THE BIODIVERSITY CRISIS: WHY POPULATION MATTERS

A Population Matters Briefing

EXECUTIVE SUMMARY

1. The global human population has increased from 3.7 billion in 1970 to approximately 8 billion today. The UN projects that it will continue to increase throughout this century. Its medium projection is for a population of 10.4 billion in 2100, with a 95% certainty range of 8.9 – 12.4 billion.

2. Biodiversity loss has been accelerating and the extinction rate is now so high that scientists have established we are in the middle of a sixth mass extinction, driven by human activity. By far the biggest culprits are habitat destruction and the overexploitation of wild species. These are joined by pollution, climate change, and invasive species and disease. Human population growth acts as a direct driver of all of these factors, except invasive species and disease, where it nevertheless can contribute due to human population movements. The failure to address population under the 2010 Aichi Biodiversity Targets, which expired in 2020, is likely to have contributed to the failure to achieve any of the twenty targets.

3. The significant contribution of population growth to global biodiversity loss has been directly acknowledged and addressed in a number of key and authoritative scientific papers, reports and reviews in recent years. Many directly call for action to address future growth.

4. Significant results from any action intended to slow global population growth will take at least a generation to manifest, but will have permanent and irreversibly positive effects throughout this century and beyond. Action to ensure future population growth does not endanger the Earth's biodiversity is therefore essential now.

5. The most effective solutions all directly benefit everyone: unhindered access to modern family planning and good quality education, 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 Earth and its biodiversity also arise reinforces the central importance of redoubling efforts to achieve them.

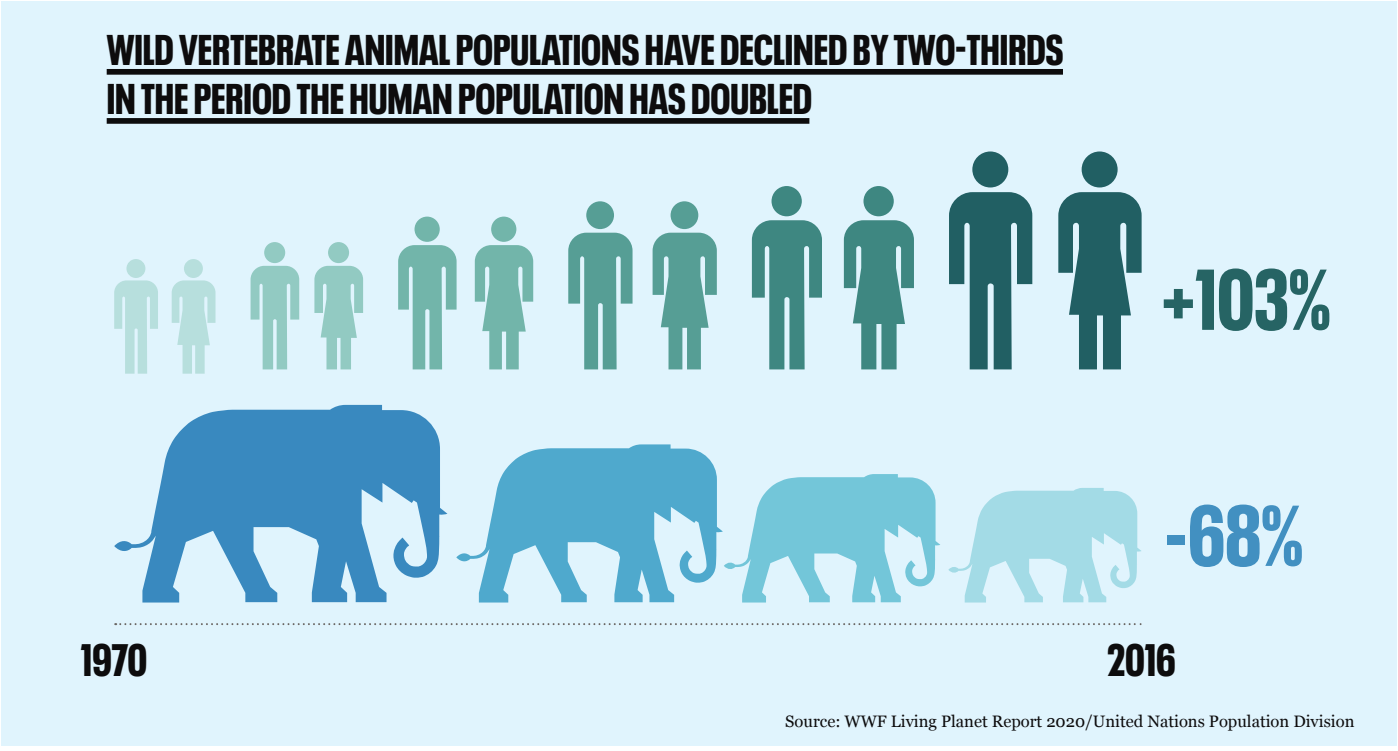
6. As a key driver of the main causes of biodiversity loss, human population growth is an appropriate and necessary issue for attention in the post-2020 Global Biodiversity Framework of the UN Convention on Biological Diversity.

