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## POPULATION MATTERS BRIEFING: DECEMBER 2020

As part of the Paris Agreement of 2015, every nation on the planet pledged to limit global warming to below 2°C (3.6 °F) and ideally 1.5°C (2.7°F). Emissions must reduce by half over the next decade and reach net-zero, the point at which a balance is achieved between the amount of emissions produced and the amount of gases removed from the atmosphere, by 2050 to achieve this goal and prevent the worst impacts of the climate crisis. The *State of Climate Action* report released this year assessed 21 indicators and concluded that only two show a rate of change sufficient enough to meet the Paris 2030 and 2050 targets<sup>i</sup>.

Whilst governments all over the world have launched plans to tackle climate change, one driver is all too often absent from policy frameworks: the rapid and ongoing growth of the human population. Although the immediate climate change priority is the urgent implementation of solutions which are maximally effective over the coming decade, minimising population growth through ethical, voluntary means will help to reduce emissions, protect carbon sinks and maximise the effectiveness of other solutions. Addressing population is not a substitute for other climate mitigation actions – it is an essential complement and accelerant to them.

### DRIVING CLIMATE CHANGE

The human population has grown from 1 billion in 1800 to 7.8 billion globally. It is still growing by around 83 million people annually. The UN projects that without action to slow population growth, we will reach between 9.4 billion and 10.1 billion in 2050<sup>ii</sup>.

The *Fifth Assessment* report in 2014 by the Intergovernmental Panel on Climate Change (IPCC) stated that “globally, economic and population growth continued to be the most important drivers of increases in CO<sub>2</sub> emissions from fossil fuel combustion”<sup>iii</sup>. This was followed by the *Fifteenth Assessment* report in 2018, identifying potential future high population growth as a “key impediment” to hitting the critical target of limiting global warming to 1.5°C<sup>iv</sup>, while its most optimistic pathway models a population of 7bn by 2100 – far below the current UN projection.

The 2019 *World Scientists Warning of a Climate Emergency* which has now been signed by more than 11,000 scientists globally, cites population growth as one of the key drivers of climate change and its six policy solutions include a call for global population to be stabilised “and, ideally, gradually reduced—within a framework that ensures social integrity”<sup>v</sup>.

The value of population action to address climate change has been quantified by the world-leading study of climate change solutions, Project Drawdown. In its words, “as we consider the future of climate solutions, it matters how many people will be eating, moving, plugging in, building, buying, using, wasting, and all the rest. Population interacts with the primary drivers of emissions: production and consumption, largely fossil-fuelled”<sup>vi</sup>.

Drawdown analysed 80 available practical policy options for minimising emissions, ranging from plant-based diets to refrigerant management. It concluded that, empowering voluntary actions to bend population growth to a low scenario based on UN projections would save 85Gt of emissions by 2050, making it the second most effective solution in limiting warming to 2°C and fifth most effective in limiting warming to 1.5°C. **This makes it a more effective climate solution than almost all popular technological solutions, including electric cars, and solar, offshore wind, wave and tidal power**<sup>vii</sup>.

## THE POPULATION DRIVERS

The linkage between population and climate change is self-evident: each additional person on the planet adds their own carbon footprint. Essential requirements for decent human living such as nutrition, housing, infrastructure, energy and material goods are all, at present and for the immediately foreseeable future, needs that cannot be supplied without producing greenhouse gas emissions.

The top two drivers of global emissions are energy (including energy-related emissions from manufacturing and industry, electricity, heat, and transport) at 73.2% of global emissions, and agriculture, forestry and land use, currently accounting for 18.4%<sup>viii</sup>. Global energy demand is expected to increase by 50% over the next 30 years as a result of both population growth and economic development<sup>ix</sup>.

The food system as a whole - including refrigeration, food processing, packaging, and transport - accounts for around one-quarter of greenhouse gas emissions<sup>x</sup> and emissions from the agricultural sector continue to rise<sup>xi</sup>. A 2018 report by the World Resources Institute concluded that 56% more food would be needed in 2050 than in 2010, with population growth driving “the majority of demand”<sup>xii</sup>. If emissions from food production were to continue as they are currently, they will rise to a cumulative 1,356Gt by the end of the century<sup>xiii</sup>, enough to miss the 1.5°C target of the Paris Agreement.

