

THE END OF THE OVERPOPULATION CRISIS?

BY RON BRUNTON

Over the past half century, the 'population explosion' has been presented as a grave threat to humanity. But as different apocalyptic predictions have failed to eventuate, the justifications have shifted, moving from claims that population growth will lead to mass starvation and the exhaustion of natural resources, to claims that it will bring about environmental degradation.

In this *Backgrounder* Ron Brunton discusses the questionable motivations of some of the advocates of population control, and critically examines the arguments that have been presented in its favour. He argues that fears that the earth is about to exceed the 'carrying capacity' of its environment, or run out of food or natural resources, are without foundation. He also discusses the substantial declines in human fertility that have occurred over much of the world over the past couple of decades, leading to continuing downward revisions in United Nations projections of the world's future population.

Dr Brunton argues that, however they might now be packaged after the 1994 Cairo Population Conference, Western nations are still in the business of telling people in the Third World not to reproduce so fast. The very individuals who are most vocal in urging respect for cultural difference seem oblivious to the paternalism and moral illegitimacy of attempting to pressure women and men in developing nations into believing that they are wrong in their assessments of their own individual circumstances. Australia should end all support for external population programmes.

INTRODUCTION*

For the past half century the spectre of a population catastrophe has held a powerful, and at times apocalyptic, sway over people's minds.¹ Such anxieties about overpopulation have a long history, and are present in the writings of ancient Babylonians, Greeks, Romans, and Chinese, as well as finding an apparently rigorous expression in the work of Thomas Malthus, first published two hundred years ago.² In the years before the Second World War, however, concerns about overpopulation were offset by widespread fears that major European countries were facing serious population declines.

While there were a number of vocal promoters of population control in the pre-war years, their attention was mostly focused on the composition of the

BEFORE WWII THERE WAS CONSIDERABLE PUBLIC AND 'PROGRESSIVE' INTELLECTUAL SUPPORT IN NORTH AMERICA AND EUROPE FOR ATTEMPTS TO REDUCE, OR EVEN PREVENT, BIRTHS AMONG SUPPOSEDLY INFERIOR PEOPLE

population, because of their fears that people of 'higher quality stock' were having fewer children than those whose qualities were less desirable. Although nowadays eugenic measures are overwhelmingly associated with Nazism, there was considerable public and 'progressive' intellectual support in North America and Europe for attempts to reduce, or even prevent, births among certain supposedly inferior people. Such measures were endorsed by individuals who are now celebrated as pioneers of birth control, such as Margaret Sanger, and Guy Irving Burch, the founder of one of the earliest of the American population organisations, the Population Reference Bureau.³

Although the initial moves for United Nations involvement in population issues were motivated by a continuation of the pre-war fears about population decline in the developed countries, by the late 1940s there was a growing chorus arguing that the real threat lay in the opposite direction. Demographers had begun to focus on population growth in undeveloped regions, particularly in Asia, and the apparent difficulties of providing the resources that would

be necessary to cope with this growth. With the support of Margaret Sanger, an International Congress on Population and World Resources in Relation to the Family was held in England in 1948, and the language of 'crisis' and 'catastrophe' in relation to finding food for the rising population was freely used.⁴

1948 also saw the publication of two books in the United States which were to play a major role in convincing people that the threat of overpopulation had to be taken very seriously: Fairfield Osborn's *Our Plundered Planet*, and William Vogt's *Road to Survival*. Osborn was a conservationist and later President of the Wildlife Conservation Society who was briefly also a member of the American Eugenics Society in the 1950s;⁵ while Vogt was an economist who was an official of the Audubon Society and who later became a director of Planned Parenthood. Both books emphasised the pressures that population growth imposed on the earth's resources as a whole, thus making the issue broader than one of simply producing sufficient food. At least one commentator has suggested that this conservationist slant provided a more acceptable approach to population control, circumventing some of the disagreeable associations it had acquired in the wake of the Second World War.⁶ Even so, Vogt's statements that 'the greatest tragedy that China could suffer, at the present time, would be a reduction in her death rate', and his complaints about the 'untrammelled [sic] copulation' of the 'Moslems, Sikhs, Hindus' of India who had been 'breeding with the irresponsibility of codfish'⁷ betray the kind of disdain for non-Europeans that has played a significant, though infrequently admitted, part in the developed world's enthusiasm for population control.

Paul Ehrlich, the best known and most influential exponent of apocalyptic population scenarios, has stated that *Our Plundered Planet* and *Road to Survival* were the books that had the most significant impact on his views.⁸ Vogt's book also had a considerable impact on Hugh Moore, a very wealthy American who devoted a great deal of his money and energy to promoting the threat of overpopulation, and who played a major role in placing the issue on the political agenda in the United States. In the mid-1950s Moore sent copies of his pamphlet, *The Population Bomb*, to a large number of prominent Americans, and he later funded a massive advertising campaign about the crisis which was supported by intellectual and other luminaries. Ehrlich's 1968 book of the same name acknowledged that the phrases 'population bomb' and 'population explosion', which by then were in general circulation, had first been used by Moore. Arguments that population pressures threatened economic development and world peace quickly became

* A few sections of this *Backgrounder* have been adapted from a monograph written by Jim Peron, *Exploding Population Myths*, which was published by the Fraser Institute.

part of conventional wisdom, and by the mid-1960s the US Government had incorporated birth control programmes as important components of its foreign aid.⁹

WHAT IS 'OVERPOPULATION'?

'Overpopulation' obviously implies either an optimum level of population for a region, country, or the earth as a whole, under which conditions would be ideal, or a maximum level of population, beyond which serious problems occur.¹⁰ The bases on which such ideal or maximum levels are calculated or inferred vary. During the first decades of the post-war anxiety about population growth, the stress was on the relationship between the numbers of humans and the continuing availability of the various resources they required. Confident predictions were made about the impossibility of maintaining current standards of living, and the imminence of devastating famines.¹¹ In more recent decades, however, with the obvious failure of these predictions to eventuate, the focus has broadened so that the appropriate level of population is seen in terms of the number who can occupy an area without causing degradation of the overall environment.¹² From this perspective, 'overpopulation' can occur if, say, biodiversity is being reduced, even while human material needs are not under any threat.

The use of the term 'overpopulation' need not necessarily be the result of any reasoned assessment of the relation between the number of people and available land or resources. In the words of one commentator, referring to American Vice-President Al Gore's statements at the 1994 United Nations Conference on Population and Development in Cairo, 'growing population numbers [were tossed out] ominously, as if they were self-evidently frightening'.¹³ At its most elemental and dangerous level, 'overpopulation' expresses an aversion to particular kinds of people or to humanity as a whole, as evidenced in the claims from some environmentalists that humans are a planetary 'weed', 'cancer' or 'malignancy'.¹⁴ But it also seems to be present in the words in which Paul Ehrlich introduced 'the problem' in *The Population Bomb*:

I have understood the population explosion intellectually for a long time. I came to understand it emotionally one stinking hot night in Delhi a few years ago.... The streets seemed alive with people. People eating, people wash-

ing, people sleeping. People visiting, arguing, and screaming. People thrusting their hands through the taxi window, begging. People defecating and urinating. People clinging to buses. People herding animals. People, people, people, people. As we moved slowly through the mob, hand horn squawking, the dust, noise, heat, and cooking fires gave the scene a hellish aspect.¹⁵

Clearly, Ehrlich felt some revulsion at the culturally unfamiliar use of personal and public space by a people who were physically different from himself. But by casting this revulsion as an example of the 'population explosion', Ehrlich gives some credence to those who see the concern with 'overpopulation' as the expression of a fear by whites that there are too many non-whites in the world.¹⁶ The callousness towards non-Europeans which the 'overpopulation' crisis can encourage is also captured by the remarks of the American environmental journalist Gregg Easterbrook:

At an environmental seminar at Harvard Divinity School two years ago, I listened to one professor expound on how it was wrong of the West to have given antibiotics and vaccines to the developing world, because if peasants still expired in the traditional numbers, the rain forests would be secure.¹⁷

