Christabel Young, Submission 177

⁹ Australian Conservation Foundation, Submission 256

of the target figure or range. Indeed, once a decision is taken that population will be managed in some way, the initial decision to be made in developing a population policy is not about numbers but whether the ultimate aim is for a near-stationary population or for something else such as population growth into the foreseeable future.¹⁰

7.39 This and following sections explain the two basic issues in developing a contemporary population policy for Australia; whether or not to stabilise population ultimately and whether population should decrease, increase a little or increase greatly before becoming stable.

7.40 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.

7.41 It can also be noted that a more-or-less stable population is the *de facto* collective choice of resident Australians. Net immigration aside, the population will cease growing in 30-35 years.

7.42 Assuming acceptance of the idea of ultimate population stability, what are the broad options for the size of a stable population? This is a question which has to be considered in conjunction with the question of time frames.

7.43 If population stability is to be achieved by 2045, and assuming fertility to remain at its current level, a little below replacement, net immigration would need to be fixed at less than 50 000 people per annum.

7.44 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 were to be reduced immediately to and held at zero, the population in 2045 would be about 20 million.¹¹

7.45 If net immigration levels are set and remain fixed at levels above 50 000 per annum, the Australian population will continue to grow for a very long time. Still, many combinations of stable populations of size greater than 23 million at a range of post-2045 target dates are possible.

¹⁰ Dr Christabel Young, Submission 177

¹¹ Professor Jonathan Stone, Submission 246

7.46 What this discussion seeks to make clear is that the option exists 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 size and target date sets the average rate of population growth over the period up to the target date.

7.47 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 and education. The unquestioned ethic of endless growth has restricted our thinking and sapped our ability to plan long term.

Minimal or large increase?

7.48 What are the most significant difficulties with nominating a numerical population target for Australia? Most importantly, we lack the data or conceptual framework to model precisely what any population target would mean in terms of quality of life measures.

7.49 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.

7.50 The bundle of quality of life achievements associated with any particular population policy stands to be significantly modified by choices made in complementary policy areas (see below). What then are the practicable and more-or-less defensible options for a core national population policy?

7.51 These cannot be set objectively or precisely but, for the purpose of narrowing discussion, options can be suggested as lying along the spectrum between a conservative or minimal-growth option and a radical or high-growth option.

7.52 The minimal-growth option is to plan to stabilise national population as soon as possible, implying a (more-or-less stationary) population goal of around 19 million by about the year 2030.

7.53 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.

Population decrease?

7.54 Under a policy of zero net migration, the Australian population would slowly decline from about 2030.

7.55 Population goals set at levels much below present numbers scarcely appear in contemporary discussions, which are basically about growth versus no-growth. Such goals require zero or even negative net immigration and this is possible at least in theory. If however, population is to be stabilised at much lower than present levels, then the question of managing fertility rates to achieve replacement level fertility will have to be addressed. Population reduction might of course move up the political agenda following an active community resolution of the high- versus minimal-growth debate.

7.56 There may in fact be many more reasons to justify a smaller population than a larger one.¹² However, it is the Committee's view that such assertions, both in submissions and elsewhere, have not been well-developed and finally can only be balanced against the assertion that there is no justification for a decline in Australia's population.¹³

Conclusions

7.57 Australia has the political capacity, basically through adjustments to its immigration program, to ensure that in 2045 it has anything between a near-stable population (some 15 per cent larger than at present) and rapid growth (to over twice the size of the present population.) It is extremely important that population and migration issues are treated in a compassionate and flexible way, preferably on a bipartisan basis. The data base of relevant information must be comprehensive and readily accessible to improve the quality of public debate on what is an extremely sensitive and potentially divisive issue.

7.58 The Committee concluded that it is not possible to determine a specific upper limit beyond which Australian society would be at threat. 'Carrying capacity' is a combination of political, social, environmental and

¹² ACF, Central Coast Branch, Submission 132

¹³ Office of the Premier, WA, Submission 252

cultural factors.¹⁴ What is, or is not supportable, for the longer term will depend on whether people are prepared to modify their behaviour in resource use.

Recommendation 10: The Australian Government should develop a population policy which explicitly sets out a range of options for long term population change, emphasising that year by year decisions on immigration intake cannot be taken in an *ad hoc* fashion without recognising incremental effects downstream. Proponents of radical change to existing policies should bear the burden of proof, bearing in mind that every increase in population imposes social and environmental costs unless accompanied by the adoption of policies of resource restraint and increased sensitivity about waste disposal, urban structures, and transport modes.

Consumption Patterns

Conclusion:

Given acceptance of the goal of a stable Australian population, Australian society will have to learn how to manage an economy which can not rely on demand generated by population growth. It will also have to learn how to exploit the opportunities created by the release of resources no longer needed to service an ever-growing population.

Conclusion:

High levels of consumption of material goods and services are part of Australians' current quality of life. They also contribute to the high levels of residues which have to be processed by the country's airsheds, waterbodies and ecosystems. Internationally, they contribute to Australia's image as part of the 20 per cent of the world's population responsible for 80 per cent of its resource consumption.

¹⁴ The well-watered Federal Division of Gippsland with a population of 120 000 has a larger area than Belgium, which has a population of 10 million. Obviously Gippsland could have a far higher population - but it is equally obvious that a substantial increase is unlikely.

Recommendation 11: Australia should adopt a consumption strategy, to be developed around the challenge of learning to move from high levels of consumption based on high levels of material throughput per unit of consumption to lower levels of consumption based on lower levels of material throughput per unit of consumption. Such a strategy need not reduce quality of life although it may change the way in which people enjoy quality lives.

Recommendation 12: While emphasising that immigration policy is only one aspect of a national population policy, proponents of radical change to existing policy and practice in immigration intake should bear the burden of proof, bearing in mind that every increase in population imposes social and environmental costs unless accompanied by the adoption of policies about resource restraint and increased sensitivity about waste disposal, urban structures and transport modes, and that the rapid growth of tourism imposes additional (but so far unquantified) burdens. Australia should adopt a precautionary policy in accordance with the principles of ecologically sustainable development (ESD).

The Committee's position

7.59 A national population policy should also address a range of population related issues through the following policy components:

- . intake composition;
- . natural increase;
- . Aboriginal and Torres Strait Islanders;
- . tourists and visitors;
- . foreign aid;
- . internal migration; and
- . education.