INTRODUCTION

Ecosystems, interdependent webs of living organisms and their physical environments, are vital to all life on Earth. Our ecosystems provide us with a vast range of vital resources, including clean air, fresh water, food, raw materials and medicines. Biodiversity, the variation of life on Earth, is a major factor in nature's resilience. In a biodiverse ecosystem, if the environment changes and some organisms can no longer thrive, others can take their place and fulfil essential functions.

However, the biodiversity of Earth's ecosystems is under increasing threat from human population growth. For example, according to WWF's *Living Planet Report 2020, "relentless human population growth is putting a damaging strain on the world's plant diversity"*[1]; and since 1970, populations of wild vertebrate animals have declined by 68%[2] – in the same period, the global human population has more than doubled, increasing from 3.7 billion to about 8 billion today. These extra billions of people have all required land, food, water and energy, amongst many other finite and renewable resources. They have also contributed to the climate change that is damaging natural habitats, changing disease patterns and acidifying the oceans. Plastic pollution, desertification and the eutrophication of waterways through fertiliser use are amongst multiple other problems exacerbated by unsustainable population growth.

Numerous authoritative scientific papers, reports and reviews have identified human population growth as a driver of biodiversity loss. While multiple other factors also contribute and must be addressed, not least unsustainably high and profoundly unequal *per capita* consumption, addressing population must form a critical part of the suite of solutions. Fortunately, the mechanisms which reduce fertility rates also improve human rights and well-being in multiple ways, and speed up progress towards attainment of the Sustainable Development Goals.



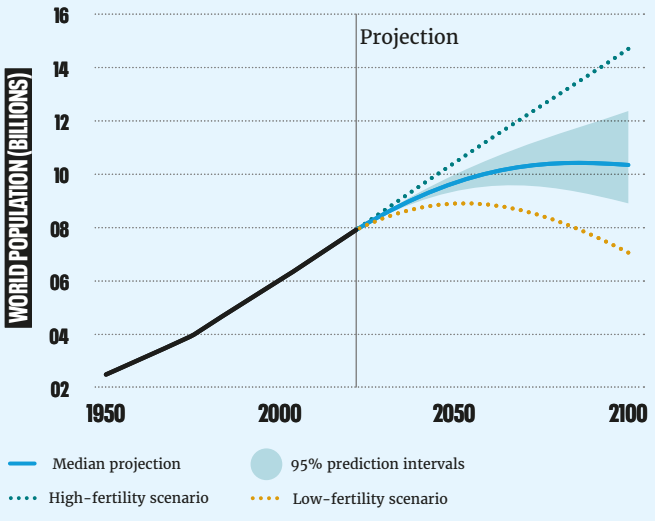
Source: WWF Living Planet Report 2020/United Nations Population Division