Construction accounts for 40% of global energy-related emissions<sup>xiv</sup>. To accommodate a projected 3 billion extra people, an extra two billion homes are estimated to be needed by the end of the century<sup>xv</sup>, alongside an additional 3-4.7 million kilometres of road<sup>xvi</sup>.

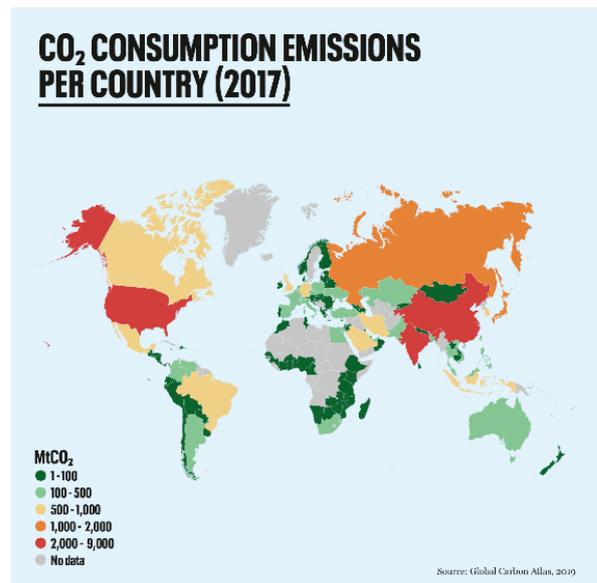
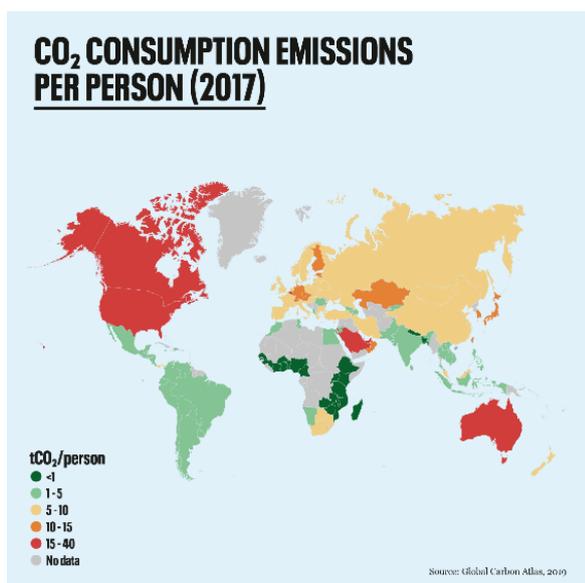
In addition to its contribution to emissions, population growth directly affects the Earth's ability to withstand climate change and absorb greenhouse gases, most significantly through land conversion. For example, between 2001 and 2019, there was a total of 386Mha of tree cover loss globally, equivalent to a 9.7% decrease in tree cover since 2000 and 105Gt of CO<sub>2</sub> emissions<sup>xvii</sup>. The highest proportion of this loss, at more than a quarter, is attributed to urbanisation and commodity-driven deforestation<sup>xviii</sup>. It is estimated that land restoration and management solutions could provide a third of cost-effective climate mitigation<sup>xix</sup>: population pressure pushes in the opposite direction.

Similarly, population growth can and does reduce the efficacy of other climate change solutions. For example, in the UK, the amount of emissions caused by population growth between 2005 and 2017 (30m tonnes) was almost double the amount of CO<sub>2</sub> removed by forests in the same period (15.7m tonnes)<sup>xx</sup>. A recent peer-reviewed study, titled *Population effects of increase in world energy use and CO<sub>2</sub> emissions: 1990 – 2019*, looked at population growth over 44 countries and concluded that whilst emissions have reduced significantly over the past thirty years due to improvements in efficiency, the additional demand, caused partly by population growth, has offset the impact of efficiency solutions by more than three-quarters<sup>xxi</sup>. Whether it is wind turbines, food waste or changed diets, the overall effectiveness of *all* other solutions in driving down emissions is compromised by increasing the number of carbon emitters.

