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Population and the Great Transition

—Opening Essay for a GTI Forum[1]

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Addressing global environmental challenges—from biodiversity loss to climate change—can often feel like running up a down escalator: maintaining our position counts as progress, and more often than not, we are falling behind. Apart from the success of stopping depletion of the ozone layer, all other global environmental problems have been getting worse.[2] This intractability will continue unless we address a significant, yet under acknowledged, driver of environmental degradation, namely, the size and growth of the human population. The global population has doubled over the past fifty years, from 3.8 billion in 1972 to more than 7.7 billion today, and, according to UN projections, it could reach 11 billion—triple what it was in 1972—by the end of end of the century.

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If we are serious about achieving a Great Transition, we must discuss this elephant in the room. Unless we adopt just and effective approaches to stabilising the global population and its demands on natural resources, it will be impossible to achieve changes at the scale necessary for a civilised future. The reason is encapsulated in the master equation for assessing human impact on the environment: I = PAT, with human impact I the product of P population, A affluence, and T technology. Efforts to temper economic growth and reduce consumerism among the rich (A) and deploy more efficient and less resource-intensive technologies (T) will be offset by increases in population (P).

[1] ↩ See the forum page: https://greattransition.org/gti-forum/population-lowe

[2] ↩ This claim comes from the World Scientists Second Warning to Humanity, signed by more than 14,000 scientists across 158 countries. William J. Ripple et al., "World Scientists' Warning to Humanity: A Second Notice," *Biosciencesm* 67, no. 12 (2017): 1026–1028, https://doi.org/10.1093/biosci/bix125.

Focusing on climate change, economic and population growth are known to be the most important drivers of increases in CO2 emissions from fossil fuel combustion.[3] Yet among policy proposals for reducing reduce greenhouse gas emissions at both global and national scales, there is scarcely any mention of actions to stop population growth. Extraordinary interventions, such as geo-engineering, are proposed, with insufficient attention to difficulty, cost, or risk. In contrast, population policy around family planning and reproductive health services is straightforward, offering many co-benefits for individual and social well-being along with emissions reduction and climate adaptation.

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Removing the Taboo

A taboo in many circles, the population issue has almost disappeared from development, environmental, climate change, and food security literatures. Some objections to population policy come from a position of deeply held religious or philosophical convictions (such as the Catholic Church's longstanding opposition to family planning, and that of the growing Evangelical Right). More directly, the great population debate between neo-Malthusians and mainstream economists over the past half-century, and the misguided policies carried out in the name of population policy, have left a troubled historical legacy. In order to move forward constructively, we must be willing to unpack and examine that legacy.

First, the fact that apocalyptic projections by some of population policy's most vocal advocates have not come to pass has caused many to believe that population growth is a non-issue. The English clergyman Thomas Malthus famously predicted in 1798 that food production would be unable to keep pace with the growing population, leading inevitably to mass starvation.[4] However, technological change has dramatically increased food production. In the twentieth century, the human population increased from about one to about six billion, but food production remarkably kept pace. Nevertheless, in the last half of the twentieth century, neo-Malthusians confidently predicted that population growth would so outstrip the expansion of food production that massive famine would ensue.[5] Instead, the Green Revolution proved to be an extraordinary technical achievement that increased food production faster than the population grew. Impoverished billions still go hungry because of lack of purchasing power, not lack of aggregate food production.

Besides an affront to human rights, coercive measures were unnecessary and counterproductive. We must be able to separate such practices from family planning practice itself.

A second factor sidelining the population issue is backlash against the dark legacy of population control policies in the last century. In the mid- and late twentieth century, some governments seeking to reduce population growth abused human rights, resorting to forced sterilisation and abortions, or various penalties for childbearing. While China's one-child policy is the most notorious, instances also occurred in India, Peru, and elsewhere. Besides an affront to human

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[3] ↩ Intergovernmental Panel on Climate Change, *AR6 Synthesis Report Climate Change* (Geneva: IPCC, 2022), https://www.ipcc.ch/report/sixth-assessment-report-cycle/.