A less offensive, but nevertheless crude way of thinking about overpopulation is in terms of population density. Most current population Cassandras no longer state that density as such is a defining measure of overpopulation,¹⁸ although there are still some who argue that a high population density is damaging in itself, quite apart from its other effects on resource availability and the environment.¹⁹

Certainly, however, some earlier writers, taking their cue from animal studies, did argue that high population densities had pathological consequences. In *The Doomsday Book* for instance, Gordon Rattray Taylor claimed that a mysterious die-off which affected a small herd of deer on James Island in Chesapeake Bay in the eastern United States was caused by stress due simply to overcrowding. Stating that 'man is in no way exempted from the laws of population growth', he asked readers to ponder a situation where all humans had spread themselves as far apart from each other as possible. By the year 2000 this would mean that each human being would be only 120 yards (110 metres) from another person, and by 2070 the distance would have shrunk to 60 yards (55 metres). Then came the supposed clincher—'When the deer on James Island began to die of brain haemorrhages they were about 80

yards apart'.²⁰ Leaving aside the questions of whether the deer really did die because of overcrowding, and whether we can extrapolate from deer to humans, the obvious question that has to be asked is why there are no signs of the human die-off in the world's urban centres, or in countries such as Singapore, where the 1995 distance would have been around 15 metres, or Malta, where it would have been 30 metres.²¹

Insofar as popular ideas about 'overpopulation' may still implicitly rely on notions about the 'teeming masses' in non-European countries, it is instructive to compare the densities for the four most populous of the Asian countries commonly thought of as 'overpopulated' with the figures for certain European countries, using the most recent data available for each country.

Table 1: Population Densities for Selected Countries in Asia and Europe

Country	Density (persons/ square km)
The Netherlands	377
Belgium	333
India	305
United Kingdom	236
Germany	230
Italy	189
Pakistan	166
Czech Republic	131
China	128
Poland	124
Indonesia	110

Source: Microsoft Encarta *World Atlas 99*

CARRYING CAPACITY

Attempts to define 'overpopulation'—as opposed to making subjectively-based assertions about it—are usually phrased, either specifically or implicitly, in terms of the 'carrying capacity' of particular environments,²² a concept developed by ecologists studying non-human species. Although there are many different, and sometimes mutually contradictory, definitions of human carrying capacity, in the simplest terms it is the maximum population that can be supported by an ecosystem for an indefinite period of time.²³

Because 'carrying capacity' appears to be an empirically-based scientific concept, it serves as a powerful underpinning for warnings about the need to stabilise or reduce population levels for given regions or for the earth as a whole. It has become a key concept for environmentalists, particularly in the context of discussions about 'sustainable development' or 'ecologically sustainable development', although Vogt invoked the notion in his 1948 book, claiming that it was 'falling ... over most of the earth'.²⁴ Assertions that the population in an area has exceeded, or is about to exceed, its carrying capacity can appear to make a compelling point about intractable limits to growth:

[In Africa] with a population of 580 million humans, demands are exceeding the carrying capacity of local biological systems, leading to consumption of the systems themselves.²⁵

[Ehrlich's essential point is] that we are in a state of crisis ... that the human population is exceeding the carrying capacity of planet Earth by leaps and bounds.²⁶

But as the geographer Harold Brookfield has observed,

Repeated predictions have been made concerning the population capacity limits of country after country for at least half of this century. In almost every significant case these limits have been exceeded, while in most cases the present people are now better off than their less numerous predecessors.²⁷

In the words of Joel Cohen, the American biologist and demographer who has produced a major study of efforts to specify the earth's carrying capacity, 'notwithstanding their cloak of quantification, many of the published estimates of human carrying capacity are probably less dispassionate analyses than they are political instruments, intended to influence actions one way or another'.²⁸

Whatever its political usefulness, carrying capacity is of very dubious value as a scientific concept, at least as far as human beings are concerned. While it seems inherently implausible to assert that there are no limits to the number of people who can live on earth, attempts to provide a numerical value for the earth's human carrying capacity produce extremely diverse results. As Cohen notes, the actual estimates 'vary from less than one billion to more than 1,000 billion'. And strikingly, there has been no progressive refinement bringing about a convergence towards a particular value. Indeed, the opposite has occurred, as 'the scatter among the estimates seems to increase with the passage of time'.²⁹ In 1994 alone, the published estimates varied from less than

3 billion to 44 billion.³⁰

Cohen identifies six different methods that different researchers have used to estimate human carrying capacity (as well as a seventh, simple categorical assertion without any supporting evidence or argument). These involve

- 1 fitting mathematical curves to historical population sizes and extrapolating into the future;
- 2 subdividing the earth into regions and assuming a maximum supportable population for each kind of region;
- 3 assuming a single constraint on population size, such as food, and calculating a figure based on this assumption;
- 4 assuming that there are multiple constraints, such as fibres, energy, and other requirements as well as food, but converting these to a single resource measure;
- 5 assuming that there are multiple independent constraints, but without considering the way in which these constraints might interact with each other; and
- 6 assuming that there are multiple independent constraints, and attempting to model the interactions among these constraints.

While the last method might seem to mitigate some of the shortcomings of the first five, which make no allowances for changes in variables which might affect the relevant constraints or in their possible interrelations, it has very serious problems of its own. It invariably depends on heroic assumptions about poorly understood constraints and their interrelations, assumptions which are not tested against existing empirical data.³¹ Indeed, when the assumptions which underlie any attempt to assess human carrying capacity are spelled out, the overwhelming complexity of the interactions between the variables that might be involved becomes very clear, as does the level of ignorance that would have to be overcome in order to produce useful results.

But in any case, human carrying capacity estimates are inherently conditional on a very wide range of human choices and natural constraints, all of which can change over time. It is therefore nonsense to suggest that there might be 'one right number', even if this number can only be known imperfectly.³² Cohen presents eleven kinds of factors involving various degrees of human choice interacting with natural constraints that must condition any assessment of human carrying capacity:

- 1 the average level of material welfare;
- 2 the way in which material welfare is distributed in the population;
- 3 the kinds of technology used;

- 4 the nature of domestic and international political institutions;
- 5 the nature of domestic and international economic arrangements;
- 6 domestic and international arrangements involving migration and, to a lesser extent, patterns of household formation;
- 7 the kinds of biogeochemical environments that will be preferred;
- 8 the degree of temporal variability of material welfare;
- 9 the acceptable level of risk of disastrous events occurring;
- 10 the time horizon which has been chosen for the assessment, (for as Cohen notes, it is meaningless to talk about the number that can be sustained indefinitely, as many definitions would require) and
- 11 fashions, tastes and moral values.³³

Cohen's book is the first to provide a scientific history of attempts to estimate the earth's carrying capacity, and Landis MacKellar suggests that his work has been so comprehensive that 'no one will have to do it again for some time to come'. But MacKellar also points out that the book 'assembles a formidable indictment of the concept of carrying capacity as applied to humans' and that it has catalogued 'the history of an intellectual folly'.³⁴

THE WORLD OF SCARCITY

As every economist knows, we live in a world of scarcity. But this is not because our world is 'overpopulated', for things would be no different even if the earth's population were only a tiny fraction of its current level. One of the classic definitions of economics states that it is 'the science which studies human behavior as a relationship between ends and scarce means which have alternative uses'.³⁵ If unlimited supplies of all the goods and services that humans might desire were available, there would be no need to allocate them, and no domain of human activity for economics to study. The economist Thomas Sowell has explained this as follows:

What is crucial for understanding the way [an economic system] functions is that it is a system for *rationing* goods and services that are *inadequate* to supply all that people want. This is true of any economic system, whether it is called capitalism, socialism, feudalism, or by any other name. The Garden of Eden was not an economic system, even though it produced

and distributed goods and services, because it produced them in such abundance that rationing was unnecessary. A utopia would not be an economic system for the same reason... Looked at another way, there are *inherent* constraints, given the limitations of nature and the unlimited desires of man, and economic systems are simply artificial schemes for administering the inherent scarcities.³⁶

The price mechanism operates to ration—or allocate—scarce goods and services, by restricting the demand for goods so that the quantity demanded is more in line with the quantity supplied. The very fact that a good or service has a price indicates that it is scarce.