## POPULATION AND CONSUMPTION: THE SPECIAL RELATIONSHIP

Climate change has historically and continues to be driven by the wealthiest. A person born in the UK will emit 17 times more consumption emissions than a person born in Nigeria over their lifetime, whilst the richest 10% of the global population, comprising about 600 million people, are responsible for almost half of all emissions<sup>xxii</sup>.

Household consumption accounts for about two-thirds of GHG emissions and UNEP's *Emissions Gap Report 2020* identifies a key role for personal lifestyle choices in tackling climate change<sup>xxiii</sup>. Because of high per capita emissions in the Global North, choosing smaller families is an effective individual action. Research conducted in 2017 suggested that by far the single most effective measure an individual in the developed world could take to cut their carbon emissions over the long term would be to have one fewer child<sup>xxiv</sup>. The study relied on estimates of future per capita climate emissions which are likely to change significantly, so its emissions savings figures must be treated with caution. It illustrates, however, how other individual climate actions - all of which remain effective and positive - lack the impact of limiting the number of new consumers, each with their own lifetime of emissions production. For people of reproductive age in high income countries, choosing a smaller family – ideally at replacement level or less (two or fewer children) – is an essential consideration in limiting their emissions.



However, the gap between the emissions of the Global North and the Global South is narrowing. As people move out of poverty, their consumption increases, and carbon footprints expand, while land and forests are cleared for housing and agriculture, and pollution and waste increases. The emissions of low-middle income countries are increasing, up by 43.2% over 2000-2013, due in part to increased industrialization and economic output<sup>xxv</sup>. Current growth in consumption is greatest in countries where population growth has until recently been amongst the highest: SE Asia, India, China. Here, the numbers and percentage of high-level consumers are rising – from today's estimated 3.5 billion high consuming individuals to 5.6 billion by 2050<sup>xxvi</sup>. The increase in emissions is largely a result of the growth in affluence of these countries. In line with rising affluence, resource use per person is projected by the United Nations to be 71% higher *per capita* by 2050 than it is today<sup>xxvii</sup>.

The *Population effects* study found that globally, growth in economic activity per person is the primary driver of energy use and carbon emissions, but that population growth has accounted for a third of emissions over the past 29 years<sup>xxviii</sup>, whilst the UNEP *Emissions Gap* report notes that the target global average per capita emissions of 2.1t CO<sub>2</sub> would see per capita emissions triple for the poorest half of humanity<sup>xxix</sup>. Most of the extra two billion people projected by 2050 will be born into that half. Everybody on the planet has the right to a good quality of life: the emissions of the poorest countries and the number of people who live there are only unimportant if the poor stay poor.

Meanwhile, in 2016, nearly one-fifth of the world's population was without access to electricity. A study titled *The 21st century population-energy-climate nexus*, modelled two scenarios and concluded that an "immediate and rapid expansion" of global renewable energy production, from just 9% in 2014 to 50% by 2028, is required to keep global warming to under 2°C in order to end energy poverty in the Global South and meet the demands of *both* growing population and consumption levels. The authors report that "world population growth, energy scarcity, and climate are interrelated issues" and "finding a beneficial solution to the interrelated problems of population growth, energy poverty, energy scarcity, and global warming is one of the great challenges of the 21st century"<sup>xxx</sup>.

The current concentration of carbon emissions in the Global North means that despite taking the world to the brink of climate catastrophe, we have still failed to improve the lives of billions trapped in poverty. The disastrous effects of climate catastrophe will impact those in poorest countries the most, in the areas that are projected to see the highest rates of population growth, especially women and girls: In 2018, more than half of the 41 million people displaced by climate change were girls and women<sup>xxxi</sup>.

A more just global system, in which resources are distributed more equitably, is essential. In order to ensure that there is enough to meet everyone's right to a decent standard of living, the richest must do their part by choosing smaller families and consuming more sustainably. However, it is ethically irresponsible and in direct contradiction of the UN Sustainable Development Goal 1: No Poverty, to expect that the climate crisis can be reversed by providing solutions only to the carbon-heavy lifestyles of the rich, whilst allowing the poor to stay entrapped in poverty, and avoiding the issue of a rapidly rising global human population.