POPULATION PROSPECTS

The global human population has increased from 3.7 billion in 1970 to approximately 8 billion today. The UN currently projects that it will continue to increase throughout this century, with a 50% chance of a peak at 10.43 billion in 2086. Its medium projection is for a population of 9.7 billion in 2050, and 10.4 billion in 2100 (with a 95% certainty range of 8.9 – 12.4 billion).[3]

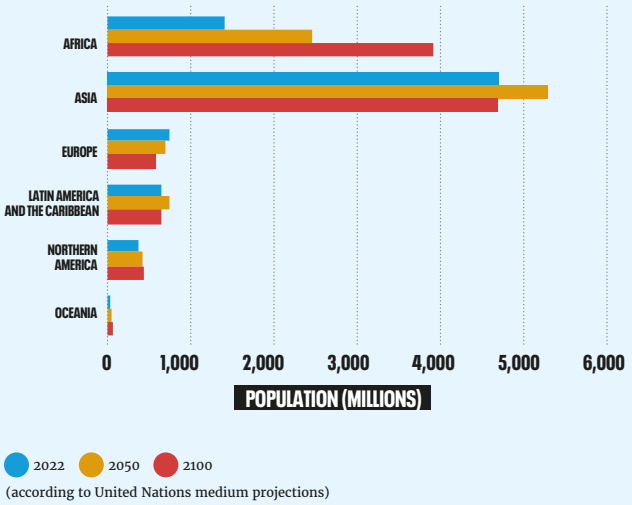
It is important to remember that while population growth is highest in the Global South, and relatively low in most parts of the Global North, consumption, resource use and carbon emissions are far greater in the richest parts of the world. This means that the global environmental impact on nature and biodiversity of each individual in wealthy countries is far higher than that of each individual in poor countries. Therefore, the size of the overall population in the Global North matters, too.

UNITED NATIONS POPULATION PROJECTIONS TO 2100: 95% CERTAINTY RANGE



Source: United Nations, 2022

POPULATION GROWTH BY CONTINENT, 2022-2100



Source: United Nations, 2022

HUMAN POPULATION GROWTH AND BIODIVERSITY LOSS

The drivers of biodiversity loss

Biodiversity loss has been accelerating and the extinction rate is now so high that scientists have established we are in the middle of a sixth mass extinction, driven by human activity.[4] Biodiversity loss has several primary drivers, which are all well-recognised. By far the biggest culprits are habitat destruction and the overexploitation of wild species. These are joined by pollution, climate change, and invasive species and disease.

Human population growth acts as a direct driver of all these factors, except invasive species and disease, where it nevertheless can contribute due to human population movements. The impact of population growth at local level, particularly in regard to habitat loss and overexploitation, is widely recognised. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), only one quarter of land areas and one third of oceans remain relatively undamaged by human activity.[5]

The population factor

A number of scientific papers, reports and reviews in recent years have directly addressed the role of population growth in global biodiversity loss.

The most significant and high-profile is the IPBES global assessment of the state of biodiversity, published in May 2019. The report identifies direct and **indirect drivers of biodiversity loss**, itemising population growth as one of the latter, alongside consumption patterns, technological innovation and governance. In its prescription for vital and urgent action, the IPBES states, *"changes to the direct drivers of nature deterioration cannot be achieved without transformative change that simultaneously addresses the indirect drivers."*[6]

Research published in the July 2017 *Proceedings of the US National Academy of Sciences* reviewed data on 27,600 terrestrial vertebrate species, with a more detailed analysis of 177 mammal species. It identified the proximate causes of population extinctions as *"habitat conversion, climate disruption, overexploitation, toxification, species invasions, disease, and (potentially) large-scale nuclear war"*, and concluded that "*the ultimate drivers of those immediate causes of biotic destruction [are] human overpopulation and continued population growth, and overconsumption, especially by the rich."*[7]

Extracting the specific role of population in biodiversity loss is a complex task that was nevertheless undertaken in two papers in 2019.