[4] ↩ Thomas Malthus, *An Essay on the Principle of Population* (1798), as discussed in Michael Shermer "Why Malthus Is still Wrong," *Scientific American*, May 1, 2016, https://www.scientificamerican.com/article/why-malthus-is-still-wrong/.

[5] ↩ Paul Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968).

rights, coercive measures were unnecessary and counterproductive. We must be able to separate such practices from family planning practice itself.

Proponents of pro-poor development have long criticised efforts to focus on population for shifting attention from affluent countries onto those with the fewest resources. For example, at recent climate conferences, countries in the Global South have pushed back against any proposed focus on population stabilisation, arguing that it is a way for the heavy-polluting Global North to deflect blame. While valid, this critique overlooks a vital point: global population policy must include the affluent advanced industrial countries as well, since each individual person in those places exerts a much more significant total environmental impact.

This global turn away from population policy has undermined family planning. While family planning has never been sufficiently funded to meet women's needs, the underfunding became dramatically worse after the 1994 United Nations Conference on Population and Development (ICPD), which shifted the focus of global population discussions from family planning to reproductive health (an important but distinct goal).[6] Before then, family planning was recognised as an instrument of economic development, reducing both poverty and food insecurity. In most countries, services were entirely voluntary and focused on improving the health and rights of women and infants.

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Early family planning programs encouraged couples, in their own interests, to limit childbearing, emphasising limits on aggregate population growth as essential for reducing poverty and ensuring food security. Still, the coercive tactics employed by some countries led to reduced interest in provision of family planning services as part of aid packages. Instead, it became widely assumed that education and empowerment of women would slow population growth on its own, without need for any intentional action. The outcome has been that women's reproductive rights have been neglected, and valuable time in the challenge of curbing population growth has been lost.

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We now hear more frequent concerns about population growth than population decline. Population has been decreasing throughout much of Europe, fuelling alarmist rhetoric from politicians who see a smaller-population future as one of economic chaos and reduced well-being. But does that claim have merit? The assertion that this growth is needed to combat population ageing is either misguided or insincere—the negative consequences of an ageing population, such as greater demands for elder care and heightened intergenerational conflict, are exaggerated, and the positives, such as reduced pressure on resources, neglected. One important benefit of decline in high-emission populations is a better chance of avoiding catastrophic climate change.[7]

Moderating population size in all countries is critical for climate change, ecosystem degradation, food security, water availability, species loss, and conflict.

[6] ↩ Stephen W. Sinding, Population, Poverty and Economic Development," Philosophical Transactions of the Royal Society B Phil. Trans. R. Soc. B 364 (2009): 3023–3030, https://doi.org/10.1098/rstb.2009.0145.

[7] ↩ Jane O'Sullivan, *Silver Tsunami or Silver Lining?—Why We Should Not Fear an Ageing Population*, discussion paper (Deakin, Australia: Sustainable Population Australia, 2020), https://population.org.au/discussion-papers/ageing/.

Why Population Matters

Moderating population size in all countries is critical for the fundamental challenges to a Great Transition: climate change, ecosystem degradation, food security, water availability, species loss, and conflict. According to a recent study, rapid population growth leads to scarcity of arable land, declining soil fertility, and encroachment on natural areas such as forests, reducing farm incomes and making it more difficult for farmers to adapt to climate change. Meanwhile, good farmland and water access are sacrificed to urban sprawl, forests are cut for fuel and land, and soil carbon is lost through intensive use. Rapid population growth accelerates climate change by reducing the carbon stores in forests and soils, as well as compounding the problem by reducing the capacity of the food production system to adapt to the changing climate.

The regions most vulnerable to critical shortages of food and water tend to be those with high population densities and growth rates. In these regions, population growth due to rapid urbanisation is a much greater driver of water and food insecurity than is climate change. A notable recent example is the 2021 famine in southern Madagascar, where there are now seven times as many people as there were seventy years ago. Stopping climate change tomorrow would not avoid deepening food insecurity in sub-Saharan Africa; that can only happen long-term through efforts to curb population growth and foster forms of economic development that benefit poor people.