It is necessary to understand that when we are talking about scarcity and abundance, we are talking about relative concepts. At the absolute scarcity end of the continuum are goods that, while probably desired, do not exist, such as machines for time travel. At the absolute abundance end are goods that are either desired by no-one, or in infinite supply. Because human desire is at least partly culturally conditioned, some things may be in absolute abundance in one society, but not in another. In our society, fingernail parings are in absolute abundance.³⁷ But in some Melanesian societies, where they can be used in sorcery, the fingernail parings of an enemy are scarce.

The best and most objective measure of the relative scarcity of something is its price. As Julian Simon points out, it is extremely unlikely that people will wake one morning to discover that a certain resource has completely vanished. Long before

its total depletion its supply will have begun to dwindle, and individuals will have found it more difficult to obtain, thereby increasing its price.³⁸ And as the price goes up, the demand will go down, thus helping to con-

serve the increasingly scarce resource. High prices tell consumers to buy less and producers to provide more. Lower prices do the opposite. In other words, prices are a means of transmitting information—although market distorting mechanisms such as price-fixing or rationing by bureaucrats can cause this information to be misleading, which is one rea-

son why environmentalists' penchant for such mechanisms are short-sighted.

Despite frequently-stated claims that the price of a resource is only a reflection of the immediately current situation, the price system also factors in expectations about the future scarcity of a resource. As Stephen Moore notes,

an asset's value is determined by the discounted present value of its future return. If the marketplace believed that oil was going to be in short supply in ten years, then owners would bid up prices today.³⁹

Such considerations apply to all commodities, indicating that doomsayers such as Lester Brown, who try to focus alarm over supposedly low levels of world grain stockpiles even though grain prices may be low, are misleading the public.⁴⁰ Indeed, as Julian Simon points out, improvements in transportation and market efficiency have dramatically reduced the total stocks that need to be maintained.⁴¹

Because the scarcity of goods and services is a function of both desirability and availability, it follows that a particular item can be both abundant and rare, while another can be both scarce and plentiful. Paul Heyne gives the example of a society in which every single person is terrified of snakes. Snakes may well be rare, but they cannot be scarce. But 'in another society, where snakes are valued as food, they could be quite common but nonetheless scarce'.⁴²

The supply of a resource can diminish, while it simultaneously becomes less scarce. Humans have clearly used up a certain fraction of the total amount of copper that exists in the earth's crust, but the scarcity of copper, as measured by its price relative to both wages and the consumer price index, has declined over the past century.⁴³ The simple explanation is that the demand has fallen as satellites and fibre optics replace copper cables for telecommunications (although at the same time new technologies have increased the amount of known and economically recoverable deposits). Alternatively, resources can become much scarcer without any being consumed, as new knowledge provides uses for substances for which there was previously little demand. Until the middle of the nineteenth century, for instance, petroleum had little value other than as a medicinal ingredient, whereas whale oil was a major source of lighting fuel. The discovery of kerosene and the subsequent development of petroleum refining caused the demand for whale oil to plummet, as well as creating new resources in the form of oil deposits, together with an increasing demand for these resources.⁴⁴

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The fact that in unregulated markets the price of a resource goes up as it becomes more scarce increases the incentives for three kinds of innovations to occur. People will look for ways to use the resource more efficiently, to supply more of the resource, and to substitute other, more abundant, resources instead. Obviously, other things being equal, growing population numbers will increase the demand for resources. But other things are very rarely equal, and because of the human capacity for change and innovation, increasing numbers of people does not necessarily mean increasing scarcity.

The inability to understand the feedback relationships between prices, demand and supply led to the dramatic predictive failures regarding resource depletion that were made by *The Limits to Growth*, the widely-touted doomsday best-seller of the early 1970s. Extrapolating from past rates of growth of resource use, the authors argued that the world faced the appalling prospect of running out of major mineral resources within the coming few years. The world would supposedly run out of gold by 1981, mercury and silver by 1985, tin by 1987, zinc by 1990, petroleum by 1992, copper and lead by 1993, and natural gas by 1994.⁴⁵

Paul Ehrlich's famous bet with the late Julian Simon provides another example of a prominent doomsayer's failure to understand the way in which the world really works. During a heated exchange with Ehrlich in the academic journal *Social Science Quarterly*,⁴⁶ Simon flung down the gauntlet,

I'll put my money where my mouth is. This is a public offer to stake \$10,000, in separate transactions of \$1,000 or \$100 each, on my belief that the cost of non-government-controlled raw materials (including grain and oil) will not rise in the long run. If you will pay me the current market price of \$1000 or \$100 worth of any standard mineral or other extractive product you name, and specify any date more than a year away, I will contract to pay you the then-current market price of the material. How about it, doomsayers and catastrophists? First come, first served.⁴⁷

Ehrlich promptly responded that, together with two of his colleagues, John Holdren and John Harte, he would 'accept Simon's astonishing offer before other greedy people jump in'.⁴⁸ The final agreed futures contract for the bet, drawn up in October 1980, centred on the quantities of five metals—copper, chrome, nickel, tin, and tungsten—which could be purchased for \$1,000 at 1980 prices. If ten years later the combined prices rose above \$1,000, Simon would pay the difference; whereas if they fell below

\$1,000, Ehrlich and his colleagues would pay Simon. In October 1990, Simon received a cheque for \$576.07. In other words, the combined real prices of the metals which Ehrlich chose fell by more than 50 per cent in the ten-year period.⁴⁹ As *The Economist* has commented, Simon 'would have won even if they had not adjusted the prices for inflation, and he would have won if Dr Ehrlich had chosen virtually any mineral: of 35 minerals, 33 fell in price during the 1980s. Only manganese and zinc were exceptions.'⁵⁰ Ehrlich and other environmentalists have attempted to dismiss the significance of their loss, claiming that resource prices will eventually increase. But those who made these claims consistently refused to take up Simon's offer to repeat the bet on any commodities of their choice.⁵¹

POPULATION GROWTH AND THE WORLD'S FOOD SUPPLIES

The place of Thomas Malthus in popular thought and language comes from his insistence that unchecked human populations would increase geometrically, while the available food supply could only increase arithmetically. The Malthusian threat that population growth supposedly presented to the world's food supplies was the dominant focus for nearly all of the first three decades of the post-war overpopulation panic. Although, since the 1980s, this threat has been overtaken by—and often dissolved into—concerns about the dangers to the environment, it still remains a significant theme.⁵²

In 1948, in an article on 'the world population crisis', Albert Brandt and James Payne told the readers of the *American Mercury* that 'even allowing for spectacular advances in agriculture and industry, the earth simply could not support 4.4 billion people in the year 2048. There would be the constant threat of famine, pandemic disease and unthinkably vicious wars for survival'.⁵³ The 1967 book by William and Paul Paddock, *Famine—1975!*, claimed that the food situation in countries such as Haiti, Egypt and India was so critical that they could not be saved. It suggested that a triage system would have to be introduced, allowing the least fit to starve so that the more robust could be saved.⁵⁴ Paul Ehrlich began his 1968 book *The Population Bomb* with the notorious statement, 'The battle to feed all of humanity is over' and warned that hundreds of millions of people would starve to death during the 1970s and 1980s.⁵⁵

The spectacular failure of these predictions to eventuate—as exemplified, for instance, by the emergence of India as a significant food exporter⁵⁶—does not seem to have diminished the credibility of those who made them. While the doomsaying of the Worldwatch Institute’s Lester Brown has been more moderate than that of Ehrlich and the Pad-dock brothers, he

began predicting in 1973 that population would soon outstrip food production, and he still does so every time there is a temporary increase in wheat prices. In 1994, after 21 years of being wrong, he said: ‘After 40 years of record food production gains, output per person has reversed with unanticipated abruptness’. Two bumper harvests followed and the price of wheat fell to record lows. Yet Mr Brown’s pessimism remains as impregnable to facts as his views are popular with newspapers.⁵⁷