## EMPOWERING SOLUTIONS

Significant results from any action intended to slow global population growth will take at least a generation to manifest – but will have permanent and irreversible positive effects throughout this century and beyond. Action to ensure future population growth does not endanger climate change mitigation achieved through other means is therefore essential now.

This action is positive, voluntary, and in line with people's aspirations and consistent with global demographic trends. Coercive and reprehensible "population control" methods are as unnecessary as they are unacceptable. For example, Thailand reduced its fertility rate by nearly 75% in just two generations with a creative and ethical family planning programme. Fertility rates are reducing almost everywhere – but more can and must be done. The UN projects only a one-in-four chance of global population plateauing by the end of the century, while an estimated 270 million women of reproductive age worldwide are still in need of but without modern contraception<sup>xxxii</sup>. This is an increase of 40 million since 1990 - due to the provision of services failing to match population growth.

Mechanisms to secure lower fertility and sustainable populations through voluntary means are positive and effective. Most are already explicitly featured in the Sustainable Development Goals:

- End poverty and reduce inequality – SDGs 1, 2 and 10
- Provide universal access to high quality education – SDG 4
- Women's empowerment – SDG 5
- Access to and uptake of modern family planning – SDG 3 and 5

The provision of equal access to modern family planning and good quality education for all is a human right, empowering women and girls to make choices about their bodies and their lives, as well as helping to lift families and entire communities out of poverty. That long-term benefits to the planet and the climate crisis also arise reinforces the central importance of redoubling our efforts to achieve them.

In addition to these structural changes, the fifth component of fertility reduction is encouraging the choice to have smaller families. This is particularly important in wealthier countries which have largely met the first four goals (although significant inequality may still exist within them) and which currently have relatively low fertility levels. These countries are also those with the highest per capita carbon footprint.

The average number of children per family has been reducing for decades: per capita consumption is not. Currently unpopular and politically unsupported action is *needed* to reverse trends of unsustainable consumption: the measures which lower family size are also what people *want*: education, empowerment, escape from poverty and family planning. Climate change demands multiple solutions. Addressing population through positive, ethical means, gives us the opportunity to work with and accelerate an existing trend, enhancing the quality of people's lives and maximising the effectiveness of all of the climate solutions that must be implemented. It is a win-win.

## ABOUT POPULATION MATTERS

*“Addressing the factor of population, alongside and in harness with consumption, is progressive, pro-people, and pro-planet. Grounded as it is, in empowering choice, enabling rights, and promoting positive, available, wanted solutions.”* - Robin Maynard, Population Matters Director

Population Matters is a UK-based charity which campaigns to achieve a sustainable human population, to protect the natural world and improve people's lives. We promote positive, practical, ethical solutions – encouraging smaller families, inspiring people to consume sustainably, and helping us all to live within our planet's natural limits. We believe everyone should have the freedom and ability to choose a smaller family. We support human rights, women's empowerment and global justice.

For more information, see [populationmatters.org](https://populationmatters.org)

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<sup>i</sup> World Resources Institute (2020) *State of climate action: assessing progress towards 2030 and 2050* <https://www.wri.org/publication/state-climate-action-assessing-progress-toward-2030-and-2050> ;

<sup>ii</sup> United Nations (2019) *2019 Revision of World Population Prospects* <https://population.un.org/wpp2019/>

<sup>iii</sup> The Intergovernmental Panel on Climate Change (2014) *AR5 Synthesis Report: Climate Change 2014* <https://www.ipcc.ch/report/ar5/syr/>

<sup>iv</sup> The Intergovernmental Panel on Climate Change (2018) *Special Report: Global Warming of 1.5 °C* <https://www.ipcc.ch/sr15/>

<sup>v</sup> Ripple et al (2020) World scientists' warning of a climate emergency, *Bioscience* <https://academic.oup.com/bioscience/article/70/1/8/5610806>

<sup>vi</sup> Project Drawdown (2020) *Sector Summary: Health and Education* <https://drawdown.org/sectors/health-and-education>

<sup>vii</sup> Ibid, *Table of Solutions: Health and Education* <https://drawdown.org/solutions/health-and-education>

<sup>viii</sup> Our World in Data (2020) *Sector by sector: where do global greenhouse gas emissions come from?* <https://ourworldindata.org/ghg-emissions-by-sector>