In the absence of significant changes in lifestyle, energy demand is directly proportional to the number of people using the energy. Most recent emissions growth has occurred in emerging economies, particularly China and India, due to their large and growing populations and steadily increasing wealth. But even in sub-Saharan Africa, where per capita fossil fuel use has fallen, emissions have grown 60% since 1990 due to population growth. If we include deforestation, Brazil and Indonesia are in the top ten countries for total emissions.[8]

Higher impacts per affluent person accentuate the impact of any population increase and the benefits of population decrease. Moreover, increasing trade means that rich countries consume goods made in other countries, with the associated emissions assigned to the producing country.

Population is still a major issue in richer countries, too. True, for most developed countries, greenhouse gas emissions per person peaked in the 1970s, and where population growth has been low, as in Europe, total emissions have since declined. However, this decline of emissions in rich countries is deceptive. Higher impacts per affluent person accentuate the impact of any population increase and the benefits of population decrease. Moreover, increasing trade means that rich countries consume goods made in other countries, with the emissions associated with making those products assigned to the producing country. Exporting emissions does not make them disappear.

Focus on Climate Change

The core question we need to ask ourselves is, can we limit global warming to less than 2°C—as science says we must —without accelerating the transition to lower fertility? Climate mitigation modellers use a set of socio-economic scenarios adopted by the IPCC to represent possible futures, with varying levels of international cooperation, inequality, and green technology. The synthesis of results from several climate models

It is not feasible to limit global warming to less than 20C if population increases.

[8] ↩ Johannes Friedrich and Thomas Damassa, "The History of Carbon Dioxide Emissions," World Resources Institute, May 21, 2014, https://www.wri.org/insights/history-carbon-dioxide-emissions.

shows that it is not feasible to limit global warming to less than 2^0C if population increases in line with the mid-range UN population projections. This unsettling conclusion demonstrates the dire consequences of ignoring population. No matter how high the price on carbon is set or how rapid the transition to renewable energy, the demand for land and water to meet fundamental needs of the growing population will continue to drive climate disruption.[9]

The dynamic between population and climate control action plays out on both social and individual levels. Consider a recent study on the amount of CO^2 emissions that could be reduced by various actions in the affluent world. Among the choices found to have most impact were living without a car (saving 2.4 tonnes of CO^2 a year) and adopting a vegetarian diet (saving 0.8 tonnes a year). Long flights produce significant emissions, with a return transatlantic flight between North America and Europe releasing about 1.6 tonnes of CO^2. But the savings that could be achieved by these sorts of actions were dwarfed by the potential impact of having fewer children. The calculation recognised that a child will not just be a consumer for their lifetime but probably in turn have children who will eventually have children of their own, and so on for future generations. By adding up the lifetime emissions of each child and their potential descendants, then dividing that total by the expected lifespan of the parents, with each parent assumed responsible for 50% of the child's emissions, 25% of each grandchild, and so on, the remarkable conclusion was that having one less child would save the equivalent of 58.6 tonnes of CO^2 each year of the parent's remaining life. By this calculation, having one fewer child saves each parent more than 20 times as much as living without a car, or about 70 times as much as eliminating meat from the diet.[10]

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If all countries instantly moved to "replacement rate" fertility (approximately 2.1 children per woman), this would only reduce the global population in 2050 by about 10%, and that reduction would occur for the most part in countries with low emissions per person. Although the period between now and 2050 is critical for decarbonising the energy system and ending deforestation, whether people will have enough food and water and infrastructure to adapt to climate change in the decades beyond 2050 will depend to a great extent on the population path we choose now. Strong support for family planning could mean 30% fewer people in 2100 than in current UN projections and thus greater odds for a liveable planet.

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Proactive Policy

To minimise the existential risk posed by climate change and other interlinked ecological crises, we need to use all policy levers at our disposal. The IPCC's scenario modelling shows that ending population growth is an essential part of the suite of actions needed to avoid the worst-case outcomes. Progressive policies to curb population growth can improve well-being for all if we vigorously pursue and implement them. We cannot merely sit back and expect population stabilisation to occur as a

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[9] ↩ Ian Lowe, Jane O'Sullivan, and Peter Cook, *Population and Climate Change*, discussion paper (Deakin, Australia: Sustainable Population Australia, 2022), https://www.population.org.au/discussion-papers/climate.