An illustration of the respect the Worldwatch Institute’s doomsaying receives from the quality press can be seen in the *Australian Financial Review’s* report on the Institute’s recent publication *The Agricultural Link: How Environmental Deterioration Could Disrupt Economic Progress* (which also appeared in a shortened form in Lester Brown’s annual *State of the World*).⁵⁸ Under the title ‘Global food shortages on the horizon’, Stephen Wyatt wrote an article for the Commodities section of the *AFR* which stated that ‘boom times are ahead for grain producers’. The half-century-long trend of declining real grain prices had supposedly been reversed, and all the key food security indicators signalled ‘a shift from surplus to scarcity’. In what the article said would be ‘music to Australian graingrowers’ ears’, Brown was quoted stating that ‘grain prices will rise and could do so quite dramatically’.⁵⁹

But even when this article was written this assessment was out of date. Certainly, there had been a blip in the long-term trend of rising world grain production in the early 1990s and substantial price rises in 1995–96. But these were due to the combination of adverse weather conditions in the United States, chaotic conditions in the countries of the former Soviet Union and policy reforms in major grain-exporting countries which, while having a negative short-term effect, would ultimately ensure that production would be more responsive to changing conditions than it had been in the past.⁶⁰ Indeed, less than a month later, Wyatt wrote another article for the *AFR*, titled ‘Dismal commodity price outlook’, noting that 1997 had seen a record world grain harvest, and that prices were down sharply. He also referred to a World Bank study which had

just been released, predicting falling nominal grain prices over the period 1997–2006, and an International Food Policy Research Institute projection that world grain output would increase by 1.5 per cent a year through to 2020, leading to a 20 per cent decline in real cereal prices between 1990 and 2020.⁶¹

While meteorological, political or economic factors will inevitably cause fluctuations over certain periods of time, there can be no question about the long-term trends in rising food production and falling food prices over the last half century. Writing in 1995, and utilising FAO and World Resources Institute data from the early 1990s, Dennis Avery noted that per capita grain supplies had increased 24 per cent since 1950, while food prices had dropped by 57 per cent since 1980.⁶² Some of the really spectacular gains have occurred in large Asian countries once thought to be basket cases. The total level of per capita food production in Asia rose by 21 per cent between 1978 and 1990.⁶³ As Table 2 shows, these gains have continued during the 1990s.

Table 2: Per Capita Indices of Food Production, World and Selected Asian Countries 1997 (1989–91=100)

Country	Index Value
World	105.2
China	145.7
Pakistan	111.9
Indonesia	107.7
India	107.4

Source: FAOSTAT⁶⁴

Even in parts of Africa, which has the world’s highest rate of population growth,⁶⁵ and where gains in output have long lagged behind those obtained elsewhere, the benefits of high-yield agriculture are finally beginning to be seen, particularly where policies of farm regulation have been liberalised.⁶⁶ As Table 3 indicates, a number of African countries have achieved substantial increases in total agricultural production during the 1990s.

Table 3: Per Capita Indices of Agricultural Production, Selected African Countries 1997 (1989–91=100)

Country	Index Value
Benin	137.5
Ghana	126.9
Sudan	126.1
Egypt	121.3
Togo	113.3
Nigeria	110.0

Source: FAOSTAT⁶⁷

The gains in world agricultural output have been achieved from a cropland base that has grown only

slowly. The world total of arable and permanent cropland increased by less than 5 per cent between 1970 and 1990. And in the major agricultural regions of Europe and North/Central America the amount actually decreased,⁶⁸ even though FAO indices of agricultural production show that the total agricultural output in both these regions increased markedly during this period.⁶⁹ Furthermore, despite claims that processes such as increasing desertification and conversion of agricultural land to urban use are leading to serious shortages of arable land, there are considerable tracts of good quality cropland in North and South America which are currently underused or idle. As they are already cleared, they can 'be brought back into production without loss of significant wildlife habitat'.⁷⁰

Nevertheless, there are still a great many people in the world who are suffering from malnutrition. The relevant questions are whether their numbers are declining, and whether the causes of their hunger can be related to population growth, or to other factors.

While there are no doubts that food production has greatly outstripped population growth since 1950,⁷¹ there are arguments about the number of people who are undernourished. The FAO estimated that there were around 580 million underfed people in 1989–90, while the current figure is well over 800 million, suggesting that the problem has got worse. And there are a number of statements from organisations such as the World Food Council which explicitly support such a conclusion.⁷² As Nicholas Eberstadt has argued, however, the methodology of the research on which these estimates is based is deeply flawed, depending on highly questionable assumptions about individual nutritional requirements and the correspondence between food supplies on a national level and individual food consumption. Furthermore, he also notes that the FAO's 'definition of the caloric threshold level for undernutrition has been steadily climbing over time'.⁷³ Eberstadt points out that while 'a precise and reliable method for estimating the incidence and severity of worldwide malnutrition has yet to be devised', the dramatic increase in life expectancies across the less developed world between the early 1950s and early 1990s (with an average increase of almost 15 years) is very difficult to reconcile with a situation of increasing hunger.⁷⁴

Insofar as daily per capita calorie requirements can be utilised, they do not lend support to arguments that malnutrition results from overpopulation. Of the nineteen countries where the average daily calorie supply was 90 per cent or less of the

requirements, twelve have a population density which is *less* than the world average, which is currently around 44 persons per square kilometre.⁷⁵ Only four of these nineteen countries can be called densely populated, Bangladesh with 836 persons per square kilometre (1995), Rwanda with 302, Haiti with 259, and Nigeria with 121.⁷⁶ On the other hand, sixteen of the twenty countries with the highest per capita daily calorie supply have a population density which is *greater* than the world average.⁷⁷

A study of caloric intake in 90 developing countries by John Bongaarts similarly pointed to the difficulty of linking malnutrition to population density. Defining population density in terms of the number of persons per hectare of potential arable land (rather than using total land area, as was done with the calculations in the previous paragraph), Bongaarts divided the countries into the 3 categories of high, medium and low density. Using 1989 figures, the high-density countries averaged 6.6 persons per hectare, while the figure for medium-density countries was 1.3, and for low density countries it was 0.3. Bongaarts' calculations showed 'somewhat surprisingly, caloric intake was significantly greater in the high- than in the low-density group (2,477 versus 2,270 calories per capita per day)'. In the medium-density group daily per capita intake was only marginally less than for the high-density group, 2,467 calories. Furthermore, although Bongaarts did not specifically comment on the fact, his data show that the 1989 situation reversed what had existed in 1962, when the per capita intake for the high-density countries (1,998) was significantly *lower* than that for the low-density countries (2,173 calories).⁷⁸

As the distinguished development economist Lord Bauer has observed,

Contemporary famines and food shortages occur mostly in sparsely populated subsistence economies such as Ethiopia, the Sahel, Tanzania, Uganda, and Zaire. In these countries, land is abundant and, in places, even a free good. Recurrent food shortages or famines in these and other LDCs reflect features of subsistence and near-subsistence economies such as nomadic style of life, shifting cultivation, and inadequate communications and storage facilities. Those conditions are exacerbated by lack of public security, official restrictions on the activities of traders, restrictions on the movement of food, and restrictions on imports of both consumer goods and farm supplies. Unproductive forms of land tenure such as tribal systems of land rights can also bring about shortages.⁷⁹

One of the more fatuous arguments produced in response to the fact that many of the most densely populated countries are also well fed is that this prosperity has been achieved at the cost of other parts of the world. Thus Paul and Anne Ehrlich write

The Netherlands can support 1,031 people per square mile only because the rest of the world does not. In 1984–86, the Netherlands imported almost 4 million tons of cereals, 130,000 tons of oils, and 480,000 tons of pulses (peas, beans, lentils)... The Netherlands is also a major importer of minerals, bringing in virtually all the iron, antimony, bauxite, copper, tin, etc., that it requires... In short, the people of the Netherlands didn't build their prosperity on the bounty of the Netherlands, and are not living on it now... Saying that the Netherlands is thriving with a density of 1,031 people per square mile simply ignores that those 1,031 Dutch people far exceed the carrying capacity of that square mile.⁸⁰

Such statements are based on a fantasy of self-sufficiency which seems to treat trade as somehow immoral. Trade is not plunder; before the Dutch or any other non-aid-receiving nation can import food, they must produce goods and services that are exchanged with other nations in order to pay for the imports. External trade enables nations to specialise in activities in which they believe themselves to have an advantage as a result of the natural and human resources available to them.

