The imperative of "stabilising human population": myths and realities

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International Policy Network

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The imperative of "stabilising human population": myths and realities[1]

The imperative of "stabilising world population": a widely accepted notion

A demographic spectre is haunting authoritative and influential circles in both the United States and the international community. This spectre is the supposed imperative to "stabilise human population".

The quest to "stabilise human population" (or to "stabilise world population", or sometimes just "stabilise population") was formally launched on the global stage in 1994 by the United Nations at its Cairo Conference on Population and Development, whose "Programme of Action" intoned that "intensified efforts" to this end were "crucial" given the "contribution that early stabilisation of the world population would make towards the achievement of sustainable development".[2] That objective is today embraced by a panoply of subsidiary institutions within the "UN family", including the United Nations Environmental Programme (UNEP), the United Nations Children's Fund (UNICEF), and the United Nations Population Fund (UNFPA), which explicitly declared its mission in 2002 to be the promotion of the "universally accepted aim of stabilising world population".[3]

Closer to home, the goal of "stabilising human population" is championed by a broad network of population and environmental advocacy groups, including most prominently Planned Parenthood and the Sierra Club (the latter of which has established "stabilising world population" as goal #4 of its "21st Century agenda".[4] The objective, however, is not merely proclaimed by an activist fringe; to the contrary, it is broadly shared by many elements of what might be called the American "establishment". "Stabilising world population", for example, is now a programmatic effort for most of the prestigious multi-billion dollar American philanthropic organisations that commit their resources to "international population activities". This list includes – but is not limited to – the Ford Foundation, the Hewlett Foundation, the MacArthur Foundation, the Packard Foundation, and the Rockefeller Foundation.

Further, "stabilising world population" is a prospect that has been welcomed and financially supported by many of America's very most prominent and successful captains of industry: among them, self-made multi-billionaires Ted Turner, Warren Buffet, and Bill Gates. The propriety – or necessity – of "stabilising global population" has been expounded by a wide array of respected writers, spokespersons, and commentators in the US media. Politically, the goal of "stabilising world population" is officially approved by USAID (America's foreign aid apparatus). And the quest to "stabilise world population" is championed in the United States by political figures who are both influential and widely popular: one of America's most passionate and outspoken exponents of "world population stabilisation", former Vice President Al Gore, very nearly won the presidency in the closely contested 2000 election.

What, exactly, does "stabilising human population" actually mean? Though the objective is widely championed today, the banner itself is somewhat misleading, for advocates of "stabilising population" are in fact not concerned with *stabilising* human numbers.

If they were, one would expect champions of "population stabilisation" to turn their attention to the outlook for Europe and Japan, where populations are currently projected to drop significantly over the next half-century.[5] On a more immediate front, human numbers have entered into an abrupt and as yet unchecked decline in the Russian Federation over the past decade:

in 2006 alone, that country suffered almost 700,000 more deaths than births.[6] Yet virtually no supporters of "population stabilisation" have agitated for coordinated measures to lower Russia's death rate, raise its birth rate, and staunch its ongoing demographic losses.

The reason for such seemingly curious insouciance about demographic decline by self-avowed population "stabilisers" is that their chosen standard does not quite describe their true quest. For exponents of "stabilising human population" do not simply look for population stabilisation: rather, as the former Executive Director of the UNFPA framed the goal, they strive "for stabilisation of world population at the lowest possible level, within the shortest period of time".[7]

Upon inspection it is apparent that "stabilising human population" is really code language: a new name for an old and familiar project. Today's call for "stabilising human population" is actually a rallying cry for anti-natalism. After all: its envisioned means of achieving "stabilisation" is through limiting the prevalence and reducing the level of childbearing around the world, especially in the Third World: implementing policies to reduce births, and thereby depressing fertility in various venues around the globe (and particularly where fertility levels are deemed to be "unacceptably" high).

The ongoing anti-natal population crusade couches its arguments in the language of social science and invokes the findings of science to bolster its authority – but it cannot withstand the process of empirical review that lies at the heart of the rational scientific method. Whether they realise it or not, advocates of "world population stabilisation" are devotees to a doctrine, not followers of facts.

The premises of "world population stabilisation"

Reduced to its essence, the case for action to "stabilise world population" rests upon four specific premises.

The first quite simply holds that we are manifestly in the midst of a world population crisis: a crisis defined by rapid population growth, which in turn is exacerbating "overpopulation". Former Vice President Gore nicely illustrated this tenet of thinking in his best-selling book, *Earth In The Balance*, and elsewhere, when he stated that in today's global population trends, "the absolute numbers are staggering"[8]; and that, "we can't acquiesce in the continuation of a situation that adds another… China's worth of people every decade".[9] Jared Diamond, author of *Collapse- How Societies Choose to Fail or Succeed,* reiterates a similar argument: "The statement about our ability to absorb current rates of population growth indefinitely is not to be taken seriously… because that would mean 10 people per square yard in the year 2779".[10]

The second premise underpinning the "population stabilisation" project is that current rates of world population growth are not only unsustainable over the long term, but have direct and immediate adverse repercussions upon living standards, resource availability and even political stability today. In the estimate of the Planned Parenthood Federation of America, for example, "Slowing population growth helps poorer countries develop politically and economically".[11] Jared Diamond is more vivid: he enumerates the consequences of population growth as "food shortages, starvation, wars among too many people, fighting for too few resources and overthrows of governing elites by disillusioned masses".[12] He lists overpopulation as the key cause for the "collapse" of past societies, such as the Mayas, as well as for recent civil wars and mass violence in countries such as Haiti and Rwanda.[13]

The third premise implicit in the agenda of "stabilising human population" is that reduced birth rates constitute the solution to the population problems adduced by premises one and two. The fourth and final premise bolstering this agenda is the presumption that well-placed decision-makers makers can effectively and expeditiously engineer the desired changes in worldwide population patterns through deliberate policy interventions. Once again, Al Gore may have represented this presumption best: in his words, "we know how to stabilise world population"[14], because "population specialists know"[15].

Unfortunately, all of these premises are highly problematic. None of them are self-evidently true. To the extent that any of these separate premises are testable, it would appear that they are demonstrably false.

"Overpopulation": a problem mis-defined

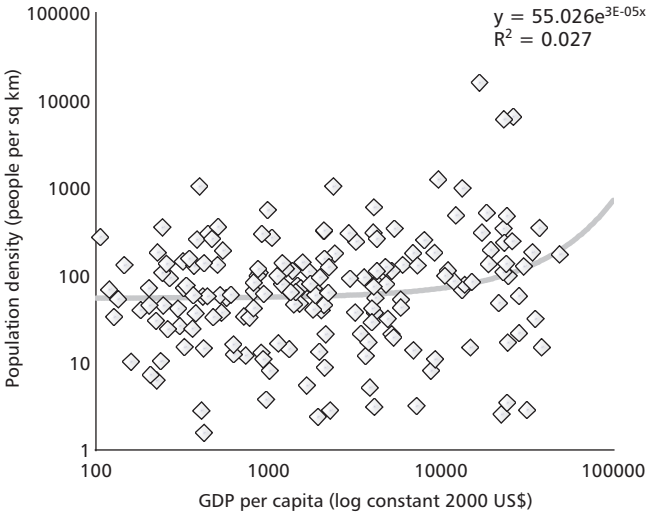
Consider the first premise: that the world faces a crisis of being burdened by simply too many people. If that premise is offered as an aesthetic judgment, it is irrefutable. (By their very nature, subjective opinions are not falsifiable.) But how does it fare if treated as a testable proposition?

Jared Diamond associates overpopulation with "more deforestation, more toxic chemicals, more demand for wild fish, etc",[16] while Gore writes that an "overcrowded world is inevitably a polluted one"[17] – a verdict that many of those worried about world population growth would accept without reservation. But "overcrowding" is not as easily established as some might suppose.

Population density, for example, might seem to be a reasonable criterion for overcrowding. By that criterion, Haiti, India, and Rwanda (each with over six times the world's average population density) would surely qualify as "overcrowded", and Bangladesh – with almost twenty times the inhabited globe's average density – would be manifestly "overcrowded". By that same criterion, however, Belgium (2000 population density per square kilometre: 336) would be distinctly more "overcrowded" than Rwanda (2000 population density per square kilometre: 289). Similarly, the Netherlands would be more "overcrowded" than Haiti, Bermuda would be more "overcrowded" than Bangladesh, and oil-rich Bahrain would be three times as "overcrowded" as India. But the most "overcrowded" country in the world would be Monaco: with a dire 33,268 persons per square kilometre in 2000, it suffers a population density almost forty times that of Bangladesh, and over seven hundred times the world average.[18] Yet as we all know, population activists do not agitate themselves about the "overcrowding" problem in Monaco – or in Bermuda, or in Bahrain.