[10] ↩ Seth Wynes and Kimberly Nicholas, "The Climate Mitigation Gap: Education and Government Recommendations Miss the Most Effective Individual Actions," *Environmental Research Letters* 12 (2017): 074024, https://doi.org/10.1088/1748-9326/aa7541; for the emissions impact of procreation, the study uses the findings of Paul Murtaugh and Michael Schlax, "Reproduction and the Carbon Legacies of Individuals," *Global Environmental Change* 19, no. 1 (2009): 14–20.

second-order impact of larger economic changes, the so-called "demographic transition" that leads countries from high birth and high death rates to both low birth and low death rates as a result of economic development.

When Malthus wrote his famous treatise, everywhere in the world had high birth rates and high death rates. Improvements in hygiene, public health, and medical care reduced death rates in affluent countries; then better education, improved security, and (more recently) reliable contraception reduced birth rates. In most affluent countries today, birth rates are similar to death rates, yielding a stable or a slowly declining population. (The only exceptions are the small group that have relatively high immigration levels: USA, Canada, Australia, and New Zealand.) Some skeptics argue that the trend of increased women's education and poverty reduction will reduce population on its own. However, the demographic transition has stalled in poor countries.

In overall terms, the countries with the highest rates of population growth are generally those where tradition and poverty reinforce each other. Misogynist and pro-natalist traditions lead to large families, which make it impossible to expand job opportunities, education, and health services fast enough, leaving people poor and with neither access to family planning nor the motivation to use it. In affluent countries, children are a significant financial burden, so people often defer childbearing to establish their career and home, then limit births to ensure they can provide well for their children. In relatively poor countries, children are often seen as both extra workers and a source of security for parents in old age. Women whose primary role is raising children also gain prestige from larger families, especially ones with sons.

Better education and changing attitudes to women's rights can transform traditional attitudes.

Just as social norms can promote large families, new social norms can promote smaller families. Better education and changing attitudes to women's rights can transform these traditional attitudes. In the countries that were most successful in reducing birth rates, active promotion of small families and contraception methods greatly accelerated the change in attitudes. By reducing population growth, these countries were able to develop economically much faster than those where birthrates remain high.

The policies needed to achieve a Great Transition are also the policies that would be needed to stabilise the population —and vice versa. Notably, voluntary family planning programs have a proven track record for priming a virtuous cycle, in which smaller families lead to better household finances and education, leading to smaller family preferences in the next generation. Family planning efforts are relatively low cost, with each dollar spent saving around three dollars in avoided health care for mothers and infants. Saving women from unwanted childbearing also saves lives of women and children; improves children's nutrition, education, and employment prospects; and eases pressure on natural resources and biodiversity. Combined with policies which empower women (education, rights, opportunity), they are an effective way to enhance societal well-being and accelerate a Great Transition.

Critical is the recognition that growth without limit cannot continue on a finite planet. Stabilising the global population alone will not keep the scale of human activity within the carrying capacity of the biosphere—that needs a deeper institutional and cultural shift.

The Larger Transformation

A Great Transition to a sustainable, equitable, and desirable future will depend on the emergence of a new suite of values. Critical to those new values is the recognition that growth without limit cannot continue on a finite planet. Stabilising the global population alone will not keep the scale of human activity within the carrying capacity of the biosphere—that needs a deeper institutional and cultural shift.

When it comes to a Great Transition, population stabilisation can be both means and end.[11] Without cost-effective and equitable steps to stabilise our population, we, in effect, lend unwitting support to undesirable global scenarios. In a Fortress World future, population policy would come under authoritarian control; a systemic Breakdown would bring a calamitous collapse of world population. Acting to stabilise population at a lower level can ease environmental pressure, food insecurity, and sources of conflict, and thereby make a better, more sustainable world a reality.

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[11] ↩ Paul Raskin, Tariq Banuri, Gilberto Gallopin, Pablo Gutman, Al Hammond, Robert Kates, and Rob Swart, *Great Transition: The Promise and Lure of the Times Ahead* (Boston: Stockholm Environment Group, 2002), 58, https://greattransition.org/gt-essay.

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