WHILE METEOROLOGICAL AND OTHER FACTORS WILL INEVITABLY CAUSE FLUCTUATIONS, THERE CAN BE NO QUESTION ABOUT THE LONG-TERM TRENDS IN RISING FOOD PRODUCTION AND FALLING FOOD PRICES

By exchanging goods or services that they produce relatively efficiently for those that they produce less efficiently—or that they cannot produce at all—nations increase the productivity of their resources and achieve a higher standard of living than would be possible without trade. Any nation or region which turned its back on external trade and attempted to meet all its people's needs from its own production would be consigning itself to poverty.⁸¹ Indeed, as Mark Sagoff notes, the real problem that many underdeveloped nations face is that protectionist and other market-distorting measures in the developed nations reduce demand for Third World exports.⁸²

For a number of nations and regions, the conse-

quences of attempting to move to greater self-sufficiency in food would probably be environmentally damaging as well as economically harmful, because such attempts would require expansion into areas of relatively poor agricultural land. This poses a greater threat to biodiversity than does farming on good-quality land. As the American ecologist Michael Huston has noted, in general terms there is an inverse relationship between plant biodiversity and potential agricultural productivity at both local and global levels. The reason for this rather surprising situation is that single species dominance of an ecosystem is more likely to occur under conditions of good soil fertility, where all organisms have the possibility of rapid growth. In conditions which are poorer, but which are still able to sustain a reasonable amount of plant growth, 'the superior competitors are not able to dominate as rapidly, if at all, and many species are able to coexist, leading to higher diversity among individuals that are smaller in size, fewer in number, or both'.⁸³ As a consequence, Huston suggests that the best approach to conserving plant diversity—and at least some animal diversity—lies in the direction of an integrated global economy in which unrestricted trade allows agricultural products to be grown in those areas where they can be produced most efficiently.

A strong focus on external trade is not just a pre-occupation of the modern capitalist world. Indeed, there were a significant number of pre-European societies in the South Pacific whose lands were unsuitable for horticulture, and who survived—and even prospered, by comparison with their neighbours—by trading specialised goods and/or services for the food and raw materials produced by other societies, sometimes located a considerable distance away.⁸⁴

It is also worth noting, as an indication of the general quality of the Ehrlichs' economic understanding, that even countries which produce large food surpluses, such as Australia, New Zealand and the United States, still import some of their food supplies. It should not be necessary to point out that some things grow better in certain environments than in others, and people may desire foods that cannot be grown in their own regions. Furthermore, the Ehrlichs' selection of the Netherlands as an example is actually a most unfortunate choice for their own argument. Despite its very high population density (see Table 1), it is a country that exports substantially more food than it imports. The value of its 1996 food and animal imports was US\$14.8 billion, and the value of its exports was US\$25 billion.⁸⁵

CAN THE WORLD'S FOOD SUPPLIES CONTINUE TO INCREASE?

Acknowledging the massive growth in agricultural yields over the past four decades, doomsayers such as Lester Brown and his colleagues at the Worldwatch Institute are now suggesting that such rates are unlikely to continue into the future. They identify various constraints that will supposedly prevent substantial increases in productivity, such as limits imposed by plant physiology, shortage of water, and deterioration of soil quality through erosion. In the words of William Paddock, of *Famine—1975!* fame, as far as grain yields go, 'We're running out of gas at the time we most need it'.⁸⁶ But the grounds for such pessimism are no stronger than the grounds for the strikingly inaccurate predictions some of the very same people made a quarter of a century ago.

Although the rates of increase in the yields of some grains in certain countries show fluctuations and slowdowns in recent years, the overall prognosis for a continuation of the major gains of recent decades is very good. Despite indications that rice yields had begun to plateau in some East Asian countries during the 1980s, a 1993 study carried out by Donald Plucknett for the Consultative Group on International Agricultural Research showed that with only few exceptions, yields of the three major grains, wheat, rice and corn, had continued to increase dramatically around the world over the previous decade. The study examined per hectare crop yields, which are the most appropriate measure for assessing progress in productivity, rather than total yields, which are affected by variations in the amount of cultivated land.⁸⁷

At a lecture announcing the study, Plucknett stated that

A fascinating aspect of yield analysis is that many yield levels do not slow down as yields rise.... Most countries are well below their potentially-attainable, practical yields.... The general trend for most crops and countries is sustained growth, often at high and even accelerating rates of gain. The data present no environmental warning signals.⁸⁸

One of the grounds for believing that grain production can continue to increase substantially is the considerable lag between the yields achieved by experimental stations and the best farmers, compared to those achieved by average farmers. While this lag points to great variations in farmers' adoption

of new agricultural technologies—with smaller farmers allowing their colleagues with larger holdings to take the risk first—it also indicates the potential for further impressive rates of yield growth as the more conservative farmers see the benefits that the new technologies can bring.⁸⁹ Even in the United States, there is a massive gap in per hectare yields for major crops between master farmers and average farmers. Noting this, the agricultural scientist Paul Waggoner comments that on the best yields currently obtained by American maize farmers, a world population of 10 billion could be provided with 2,900 calories a day, using less than 10 per cent of the earth's present cropland.⁹⁰

Indeed, rather than fearing that we are at the tail end of a period of rapidly increasing agricultural productivity, it is far more likely that we are in the early phases of a major technological revolution based on the genetic manipulation of plants and animals.⁹¹ While, like any new technology, the genetic engineering of plants may carry some risks—such as the escape of herbicide- or pest-resistant genes to wild relatives, or the introduction of new allergens into foods—these are not insurmountable difficulties. They are also being overstated by people who are opposed to biotechnology on political and philosophical grounds, and who ignore the fact that conventional breeding techniques can also produce not dissimilar problems.⁹²

On the other hand, the agricultural potential of biotechnology is very great. It offers possibilities such as greatly reduced crop losses by enhancing crop resistance to pests and diseases while also reducing the need for chemical treatments that may be environmentally damaging; improvements in drought resistance and salt tolerance; the development of cereals which have the ability of leguminous plants to provide their own nitrogen by bacterial symbiosis, thus reducing the need to produce and apply nitrogen fertilisers; the development of perennial, rather than annual grain crops, which would greatly increase the energy efficiency of cultivation; and improvements in the nutritional content of staples.⁹³

A single example of the way in which current developments could bring massive benefits can be seen in work designed to produce aluminium tolerant grains. Aluminium is a problem on 30 to 40 per cent of the world's arable lands, particularly in the tropics where acidic soils make the aluminium soluble, allowing it to be taken up by plant roots. The aluminium is toxic to cell metabolism and prevents healthy root growth, and for some crops, such as corn, it is second only to drought as a cause of

low yields. Varieties of corn which could produce 10 tons per hectare are only able to achieve around 2 tons in affected soils.⁹⁴

But even ignoring the potential of biotechnology, some of the warnings about supposed constraints to increased agricultural yields are greatly exaggerated. In 1984, Lester Brown and Edward Wolf claimed that the global excess of soil erosion over soil formation was over 25 billion tonnes a year, and that if this continued it would be a major threat to the world's agricultural productivity.⁹⁵ In 1995, David Pimentel and his associates published a paper in *Science* which stated that the figure was three times higher.⁹⁶ However, as an analysis by Pierre Crosson from Resources for the Future shows, 'losses due to erosion and other forms of land degradation [such as salinization and soil compaction] do not pose a serious threat to the capacity of the global agricultural system to increase yields'.⁹⁷ He points to the considerable problems with Brown's and Pimentel's estimates, including the questionable data on which they were based. And both falsely assumed that soil removed by wind and water is lost to future agricultural use, whereas there are a large number of studies which show that most of the soil subject to erosion is deposited elsewhere on the landscape, thereby remaining 'available' for agriculture.