Moreover, it is hardly self-evident that there is any association at the international level between population density and economic performance (see Figures 1 through 4, which are specifically drawn from data compiled by the World Bank in its compendium of *World Development Indicators*; although other databases could be used to much the same effect.)

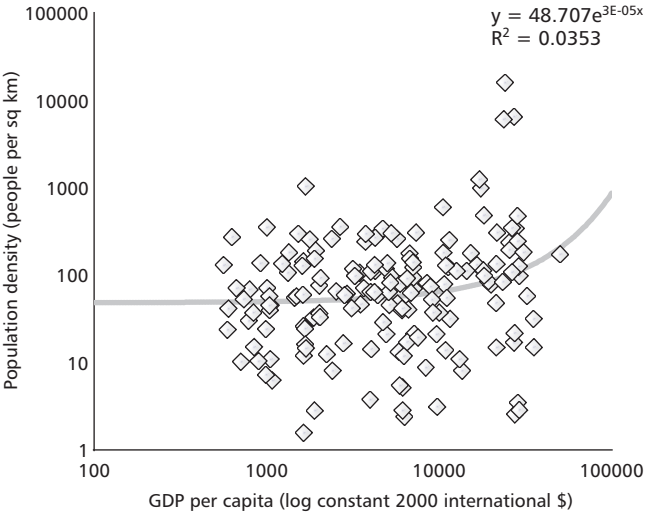
Figure 1 **Population density vs GDP per capita** 2003



Source: World Development Indicators 2007

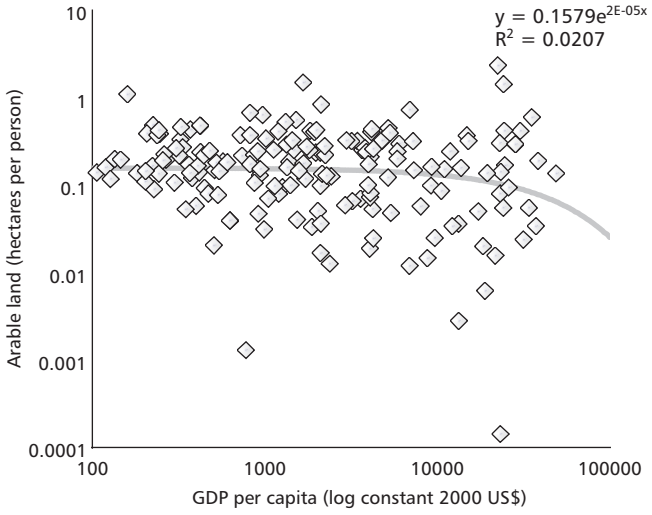
As Figures 1 and 2 attest, there was no discernable international relationship between overall national population density and a country's per capita GDP in the year 2003 (the most recent year for which such data are

Figure 2 **Population density vs GDP per capita** 2003



Source: World Development Indicators 2007

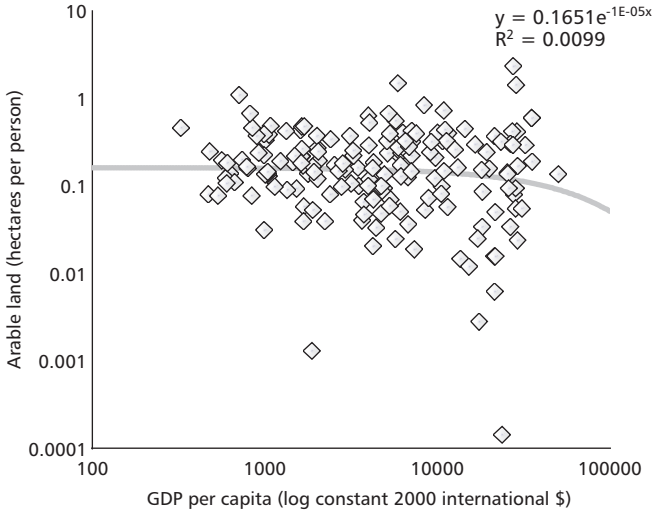
Figure 3 **Arable land vs GDP per capita**
2003



Source: World Development Indicators 2007

currently available), regardless of whether one measured per capita output on an exchange-rate basis or in terms of "purchasing power parity" (i.e., "international" dollars). The same holds true for the density of

Figure 4 **Arable land vs GDP per capita**
2003



Source: World Development Indicators 2007

population with respect to arable land: by the data in Figures 3 and 4, it is impossible to distinguish any meaningful association – positive or negative – between a country's per hectare output level and the number of people "supported" by each local hectare of farm – or pasture – land. Surprising as it may sound to those convinced that the world is beset by "overpopulation", the fact is that in our era, *population density provides us with no information whatsoever for predicting a country's level of economic development or economic performance*.

Do other demographic measures provide a better reading of the population problem that so many take to be so very obvious today? Perhaps we might look at rates of population growth. At the dawn of the 21st century, sub-Saharan Africa was estimated to have the world's very highest rate of population growth – the United Nations Population Division put its pace at just under 2.5 per cent a year for the period 2000/2005 [19] – and sub-Saharan Africa is clearly a most troubled area these days. However, if we look back in history, we will discover that the United States had an even higher rate of population growth at the end of the 18th century: in the decade 1790–1800, in fact, the U.S. pace of population growth was 3.0 per cent a year.[20] Some today may believe that sub-Saharan Africa has too many people – but would they say the same about early frontier America?

Fertility rates are hardly more illuminating. In *Earth In The Balance*, Gore expressly mentions Egypt, Kenya, and Nigeria as candidates for places with too many people (either today or in the decades immediately ahead).[21] All three countries are thought to experience fertility levels above the current world average. According to the latest (August 2006) projections by the U.S. Census Bureau, as of 2007 the total fertility rate (births per woman per lifetime under prevailing childbearing schedules) for the world as a whole was about 2.6, as against 2.8 in Egypt, 4.8 in Kenya, and 5.5 in Nigeria.[22] But once again: fertility levels were far higher in the United States in the early years of the Republic than in any of these places today. Around 1800, according to estimates by the demographer Michael Haines, the total fertility rate for white Americans was just over *seven* births per woman per lifetime [23] – yet Thomas Jefferson's America is not today widely regarded as a society in the throes of a population crisis.

We could continue combing for demographic measures that might help to clarify the nature, and pinpoint the epicentres, of the population crisis that Al Gore, Jared Diamond and so many others envision. But as our exercise should already indicate, that would be a fruitless task. Additional demographic criteria will confront the same problem of obvious misidentification of presumptive regions suffering from "too many people" because *demographic criteria cannot by themselves unambiguously describe "overpopulation"*. This is a basic fact, recognised by every trained demographer. And that basic fact raises correspondingly basic questions about the concept of "overpopulation".

The "population crisis" that advocates of "world population stabilisation" wish to resolve is impossible to define in demographic terms because it is a problem that has been mis-defined. In most people's minds, the notions of "overpopulation", "overcrowding", or "too many people" are associated with images of hungry children, unchecked disease, squalid living conditions, and awful slums. Those problems, sad to say, are all too real in the contemporary world – but the proper name for those conditions is *human poverty*. And the correspondence between human poverty and demographic trends, as we shall see in a moment, is by no means as causal and clear-cut as some would suppose.

If we are to make inroads against the problems of humanity, it is important that we begin by calling those problems by their proper names. The problem of global poverty, in and of itself, cannot in an empirical sense be defined as a "world population crisis" – unless one means it is a crisis that so many people today should be suffering from poverty. But it is a fundamental lapse in logic to assume that poverty is a "population problem" simply because it is manifest today in large numbers of human beings. The proper name for that logical error is "the fallacy of composition".

Population growth, development, and political stability

Let us now consider the second premise of "world population stabilisation": that rapid population growth and high fertility levels cause or exacerbate poverty, resource scarcity, and political instability. If we wish to treat this premise as an empirically testable proposition (rather than an unchallengeable tenet of faith), we will recognise immediately the complexity of the processes we propose to observe. The relationships between population change and economic or political change encompass an extraordinarily broad and complicated set of interactions with an array of multi-directional influences, and consequential second-, third- and even higher-order impacts.

Describing these interactions comprehensively and accurately is a tremendous and subtle challenge. And researchers who have approached this challenge with care and objectivity have typically described the economic impact of demographic changes in nuanced and qualified terms. Typical of such work are the findings of econometrician Dennis Ahlburg, who concludes that "it is not clear whether population growth causes poverty in the long run or not, [although] high fertility leading to rapidly growing population will increase the number of people in poverty in the short run".[24] Development economist Robert Cassen accurately describes the state of current research when he notes "the issue of whether per capita economic growth is reduced by population growth remains unsettled. Attempts to demonstrate such an effect empirically have produced no significant and reliable results…"[25]

Even so: we need not rely upon the judgments of experts, or attempt to replicate their efforts at model-building, to appreciate the flaws inherent in this premise.