7.60 While each of these components already falls within an existing wider policy area, the Committee concludes that the importance and pervasiveness of the population question is now such that the time has come to re-focus and draw population-relevant components of a range of policy areas together. Some points relevant to developing policy in these seven areas are listed in following sections.

Immigration policy

7.61 The scope of immigration policy is well-canvassed in the 1992 National Population Council report.¹⁵ It is a report which accepts immigration as the core of active population policy; it accepts the legitimacy of migrants in skill, family and refugee categories and 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.

7.62 Interest in the present Inquiry is primarily in the size and composition of any migrant intake, reflecting the prevailing confusion between population and immigration.

Intake size

7.63 Clearly, immigration policy is and will remain central to Australian population policy. While the Australian public has little concern for long term population level *per se*, it has stronger opinions on the main determinant of that level, namely short term immigration rates. A recent Saulwick Poll found that some 71 per cent of Australians want lower immigration and Betts (1993) shows the percentage of people favouring a reduced immigration intake as increasing from 16 per cent in 1961 to 73 per cent in 1991.¹⁶

7.64 But what should the figure be? The 1994 National report (p.33) says that the target figure of 80 000 visas for 1992-93 was arrived at because of

¹⁵ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

¹⁶ Dr Christabel Young, Submission 177, Betts 1993, Saulwick Poll, *Sydney Morning Herald*, 4 November 1991, p.2

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? ¹⁷

7.65 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. The *rate* of population growth falls when the immigration intake remains constant in absolute terms.

7.66 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.

7.67 Surprisingly, the Australian Bureau of Statistics has not done the work which would allow the temporal population profile implied by each migration level (and composition) to be displayed. This is the type of basic projection which should be available at call to everyone interested in the population question.

Some suggested immigration levels

7.68 The National Population Council (1992) identified a core intake of about 55 000 immigrants a year based around the categories of family reunion, refugees, employer nominations and migrants with business skills.¹⁸ The 1988 Committee to Advise on Australia's Immigration Policies (the FitzGerald Committee) recommended a ten year planning frame for immigration in order to achieve some stability in annual numbers, something always made difficult because of the lack of any control over trans-Tasman population movements.¹⁹

¹⁷ Dr Christabel Young, Submission 177

¹⁸ Department of Immigration and Ethnic Affairs, Submission 247

¹⁹ Department of Immigration and Ethnic Affairs, Submission 247; Committee to Advise on Australia's Immigration Policies 1988, *Immigration: A commitment to Australia*, Report of the Committee to Advise on Australia's Immigration Policies, Australian Government Publishing Service, Canberra

Conclusions

7.69 All population change, whether by natural processes or by immigration, will have significant impact on the environment, resource use and quality of life. The Committee does not propose a target or optimum figure for Australia's population by a particular date and urges flexibility and caution, while pointing out that there may be a variety of optima within a broad range of population policies. The search for a magic figure or Rubicon between safety and danger is chimerical.

7.70 Immigration is, no doubt, the easiest variable to control in that Governments have the power to determine the number of entrants from year to year. If Government determines on a goal of a stable population of about 23 million around the year 2040 this would involve annual net migration being confined to about 50 000.

7.71 However, control of immigration is not the only variable in determining the size of Australia's population, and is only indirectly connected to its rate of resource use.

7.72 Willingness to accept a higher population than, say, 23 million in 2040 would depend on a national willingness to accept some degree of resource restraint, with more environmental sensitivity, control of urban sprawl, less car dependence, giving higher priorities to waste management strategies, and adopting technology to use resources (such as energy in transport and housing) far more efficiently.

7.73 Opting for a lower population would avoid the need for resource conservation.

7.74 Conclusion:

Community attitudes to population growth and immigration have tended to reflect prevailing modes of optimism or pessimism, especially related to existing levels of unemployment. If confidence is high with low recorded levels of unemployment, then high population/immigration growth rates are politically acceptable; when low, they are not. Varying rates of natural increase also reflect the same community feeling as individual choices are made in families. Australia may be going through a mood change in 1994 and the Committee expresses caution

about recommending a rigid approach which may largely reflect community anxieties in the 1980s. As the report *An Overview of Research on the Links between Human Population and the Environment* (1994) concluded:

The present population-environment debate is largely unproductive, being mostly about conflicting opinions reached on intuitive understandings or moral interpretations.

Intake composition

7.75 In his submission as well as in his evidence before the Committee, Mr Des Moore of the Institute of Public Affairs pointed out that in his opinion:

probably the most important population policy issues in which the government does need to be involved are the level and composition of immigration. Australia is in a position to be selective in choosing its migrants and the government should endeavour to ensure that, to the maximum extent practicable, entrants with high qualifications are selected...To date, Australia has been comparatively successful in avoiding conflict between different ethnic groups and we should aim to maintain that record by pursuing an immigration policy that, while recognising the contribution which people from different cultures can and have made, is most likely to lead, in due course, to mutual assimilation rather than ethnic or cultural separation...²⁰

7.76 Submissions suggest that there would be considerable community support for an immigration policy which had as its basis a commitment to take in a number of refugees and humanitarian immigrants in any year. Of course, as pointed out in the Borrie report (p.734) any immigration policy other than an open door implies regulation and therefore discrimination in some sense eg in terms of skills.²¹

7.77 **Conclusion:**

As regards the composition of the immigration intake, the Committee confirms its support for the established principle that

²⁰ Des Moore, transcript of evidence, 20 September 1994, p. 340

²¹ National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra. p.73

potential migrants should not be discriminated against on grounds of ethnicity, colour, sexuality and beliefs.

7.78 Notwithstanding, all immigration programs are positively discriminatory to the extent that they favour certain categories of people. The Committee confirms its support for the position that positive discrimination in immigrant selection should only be on the grounds of people being 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.

Aboriginals and population policy

...the bottom line for Aboriginal people is to what extent immigration jeopardises their quest for social and economic equity.²²

7.79 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; and
- . to satisfy Aboriginal aspirations for consumption levels similar to the rest of the community.

7.80 The latter goal would remain valid even if the community formally adopted the goal of reducing average levels of consumption of goods and services as a means of reducing the quantity of residues to be processed by environmental sinks.

²² Speech by ATSIIC Deputy Chairperson, Sol Bellea, at Bureau of Immigration Research's Second national immigration outlook conference, November 1992

Recommendation 13: The Australian Government should develop and implement an integrated population policy centred on the recognition of long term demographic trends and which draws together population aspects of issues in the areas of immigrant intake composition, natural population increase, Aboriginal and Torres Strait Islander aspirations, tourist and visitor management, foreign aid, internal migration and education.