Crosson also notes that Pimentel and his associates, who are not experts on soil erosion and its effects on productivity, simply ignored more comprehensive research suggesting a far less alarming situation which had

'A FASCINATING ASPECT OF AGRICULTURAL YIELD ANALYSIS IS THAT MANY YIELD LEVELS DO NOT SLOW DOWN AS YIELDS RISE ... MOST COUNTRIES ARE WELL BELOW THEIR POTENTIALLY-ATTAINABLE, PRACTICAL YIELDS'

been carried out by scientists who were experts on the topic, even though they were aware of it. Analysing these other studies, Crosson calculates that from 1945 until 1990, 'the cumulative average degradation-induced loss of global soil productivity was roughly 0.1 to 0.2 percent per year', and that 'there is reason to believe that in the future, losses are more likely to decrease than to increase'. This is because economic, technological and legal developments in many Third World countries are providing increasing incentives for farmers to take measures to protect their land from degradation.⁹⁸

Water availability is another instance where the

threats to future agricultural productivity have been exaggerated. Thus Sandra Postel, who has had a long association with Lester Brown's Worldwatch Institute, recently wrote that 'lack of water is already constraining agricultural output in many parts of the world' and that 'water availability will be a serious constraint to achieving the food requirements projected for 2025'.⁹⁹ Certainly, there can be little question that there are many regions where water shortages limit agricultural productivity. But as Waggoner notes, 'bumper crops consume only a little more water than do sparse ones'.¹⁰⁰ And with the development of high-efficiency irrigation systems, the promise of much more efficient water purification systems, the development of more drought resistant crops, the possibilities of seawater irrigation for agriculture in desert areas, and the growing realisation of how expanded markets for water can provide significant incentives for conservation, the effects of water constraints are more likely to weaken rather than intensify.¹⁰¹

POPULATION GROWTH AND THE ENVIRONMENT

The enormous concern about environmental issues that has developed over the past three decades has provided a powerful integrating theme for the overpopulation doomsayers, enabling them to argue that, whether or not humanity can continue to feed itself, the increasing numbers of people in the world are putting an intolerable burden on the environment. Wilmoth and Ball's study of articles on the population debate in American popular magazines from 1946 until 1990, shows that 'environmental damage' changed from being a virtual non-issue in the years immediately following the end of the Second World War, to being the single most frequently invoked argument against population growth in the 1980s by an overwhelming margin.¹⁰² Nearly all population control advocates, from the moderate Zero Population Growth, to the off-the-planet Voluntary Human Extinction Movement, stress that increasing population is responsible for most of the world's environmental problems:

Continued population growth is foremost among the factors aggravating critical environmental problems such as urban sprawl, air and water pollution, deforestation, wildlife extinction, and climate change (Zero Population Growth).¹⁰³

[The environmentalists who founded Negative Population Growth in 1972] felt strongly that all efforts to preserve our environment would ultimately fail without a substantial reduction in human numbers... (Negative Population Growth)¹⁰⁴

Overpopulation is the root of most, if not all, environmental and many economic issues (World Overpopulation Awareness).¹⁰⁵

Phasing out the human race by voluntarily ceasing to breed will allow Earth's biosphere to return to good health (Voluntary Human Extinction Movement).¹⁰⁶

'Environmental damage' obviously includes a number of different dimensions. In terms of population impacts, the major dimensions are the utilisation of natural resources, the capacity to assimilate wastes, and the maintenance of biodiversity.¹⁰⁷ Other things being equal, it does seem plausible to argue that increasing the size of a population will increase environmental pressures along all of these dimensions. But the complexity of the linkages between human populations and the environment ensures that once again, things are not at all equal. A sparse population can cause just as much, if not more, environmental damage as a much more dense population—as Castles *et al.* remind us, in Australia 'most species loss occurred during phases of intensive land clearance and development, when population was much lower'.¹⁰⁸

The environmental impacts of increasing population numbers are an outcome of cultural values relating to environmental amenity; social, legal and economic institutions that provide incentives and penalties for particular kinds of behaviours; scientific understanding of the links between actions and environmental consequences; and the direct and indirect environmental effects of technological developments. Well-documented trends in energy efficiency—including the declining level of carbon intensity of the world's primary energy sources—and efficiencies in the use of land, water and raw materials, combined with a judicious and continually refined mix of market and regulatory approaches will allow us 'to restore the environment even as population grows'¹⁰⁹—now that all Western, and many other, nations publicly acknowledge environmental degradation as an important problem. Certainly, such an approach will be derided as depending on 'technological fixes' by those who are enamoured of wholesale 'social engineering fixes'.¹¹⁰ But modern economies 'depend far more on the progress of technology than on the exploitation of nature',¹¹¹ and the track record of technological improvements over

the past half century is far more impressive than the record of cultural and social changes along the direction that most environmentalists advocate.

The fact that serious concern about environmental issues is comparatively recent means that there is a dearth of reliable long-term data on environmental changes, as well as considerable disagreements about appropriate indicators.¹¹² Nevertheless, there are indications of substantial improvements along a number of dimensions in some countries, even while populations have continued to grow. The Fraser Institute recently published a study which examined changes in environmental quality over the fifteen-year period from 1980 to 1995, during which the population increased 21 per cent for Canada, and 16 per cent for the United States.¹¹³ The study considered a very wide range of data on air quality, water quality, natural resource use, land use and condition, solid waste generation, carbon dioxide emissions, oil spills, pesticide use, release of toxic materials, and wildlife preservation. It concluded that although a few indicators did show that there were

still some serious problems that need to be addressed ... in most instances objectives for protecting human health and the environment are being met, pollution and wastes are being controlled, and resources and land are being sustainably and effectively managed. Environmental quality in both Canada and the United States is improving, not deteriorating.¹¹⁴

Data from the 1990s shows that even though per capita agricultural production indices have risen substantially since the beginning of the decade in both countries, the forest cover has also increased. A number of other OECD countries have also experienced increases in their agricultural production and population growth while their forest cover has either increased or remained stable (see Table 4 on the next page).

Of course, the above discussion does no more than indicate that population growth is not incompatible with increasing environmental quality. It could still be countered that a stable or declining population might bring about even greater improvements.

GIVEN THE APPROPRIATE SOCIAL, ECONOMIC AND LEGAL CONDITIONS, RAPID POPULATION GROWTH CAN BE A DRIVING FORCE FOR BOTH PRODUCTIVITY INCREASES AND ENVIRONMENTAL IMPROVEMENT

Table 4: Selected OECD Countries, Indices of Agricultural Production 1997 (1989–91=100), 1990–96 Deforestation Rates, and 1997 Population Growth Rates

Country	Agriculture PIN	Deforestation Per Cent	Population Growth Per Cent
New Zealand	121	-0.56	1.08
United States	118	-0.28	0.89
Australia	114	-0.04	0.96
Canada	111	-0.07	1.13
Ireland	108	-2.66	0.33
The Netherlands	107	0.00	0.53
Denmark	105	0.00	0.59
Turkey	104	0.00	1.64
Greece	103	-2.31	0.44
France	102	-1.11	0.35

Source: Microsoft Encarta *World Atlas 99*

Nevertheless, a highly acclaimed recent study examining environmental changes over a 60-year period in a densely populated, mostly semi-arid area of Kenya has indicated that given the appropriate social, economic and legal conditions, rapid population growth can be a driving force for both productivity increases *and* environmental improvement.¹¹⁵

The study was carried out in the Machakos District by a team of specialist scientists from the University of Nairobi and the Overseas Development Institute in the United Kingdom, including Mary Tiffen and John Mortimore. Machakos begins 50 km south-east of Nairobi and is inhabited by an agricultural and pastoral people known as the Akamba. In the 1989 census, the district had a population of nearly 1.4 million people, an average density of over 100 people per square kilometre, and an annual population growth rate of 3.09 per cent, a little below the Kenyan average of 3.34 per cent.¹¹⁶ The study team was able to utilise extensive records, data and photographs produced by agricultural and soil conservation officers and other researchers beginning from the 1930s, to assess the changes that had occurred since then. In the initial period the Machakos area was regarded as a badlands, reflecting the 'official consensus that overstocking, inappropriate cultivation, and deforestation were occurring in the reserve, which was already overpopulated in relation to its carrying capacity'.¹¹⁷ In 1937, the colonial government's chief soil conservation officer wrote:

The Machakos Reserve is an appalling example of a large area of land which has been subjected to uncontrolled development by natives whose multiplication and the increase of whose stock has been permitted, free from the checks of war and largely from those of disease, under benevolent British rule.