In *Nature Ecology & Evolution*, Marques *et al.* examined biodiversity loss and carbon sequestration through the measures of bird diversity and deforestation, and used decomposition analysis to quantify the particular impacts of drivers including population and affluence. The research

identified that environmental impact per unit of GDP has been declining, suggesting a greater efficiency of environmentally relevant economic activities. However, **these efficiency gains were cancelled by overall growth**, and the authors concluded that *"economic and population growth have been driving the upward trend of impacts on biodiversity and ecosystem services, despite a reduction of the impacts per unit of GDP."*[8]

The 2019 United Nations' *Global Resources Outlook* report found that 90% of biodiversity loss and water stress are caused by resource extraction and processing, including agriculture. Analysis of specific drivers showed that globally, up to the year 2000, **population growth was the strongest driver of increased resource extraction**. From 2000 onwards, increasing affluence overtook population as the biggest driver, except for in Africa and West Asia, where rapid population increase remains the biggest cause.[9]

One of the scientific papers with the greatest impact of recent years[10] has been the *World Scientists' Warning to Humanity: A Second Notice*, published in *Bioscience* in 2017. This paper has now been endorsed by more than 20,000 scientists. It details decline in almost every marker of environmental resilience, and warns of *"catastrophic biodiversity loss"*. The paper identifies *"continued rapid population growth as a primary driver behind many ecological and even societal threats."* The Warning lists thirteen policy measures essential to safeguarding our future, including the **provision of family planning and girls' education to reduce fertility**, and *"estimating a scientifically defensible, sustainable human population size for the long term while rallying nations and leaders to support that vital goal."*[11]

Twelve studies, headed by Professor David Wagner of the University of Connecticut and published in the *Proceedings of the US National Academy of Sciences* in January 2021, examined global insect decline and evaluated the principal threats to insect populations. Highlighting the essential nature of insects to the ecosystems upon which humanity depends, the research found that insect populations are falling at frightening rates due to human-induced threats such as **the destruction of wild habitats for farming, urbanisation, pesticide use and light pollution**.[12] One paper in the series, co-authored by Wagner, concluded: *"To mitigate the effects of the Sixth Mass Extinction event that we have caused and are experiencing now, the following will be necessary: a stable (and almost certainly lower) human population, sustainable levels of consumption, and social justice that empowers the less wealthy people and nations of the world, where the vast majority of us live."*[13]

Food and biodiversity loss

Another two studies in recent years have specifically examined the relationship between food and environmental sustainability, including biodiversity loss.

The 2019 EAT-Lancet Commission report on global food sustainability examines how to feed the human population up until 2050 without causing irreversible damage to the environment. It notes the multiple impacts on biodiversity of food production, including that 80% of extinction threats to mammal and bird species are due to agriculture. The study concluded that only a *"transformation"* of food production and consumption would allow a global population of 10 billion to be fed sustainably, but that even with such a transformation, **feeding a population of over 10 billion without negative impacts on biodiversity and the environment is *"increasingly unlikely"***.[14]

The World Resources Institute's *Creating a Sustainable Food Future*, published in December 2018, was specific in including reducing human population growth in its "menu" of actions to ensure food sustainability. **It specified the goal of achieving replacement level fertility rates through voluntary means**, including *"improving women's access to education and healthcare in Africa to accelerate voluntary reductions in fertility levels."*[15]

Transformative change needed

A further report, published in February 2021, specifically looked at **the relationship between our economic and financial systems and biodiversity loss**. Commissioned by the UK Treasury from leading economist and Population Matters Patron, Sir Partha Dasgupta, *The Economics of Biodiversity: The Dasgupta Review* details how a focus on growth and profit, which ignores and fails to account for environmental impacts, has increased human prosperity, but devastated nature and biodiversity. The report calls for *"transformative change"* in our consumption patterns and directly addresses the issue of population: *"Growing human populations have significant implications for our demands on Nature, including for future patterns of global consumption."* **It also highlights the huge, positive impact of advancing women's rights and family planning on protecting biodiversity**: *"As well as improving women's access to finance, information and education, support for community-based family planning programmes can shift preferences and behaviour, and accelerate the demographic transition. There has been significant underinvestment in such programmes. Addressing that shortfall, even if the effects may not be apparent in the short-term, is essential"*[16]

