

Discussing population concepts: Overpopulation is a necessary word and an inconvenient truth

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Abstract

In science, in the media, and in international communication by organizations such as the UN, the term ‘overpopulation’ is rarely used. Here we argue that it is an accurate description of our current reality, well backed up by scientific evidence. While the threshold defining human overpopulation will always be contested, overpopulation unequivocally exists where 1) people are displacing wild species so thoroughly, either locally or globally, that they are helping create a global mass extinction event; and where 2) people are so thoroughly degrading ecosystems that provide essential environmental services, that future human generations likely will have a hard time living decent lives. These conditions exist today in most countries around the world, and in the world as a whole. Humanity’s inability to recognize the role population growth has played in creating our environmental problems and the role population decrease could play in helping us solve them is a tremendous brake on environmental progress. While reducing excessive populations is not a panacea, it is necessary to create ecologically sustainable societies. We therefore recommend use of the concept of overpopulation in scientific publications and in public outreach.

Key words: Human population, overpopulation, population decline, biodiversity, climate change, mass extinction

Background

People who work to draw attention to the risks of excessive human populations and to promote family planning to minimize further population growth, are often warned not to use the word overpopulation (see Gardner 2014, for one example). In one sense, overpopulation is humanity's present project: the process of increasing human numbers globally to the detriment of wildlife, our common climate, food security, green urban spaces, and more (Foreman & Carroll 2014, Crist et al. 2017). But the word can be construed as misanthropic: perhaps not as bad as Thanos in the film *Avenger's: Endgame* (Abegão 2019) but still somehow guilty of wanting to eliminate surplus people by unethical means. Of course, this is a misrepresentation, but it happens repeatedly. Should we self-censor to be a smaller target for criticism? Or should we present our honest view: that humanity is already overpopulated, and that by denying it we turn our backs on the best options for averting humanitarian and ecological crises?

Science and a definition

The word 'overpopulation' can be applied to any species which exceeds the carrying capacity of its habitat. For a while, the species might continue to uphold its numbers, but only by running down its 'natural capital', consuming the critical resources faster than they can regenerate and disrupting the balance that sustains each year's bounty. Ultimately, the degraded habitat will no longer support such numbers and the population collapses locally. But people are clever in modifying environments to support more people. They can use technology to get more goods and services from the same resources. People can also gather and trade resources over vast distances far from where they actually live – a major difference compared to other species. This has led to lengthy discussions about the question "How many people can the Earth support?" (Cohen 1995). The answers depend on value judgements, such as what quality of life we want people to have and how much we value preserving wild places where other species can thrive (Wilson, 2017); they also depend on what technologies we might conceivably draw upon in the future. Maximum and optimum population sizes are likely to differ substantially (Lianos & Pseiridis 2016, Derer 2018a).

All of this creates a large grey area, with much room for disagreement about what constitutes overpopulation. The Global Footprint Network (GFN), for example, defines "overshoot" by

contrasting a human population's overall consumption with its country's total biocapacity (see website, www.footprintnetwork.org). This definition assumes perfect substitutability between different biocapacities, as well as an entitlement for humans to consume it all (a country could be sustainable, according to the GFN's criteria, even if it had no national parks and exterminated all its native wildlife). But even such selfish calculations, grounded on the human species only, imply that we would need 1.75 planet Earths to sustain our current behaviors. In theory, humanity could retreat from this excess purely by consuming less and improving technology, without also stemming its population growth. In practice, that is unlikely, and much more costly than addressing both population growth and per person impacts simultaneously. But because the GFN's online footprint calculator and its publications emphasize per capita footprints while deemphasizing numbers of "feet," users of this approach can avoid thinking about population matters.

There are limits beyond which human overpopulation becomes undeniable. We suggest the following definition of overpopulation, grounded straightforwardly in environmental ethics: overpopulation exists where 1) people are displacing wild species so thoroughly, either locally, regionally, or globally, that they are helping create a global mass extinction event; and where 2) people are so thoroughly degrading ecosystems that provide essential environmental services, that future human generations likely will have a hard time living decent lives (Staples and Cafaro 2012, The Overpopulation Project 2020). This definition recognizes that people are not on this planet alone, we share it with perhaps 10 million other species, and we do not want to live under too crowded conditions. We want to live well, we want our grandchildren to live well, and we want them and *their* grandchildren to live well in a biologically rich world (Dodson 2019). On this definition, most nations and the world as a whole are overpopulated, and getting more overpopulated with each passing year. Fortunately, not all areas of the Earth are overpopulated and in places that are, we could reduce our numbers to restore and protect ecosystems. But in order to motivate action to do so, we must be able to name overpopulation as a problem. We have to be able to use the word.