We can begin by recalling the reason for the 20th century's "population explosion". Between 1900 and 2000, human numbers almost quadrupled, leaping from around 1.6 billion to over 6 billion;[26] in pace and magnitude, nothing like that surge had ever previously taken place. But why exactly did we experience a world population explosion in the 20th century? It was not because people suddenly started breeding like rabbits – rather, it was because they finally stopped dying like flies.

Between 1900 and the end of the 20th century, the human life span likely doubled: from a planetary life

Table 1 **Estimated life expectancy at birth** (both sexes)

	1950/ 55	*2000/ 2005*	*Absolute change (years)*	*% change*
World	46.4	66.0	19.6	42%
Developed countries	66.1	75.6	9.5	14%
Developing countries	40.8	64.1	23.3	57%
Latin America and Caribbean	51.4	72.0	20.6	40%
Asia	41.0	67.5	26.5	65%
Sub Saharan Africa	36.7	48.8	12.1	33%
Memorandum items:				
Russia	64.5	64.8	0.3	0%

Source: UN World Population Prospects, 2006 revision

Table 2 **Estimated infant mortality at birth** (both sexes)
Deaths per 1,000 live births

	1950/ 55	*2000/ 2005*	*Absolute change (years)*	*% change*
World	153.1	53.9	-99.2	-65%
Developed Countries	59.1	7.5	-51.6	-87%
Developing Countries	175.0	59.0	-116.0	-66%
Latin America and Caribbean	126.2	25.4	-100.8	-80%
Asia	176.0	48.6	-127.4	-72%
Sub Saharan Africa	177.4	99.8	-77.6	-44%
Memorandum Items:				
Russia	97.5	17.2	-80.3	-82%

Source: UN World Population Prospects, 2006 revision

expectancy at birth of perhaps thirty years[27] to one of well over sixty years.[28] By this measure, the overwhelming preponderance of the health progress in all of human history took place during the past hundred years.

Over the past half-century, worldwide progress in reducing death rates has been especially dramatic. Tables 1 and 2 underscore this important fact. Between the early 1950s and the first years of the 21st century, according to estimates by the United Nations Population Division (UNPD – not to be confused with UNFPA), the planetary expectation of life at birth jumped by almost 20 years, or over two-fifths: from about 46 years to 65 years. For the low income regions, the leap was even more dramatic: taken together, estimated life expectancy in these "developing countries" surged up by 23 years, a rise of nearly three-fifths. Even troubled sub-Saharan Africa – despite its protracted post-independence-era political and economic turmoil and the advent of a catastrophic HIV/AIDS epidemic – is thought to have enjoyed an increase in local life expectancy of roughly a third. (Practically the only countries to register no appreciable improvements in life expectancy over this period were the handful of "European" territories within what was once the Soviet Union; in the Russian Federation in particular, gains over these four and a half decades were negligible.)

Among the most important proximate reasons for the global surge in life expectancy was the worldwide drop in infant mortality rates. In the early 1950s, according again to UNPD estimates, 153 out of every 1000 children born around the world did not survive their first year of life; by the start of the new century, that toll was down to 54 per 1000. In "developed" countries, infant mortality is thought to have fallen by seven-eighths during those decades, and by almost two-thirds in the collectivity of "developing" countries. Even in troubled regions, great advances in infant survival were achieved: in sub-Saharan Africa, for example, the infant mortality rate is thought to have declined by over two-fifths, and Russia's infant mortality rate may have declined by over 80 per cent.

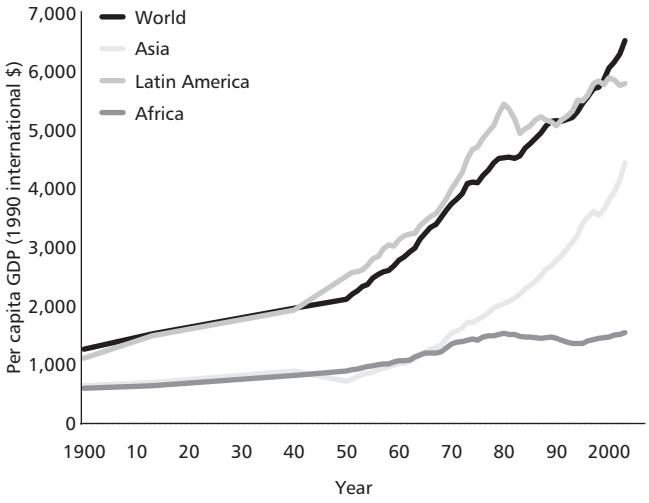
These sweeping and radical declines in mortality are entirely responsible for the increase in human numbers over the course of the 20th century: the "population explosion", in other words, was really a "health explosion".

Now, with respect to economic development, the implications of a health explosion – of *any* health explosion – are, on their face, hardly negative. Quite the contrary: a healthier population is clearly going to be a population with greater productive potential. Healthier people are able to learn better, work harder, and engage

in gainful employment longer and contribute more to economic activity than unhealthy, short-lived counterparts. Whether that potential actually translates into tangible economic results will naturally depend on other factors, such as social and legal institutions, or the business and policy climate. Nevertheless: the health explosion that propelled the 20th century's population explosion was an economically auspicious phenomenon rather than a troubling trend.

All other things being equal, one would have expected the health explosion to contribute to the acceleration of economic growth, the increase of incomes, and the spread of wealth. And as it happens, the 20th century witnessed not only a population explosion, and a health explosion, but also a "prosperity explosion". Estimates by the economic historian Angus Maddison, who has produced perhaps the most authoritative reconstruction of long-term global economic trends presently available, demonstrate this (figure 5).[29]

Figure 5 **Estimated per capita GDP**
World and selected regions, 1900–2003



Source: Angus Maddison, "Historical Statistics for the World Economy: 1–2003 AD," Table 3: Per Capita GDP, available at http://www.ggdc.net/maddison/, accessed May 8, 2007

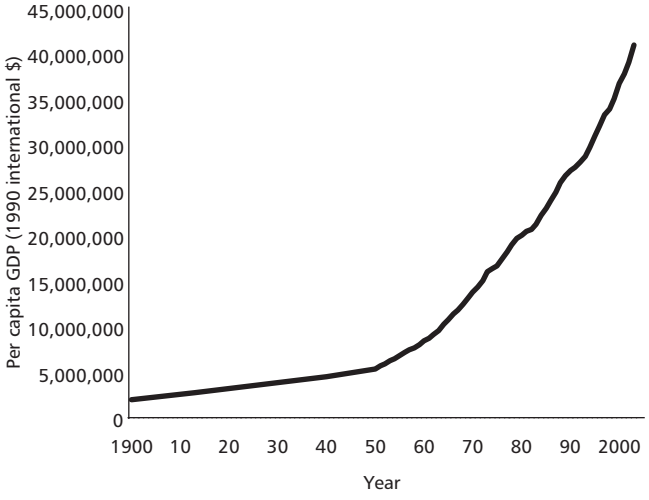
Between 1900 and 2003, by Maddison's reckoning, global GDP per capita (in internationally adjusted 1990 dollars) more than quintupled. Gains in productivity were globally uneven: in both relative and absolute terms, today's OECD states enjoyed disproportionate improvements. Nonetheless, every region of the planet became richer. Africa's economic performance, according to Maddison, was the most dismal of any major global region over the course of the 20th century: yet even there, per capita GDP was approximated to be over two and a half times higher in 2003 than it had been in 1900.[30]

Suffice it then to say that the 20th century's population explosion did not forestall the most dramatic and widespread improvement in output, incomes, and living standards that humanity had ever experienced. Though severe poverty still endures in much of the world, there can be no doubt that its incidence has been markedly curtailed over the past hundred years, despite a near-quadrupling of human numbers.

Maddison's estimates of global economic growth highlight another empirical problem with the second premise of the "population stabilisation" project. With a near-quadrupling of the human population over the course of the 20th century, and a more than four-fold increase in human GDP per capita over those same years, global economic output has taken an absolutely amazing leap: Maddison's own figures suggest world GDP might have been over 18 times higher in 2000 than it was in 1900, and over 20 times higher by 2003 (figure 6). But GDP is a measure of economic output – and for the world as a whole economic output and economic demand must be identical. If the demand for goods and services multiplied nearly twenty-fold during the 20th century, humanity's demand for, and consumption of, natural resources has also rocketed upward. But despite humanity's tremendous new pressures on planetary resources the relative prices of virtually all primary commodities have *fallen* over the course of the 20th century – for many of them, quite substantially.