EMPOWERING SOLUTIONS

Positive population action

Significant results from any action intended to slow global population growth will take at least a generation to manifest, but will have permanent and irreversibly positive effects throughout this century and beyond. Action to ensure future population growth does not endanger the Earth's biodiversity is therefore essential now.

This action is positive, voluntary, 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, Bangladesh reduced its fertility rate from above 7 in the early 1970s to 2.2 in 2014 through a creative and ethical family planning programme.[17] Fertility rates are declining almost everywhere, but more can and must be done. The UN projects about a 50% chance of global population peaking by the end of the century[18], while an estimated 270 million women of reproductive age worldwide are still in need of but without modern contraception.[19] This is an increase of 40 million since 1990, due to the provision of services failing to match population growth. More must therefore be done to plug this shortfall through greater funding and political will.

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 – **SDGs 3 and 5**

The provision of equal, unhindered access to modern family planning and good quality education, which empowers women and girls to make choices about their bodies and their lives, as well as helps to lift families and entire communities out of poverty, benefits everyone, everywhere. That long-term benefits to the Earth and its biodiversity 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 measure is effective in all scenarios, but particularly important in countries with a relatively high Human Development Index, which already are a lot closer to achieving the first four goals (although significant inequality may still exist within them) and which currently have relatively low fertility levels. These countries, mainly in the Global North, may still have significant local biodiversity problems (the UK, for instance, has been described as one of the most nature-depleted countries in the world[20]) and contribute significantly to the global drivers of biodiversity loss, such as climate change or overconsumption, for example through the high demand for imported agricultural products leading to habitat loss.

Local actions

Programmes to protect biodiversity through the reduction of population pressure are already being employed at a local level across the world. The Population Health Environment (PHE) model recognises the synergies and mutual benefits of improving the conditions of human communities in achieving local conservation goals,[21] including through the provision of family planning services to reduce local human population pressures on biodiversity. Organisations successfully implementing this approach include Blue Ventures (Madagascar), Nature Uganda and Cheetah Conservation (Namibia).[22]

The Convention on Biological Diversity

As a key driver of the main causes of biodiversity loss, human population growth is an appropriate and necessary issue for attention in the post-2020 Global Biodiversity Framework of the Convention on Biological Diversity[23], the multilateral treaty with the goals of conserving biological diversity, promoting the sustainable use of its components, and promoting the fair and equitable sharing of benefits arising from genetic resources. Indeed, the failure to address population under the 2010 Aichi Biodiversity Targets[24], which expired in 2020, is likely to have contributed to the failure to achieve any of the twenty targets.

Recognition of the global extent and relevance of the problem is an essential first step, followed by discussion of appropriate mechanisms to progress towards sustainable population levels within the post-2020 Global Biodiversity Framework. These could include the establishment of targets relating to population, and the addition of a suitable protocol and/or provision for their inclusion in National Biodiversity Strategies and Action Plans, which are the framework's key implementation mechanisms at the national level.

CONCLUSION

It is clear that Earth's biodiversity is under threat as never before, and will continue to face great pressures unless we take consistent and united action now on multiple fronts. Our future survival depends on it.

It is also abundantly clear that in order to tackle the drivers of biodiversity loss effectively on a global scale, we must not ignore the issue of human population growth.

Fortunately, solutions are at hand, and are extremely effective. By addressing population through positive, ethical and choice-based means, we give ourselves the opportunity to enhance the quality of people's lives and maximise the effectiveness of all of the solutions to the biodiversity crisis that must be implemented.

ENDNOTES

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ABOUT POPULATION MATTERS

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.

More information:

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