An uncomfortable concept

Why are so many people uncomfortable talking about overpopulation? There are many reasons, two of which seem especially important. First, some people deny overpopulation exists, referring to recent progress in human well-being around the world (one influential book is discussed in Götmark 2018). Second, the term may cause communication problems, if not explained well. Some colleagues and conservationists, both in rich low-fertility countries and poor high-fertility countries, feel it gives the wrong impression about whose interests are being pursued.

Regarding the first point, we do not deny that the average living conditions for many people around the world have improved in recent decades (see Roser 2020). But this general case is often taken too far, since in absolute numbers undernourishment, for instance, persists and has even increased compared to 60 or 70 years ago (Marsh 2017, FAO 2019). Furthermore, future improvements in peoples' lives are commonly taken for granted, despite the UN's forecast that we face another 80 years or more of substantial global population increase, while environmental capital, from groundwater reserves to climate stability, are being run down already (Drechsel et al. 2001, UNEP 2012, Vaughan 2019). But pointing to the fact that food (Le Page 2020) and freshwater (D'Odorici et al. 2018, Götmark 2019) cannot increase indefinitely as the human population grows usually has little effect; many will argue that Malthus was proven wrong in the 19th century (Wikipedia 2020), Paul Ehrlich in the 20th (Climate One 2018) and smart *Homo sapiens* will once again solve new problems through clever management or new technology in the 21st. And the more people, the more brains to solve the problems!

But note, this is a common response from political and intellectual elites whose privilege has allowed them to do well and feel confident about the future. The general public heading to work on crowded buses, low-paid workers fighting flooded labor markets, or poor farmers worried about droughts or subdividing their properties among their numerous children, usually have more negative and realistic views about population growth (Dodson 2019). You can see this contrast when the public responds to newspaper reports or opinion pieces focused on solving environmental problems through technical solutions; check the online comments after the article, where readers often recognize population growth or overpopulation as the missing piece in the texts, and express skepticism that solutions which ignore it will work.

Those who have any interest in wildlife are even less inclined to argue away overpopulation, since they are aware of current clear negative trends for species and populations. One study of mammal population trends for the period 1900-2015 concludes, of “the 177 mammals for which we have detailed data, all have lost 30% or more of their geographic ranges and more than 40% of the species have experienced severe population declines, and >80% range shrinkage” (Ceballos et al. 2017, study summarized in Carrington 2017). Another recent study concluded that North American wild bird abundance decreased by 30% during the last 50 years, an astonishingly rapid rate of population loss (Pennisi et al. 2019, study summarized in Cafaro 2019). Human overpopulation has obviously contributed to these negative effects on other species.

The second issue is that in some circles, such as in discussions regarding international developmental aid, the word overpopulation increasingly seems to have become taboo over the last two or three decades (Bognar 2019). Among our colleagues in Africa, use of the word can create negative responses, despite our sharing similar views on the negative effects of population growth and on the needed solutions, such as greater financial support for family planning. For example, in a response to text on The Overpopulation Project’s website where overpopulation was highlighted, an African colleague wrote: [The text]” ... *ignores the issues of inequities within and across countries which is at the heart of the poor state of human conditions we see in different parts of the world today. It is NOT overpopulation that is sending millions of children to bed hungry each night. It is not overpopulation that is responsible for the massive ecological devastation in Africa today.*”

There is a lot to unpack in these words, but implicit is the idea that citing overpopulation means denying the inequities of colonial legacies and modern exploitation. Even worse, that the person citing overpopulation wishes to impose some sort of penalty on poor, high-fertility countries, rather than identifying a crucial area in which they need help. We are all raised on stories where adversity is characterized by villains and heroes, so it may be hard to grasp that naming is not blaming. Yet it is incorrect to argue that population growth has played no role in driving deforestation, overgrazing, soil degradation and loss of species in Africa, not to mention shrinking land holdings, burgeoning urban slums and insufficient access to food, infrastructure

and services (see Campbell et al. 2007, Graves et al. 2019). And with all that is known about crowded labor markets leading to low wages and exploitative working conditions, can it really be argued that population growth plays no role in driving economic inequality?