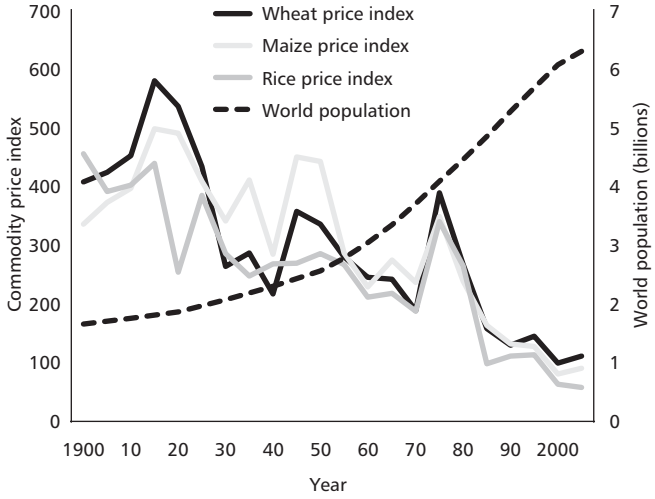
Despite the tremendous expansion of the international grain trade over the past century, for example, the inflation-adjusted, dollar-denominated international price of each of the major cereals – corn, wheat and rice – fell by over 70 per cent between 1900 and 2000 (figure 7).[31] Over the course of the entire 20th century, the long-term trend in real prices for each of these cereals was a decline averaging over one percentage point per year. By the same token: The *Economist* magazine's "industrials price index" – a weighted composite for 14

Figure 6 **Estimated global GDP**
1900–2003



Source: Angus Maddison, "Historical Statistics for the World Economy: 1–2003 AD," Table 3: Per Capita GDP, available at http://www.ggdc.net/maddison/, accessed May 8, 2007

Figure 7 **World population vs. prices of wheat, maize, and rice**
1900–2003



Sources: Commodity Price Indices: 1900–1984 compiled from World Bank data by Enzo R. Grilli and Maw Cheng Yang, World Bank; data for 1985–2003 compiled from World Bank data by Stephan faffenzeller, University of Nottingham. (Adjusted for CPI inflation.) The author thanks Stephan Pfaffenzeller for providing this data. World population: U.S. Bureau of the Census

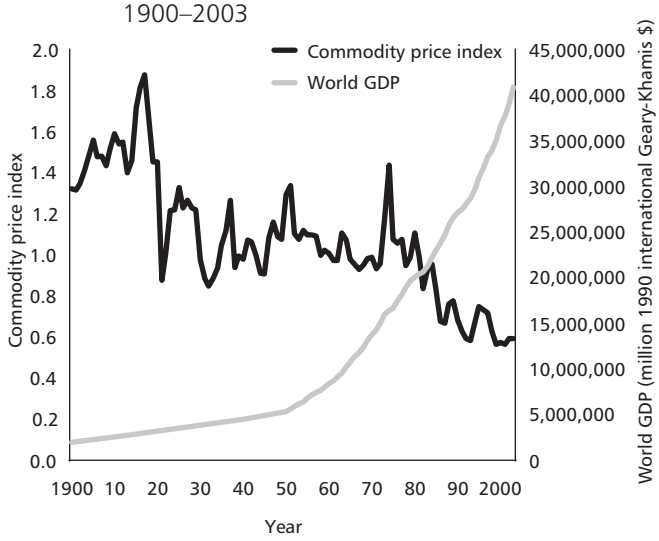
internationally-traded metals and non-food agricultural commodities [32] – registered a decline in inflation-adjusted dollars of almost 80 per cent between 1900 and the very end of 1999.[33] Perhaps the most comprehensive index of long-term real primary commodity prices was the one constructed by Enzo Grilli and Maw Cheng Yang in 1988, and subsequently updated and extended by Stephan Pfaffenzeller and colleagues in 2007. [34] This series encompassed 24 internationally-traded non-fuel primary commodities. Grilli and Yang's initial calculations extend from 1900 only up to 1986, but their results were nevertheless arresting. For that 86-year period, Grilli and Yang found that real prices (deflated by the value of manufactured products) of non-fuel primary commodities – renewable resources like cereals, and non-renewable resources such as metals – fell substantially, trending downward by an average of 0.6 per cent per year. When the series is extended to the beginning of the 21st century, Pfaffenzeller and his colleagues found, the long-term rate of decline in commodity prices accelerated somewhat, to around 0.8 per cent a year. Suffice it to say that the Grilli-Yang commodity price index entered the 21st century nearly 60 per cent lower than the level it recorded for the year 1900 (see figure 8).[35]

The paradox of exploding demand for resources and simultaneous pronounced declines in real resource prices will appear curious and compelling to any observer, but it should be especially arresting to those with essentially Malthusian sensibilities. In the most fundamental sense, after all, price data are meant to convey information about scarcity – and by the sorts of information that they convey, they would seem to be indicating that the resources used by humanity have been growing *less scarce* over the course of the 20th century. There are, to be sure, explanations for this paradox – but the "stabilisation" project's second premise, which holds that population growth must result in resource scarcity, is hardly able to provide it.

The dilemma can be stated even more starkly: if the presumptions incorporated in that premise regarding the interplay between population growth, living standards and resource scarcity were valid, the 20th century should not have occurred.

What about the supposed relationship between rapid population growth and political strife? The hypothesis that population growth could affect political stability is certainly worth entertaining. It is plausible, after all, to

Figure 8 **World GNP vs relative prices of primary commodities**
1900–2003



Sources: Commodity Price Index: Stephen Pfaffenzeller, "Supplementary Data," Grilli and Yang Data, http://www.stephan-pfaffenzeller.com (accessed June 22, 2007). Angus Maddison, "Historical Statistics for the World Economy: 1–2003 AD," Table 2: GDP, http://www.ggdc.net/maddison/ (accessed June 21, 2007)

conjecture that instability is more of a risk for governments that do not cope well with change – and population growth, whatever else it may be, is also inescapably a form of social change.

The vision of the link between rapid population growth and political de-stabilisation, however, is sometimes undercut by the very evidence adduced to support it. Take Gore's aforementioned attribution of the carnage in the former Yugoslavia in the early 1990s to rapid population growth. The problem with the argument is that the former Yugoslavia was characterised neither by especially rapid rates of population growth nor by particularly high levels of fertility.

Consider Bosnia and Herzegovina, which suffered war, horrific "ethnic cleansing" and other atrocities in the early 1990s. Over the three decades before pandemonium erupted (i.e., 1961–91), Bosnia-Herzegovina recorded a population growth rate of about 1 per cent a year – slower than the United States' 1.1 percent per annum rate over the same period, and barely half the average worldwide pace of 1.9 per cent during those years. Moreover, in 1991 – on the eve of its descent into chaos – Bosnia's estimated total fertility rate was 1.7 births per woman per lifetime – well below the replacement level. Estimates by the United Nations Population Division suggest that Bosnia-Herzegovina's fertility levels had been below replacement throughout the 1980s as well. The situation is little different in the other fragments of the former Yugoslavia. Fertility levels and population growth rates were even lower than Bosnia's in Croatia and Slovenia, and only marginally higher in Macedonia; Serbia's fertility level was slightly higher, but its rate of population growth was slightly lower.[36] (Today, incidentally, all the countries carved out of the former Yugoslavia report fertility levels far below the replacement.)[37]

One can only wonder: if the former Yugoslavia is an example of a region wrought by demographically-driven political turmoil, exactly how low are population growth rates supposed to fall, and birth rates to sink, before a region is safe from this purported menace? It is perfectly true that political conflict cannot take place without human populations – but it does not follow that the surest and soundest way of preventing political conflict is simply to prevent the existence of people in the first place.[38]

"World population stabilisation" through scientific population policies?

The third premise of "world population stabilisation" – that birth rates must be lowered to alleviate the world population crisis and to mitigate the adverse economic, resource, and political consequences of rapid population growth – requires absolutely no substantiation if one is a true believer in the anti-natalist creed. To the anti-natalist way of thinking, the purposeful reduction of birth rates (and especially birth rates in poorer regions) is an incontestably worthy policy objective – for to this way of thinking it is axiomatic that fewer births translates directly into benefits for present and future generations. For those who must be convinced that a problem exists before consenting to the public action proposed to redress it, that premise rests on his first two premises – and for the empirically inclined, as we have seen, those are shaky foundations indeed.