Tourist and visitor policy

7.81 There is a growing perception that while the days of large-scale immigration are drawing to an end a new era of short-stay population movements is beginning.²³

7.82 Tourists generally have very high consumption rates. The average overseas tourist in Australia spends 65 per cent more per day than the average resident.²⁴ Tourism is an industry which involves high per capita levels of energy expenditure (eg transport) and other forms of consumption. Given very large projected increases in domestic and international tourism, a way of converting tourists and visitors to 'resident equivalents' needs to be devised and factored into overall population policy.

7.83 Overseas students, New Zealanders and temporary workers are other groups whose impacts and contributions need to be estimated, monitored and incorporated into Australia's population policy.

7.84 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.²⁵

²³ Report of an interview with the Hon Nick Bolkus, Minister for Immigration, *Weekend Australian* 18 June 1994; ABC Radio talk by Dr J Nieuwenheysen, Director, Bureau of Immigration and Population Research, 20 June 1994

²⁴ McGlynn G, 1992, Population and Australia's resource endowment in *National Population Council, Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

²⁵ Department of Immigration and Ethnic Affairs, Submission 247; McGlynn G, 1992, Population and Australia's resource endowment in *National Population Council, Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

7.85 Conclusion:

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 need to be managed in the context of an overall population policy.

Internal migration policy

Movement between regions

7.86 There will always be a degree of internal migration as people follow jobs and lifestyle opportunities. Recently, this has meant different regions experiencing markedly different rates of population growth.²⁶ Thus parts of northern coastal New South Wales have and southern Queensland have much higher growth rates than the average for their States. Conversely, many rural areas continue to lose population to the cities.

7.87 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. Although past attempts at decentralisation and closer settlement have largely failed, there may be a range of modest free-standing measures which could help, for example, improved taxation concessions for those who live outside the major population centres. The Borrie report supports the idea that facilities available to new settlers should also be available to internal migrants.²⁷ Making migrants stay in an area for a period is one idea which has long been abandoned.

7.88 It is the Committee's view however that the decentralisation issue is more appropriately centred within Settlement and Regional Planning policy (see below) than within population policy as such.

²⁶ Department of Immigration and Ethnic Affairs, Submission 247 internal migration studies by Stimson and Walmsley

²⁷ *Population and Australia: A demographic analysis and projection*, First Report of the National Population Inquiry, AGPS, Canberra, 1975 p.738

Population management within regions

7.89 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 sensitising governments to these issues need to be developed.

7.90 One local authority, Douglas Shire in north Queensland, has attempted to set a long term population goal for itself, implying a conclusion that the long term net social costs of population growth outweigh the corresponding benefits. Douglas Shire is in the vanguard; developing such local or regional population management strategies is a new and difficult task worthy of Commonwealth support.

7.91 Conclusion

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 will differ in the degree to which population change is economically, environmentally and socially beneficial or problematic.

Education Policy

7.92 There is a great need for public education in population-relevant matters. These include an understanding of the climate and soils of Australia, the demographic processes by which populations grow, stabilise and decline, and the arguments for and against population change.

Overview of population policy

7.93 If Australia attempts to stabilise its population with all reasonable speed, then it will have a stable population of about 20 million by the 2030s. This would not mean that Australia had a population policy incorporating a population goal 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.

7.94 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, whose *Report* was issued in 1972.

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 stabilised population.²⁸

7.95 At about the same time the United Kingdom Population Panel concluded that, for a number of definable social and economic reasons, 'a stationary rather than an expanding population would be more advantageous...in Great Britain'.²⁹

Interactions between policy components

Australia needs an integrated population strategy.³⁰

7.96 The above discussion of population policy is 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 available instruments which 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.

²⁸ United States President's Commission on Population Growth and the American Future 1972, p 192 quoted in National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

²⁹ United Kingdom Population Panel 1973, quoted in National Population Inquiry, 1975, *Population and Australia: A demographic analysis and projection*, First report of the National Population Inquiry, The Government Printer of Australia, Canberra

³⁰ Professor David Pope, ANU, Submission 53

7.97 Policies in relation to 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 below) which stand to strongly reinforce or negate the impact of direct population policies on quality of life.

7.98 Part of the complexity of developing population policy is that there will be interactions between various policy components. For example, this Inquiry's background paper raised the question of whether there should be a balance between the contributions to population growth of natural increase and immigration. The only submission to respond to this question pointed out that any such comparison would be better if between births and immigration not between natural increase and immigration; in any case, (it said) there is no *a priori* reason why these two should be of similar size.³¹

Complementary policies

7.99 Reflecting the view that a very wide range of factors impact on quality of life together with population, policies complementary to population policy are grouped and discussed in this section under four major headings:

- . Ecologically sustainable development;
- . Settlement policy and regional planning;
- . Education and social learning; and
- . Technology assessment and adoption.

7.100 The following arguments reinforce the proposition that population and other policies are interdependent:³²

³¹ Dr Christabel Young, Submission 177

³² Department of Immigration and Ethnic Affairs, Submission 247, CSIRO, Submission 259

The international community, at the Cairo conference, has reached agreement that population issues cannot be considered in isolation from issues of sustainable development, gender equity etc;³³

the 1992 National Population Council report noted the need to co-ordinate population policy with policies such as urban affairs, education, aid;³⁴

Norton et al (1994) conclude that there is little point in developing a population policy for environmental protection reasons without long term ecological and social goals;³⁵ and

Australia needs to establish general demographic goals in order to provide a framework within which policies in non-demographic areas might be better developed.