Every phase of misuse of land is vividly and poignantly displayed in this Reserve, the inhabitants of which are rapidly drifting to a state of hopeless and miserable poverty and their land to a parching desert of rocks, stones and sand.¹¹⁸

Yet by the early 1990s, the environmental degradation problem of the 1930s had been very substantially reversed. Gullied treeless slopes had become carefully terraced fields, extensive water conservation activities had been introduced, and the district had become more wooded, even though the population was five times larger than it had been in the 1930s. The authors of the study present a compelling argument that these improvements did not occur *despite* population growth, but largely *because* of them as the increasing population triggered a process of agricultural intensification. (This involves increases in labour inputs per unit of land, the creation of agricultural capital in the form of soil/water conservation structures or irrigation systems, and changes in land management.¹¹⁹) Pressure on land made it more valuable, thus increasing the incentives to invest in and practise conservation measures, and to adopt new technologies. It is most unlikely that intensification would have occurred un-

der low population densities, because 'shifting cultivation and migratory grazing represented a more productive use of scarce labour'.¹²⁰ High population densities also made it more economical to provide infrastructure that would facilitate access to markets and encourage innovation.

As John Mortimore told the environmental journalist Fred Pearce: 'Conservatory land-use methods are labour-intensive. Terracing, tree planting, distributing manure or fertilisers are not consistent with low population density. There is an inherent contradiction in calling simultaneously for intensified, conservatory land use and for family planning'.¹²¹ Pearce notes, rather archly, that even though Nairobi is the headquarters of the United Nations Environment Programme, there is no evidence that its scientists have ever 'investigated the success story on their doorstep'.¹²²

The obvious question is the extent to which the Machakos results are replicable elsewhere. Intensification is not an inevitable response to increasing population, because it does have its costs. Discussing a very densely populated region around Kano in Nigeria which exemplifies many of the characteristics of the Machakos experience, Mortimore and W.M. Adams note that intensification becomes attractive when the returns from additional labour on existing lands are greater than the returns of acquiring and clearing new land; where there are 'point' resources, such as specific irrigation projects; or where appropriate market conditions exist.¹²³

Certainly, Machakos's relative proximity to Nairobi also enabled the Akamba farmers to take advantage of market opportunities, as well as giving them access to non-farm employment which, through remittances and circulating labour, provided a source of capital for agricultural and business investment. Travel to Nairobi and elsewhere also provided them with new knowledge: 'Akamba innovators interacted with a greater stock of existing ideas. It also gave a great stimulus to investment in schools, institutions which store and transmit knowledge'.¹²⁴ The study's authors state that the Akamba's capacity to adapt constructively to growing constraints and new opportunities were underestimated in the past, when they were subject to pressures to act in accord with what government officials thought best for them, and suggest that the same is true of many other Third World peoples.

Mortimore and Tiffen argue that Machakos was not a 'miracle', but the consequence of increasing population density occurring in conditions of 'peace and security for trade and investment and a marketing and tenure system in which the benefits of

these are widely shared', and where the system of property rights ensure 'that the investors and their children may reap the rewards of foresight'.¹²⁵ They note that comparative studies in other parts of tropical Africa, and particularly in the semi-arid zone in the west, east and south of the continent, indicate that the Machakos experience is likely to have wider applicability.¹²⁶ As Mortimore observes elsewhere, the conventional wisdom that population pressure in sub-Saharan Africa causes environmental decline is now being challenged by an increasing number of empirical studies.¹²⁷

So those who are concerned about environmental degradation in Africa and other Third World regions would be better served by focusing attention on the institutional reforms that enhance property rights and strengthen markets than on 'overpopulation'. Unfortunately, it is a dislike of private property rights and market relationships that has made at least a substantial number of Western environmentalists take up their cudgels in the first place.

THE FERTILITY REVOLUTION

One of the most remarkable events over the past three decades has been the rapid decline in fertility rates over most of the world. United Nations estimates indicate that the total fertility rate (TFR) for the world as a whole was about 5 children per woman in 1950-5, and that this figure had dropped to around 3.1 by 1990-5. For the less developed countries, which currently account for 97 per cent of the world's population increase,¹²⁸ the decline was even more marked, with the TFR falling from 6.2 to 3.5.

Certainly these figures conceal very wide variations between countries and regions. The most substantial declines have been in Asia (5.9 to 3.0) and Latin America (5.9 to 3.1), and up until the early 1990s it seemed as though there had been very little, if any, decline in sub-Saharan Africa.¹²⁹ But with the 1994 Revision of its *World Population Prospects*, the United Nations Population Division noted that 'evidence is growing that a broad-based fertility decline may have begun in sub-Saharan Africa'.¹³⁰

The fertility decline was completely unexpected. As Nicholas Eberstadt observes,

demographers were unable to predict either the transnational postwar baby boom or the subsequent shift to a sub-replacement fertility level in every country of the Organisation for Economic Co-operation and Development

(OECD).¹³¹ As for developing countries, demographers have been unable to forecast either the onset of fertility decline or the trajectory it follows, once it begins.¹³²

Indeed, even as the decline was underway, demographers initially failed to notice it. In a 1973 study, Ansley Coale, a leading demographer whose arguments that population growth hampered economic growth in developing countries helped make

MANY DIRECT ATTEMPTS TO ALTER PEOPLE'S FERTILITY BEHAVIOUR ARE AT BEST PATERNALISTIC PROPAGANDA, WHICH MAY BE LARGELY INEFFECTIVE AND EVEN COUNTERPRODUCTIVE

birth control an important part of US foreign aid policy,¹³³ 'found little evidence of a fertility decline in the developing world except in several small countries with populations of Chinese origin.' It is now known, however, that in

the decade from 1965 to 1975, world birth rates decreased by about 13 per cent, with declines occurring in 127 countries.¹³⁴

This points to a fundamental difficulty with population projections. There is simply no accurate method for predicting what birth rates—or death rates—will be for a particular country, or the world as a whole.¹³⁵ Nevertheless, on the best evidence that is now available to us, it is clear that the 'overpopulation crisis' is increasingly running out of steam, as fertility rates decline in nearly every country of the world. (Of the 143 countries or regions in which TFR figures are available for two different periods from the United Nations Population Division World Wide Web database, only 3—Togo, Finland and the Gaza Strip—have shown no decline, with figures for the first two remaining stable.¹³⁶) The most recent estimates from the United Nations Population Division are that in 1995–2000 the TFR will be at or below the replacement level of around 2.1 per woman¹³⁷ in 61 countries—ten more than in 1990–95. The combined population of these countries is 44 per cent of the world's population.¹³⁸

In *World Population Prospects: The 1996 Revision*, which is the latest published version of the United Nations biennial attempt to outline future demographic

trends, the low variant projection anticipates zero overall population growth by the year 2040 when the world's population would be between 7.7 and 7.8 billion people. This is less than 2 billion more people than are alive today. Thereafter, the population would begin to shrink, with 7.7 billion projected for the year 2050 and 5.6 billion for 2100. In the medium variant projection, which the United Nations states is 'usually considered as "most likely"'¹³⁹—although at least some commentators think that continuing fertility declines mean that the low variant is more likely¹⁴⁰—the world's population would be 9.4 billion in 2050, 10.4 billion in 2100, and would stabilise at around 11 billion a century later.¹⁴¹ In the most recent revision—which will be published next year, although the major results were announced on 28 October 1998—these figures have come down significantly, due to larger than expected fertility declines in many countries. The low variant projection is for 7.3 billion people by 2050, and the medium variant is for 8.9 billion. Table 5 (below) illustrates the declines in projected 2050 world population levels over the past four years.