<sup>ix</sup> U.S. Energy Information Administration (2020) *International Energy Outlook 2020* <https://www.eia.gov/outlooks/ieo/>

<sup>x</sup> *Our world in data* <https://ourworldindata.org/food-ghg-emissions>

<sup>xi</sup> World Resources Institute (2020) *State of climate action: assessing progress towards 2030 and 2050*

<sup>xii</sup> World Resources Institute (2018) *Creating a sustainable food future* <https://www.wri.org/publication/creating-sustainable-food-future>

<sup>xiii</sup> Clark et. al (2020) Global food system emissions could preclude achieving the 1.5° and 2°C climate change

targets, *Science* <https://science.sciencemag.org/content/370/6517/705>

<sup>xiv</sup> World Green Building Council *Global status report 2017* <https://www.worldgbc.org/news-media/global-status-report-2017>

<sup>xv</sup> World Economic Forum *The world needs to build 2 billion new homes over the next 80 years* | World Economic Forum ([weforum.org](https://www.weforum.org))

<sup>xvi</sup> Meijer et al (2018) *Environmental Science* <https://iopscience.iop.org/article/10.1088/1748-9326/aabd42>

<sup>xvii</sup> Global Forest Watch <https://www.globalforestwatch.org/dashboards/global/>

<sup>xviii</sup> ibid

<sup>xix</sup> Griscom et al (2017) Natural climate solutions *PNAS* <https://www.pnas.org/content/114/44/11645>

<sup>xx</sup> Population Matters calculation. CO2 emissions due to population growth calculated by multiplying annual population growth by average annual per capita emissions over each year. Carbon sequestration figures from Department for Environment Food & Rural Affairs (2017) *UK Biodiversity Indicators 2017* <https://data.incc.gov.uk/data/d69db841-3bea-4809-b384-5ce616e5d278/UKBI-2017.pdf> Full calculations available from Population Matters on request.

<sup>xxi</sup> Chaurasia (2020) *Population effects of increase in world energy use and CO2 emissions: 1990 - 2019*

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- <sup>xxii</sup> UNEP *Emissions gap review 2020* [Emissions Gap Report 2020 | UNEP - UN Environment Programme](#)
- <sup>xxiii</sup> *ibid*
- <sup>xxiv</sup> Wynes & Nicholas (2017) The climate mitigation gap *Environmental research letters* <https://iopscience.iop.org/article/10.1088/1748-9326/aa7541>
- <sup>xxv</sup> United Nations Statistics Division (2019) *The Sustainable Development Goals Report 2019* <https://unstats.un.org/sdgs/report/2020/goal-13/>
- <sup>xxvi</sup> The World Counts <https://www.theworldcounts.com/populations/world/consumers>
- <sup>xxvii</sup> United Nations International Resource Panel (2017) *Assessing Global Resource Use* <https://www.resourcepanel.org/reports/assessing-global-resource-use>
- <sup>xxviii</sup> Chaurasia (2020) [Population effects of increase in world energy use and CO2 emissions: 1990 - 2019](#)
- <sup>xxix</sup> UNEP *Emissions gap report 2020* <https://www.unep.org/emissions-gap-report-2020>
- <sup>xxx</sup> Jones and Warner (2016) [The 21st century population-energy-climate nexus](#)
- <sup>xxxi</sup> CARE International (2020) *Evicted by Climate Change: Confronting the Gendered Impacts of Climate-Induced Displacement* <https://careclimatechange.org/wp-content/uploads/2020/07/CARE-Executive-Summary-Policymakers-v0.3.pdf>
- <sup>xxxii</sup> Kantorová et al. (2020) Estimating progress towards meeting women's contraceptive needs in 185 countries: A Bayesian hierarchical modelling study, *PLOS Medicine* <https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003026>

## Further reading

- [Global warming policy: Is population left out in the cold?](#) Bongaarts & O'Neill (2018)
- [Hitting the Targets: the case for ethical and empowering population policies to accelerate progress towards the Sustainable Development Goals](#) Population Matters, 2020
- [Progress towards the Sustainable Development Goals](#) United Nations, 2020
- [Gender and environment resource center](#), IUCN