Ecologically sustainable development

7.101 More generally, it is widely recognised that environmental impacts are a function of population, lifestyle, organisation and technology.³⁶ CSIRO believes 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. Australia lacks the necessary knowledge and understanding to manage effectively its current population at current living standards. Every extra person and every unit increase in consumption increase the need to rectify this situation.³⁷

7.102 The Academy of Technological Sciences and Engineering takes more of a 'technological optimist' position on this matter:

³³ Communique from *United Nations international conference on population and development*

³⁴ National Population Council, 1992, *Population issues and Australia's future: Environment, economy and society*, Final report of the Population Issues Committee, AGPS, Canberra

³⁵ Norton T, Dovers S, Nix H and Elias D, 1994, *An overview of research on the links between human population and the environment*, Centre for Resource and Environmental Studies, Australian National University, Canberra

³⁶ CSIRO, Submission 259

³⁷ CSIRO, Submission 259

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.³⁸

7.103 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.³⁹

7.104 In practice, ecologically sustainable development requires a greater focussing on such things as urban planning and design, infrastructure, resource management, environmental protection, pollution abatement and the research, education and innovation to underpin these.⁴⁰

- . New and more convincing methods of project impact assessment are badly needed (particularly to assess tourist development projects).
- . We should be trying to adopt a more pre-emptive approach in place of our present damage control approach to environmental management. Preventive actions which are affordable now are likely to be unaffordable as remedial actions later.
- . While it is almost certainly impossible to achieve further development without any environmental degradation, 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.⁴¹

³⁸ Academy of Technological Sciences, Submission 241, p.9

³⁹ Australian Conservation Foundation, Submission 256

⁴⁰ CSIRO, Submission 259

⁴¹ Australian Conservation Foundation, Submission 256

Recommendation 14: The Australian Government should encourage State and Local Governments as a matter of high national priority to encourage development of sewerage and waste disposal systems that reduce the use of pristine water and/or environmentally sensitive land areas, and which promote feral animal and noxious weed control, and recycling.

Use of economic instruments to ameliorate externalities

7.105 Evidence to the Committee advocates the use of appropriate economic instruments to improve environmental and socio-cultural aspects of people's quality of life. Largely, this is because such instruments force producers to recognise and meet the full environmental and social costs of their production. Evidence also forecasts that the widespread adoption of social marginal cost pricing will have occurred by 2045; governments will have been forced to internalise the vastly expanding set of externality costs that have caused so much social concern at the end of the 20th century.⁴²

7.106 Conclusion:

Ecologically sustainable development implies a system of production and consumption which very strongly protects the future amenity, environmental and productive values of natural resources (biodiversity, air, water and earth materials), notwithstanding that this will commonly be at the expense of more contemporary values. The Committee confirms its support for the efforts of the Commonwealth and State governments to develop and implement a strategy for achieving ecologically sustainable development.

Consolidation policy

7.107 Urban consolidation is a planning strategy with both supporters and critics.⁴³ Points made about urban consolidation and the reduction of urban sprawl at the edges of large cities include the following:

⁴² Dr RDM Cotgrove, Lecturer in Environmental Economics, University of Tasmania, Submission 23

⁴³ Submission 252, Dr Christabel Young, Submission 177, Troy P, 1992, The new feudalism, *Urban futures Journal*, 2:36-4

- moves towards greater urban consolidation, supported by moves towards more rational infrastructure financing, will lead to direct savings in energy and water use;⁴⁴
- growing cities tend to become multi-centred with the result that transport costs do not rise as rapidly as might otherwise be the case;⁴⁵
- city fringe residents over-run by urban spread can sometimes benefit through improvements in employment prospects and services;⁴⁶ and
- national population strategy should include a national settlement strategy based on an audit of sustainable environmental capacity for all regions.⁴⁷

7.108 Conclusion:

There is great scope for improving day-to-day efficiency, equity and environmental quality in the handful of big cities where most Australians will continue to live.

Technology assessment and adoption

Technological optimism

7.109 Technological optimists say humanity will always cope with its problems with the help of market forces and ingenuity;⁴⁸ because of their inventiveness, people can ignore biological limits affecting other species.

7.110 Technological optimism is widespread in the community and a common response to an alerting to such problems as diminishing water supplies, declining productivity of agricultural land and increasing air and water pollution is to suggest that technology will cope with these.

⁴⁴ McGlynn G, 1992, Population and Australia's resource endowment in National Population Council, *Population issues and Australia's future, Consultants' reports*, AGPS, Canberra

⁴⁵ CSIRO, Submission 259

⁴⁶ Queensland Conservation Council, Submission 205

⁴⁷ Submissions 9, 202

⁴⁸ Australian Academy of Technological Sciences and Engineering, Submission 241

Technologies have been developed which would increase water and land conservation. New technologies for more concentrated food production such as hydroponics have also been developed. Of course, having the technology to reduce environmental impacts does not necessarily mean that it will be used.

Technology and environmental quality

7.111 In evidence to the Committee, technological change is seen as both a major cause of declining quality of life and as having great potential to both 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 a given level of consumption by increasing efficiency and reducing waste.⁴⁹

Recommendation 15: The Australian government should commission a comprehensive cost benefit analysis of developing technologies which reduce environmental impacts, for example, soil and water conservation technologies, and capital intensive agricultural technologies such as greenhouse and hydroponic production.

Technology assessment and guidance

7.112 A first policy implication of this diversity of observations is that Australia needs to actively enter the developing field of technology assessment. Proper technology assessment involves comprehensive evaluation of the full range of social, environmental and economic benefits and disbenefits of potential, new and problematic technologies.

7.113 Conclusion:

Probably the most important determinant of sustained growth in income per head is productivity growth achieved through technical change as given effect through investment. Nevertheless, technology change is currently expressed much

⁴⁹ CSIRO, Submission 259

more in terms of increased physical production rather than through product quality enhancement, reduced input costs, reduced impact on the resource base etc and this is a matter for concern.

Some general comments on complementary policies

7.114 Two sorts of policies can be seen as directly related to population policies; reactive policies which have to take account of population changes as contingencies to be planned for (eg health care provision)⁵⁰ and complementary policies which operate in concert with population policies to achieve quality of life objectives.

⁵⁰ Professor J Walmsley, and Mr A Sorensen, Department of Geography and Planning, University of New England, Submission 66

Chapter 8

PRINCIPLES, CONCLUSIONS AND RECOMMENDATIONS

Principles

8.1 So far, much of the debate about population and the 'carrying capacity' of the Continent has been of poor quality, highly emotive, with extremes of optimism and pessimism, not based on a rigorous consideration of evidence - for example, about rates of per capita resource use, availability of water, etc.

8.2 There is a difference between what is possible (feasible) and what is desirable.

8.3 There are striking sectoral differences in 'carrying capacity' within the Australian Continent - that some 10% (an area equivalent to Britain and France combined) of the landmass, mostly on the eastern southern and south-western coasts, east, south and south-west coasts, is fertile and relatively well watered, and sustains 98 per cent of our population, which 90 per cent is arid and capable of supporting only a small population.