No country outside OPEC has achieved middle-income status without first reducing its birth rate substantially through voluntary family planning, and countries which did so, regardless of their colonial legacy, have seen substantial improvements (O’Sullivan 2013). By denying overpopulation and the problems generated by continued rapid population growth, our colleague’s commendable desire to address economic equity could contribute to worsening it. Such denial also ignores the fact that limiting future population growth is likely to be an important factor in whether African nations are able to preserve their spectacular wildlife heritages (Bradshaw & Di Minin 2019).

A balanced view and a recommendation

Pointing all this out does not mean arguing against greater economic equity between nations, fairer trade relations, or increased foreign aid—all of which is needed. Nor does it mean acquiescing in overconsumption by wealthy people, or pretending that overpopulation is only an issue in the developing world. *It is important to acknowledge that overpopulation exists in many rich countries with too high rates of consumption as well as in many poor countries with too high fertility rates. Every effort should be made to reduce high consumption rates as well as high birth rates; in combination, these two measures would create a much better future for people on the planet.*

From this perspective, the fact that some rich nations have aging and declining populations is good news (Götmark et al. 2018). Each nation, each political leader, each citizen, can contribute to creating sustainable societies by addressing both consumption and population issues, and their interconnections. Avoiding overpopulation is important in creating societies that sustain good human lives and maintain the existence of other species. Many futurists acknowledge the threat, but claim that the problem is fixing itself by clever people (for example, Randers 2012, Rosling et al. 2018). This belief is part of the mythology through which population growth and

overpopulation were rendered taboo, particularly since the mid-1990s. Sadly, as a consequence of this complacency, family planning efforts were neglected and many countries have seen fertility declines stall or reverse (Bongaarts 2008). The United Nations' prediction of peak world population was consequently revised upward from 9 to 11 billion people (O'Sullivan 2016). The partnership "Family Planning 2020" was launched in 2012 to revitalize languishing family planning efforts, and has helped many women in many countries receive contraception (Cahill et al. 2018). But it has fallen well short of its targets, due to weak political will in both donor and recipient countries (see www.familyplanning2020.org, for reports and news). Indeed, the number of women with an unmet need for contraception continues to rise (Kantorová et al. 2020), while family planning receives only 1% of international aid (Potts and Graves, 2019).

It seems that the campaign to disavow overpopulation and refocus birth control efforts exclusively on women's reproductive health and rights has not served women's rights well. Equally, it has impeded environmental protection. The Convention on Biological Diversity's Aichi targets systemically neglect population growth as a driver of biodiversity loss (Driscoll et al. 2018). Integrated assessment models (IAMs) using the IPCC's 'shared socioeconomic pathway' (SSP) scenarios have found that the feasibility of achieving less than two degrees warming depends on extremely rapid fertility decline in Africa, but fail to include measures to achieve that decline (O'Sullivan 2017). An area of forest the size of Germany could be saved from conversion to crops by accelerating fertility decline in Africa (Searchinger et al. 2018). We ignore overpopulation at our peril. Yet in recent decades, many environmental scientists and environmental advocacy organizations have done just that (Porritt 2014, Foreman & Carroll 2014, Derer 2018b). The word 'overpopulation' is rare in titles or abstracts of articles in the fields of demography, ecology, food science, or sustainability in general. This neglect or denial has made it much harder to deliver the reproductive freedoms that millions of people in high-fertility countries want, and consequently undermined their own conservation aims. Still, the fight to address overpopulation continues. We recommend that the concept be used widely in scientific analyses as well as in public outreach, especially in media discussions about environmental issues.

In a promising sign, the “World Scientists’ Warning to Humanity: A Second Notice” (Ripple et al., 2017) attracted endorsements from 15,364 scientists for an agenda which states “further reducing fertility rates by ensuring that women and men have access to education and voluntary family-planning services, especially where such resources are still lacking.” The organization formed to advance that agenda, ScientistsWarning.org, organized a well-attended seminar on overpopulation at the most recent annual UN climate change summit, COP 25 in Madrid in December 2019 (Scientists’ Warning 2019). As was eloquently argued at that event, overpopulation is a major threat to climate stabilization and there are effective, just and practical solutions to help us deal with it (Cafaro 2012). The self-righteous refusal to name the problem can only deepen the environmental and social crises we face. Having come so close to the brink of cascading disasters (Cafaro & Crist, 2012), we can no longer afford to pander to misguided political correctness.

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