But even if we were convinced of the pressing need to take public action to lower global birth rates, it would

not necessarily follow that the desired result could be achieved – or achieved at an acceptable cost – or achieved voluntarily. Here lies the pivotal importance of the fourth premise of "world population stabilisation": for this tenet maintains that it is an established fact that "population specialists" know how international birth rates can be lowered, and that these specialists can consequently provide policymakers with reliable advice about the precise interventions that will bring about fertility declines.

But once again, the final premise underpinning the quest for "stabilising world population" is badly flawed. The plain fact is that students of contemporary and historical child-bearing patterns have *not* uncovered the magic formula that explains why fertility changes occurred in the past – much less identified the special levers that can determine how these trends will unfold in the future.

The trouble with the mission to identify universal and reliable determinants of fertility decline goes back literally to the origins of the phenomenon. "Secular fertility decline" – the sustained, long-term shift from big families to small ones – commenced for the first time in Europe, about two hundred years ago. But it did not begin in England and Wales – then perhaps the most open, literate, and industrialised part of the continent, if not the world. Instead it began in France: a country then impoverished, overwhelmingly rural, predominantly illiterate – and, not to put too fine a point on it, Catholic. Clearly, the "modernisation" model does not plausibly explain the advent of fertility decline in the modern world. And unfortunately, alternative models do not really fare much better. Reviewing the theories of fertility decline in Western Europe and the evidence adduced to support them, the historian Charles Tilly wrote that "The problem is that we have too many explanations which are plausible in general terms, which contradict each other to some degree and which fail to fit some significant part of the facts".[39] But what was true for Western Europe at the onset of this process holds equally for the rest of the world today.

Al Gore's bestseller *Earth In The Balance* exemplifies the thinking of many current proponents of "world population stabilisation" in describing the factors that he holds to be instrumental in achieving sustained fertility reductions:

> High literacy rates and education levels *are important, especially for women; once they are empowered intellectually and socially they make decisions about the number of children they wish to have.* Low infant mortality rates *give parents a sense of confidence that even with a small family, some of their children will grow to maturity… and provide physical security when they are old.* Nearly ubiquitous access to a variety of affordable birth control techniques *gives parents the power to choose when and whether to have children.*[40] *[emphasis in the original]*

Each of these three *desiderata* may qualify as a social objective in its own right, entirely irrespective of its influence on demographic trends. As purported "determinants" of fertility change, however, the explanatory and predictive properties of these three factors leave something to be desired.

Data from the *2007 WDI* underscore the problem. According to the World Bank's figures, the adult literacy rate in 2006 was almost 15 percentage points higher in Malawi than Morocco (54 per cent vs. 40 per cent) – but the fertility level in Malawi was also over twice as high in 2005 (5.8 births vs. 2.4 births). Kenya and Iran were said to have almost identical rates of adult literacy in 2006 (70 per cent), yet Iran's 2005 fertility level is put at just over replacement (2.1) while Kenya's is almost two and a half times higher (5.0). Iran's total fertility rate, incidentally, is said to have plummeted by nearly 70 per cent – from 6.7 to 2.1 – between 1980 and 2006. But presumably the Iranian revolution was quite not what Gore had in mind in arguing that intellectual and social empowerment of women would lead to smaller families.

Infant mortality provides scarcely more information about fertility levels or fertility change. By the UN Population Division's projections, for example, the 2000/2005 infant mortality rate for Armenia was somewhat higher than for the "Occupied Palestinian Territory" of West Bank and Gaza (30 per 1000 vs. 21 per 1000) – but while Armenia's estimated fertility level at that time was far below replacement (1.35 births per woman), the level for the West Bank and Gaza was put at 5.63 births per woman per lifetime, over four times as

high! By the same token, although infant mortality rates were said to be similar in Bangladesh and Yemen in the early years of the new century, Yemen's total fertility rate at that time was almost twice as high as Bangladesh's (6.02 vs. 3.22).[41] Historically, the onset of sustained fertility decline in France took place during a period (1780–1820) when the country suffered an estimated average of almost 200 infant deaths for every 1000 births.[42] No country in the contemporary world suffers from such a brutally high infant mortality rate – but a number of present-day countries with considerably lower infant mortality rates than prevailed in Napoleonic France evidently have yet to enter into fertility decline (among them: Afghanistan, the Democratic Republic of the Congo, East Timor, and Liberia). Conversely, literally dozens of contemporary low-income countries with much more favourable infant and child survival schedules than prevailed in that of bygone France have yet to report fertility levels as low as the 4 births per woman per lifetime estimated for French society around 1800.[43]

As for the relationship between fertility and the availability of modern contraceptives (or national programs to subsidise or encourage their use), inconvenient facts must once again be faced. To start with, the utilisation rates for modern contraceptive methods are not an especially reliable indicator of a society's fertility level. According to World Bank figures, among married women aged 15–49, the rate of modern contraceptive utilisation was higher in the West Bank and Gaza in 2004 than in Bulgaria in 1998 (51 per cent vs. 42 per cent) – yet the total fertility rate was over four times higher in the former than the latter. In the first years of the new century, contraceptive prevalence rates were all but identical in Japan and Jordan (70 per cent) – but Jordan's fertility level was said to be two and a half times higher than Japan's (3.5 births vs. 1.4 births). Contraceptive prevalence in Bangladesh in 2004 was reportedly higher than in Austria in 1996 (58 per cent vs. 51 per cent) – and fertility levels were also well over twice as high.[44] There are many more such examples.

For another thing, the independent influence of national population programs on national birth rates appears to be very much more limited than enthusiasts are willing to recognise. A comparison of Mexico and Brazil, Latin America's two most populous countries, illustrates the point. Since 1974, the Mexican government has sponsored a national family planning program expressly committed to reducing the country's rate of population growth. Brazil, by contrast, has *never* implemented a national family planning program. In the quarter century after the introduction of Mexico's national population program, Mexican fertility levels fell by an estimated 56 per cent. In Brazil, during the same period, fertility is estimated to have declined by 54 per cent – an almost identical proportion. And despite the absence of a national family planning program, Brazil's fertility levels today remain lower than Mexico's.[45]

In the final analysis, the single best international predictor of fertility levels turns out to be *desired* fertility levels: the number of children that women say they would like to have.[46] Perhaps this should not be surprising: parents tend to have strong opinions about important matters pertaining to their family; parents tend to act on the basis of those opinions; and even in the Third World, parents do not believe that babies are found under cabbages. The primacy of desired fertility explains why birth rates can be higher in regions where contraceptive utilisation rates are also higher: for it is parents, not pills, that make the final choice about family size.

For advocates of "stabilising world population", the predominance of parental preferences in the determination of national and international birth rates poses an awkward dilemma. If parental preferences really rule, and a government sets official population targets for a truly voluntary family planning program, those targets are not likely. Indeed: if parents are genuinely permitted to pursue the family size they personally desire, national population programs can only meet pre-established official demographic targets by complete and utter chance.

On the other hand, if a government sets population targets and wishes to stand a reasonable chance of achieving them, the mischievous independence of parental preferences means that wholly voluntary population programs cannot be relied upon. If states, rather than the parents, are to determine a society's preferred childbearing patterns, governments must be

able to force parents to adhere to the officially approved parameters.

Despite previously denouncing coercive and violent population control techniques, Jared Diamond still goes on to praise the Chinese government's courage to "restrict the traditional freedom of individual reproductive choice…" It is this type of population control – coerced restrictions, forced abortion, infanticide – that apparently "contributes to [his] hope" and "may inspire modern First World citizens" to follow a similar path.[47]

Whether they recognise it or not, every advocate of anti-natal population programs must make a fateful choice. They must either opt for voluntarism, in which case their population targets will be meaningless. Or else they must opt for attempting to meet their population targets – in which case they must embrace coercive measures. There is no third way.