8.4 The range of proposed options for future population levels put before the Committee was wide. The Borrie Report of 1975 said that a population of 50-60 million was possible for Australia and in his evidence to the Committee Professor John Caldwell said that he agreed with that estimate. Professor Jonathan Stone preferred a population stabilising at 23 million in 2040.

8.5 The Committee rejects the view that Australia is close to its maximum population already and that an increase would lead to intolerable pressure on resources and lead to a sharp decline in health, increase in crime, pollution, etc. There is no numerical population level beyond which the social fabric and environmental quality might be expected to go into precipitate decline.

8.6 The Committee thinks that a population policy ought to be adopted because it is better to have some idea of where we are going and/or where we want to go, rather than improvising, year by year, without a context, about something which has such long term implications.

8.7 There must be an adequate and readily accessible data base (which there is not) pointing out the availability of resources and targeting problem areas eg land management, wasteful use of water, etc.

8.8 Ultimately decisions about population are/will be political, including cultural, ethnic, social and environmental implications.

8.9 All human behaviour is open to change. Operating methods can be improved: the Committee rejects the sense of fatalism in most submissions - that we have no choices, that we cannot manage better, and that immigration is the only factor that can change the impact of population on environment.

8.10 The Committee does not propose a target figure - or an optimum - for Australia's population by a particular date, but there may be a variety of optima, within the broad range of population policies that Governments decide to choose. But the search for a magic figure of a Rubicon between safety and danger is chimerical.

Conclusions

8.11 The Australian community must, with its Government, have an informed, ongoing debate on the implications of alternative scenarios:

i. ***The high population option***

[Possible range 50-100+m]

While some enthusiasts went further than Borrie and have suggested figures in excess of 100 million, in the Committee's opinion it would now be politically and socially impossible to propose the high population option, especially as it would inevitably involve such major changes in lifestyle and resource use.

ii. ***The high population/low resource use option***

[Possible range 30-50m]

Again, this model could only be adopted with political consensus. It would be essentially a European (eg Netherlands) model: higher density

cities, less car dependence, more care about waste disposal. It would involve a degree of self discipline and quality of life would depend less on consumption and high resource use.

- iii ***The modest increase/modest restraint option***
[Possible range 23-30m]
This view has some support in the submissions, but is clearly a minority view. However, it is worth noting that historically immigration was often unpopular.
- iv ***The stable population option***
[Possible range 17-23m]
This has strong community support. Its opponents argue that with growing longevity it may be necessary to increase the population of labour force age, but there is no longer consensus on this.
- v ***The reduced population option***
[Possible range 5-17m]
This is proposed by many submissions but it is based on a fallacy - that if Australia's population increased from 7 million in 1947 to (say) 14 million in 1976 then it would be possible to turn back the clock and halve population in an equivalent period. But time (and society) does not run backwards.
- vi ***Return to 1788 'carrying capacity'***
[Possible range 1-9m]
This extreme position is argued in several submissions: its central theme is that this would best safeguard Australia's unique flora and fauna.

Politically and socially realistic options

8.12 The Committee rejects options i and vi as illusory, unattainable and undesirable.

8.13 Realistic options for ongoing community involvement and debate and political decision on population can be confined to four:

1. Relatively high population growth (30-50 million)
2. Moderate population growth (23-30 million)
3. Population stabilisation (17-23 million)
4. Moderate to major population reduction (5-17 million)

8.14 Options 2 and 3 put the break point between moderate population growth and population stabilisation at 23 million. A stable population of 23 million is readily achievable with a net migration of 50,000 a year. With a net migration of much more than 50,000 a year population stabilisation would not be achievable at the earliest until late next century.

8.15 The Committee does not propose a specific target or optimum figure for population for the year 2045, but encourages the ideas of community debate and open processes in decision making, and suggests an approach of openness and flexibility while emphasising that the best outcome will depend on how we organise economic, social and cultural arrangements. Community attitudes do change: citizens in 1994 are more sensitive about environmental health, diet and urban issues than at any other time. Optima will vary over time: we need to be aware of possible ranges within each set of alternatives.

Recommendations

Recommendation 1: The Government should determine that population policy and immigration policy are quite distinct, with differing goals, although the long term consequences are inextricably linked. The political and administrative responsibility for population and immigration must be separated (Paragraph 1.73).

Recommendation 2: The Australian Government should adopt a population policy which explicitly sets out options for long term population change, in preference to the existing situation where a *de facto* population policy emerges as a consequence of year by year decisions on immigration intake taken in an *ad hoc* fashion, such decisions being largely determined by the state of the economy in the particular year and with little consideration of the long term effects. Population policy is central to establishing national goals and must involve the Prime Minister directly (Paragraph 1.73).

Recommendation 3: The Government should establish a Cabinet Committee on Population, chaired by the Prime Minister, to take specific responsibility for *population* policy in distinction to *immigration* policy, to create a publicly assessable data base on population issues and publish material intended to improve the quality of public understanding and political debate on the subject (Paragraph 1.73).

Recommendation 4: Immigration would continue to be the responsibility of the Minister for Immigration and Ethnic Affairs (Paragraph 1.73).

Recommendation 5: A Commonwealth - State Ministerial Council for Population and Urban Affairs should be established and population placed on the agenda of the Premiers' Conferences (Paragraph 1.73).

Recommendation 6: An annual or biennial Population Report covering demographic trends and trends in population-sensitive standard of living and quality of life indicators should be presented to Parliament. It may be possible and appropriate to incorporate such reports into the regular State of Environment reports being planned by the Department of Environment (Paragraph 4.19).

Recommendation 7(a): An appropriate agency, perhaps the Department of Environment's State of Environment Reporting Unit or the Australian Bureau of Statistics should be directed to establish a public domain demographic modelling facility primed with regularly updated information on population changes (Paragraph 4.19).

Recommendation 7(b): That the Bureau of Immigration and Population Research be renamed as the Bureau of Population Research and transferred to the Department of Prime Minister and Cabinet to service the proposed Cabinet Committee on Population (Paragraph 4.19).

Recommendation 8: The Cabinet Committee on Population should have its own research budget of at least \$1 million annually, to fund independent scientific research programs designed to facilitate more informed evidence-based analysis of population policy options. This should include support for institutions pursuing the emerging discipline of future studies (Paragraph 4.26).