There is little consensus about the reasons for the massive turnaround in world fertility patterns, and single-factor explanations are invariably confounded by counter-examples, or by the very wide range of social and economic conditions prevailing in the different countries where these turnarounds have occurred. As Eberstadt points out, even the apparently plausible attempts to explain the phenomenon in terms of modernisation theories have to account for the fact that late-eighteenth-century France was the first country in world to commence a long-term fertility decline, despite it being 'impoverished, overwhelming agrarian, predominantly illiterate and devoutly Catholic' at the time.¹⁴³ Similarly in Italy, Spain, Hungary and Bulgaria, 'birthrates turned downward while the societies remained predominantly agrarian and illiterate'.¹⁴⁴ In parts of Asia, substantial declines in birth rates also began before industrialisation and economic development, and

Table 5: United Nations World Population Projections for the Year 2050¹⁴²

Version	Low Variant	Medium Variant	High Variant
1994 Revision	7.9 billion	9.8 billion	11.9 billion
1996 Revision	7.7 billion	9.4 billion	11.2 billion
1998 Revision	7.3 billion	8.9 billion	10.7 billion

before the implementation of intensive national family planning programmes.¹⁴⁵

Robert Kates distinguishes four kinds of arguments that are commonly invoked to explain fertility decline:

- 1 Changes in the economic costs and benefits of having children as the need for child labour and children's support in old age declines, while the importance of providing education for children increases;
- 2 Substantial reductions in child mortality allow parents to achieve desired family size with fewer births;
- 3 Improved education and outside work opportunities for women reduce the incentives to have large numbers of children;
- 4 Access to modern birth-control techniques allows families to achieve their desires for smaller families more effectively than did traditional techniques.¹⁴⁶

A great deal of debate, not all of it disinterested, surrounds the role of family planning programmes and new methods of contraception in triggering fertility declines. Kates notes that a number of cross-national studies have claimed that increases in economic development can account for about two-thirds of the decline in fertility, with organised family planning accounting for an additional 15–20 per cent. Few of these studies, however, have considered other cultural factors. And some analysts think that the 15–20 per cent figure greatly overstates the effects of family planning programmes, arguing that 'at least 90 per cent of the variations in fertility levels in developing countries in the postwar era can be explained by differences in the desired levels of fertility reported by local women'.¹⁴⁷ Where women say they want many children, they are likely to have many children. Although in general, national figures indicate that women give birth to more children than they actually say they want, the proportion of such 'unwanted' births is no greater in countries with comparatively high fertility rates and low contraceptive use, than in countries with comparatively low fertility rates and high contraceptive use. (Part of the reason for this, at least in countries where fertility rates are falling, is that there is a time lag between the two relevant sets of data, with the actual fertility rates being calculated for the five-year period before the survey about desired fertility takes place.¹⁴⁸) 'Fertility falls because women decide they want smaller families, not because they have fewer unwanted children.'¹⁴⁹

These decisions about desired family size are an outcome of women and their husbands considering

their social, economic and cultural circumstances. New cultural influences and attitudes about child-bearing and women's rights fostered through the expansion of local, national and international channels of communication obviously play an important part in changing people's ideas about the number of children they would like to have.¹⁵⁰ Some of these influences are indirect and/or benign, and do not compromise dignity or freedom. And there can be no question that providing women and men throughout the world with safe and effective means of achieving their desired family size is a most worthwhile objective, whether this involves easy access to contraceptives, or the provision of appropriate natal services.

But such beneficial services can be provided independently of heavy-handed population policies which attempt to intervene in private matters which should be beyond the purview of the state or other outside organisations, particularly those from powerful Western nations. There is no evidence to suggest that families in developing countries are any less likely to make sensible decisions about the matters that are most intimately involved with their own lives than are people in the industrialised world.¹⁵¹ Many direct attempts to alter people's fertility behaviour are at best paternalistic propaganda, which may be largely ineffective and even counter-productive. At worst, they may involve various degrees of pressure and coercion which shade into serious assaults on human rights.¹⁵² It is one of the ironies of our times that many of the very people who are most vocal in urging respect for cultural differences and the value of indigenous knowledge, regard it as totally legitimate to pressure Third World women and men into believing that they are wrong in their assessments of their own individual circumstances, and irresponsible in wanting large families.

CONCLUSION

In the past half century, as the supposed justifications for population control policies have progressively lost some of their allure, they have undergone various transformations—from claims that 'overpopulation' hinders economic growth in developing countries, to Malthusian claims about insufficient food supplies and other forms of resource depletion, to claims that continuing population growth will bring about an ecological catastrophe.

As the Australian demographer Geoffrey McNicoll has commented,

If the economic case for birth control is held to be weak, environmental arguments can be substituted. Or demography can be dispensed with altogether, goals being defined in terms of reproductive health and women's autonomy.¹⁵³

After the 1994 Cairo International Conference on Population and Development, population control has been repackaged as women's empowerment. This is partly an attempt to sustain a re-assembled alliance between population controllers and Western feminists, who for some decades had been critical of international birth control programmes.¹⁵⁴ It also helps the population controllers to regain some of the moral high ground that they lost because of the abuses that were being carried out in their name, and the increasing signs that the 'crises' they were trumpeting were greatly overstated. Nevertheless, as a number of observers have noted, even though the phrase 'population problem' does not appear in the Programme of Action adopted at Cairo, the familiar neo-Malthusian refrain about the harmful effects of population growth on economic development and the environment runs through much of the document.¹⁵⁵ There are few grounds for thinking that people 'on the ground' in the developing world will really see much difference in the programmes attempting to press them into having smaller families. Nor are there any signs that the population advocacy groups are modifying their warnings about the dire threats that 'overpopulation' supposedly represents.

Australian commentators are presently criticising the government for supposedly pandering to Senator Harradine and cutting funding to international family planning and population programmes.¹⁵⁶ In fact, the government has probably

not gone far enough, and should seriously consider ending all funding to these programmes. The recent experience with the 'stolen generations' issue should provide a warning that programmes undertaken with good intentions may look very different from the perspective of their supposed beneficiaries. Some Third World intellectuals and activists, as well as others, have long argued that population control is a form of genocide, basing their claims on article II (d) of the United Nations Genocide Convention, which covers the imposition of measures intended to prevent births within a national, ethnic, racial or religious group.¹⁵⁷ As improbable as such accusations might seem at present, some of the material I presented earlier indicates that it is not too difficult to make out a case that significant sections of the population control movement really are motivated by a barely-suppressed fear that there are simply too many non-Europeans in the world.

Certainly, as I explained in a recent *Quadrant* article, arguments that the population control advocates are promoting genocide are more compelling than the arguments the 'Stolen Generations' inquiry presented to support its claim that Australian governments had committed genocidal actions by removing Aboriginal children from their parents.¹⁵⁸ Given that the 'Stolen Generations' inquiry's claim has been accepted by many in the media, churches and universities, and intellectuals' seemingly irrepressible desire to find new grounds for condemning Australia, it is not unreasonable to expect a clamour sometime in the future for an inquiry into the genocidal aspects of Australia's support for overseas population programmes. And if past experience is any guide, some of those who are now most active in advocating support for population control will be the ones who will be leading the cry.

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ENDNOTES

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