Prospects for world population growth in the 21st century

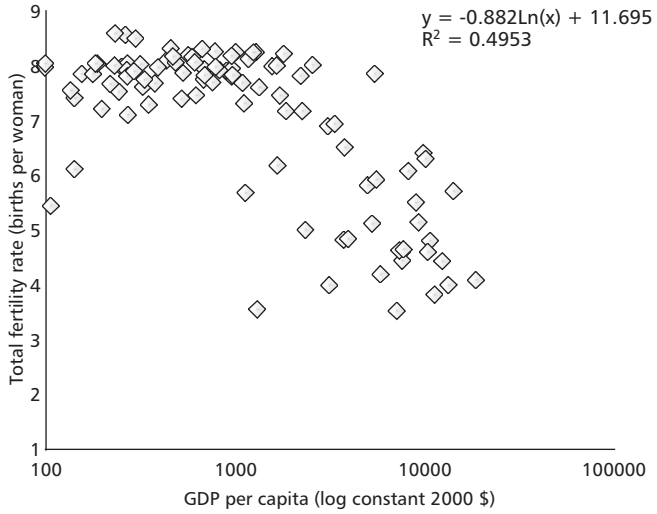
Advocates of the project to "stabilise human population" typically regard the phenomenon of natural increase as an inexorable and almost uncontrollable phenomenon. (The purportedly all-but-irrepressible nature of human population growth, in turn, helps to explain why anti-natalists view the process as inherently fraught with terrifying consequence.) Some of these advocates have warned that the human population will double, or more than double, over the course of the coming century unless the comprehensive program of population action that they prefer is rigorously implemented. Thus Alex Marshall, a spokesperson for the UNFPA, speaks ominously of a near-doubling of global population in the next half century: without "promised cash for family planning in developing countries", he reportedly explained, world population is likely to hit 11 billion – a prospect he likened to "looking over a cliff".[48] Likewise, Al Gore justifies his call for a "Global Marshall Plan" – the first of whose four points is "stabilising world population" – with the assertion that experts "say the [world population] total could reach 14 billion or even higher before leveling off" at the end of the 21st century.[49]

As we have already seen, the grim and inescapable connection between population growth and mounting economic problems that is posited by today's anti-natal doctrine is hardly faithful to the actual record of global demographic and economic development over the past century. But the apparent anxiety that some proponents of "stabilising world population" experience in contemplating a future with 11 billion, 14 billion, or more human inhabitants of our planet may also be misplaced for a more prosaic reason: to judge by current trends, such levels may never be achieved.

To be sure: long-term population projections are extraordinarily problematic. No robust scientific basis exists for anticipating desired parental fertility in *any* locale – much less for the world as a whole – very far in advance. Since it is fertility levels that largely determine future population trajectories, this is more than an incidental inconvenience. The experience of the past four decades, however, is worth bearing in mind. In the four decades sine the early 1960s, global fertility levels are thought to have dropped by almost half: from a "total fertility rate" (TFR, or births per woman per lifetime) of around 5 in 1960/65 to one of about 2.6 in 2000/2005. Over that same period, the average TFR for "developing countries" is thought to have dropped by over half, from 6 to under 3. [50] Although there is a well-known and general correspondence between increasing affluence and lower fertility, material progress alone does not account for this tremendous decline in birth rates in low-income countries. Equally important has been the largely overlooked fact that *parents still caught in Third World poverty have been choosing to have ever-smaller families.*

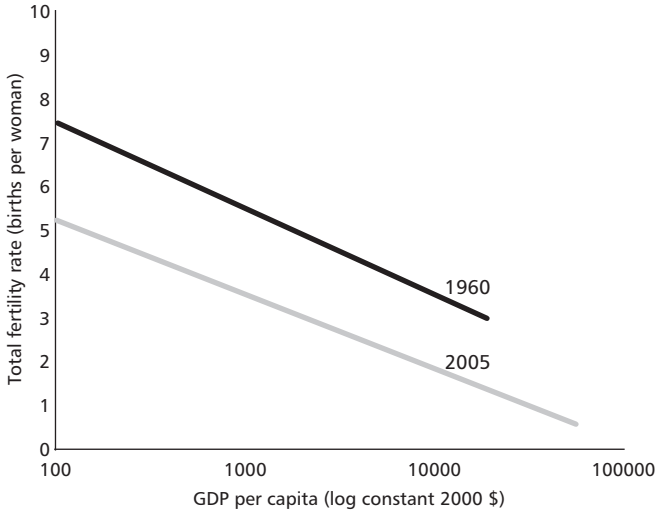
Figures 10 to 13 illustrate the point. They draw upon World Bank data on fertility levels, per capita income levels, and adult female illiteracy levels for almost 200 countries over the period 1960–2005. In 1960, the international association between per capita GDP (calculated on the basis of exchange rates) and TFRs was relatively strong (although by no means mechanistic) – and the same was true in 2005 (figures 9 and 10). But over the intervening four decades, the *particulars* of that association had shifted quite dramatically: the income-fertility curves of 1960 and 2005 look quite different (figure 11). In 1960, a country

Figure 9 **World GNP vs relative prices of primary commodities**
1900–2003



Source: World Development Indicators 2007

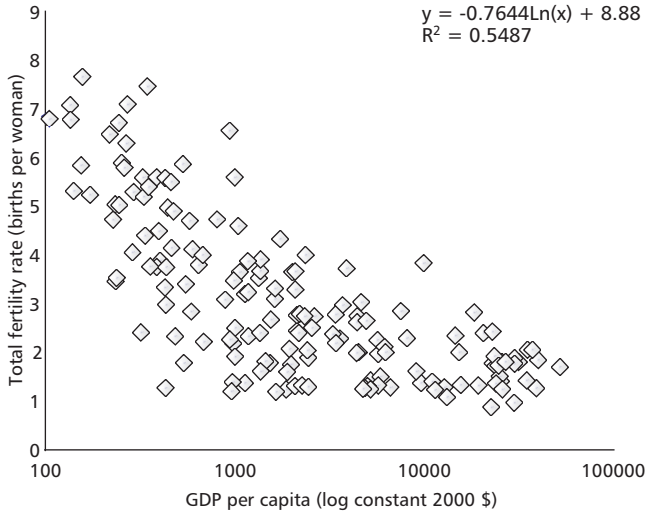
Figure 11 **Estimated total fertility rates vs GDP per capita**
1960 vs 2005 correlations



Source: World Development Indicators 2007

with a per capita GDP of $1000 (on exchange-rate basis) would have a TFR of about 6. In 2005, a country with that same income level would have been predicted to have a TFR of about 3.3 births per woman per lifetime

Figure 10 **Total fertility rate vs per capita GDP**
2005



Source: World Development Indicators 2007

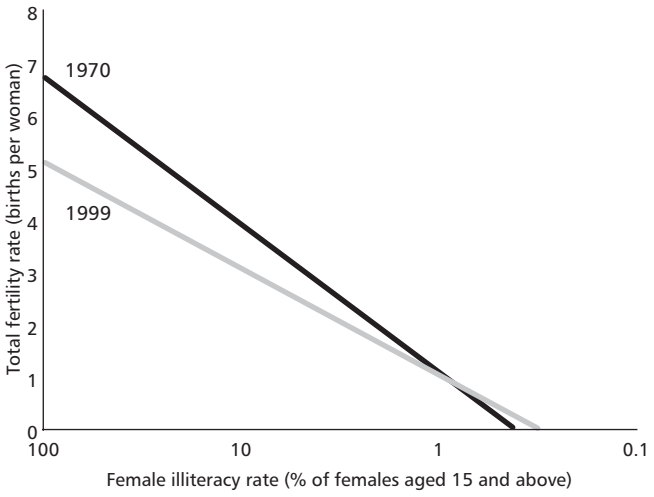
fewer. At any given income level – including even very low income levels – parents around the world have generally been opting for fewer children over the past four and a half decades.

The World Bank databases do not offer estimates of illiteracy rates for women for 1960 or 2005, but they do make possible comparison of the illiteracy-fertility situation in 1980 and 1999 (figure 12).[51] Once again, it appears that even in settings where female illiteracy levels happen to be very high, fertility levels are in general substantially lower than they would have been in the past.

Few people would choose to be poor or illiterate. Yet poor and illiterate people have demonstrated, over the past generation and a half, that they too can make family planning choices – and they have increasingly chosen post-traditional fertility regimens. Quite clearly, neither low income levels nor the lack of education among young women constitute the sort of "structural" barrier against fertility decline that many population activists have heretofore supposed.