Recommendation 9: That the Australian Government continue to make it clear that Australia's contribution to assisting the problems of global overpopulation will be a combination of aid, expertise and example, pointing out that reduced fertility rates have a close relationship with encouraging education for girls and women and with rising levels of prosperity. In addition, Australia must improve its efforts to reduce the impact of global pollution, particularly the emission of greenhouse gases (Paragraph 5.27).

Recommendation 10: The Australian Government should develop a population policy which explicitly sets out a range of options for long term population change, emphasising that year by year decisions on immigration intake cannot be taken in an *ad hoc* fashion without recognising incremental effects downstream. Proponents of radical change to existing policies should bear the burden of proof, bearing in mind that every increase in population imposes social and environmental costs unless accompanied by the adoption of policies of resource restraint and increased sensitivity about waste disposal, urban structures and transport modes (Paragraph 7.58).

Recommendation 11: Australia should adopt a consumption strategy, to be developed around the challenge of learning to move from high levels of consumption based on high levels of material throughput per unit of consumption to lower levels of consumption based on lower levels of material throughput per unit of consumption. Such a strategy need not reduce quality of life although it may change the way in which people enjoy quality lives (Paragraph 7.58).

Recommendation 12: While emphasising that immigration policy is only one aspect of a national population policy, proponents of radical change to existing policy and practice in immigration intake should bear the burden of proof, bearing in mind that every increase in population imposes social and environmental costs unless accompanied by the adoption of policies about resource restraint and increased sensitivity about waste disposal, urban structures and transport modes, and that the rapid growth of tourism imposes additional (but so far unquantified) burdens. Australia should adopt a precautionary policy in accordance with the principles of ecologically sustainable development (ESD) (Paragraph 7.58).

Recommendation 13: The Australian Government should develop and implement an integrated population policy centred on the recognition of long term demographic trends and which draws together population aspects of issues in the areas of immigrant intake composition, natural population increase, Aboriginal and Torres Strait Islander aspirations, tourist and visitor management, foreign aid, internal migration and education (Paragraph 7.80).

Recommendation 14: The Australian Government should encourage state and local governments as a matter of high national priority to encourage development of sewerage and waste disposal systems that reduce the use of pristine water and/or environmentally sensitive land areas and promote recycling (Paragraph 7.104).

Recommendation 15: The Australian Government should commission a comprehensive cost benefit analysis of developing technologies which reduce environmental impacts, for example, soil and water conservation technologies, and capital intensive agricultural technologies such as greenhouse and hydroponic production (Paragraph 7.111).

APPENDIX I

LIST OF WITNESSES

CANBERRA, 31 May 1994

STONE, Professor Jonathan, Convenor, Population 2040 Working Party, Australian Academy of Science

CANBERRA, 28 June 1994

BETTS, Dr Katharine Jane

BIRRELL, Dr Robert James, Reader, Sociology Department, Monash University

POPE, Professor David Hewitt

MELBOURNE, 29 July 1994

KHOO, Dr Siew-Ean, Demographer and Principal Research Officer, Canberra Research Section, Bureau of Immigration and Population Research, Department of Immigration and Ethnic Affairs

McCORMACK, Mr Denis Myles, Spokesman and Political Researcher, Australians Against Further Immigration

McMAHON, Mr Vincent, Assistant Secretary, Migration Planning, Department of Immigration and Ethnic Affairs

NEWMAN, Ms Sheila Mary, President, Victorian Branch, Australians for an Ecologically Sustainable Population

NIXON, Dr John Crammond, Vice-President, Australian Academy of Technological Sciences and Engineering

Appendix I - List of Witnesses

O'CONNOR, Dr Kevin Bernard, Senior Lecturer, Department of Geography and Environmental Science, Monash University

SHORT, Professor Roger Valentine

SPENCER, Dr Rodney Alan, Chairman, Australians Against Further Immigration

STORER, Mr Desmond Stanley, First Assistant Secretary, Settlement and Ethnic Affairs, Department of Immigration and Ethnic Affairs

SYDNEY, 19 AUGUST, 1994

FORAN, Mr Barney, Principal Research Scientist, CSIRO, Wildlife and Ecology

GOLDIE, Ms Jennifer Gordon, National President, Australians for an Ecologically Sustainable Population

GREEN, Dr Roy Montague, Director, Institute of Natural Resources and Environment, CSIRO-INRE

JONES, Mr John Gifford, Senior Officer, Strategic Development Unit, Aboriginal and Torres Straight Islander Commission

SUTTON, Mrs Audrey Fay, Executive Councillor, Australian Conservation Foundation

YOUNG, Dr Christabel Marion, Fellow, Demography Program, Research School of Social Sciences, Australian National University

CANBERRA, 20 September 1994

- . **CALDWELL**, Professor John Charles, Co-ordinator, Health Transition Centre, National Centre for Epidemiology and Population Health, Australian National University
- . **DENGATE**, Dr Howard Norman
- . **MOORE**, Mr John Desmond, Senior Fellow, Institute of Public Affairs

LIST OF SUBMISSIONS

- 1 Mr Frank Hunt, NSW
- 2 Mr James Young and Ms Mary Lee, NSW
- 3 Mr Jack Forward, NSW
- 4 Mr JB Douglas, NSW
- 5 Mr W Pye, NSW
- 6 Concerned Citizens For The Environment, QLD
- 7 Mr Brian Newell, VIC
- 8 Mr Keith Bremner, SA
- 9 Coalition of Hawkesbury & Nepean Groups for the Environment (CHANGE), NSW
- 10 Mr RJ Bailey, SA
- 11 Mr Julian Yates, WA
- 12 Mr Colin McQueen, NSW
- 13 Mr DJ and Mrs MM McDonald, SA
- 14 Mr PB Gould, NSW
- 15 Stop Environmentally Wrecking Everyone's River (S E W E R)
- 16 RJ Lord Pty Ltd, NSW
- 17 Ms Wendy Gleen, NSW
- 18 Mr Richard Simpson, NSW
- 19 Ms Maggie Bolitho, NSW
- 20 Council for Christian Union, VIC
- 21 Institute of Public Affairs, VIC
- 22 Mr George Lines, VIC
- 23 Dr Graham Chittleborough, WA
- 24 Mr Paul Roberts, ACT
- 25 Mr Jack Seekamp, SA
- 26 Hills Environment Forum NSW
- 27 Ms Rosalie Schultz, WA
- 28 Dr Peter Tod, QLD
- 29 Ms Judith Cousins, NSW
- 30 Dr Olive Johnston, WA
- 31 Mr Stephen Taylor, ACT
- 32 Confidential Submission
- 33 Mr Peter Stewart, NSW
- 34 Ms Susan Nancauon, ACT
- 35 Mr AG Colley, OAM, NSW
- 36 Mr Glen Marshall, VIC