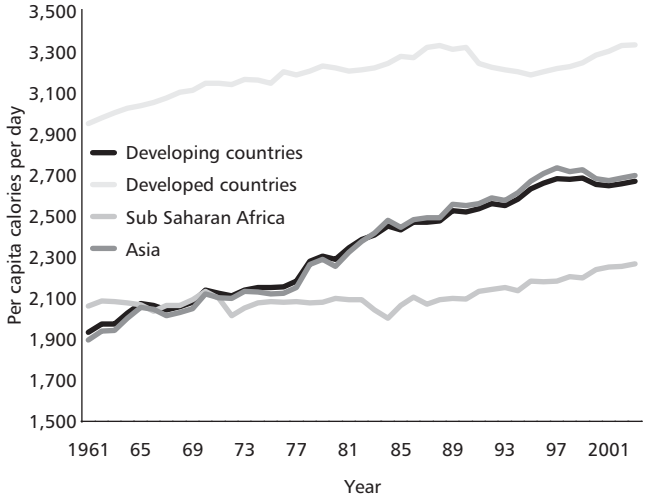
Expert demographic opinion is today catching up with revealed reality. Thus, in August 2001, a study in *Nature* by researchers with IIASA (International Institute for

Figure 12 **Estimated total fertility rates vs illiteracy rates**
1970 vs 1999 correlations



Source: World Development Indicators 2002

Figure 13 **Per capita caloric availability**
1961–2003



Source: Food and Agriculture Organization of the United Nations, http://apps.fao.org

Applied Systems Analysis) spoke of "the end of world population growth", contending that "there is around an 85 per cent chance that the world's population will stop growing before the end of the century… [and] a 60 per cent probability that the world's population will not exceed 10 billion people".[52] In March 2002, in a major shift from its previous practices, the United Nations Population Division (UNPD) announced that the 2002 revision of its *World Population Prospects* would presume sub-replacement fertility levels for 80 per cent of the world by the middle of the 21st century, hypothesising further that "below replacement fertility will lead first to the slowing of population growth rates and then to slow reductions in the size of world population".[53] With the 2006 revision of *World Population Prospects*, moreover, UNPD's "medium variant" projections posit that global fertility will fall below the net replacement level in 2025/30 – that is to say, about two decades from now.[54] (For a decade now, incidentally, the UNPD's *World Population Prospects* series has offered a "low variant" projection for global population that envisions a peaking of human numbers around the year 2040, and an indefinite decline thereafter.)

Table 3 **Estimated illiteracy rate** (both sexes, aged 15 and over)

	1970	*1980*	*1990*	*1995*	*2000*	*2005*
World	37.0	30.6	24.8	22.7	20.6	17.6
Developed Countries	5.7	3.4	1.9	1.4	1.1	1.0
Developing Countries	51.9	41.8	32.6	29.5	26.3	22.8
Least Developed Countries	73.2	66.0	57.7	53.7	49.3	46.6
Latin America and Caribbean	26.1	20.3	14.9	13.3	11.7	10.1
Asia	49.1	39.4	30.5	27.7	24.9	21.3
Sub Saharan Africa	71.6	61.7	50.7	45.2	39.7	40.7

Source: UNESCO Institute for Statistics, http://unescostat.unesco.org/en/stats/stats0.htm

Table 4 **Estimated educational attainment by sex**
(population age 15 and over)

		Average school year		Gender ratio
		Females	*Males*	*(female/ male %)*
World	1960	4.31	4.98	86.7
	1970	4.74	5.59	84.7
	1980	5.42	6.43	84.3
	1990	5.93	6.94	85.5
	1995	5.94	6.95	85.4
	2000	6.13	7.19	85.3
All developing	1960	1.46	2.63	55.7
	1970	1.94	3.38	57.2
	1980	2.74	4.37	62.5
	1990	3.61	5.21	69.3
	1995	3.99	5.56	71.8
	2000	4.33	5.92	73.2
Middle East/North America	1960	0.83	1.63	51.0
	1970	1.39	2.75	50.5
	1980	2.41	4.15	58.0
	1990	3.57	5.17	69.1
	1995	4.21	5.74	73.3
	2000	4.69	6.17	76.0
Sub-Saharan Africa	1960	1.34	2.17	61.8
	1970	1.56	2.60	60.1
	1980	1.91	2.89	66.0
	1990	2.49	3.83	65.0
	1995	2.82	3.98	70.8
	2000	3.01	4.04	74.4
Latin America/Caribbean	1960	3.24	3.36	96.3
	1970	3.52	4.14	85.0
	1980	4.29	4.57	93.7
	1990	5.24	5.41	96.8
	1995	5.58	5.91	94.4
	2000	5.81.	6.3	92.2

Source: Barro, Robert J. and Jong-Wha Lee, International Data on Educational Attainment: Updates and Implications, CID Working Paper No. 42, Harvard University, April 2000

All these population projections are, of course, based on the same fragile theoretical foundations as the earlier projections they supersede; there is no reason to accord them special and unparalleled authority. The simple fact of the matter, however, is that even poor people can choose to have small families, and that increasing numbers of poor couples around the world are doing just that. If poor people in low income countries reveal a preference for smaller families in the decades to come, world population totals will be distinctly lower than proponents of "world population stabilisation" have heretofore imagined – and those lower totals would have been reached without the emergency worldwide population programs that many activists today advocate.

Natural resources, human resources, and development

Fortunately for our perennially troubled planet, humanity's population demographic and development prospects appear to be seriously misconstrued by the pessimistic doctrine of "world population stabilisation".

While the prevalence of poverty across the globe is unacceptably great today – and will continue be so in the future (after all: what level of poverty should be *acceptable*?) – humanity has enjoyed unprecedented and extraordinary improvements in material living standards over the past century, and over the past few decades in particular. Those improvements are represented in the worldwide increases in life expectancy and per capita income levels that we have already reviewed.

The tremendous and continuing spread of health and prosperity around the planet betokens a powerful and historically new dynamic that anti-natalists today only dimly apprehend. This is the shift on a global scale from the reliance on "natural resources" to the reliance on "human resources" as fuel for economic growth. The worldwide surge in health levels has not been an isolated phenomenon. To the contrary: it has been accompanied by, and is inextricably linked to, pervasive and dramatic (albeit highly uneven) increases in nutrition levels, literacy levels, and levels of general educational attainment (figure 13, tables 3 and 4). These interlocked trends speak to a profound and continuing worldwide augmentation of what some have called "human capital" and others term "human resources" – the human potential to generate a prosperity based upon

knowledge, skills, organisation and other innately human capabilities.

In a physical sense, the natural resources of the planet are clearly finite and therefore limited. But the planet is now experiencing a monumental expansion of different type of resource: human resources. Unlike natural resources, human resources are in practice always renewable and in theory entirely inexhaustible – indeed, it is not at all self-evident that there are any "natural" limits to the build-up of such potentially productive human-based capabilities.

It is in ignoring these very human resources that so many contemporary surveyors of the global prospect have so signally misjudged the demographic and environmental constraints upon development today – and equally misjudged the possibilities for tomorrow.

Notes

1. This essay is a revised and updated version of a chapter originally prepared for a Competitive Enterprise Institute volume edited by Ronald Bailey. Special thanks go to Ms. Megan Davy of AEI for her superb data analysis, and to Ms. Caroline Boin of IPN for acute editorial comments and suggestions. Thanks are also due Professor Stephan Pfaffenzeller of the University of Liverpool for generously sharing his research on long-term commodity price trends. The usual caveats apply.
2. UN Cairo Conference on Population and Development, Programme of Action, Preamble, Paragraph 1.11, available electronically at http://www.unfpa.org/icpd/icpd_poa.htm#ch1, accessed June 20, 2007.
3. UNFPA Annual Report 2002, available electronically at http://www.unfpa.org/about/report/2002/1ch1pg.htm, Accessed July 2006.
4. Sierra Club, "Ecoregions: Strategy", available electronically at http://www.sierraclub.org/ecoregions/strategy.asp, accessed July 2006.
5. The U.S. Census Bureau's most recent (May 2000) projections, for example, envision a decline in the population of continent of Europe from 727 million in 2007 to 640 million in 2050. For Japan, the corresponding figures are 127 million in 2007 and a projected 100 million in 2050. Data available electronically from the U.S. Census Bureau website at http://www.census.gov/ipc/www/idbagg.html, accessed June 20, 2007.
6. For 1999, Russia reported 2.166 million deaths and 1.476 million births. "Federal Statistics Service: Russia's Population was an estimated 142.2 million on January 1, 2007", Russia and CIS Statistics Service, May 3, 2007.
7. Jaya Dalal, "Population: U.N. Agency Projects Record Income For 1996", Inter Press Service, November 7, 1995.
8. Al Gore, *Earth In The Balance: Ecology And The Human Spirit*, (New York: Houghton-Mifflin, 2000), p. 309.
9. Vice President Gore on *Nightline* (ABC News), Transcript # 3467, September 6, 1994
10. Diamond, *ibid,* p. 511.
11. Planned Parenthood Federation of America, "Fact Sheet", available electronically at http://www.plannedparenthood.org/library/FAMILYPLANNINGISSUES/fpworldof difference_fact.htm, accessed July 2006.
12. Diamond, *ibid*. p. 6
13. Diamond, *ibid*. p. 176
14. Former Vice President Gore in "Beyond The Numbers", *loc. cit.*
15. *Earth in the Balance*, p. 310.
16. Diamond, *ibid,* p. 496.
17. *Earth In The Balance*, p. xxi.
18. All data in this paragraph taken from United Nations, *Demographic Yearbook 2000*, (New York: United Nations, 2000), Table 3. Estimates of population density are for 2000, and the estimate of global population density excludes uninhabited territory (e.g. Antarctica).
19. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat,

World Population Prospects: The 2006 Revision , http://esa.un.org/unpp, Thursday, June 14, 2007; 5:50:35 AM.