Appendix II - List of Submissions

- 37 Ms Anne Mellady, Mr Vladislav Zhukov, Ms Zelma Peterson, ACT
- 38 Mr Desmond Milligan, NSW
- 39 Confidential Submission
- 40 Dr Trevor Sauer, QLD
- 41 Mr John and Mrs Elaine Ridd, QLD
- 42 Mr Michael Holland, SA
- 43 Ms Lynn Howard, WA
- 44 Mr Bob Whiteway, VIC
- 45 Mr DH Brading, NSW
- 46 Mr D McNeil, VIC
- 47 Mr Gerard Cafe, NSW
- 48 Mr Lew Spratt, NSW
- 49 Ms Janet Devlin, VIC
- 50 Mr S and Mrs Betty Thatcher, NSW
- 51 Mr Brian and Mrs Joan Engris, NSW
- 52 Mr Graham Calley and Mr Denis Hansen, NT
- 53 Professor David Pope, ACT
- 54 Family Planning Australia Inc., ACT
- 55 Ms Winifred Barnell, NSW
- 56 Dr Robert Taylor, TAS
- 57 Conservation Council of South Australia
- 58 Mr Geoff Hyde, NSW
- 59 Dr Patricia Dimmock, NSW
- 60 Mr BJ Ferguson, NSW
- 61 Mr Bob Whitworth, QLD
- 62 Mr JM Smith, NSW
- 63 Ms Marion Donworth, NSW
- 64 Mrs Betty Thatcher, NSW
- 65 Mr Stuart Mead, QLD
- 66 Professor Jim Walmsley and Mr Tony Sorensen, NSW
- 67 Mr Mark McGrouther, NSW
- 68 Mrs Margaret J Brownscombe, NSW
- 69 Mr Keith Brownscombe, NSW
- 70 Mr Terence Anderson, VIC
- 71 Confidential Submission
- 72 Mr Terence Fowler, NSW
- 73 Ms Ruth Burlakov, NSW
- 74 The Cranney Family, QLD
- 75 Mr Ross Blick, NSW
- 76 Mrs Audrey K Mann, VIC
- 77 Ms Heather Luvis and Mr David Haselgrove, QLD

Appendix II - List of Submissions

- 78 Mr JR Short, NSW
- 79 Mr John Leary, QLD
- 80 Mr Jim Dimo, QLD
- 81 Mr David Griffiths, NSW
- 82 Mrs Heather Cooper, NSW
- 83 Mr Alan Dimmock, NSW
- 84 Mrs Margaret Mackay, QLD
- 85 Jewells Total Catchment Management Group, NSW
- 86 Mr John Burke, NSW
- 87 STEP Inc, Community Based Environmental Conservation since 1978 (NSW)
- 88 Free Public Transport, NSW
- 89 Mr Eric Claus, NSW
- 90 Mr Paul Spencer, VIC
- 91 Mr David Cooper, NSW
- 92 Mr JF Cahill, NSW
- 93 Ms Valerie Garth, VIC
- 94 Professor R V Short, VIC
- 95 Ms Angela Gurton, WA
- 96 Mr Dane Thwaites, NSW
- 97 Mr Don Owers, NSW
- 98 Dr Lincoln Day, USA
- 99 Mr Clive Moy, VIC
- 100 Dr Marjorie Gray, QLD
- 101 Mr Greg and Mrs Eileen Dunstone, ACT
- 102 Mr Colin Watson, OAM, NSW
- 103 Mr RK Hammond, WA
- 104 Mr PS Bembrick, NSW
- 105 Mr Richard Mitchell, NSW
- 106 Mr N R White, VIC
- 107 Mr DO Byrne, SA
- 108 Mr Brenton E Smith, SA
- 109 K & J Tomholt, VIC
- 110 Ms Betty Korber, NSW
- 111 Ms Lorraine K Rogers, SA
- 112 Inbound Tourism Organisation of Australia Limited (ITOA)
- 113 Ms Suzanne Welboon, WA
- 114 Ms G Heather Stewart, ACT
- 115 Mrs Judy and Mr David Kelly, ACT
- 116 Howard and Nadine Wiseman, NZ
- 117 Mrs NI McNeil, VIC
- 118 Mr Les Cowper, QLD

- 119 Mr Herbert E Fenn, NSW
- 120 Mr Dariusz Janiak, NSW
- 121 CvB Nesor, SA
- 122 Ex-Members of the 2/33 Australian Infantry Battalion (7th Division, AIF), NSW
- 123 Mr Hinton Garland, NSW
- 124 East-Hills State Electoral Council Sub-Committee, NSW
- 125 Australians Against Further Immigration Party VIC Branch
- 126 Mr Lon Eisenweger, VIC
- 127 Australians for an Ecologically Sustainable Population Inc (AESP), NSW Branch
- 128 Dr Valerie Yule, VIC
- 129 Ms Joan Carey, NSW
- 130 DP and A Cameron, WA
- 131 Mr Richard Ostle, WA
- 132 Australian Conservation Foundation Central Coast Branch, NSW
- 133 Miss Margaret O H Walker, NSW
- 134 Australian Institute of Biology Inc, CSIRO, CANBERRA
- 135 Mr Dudley Marrows, VIC
- 136 GL Kesteven, NSW
- 137 Blackburn Uniting Church Social Justice Committee, VIC
- 138 Mr Scott Morrison, ACT
- 139 Mr Peter Snelling, NSW
- 140 AL Lindley, SA
- 141 PD Carter, VIC
- 142 Mr Lesley Inglis, NSW
- 143 Mr John S Bentley, NSW
- 144 Mrs Jan Tendys, NSW
- 145 Dr Howard N Dengate, NT
- 146 Ms Valerie Garth, VIC
- 147 Ms Diana Evans, VIC
- 148 SH Allen, SA
- 149 Family Support Services Assoc NSW (Inc)
- 150 Mr Allan V Dicker, NSW
- 151 Dudley Progress Association, NSW
- 152 Australian Humanists, VIC
- 153 Australian Independent Alliance, SA
- 154 R Jurgenson
- 155 M.O.S.E.S, NSW
- 156 Sunshine Coast Environment Council Inc., QLD

Appendix II - List of Submissions

- 157 Citizens Against Unsustainable Populations, QLD
- 158 Mr Roger M Lilley, VIC
- 159 Mr Lionel Young, NSW
- 160 Ms Kaye Stannard, NSW
- 161 Mr C Short, NSW
- 162 Mr Robert Wolcott, VIC
- 163 Mr Mike Barron, QLD
- 164 Mr KG Steadman, NSW
- 165 Stuart and H Carter, Anita Lawrence, R McLennan, J Sealby,
Gail Braun, T and Dianne van Balen, NSW
- 166 Ms Joy Hafey, NSW
- 167 Ms Gael Paul, QLD
- 168 Mr Jim Pashley, VIC
- 169 Dr John L Perkins, VIC
- 170 Ms Sheila Newman, VIC
- 171 Mr Peter W B Myers, NSW
- 172 Ms Ann Rayner, NSW
- 173 Nicki Taws and Anthony Scott, ACT
- 174 Aboriginal Deaths in Custody Watch Committee, NSW
- 175 Mr Keith Adkins, VIC
- 176 J Casteleijn, S Casteleijn and M Casteleijn, QLD
- 177 Dr Christabel Young, ACT
- 178 Ms Jacqueline Henrion, QLD
- 179 Dr Katharine Betts and Dr Bob Birrell, VIC
- 180 Assoc Professor F P C Blamey, QLD
- 181 Mr Alan H Magnusson, NSW
- 182 The Tamworth Environment Centre, NSW
- 183 Mr AE Jackson, SA
- 184 Mr Hugh Milne, QLD
- 185 Ms Barbara Guest, NSW
- 186 Mr Otto Mueller, WA
- 187 Mrs Gwenyth Curtis and Mr Frederick Curtis, VIC
- 188 Ms Elizabeth Musgrave, NSW
- 189 Australian Humanists, VIC
- 190 Mr David Hall, ACT
- 191 Ms Sandra Kanck, MLC, Australian Democrats Member of the
South Australian Legislative Council
- 192 Ms Esme Wood, NSW
- 193 Mr Ian M Jones, VIC
- 194 Mr Gordon E Hocking, NSW
- 195 Mr David Kitson, NSW
- 196 Australian Catholic Social Welfare Commission, ACT

Appendix II - List of Submissions

- 197 Writers for Sustainable Population, ACT
- 198 Ms Hellen Cooke, ACT
- 199 Tamworth Environmental Centre, NSW
- 200 Sunshine Coast Environment Council Inc., QLD
- 201 City of Wanneroo, WA
- 202 Wide Bay Burnett Conservation Council Inc, QLD
- 203 Mr John GN Gray, QLD
- 204 Mr LB Daniel, NSW
- 205 Queensland Conservation Council, QLD
- 206 Mr W J Lines, ACT
- 207 N Redwood, VIC
- 208 Dr Christopher L Watson, ACT
- 209 Coalition for Wanneroo's Environment, WA
- 210 Australians for an Ecologically Sustainable Population North
Queensland Branch, QLD
- 211 Kingsfisher Centre, QLD
- 212 Mr Graham Caldersmith, ACT
- 213 Hon DN Everingham, QLD
- 214 Coalition Against Welcome Reef Dam (CAWRD), NSW
- 215 Mr W Kirsop, NSW
- 216 Mr Alan Rich, NSW
- 217 W S Cummings, QLD
- 218 Mr Jeff Spargo, NSW
- 219 The Council of the City of Lismore, NSW
- 220 Mrs Margaret and Mr Dean Graetz, ACT
- 221 Mr Norman Poulter, WA
- 222 Monaro Conservation Society, NSW
- 223 Australians for an Ecologically Sustainable Population, ACT
- 224 Mr James M Thomson, NSW
- 225 Mrs Lorna Wright, TAS
- 226 Mr Garry Hopkins, NSW
- 227 Mr Robert Story, ACT
- 228 Council for the National Interest, VIC
- 229 Mr Tad Soroczynski, NT
- 230 Dr Alan Hall, NSW
- 231 Mr Neal Hardy, ACT
- 232 Mr W Gibberd, SA
- 233 Mr Henry Teltscher, VIC
- 234 Ms Evonne Moore, SA
- 235 Bureau of Meteorology, VIC
- 236 Mr DV Duntley, ACT

Appendix II - List of Submissions

- 237 Mr R Stephenson, NSW
- 238 Dr W Sorby, NSW
- 239 Mr RDM Cotgrove, TAS
- 240 G and J Greenland, NSW
- 241 Australian Academy of Technological Sciences and Engineering,
VIC
- 242 Australian Institute of Environmental Health, ACT
- 243 Fairfield City Council, NSW
- 244 Mr David Larkings, QLD
- 245 Councillor James Adams, NSW
- 246 Population 2040 Working Party, ACT
- 247 Dept of Immigration and Ethnic Affairs, CANBERRA
- 248 Citizens Electoral Councils of Australia Group, VIC
- 249 Melville Environment Group, WA
- 250 Ms Mairi Mackenzie, QLD
- 251 The Growth Lobby, QLD
- 252 Office of the Premier, WA
- 253 Ms Indra Esguerra, ACT
- 254 Ms Astrid Herlihy, WA
- 255 The Greens (WA)
- 256 Australian Conservation Foundation, NSW
- 257 The Hon Laurie Brereton, Minister for Transport, CANBERRA
- 258 Australian Population Association (QLD)
- 259 CSIRO Australia, ACT
- 260 Aboriginal and Torres Strait Islander Commission (ATSIC),
CANBERRA
- 261 Emeritus Professor Charles Birch, NSW
- 262 Agriculture and Food Group Staple Foods Project, Action for
World Development (NSW Inc), NSW
- 263 Mr Martin Bray, SA
- 264 Ms Lyndria Cook, QLD
- 265 Great Barrier Reef Marine Park Authority, ACT
- 266 Dr IR Lantzke, WA
- 267 Department of Employment, Education and Training (DEET),
CANBERRA
- 268 McLachlan Consultants, NSW
- 269 Dr Gilbert Wallace, NSW
- 270 Dr FE Trainer, NSW
- 271 Ms Leila W Huebner, VIC