20. Michael R. Haines, "The Population of The United States, 1790–1920", in Stanley Engerman and Robert E. Gallman, *The Cambridge Economic History of the United States, Volume 2*, (New York: Cambridge University Press, 2000), Table 1.

21. *Earth In The Balance*, p. 309.

22. Projections available electronically from U.S. Census Bureau International Data Base at http://www.census.gov/ipc/www/idbagg.html; accessed June 21, 2007.

23. "The Population of The United States, 1790–1920", *loc. cit.*, Table 3.

24. Dennis A. Ahlburg, "Population Growth and Poverty", in Robert Cassen and contributors, *Population and Development: Old Debates, New Conclusions*, (New Brunswick, NJ: Transaction Publishers, 1994), p. 143.

25. Robert Cassen with Lisa M. Bates, *Population Policy: A New Consensus* (Washington, DC: Overseas Development Council, 1994), p. 15.

26. U. S. Bureau of the Census, "Historical Estimates of World Population" available electronically at http://www.census.gov/ipc/www/worldhis.html; and *idem.*, International Data Base, available electronically at http://www.census.gov/ipc/www/idbagg.html, accessed September 27, 2001.

27. Samuel H. Preston, *Mortality Patterns In National Populations*, (New York: Academic Press, 1976), p. ix.

28. The U.S. Census Bureau's August 2006 projections put global life expectancy at birth for the year 2000 at 63.7 years. (U.S. Census Bureau International Data Base, available electronically at http://www.census.gov/ipc/www/idbagg.html, accessed June 21, 2007.) The projections of the United Nations Population Division are similar: for 1995/2000, that estimate of planetary life expectancy at birth is 65.2. http://esa.un.org/unpp/, accessed June 21, 2007.

29. Angus Maddison, *Monitoring The World Economy: 1820–1992*, (Paris: OECD, 1995); *The World Economy: A Millennial Perspective*, (Paris: OECD, 2001); *The World Economy:Historical Statistics*, (Paris: OECD, 2003), and "World Population GDP and Per Capita GDP 1-2003" (March 2007), available online at http://www.ggdc.net/maddison/Histoical_Statistics/horizontal-file_03-2007.xls, accessed June 21, 2007

Though specialists may quibble over particular figures in Maddison's detailed long-term series, the overall economic picture that his calculations paint, and the general trends they outline, are not matters of dispute among serious students of economic history today.

30. *Monitoring The World Economy*, Tables E-1, E-3; *The World Economy: A Millennial Perspective*, Tables A-a, B-21, A4-c.

31. Nominal prices for corn, wheat and rice for 1900–1984 compiled from World Bank sources by Enzo R. Grilli and Maw Cheng Yang, World Bank; 1985–98 series compiled from World Bank data by Stephan Pfaffenzeller, University of Nottingham. Nominal prices adjusted by US CPI (consumer price index). The author thanks Mr. Stephan Pfaffenzeller for generously sharing his research.

32. Aluminum, copper, nickel, zinc, tin, lead, cotton, timber, hides, rubber, wool 64s, wool 48s, palm oil, and coconut oil. The makeup and weighting of the index is outlined in Bjorn Lomborg, *The Skeptical Environmentalist: Measuring the Real State of the World*, (New York: Cambridge University Press, 2001), p. 382, fn. 1006.

33. "Indicators – Millennium Issue: Commodity Price Index", *Economist*, December 31, 1999, p. 139. Note that an updated and re-based *Economist* commodity-price index, now covering 25 primary commodities (but excluding oil and precious metals) was released in 2005; for the 1900–2000 period, the revised index reports a real decline in the commodities it covers of over 70%. See "The Economist's commodity-price index: 160 years on", *Economist*, February 12, 2005.

34. Enzo R. Grilli and Maw Cheng Yang, "Primary Commodity Prices, Manufactured Goods Prices, and the Terms of Trade of Developing Countries: What the Long Run Shows", *World Bank Economic Review*, Volume 2, Number 1 (January 1988), p. 1–48; Stephan Pfaffenzeller, Paul Newbold, and Anthony Rayner, A Short Note on Updating the Grilli and Yang Commodity Price Index, The World Bank Economic Review 2007 vol. 21, no. 1 (January 2007), pp.151–163

35. Note that neither the Grilli-Yang index nor the Pfaffenzeller et al updates include energy products – an arguably quite serious omission. In one computation, however, Grilli and Yang added coal and oil to their 24 commodity trade-weighted series. The introduction of fuels altered the picture, but only slightly: with energy included in their primary commodity index, real prices still fell at a pace of 0.5 percent per annum from 1900 through 1986, a trajectory that would imply a drop of about 40 percent if continued over the course of a century.

36. Data utilised in the preceding paragraph are drawn from *World Population Prospects: The 2006*, *loc.cit.* and from the Census Bureau's International Data Base, available electronically at http://www.census.gov/ipc/www/idbagg.html, accessed July 2006.

37. Serbia's most recently reported total fertility rate (2005), for example, was 1.18; Bosnia-Herzegovina's (2005), 1.29; Macedonia's (2005), 1.47; Croatia's (2005), 1.33; Slovenia's (2005), 1.21. (Data available from Institut National d'Études Démographiques website at http://www.ined.fr/population-en-chiffres/pays-deelopes/indefcon.htm; accessed July 2006.) A total fertility rate of roughly 2.1 is necessary for long-term population stability.

38. Some might object that other settings have seen political instability or conflict driven by high rates of population growth or increasing population density: contemporary Haiti or Rwanda might be adduced as examples here. It is true that in both of these societies – unlike the former Yugoslavia – fertility levels were *above* replacement in their eras of upheaval and breakdown. This fact in itself, however, does not establish demography as the causative factor in their political travails – or even necessarily a significant contributor, .Suffice it to say that until the role of such factors as quality of governance, soundness of policy regimens, and security of property rights and rule of law, etc. are carefully assessed in relation to these political breakdowns, the presumption that population was the driving force behind the plunge into political chaos or catastrophe remains at best premature.

39. Charles Tilly, "Introduction", in Charles Tilly, ed., *Historical Studies of Changing Fertility*, (Princeton, NJ: Princeton University Press, 1978), p. 3.

40. *Earth In The Balance*, p. 311.

41. Data for the preceding analysis drawn from *World Population Projections: The 2006 Revision*, *loc. cit.*

42. Michael W. Flinn, *The European Demographic System, 1500–1820*, (Baltimore, MD: Johns Hopkins University Press, 1981), p. 94.

43. For France's 1800 total fertility rate, see Ansley J. Coale, "The Decline of Fertility in Europe since the Eighteenth Century as a Chapter in Human Demographic History", in Ansley J. Coale and Susan Cotts Watkins, eds., *The Decline of Fertility in Europe*, (Princeton, NJ: Princeton University Press, 1986), p. 27.

44. Data derived from *WDI 2007.*

45. For more information, see David P. Lindstrom, "The role of contraceptive supply and demand in Mexican fertility decline: Evidence from a microdemographic study", *Population Studies*, vol. 52, no. 3 (November 1998), pp. 252–274; George Martine, "Brazil's fertility decline, 1965–95: a fresh look at key factors", *Population and Development Review*, vol. 22, no. 1 (March 196), pp. 47–75, and U.S. Census Bureau International Data Base, available electronically at http://www.census.gov/ipc/www/idbagg.html.

46. For data and analysis, see Lant Pritchett, "Desired fertility and the impact of population policies", *Population and Development Review*, vol. 20, no. 1 (March 1994), pp. 1–55.

47. Jared Diamond, *ibid,* p. 524

48. Jude Sheerin, "Population Crisis Looms Because Of Failed Promises – UN", *Press Association Limited*, November 7, 2001.

49. *Earth In The Balance,* p. 308.

50. *World Population Prospects: The 2006 Revision, loc. cit.*.

51. Data drawn from *WDI 2002*.

52. Wolfgang Lutz, Warren Sanderson, and Sergei Scherbov, "The end of world population growth", *Nature*, vol. 42, pp. 543–545 (August 2, 2001).

53. UNPD, "The Future Of Fertility In Intermediate-Fertility Countries", *Expert Group Meeting On Completing The Fertility Transition*, UNPD, New York, March 11–13 2002, available electronically at http://www.un.org/esa/population/publications/completingfertility/RevisedPEPSPOPDIVpaper.PDF , accessed July 2006.

54. "World Population Prospects: The 2006 Revisions", *loc. cit.*

The imperative of "stabilising human population": myths and realities