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Smaller human populations are still not a necessary condition for biodiversity conservation: A response to Cafaro et al. (2023)

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1. Maligning the population issue using Malthusian theory

The persistence of the "population size problem" in conservation-related debates suggests that, despite all evidence accumulated (Hughes et al., 2023), the sophism of population growth as the central driver of human-environmental issues continues to persist. The origins of this scapegoat for problems that have to do with political economy dates back to Thomas Malthus' work: *Essay on population* (Malthus, 1798). Though very influential at the time of publication, the mechanisms that generate scarcity are well understood today and a large body of evidence supports the argument that population size plays a minor role when compared to social, economic and political structure of populations. So, why does the *population problem* come into play over and over? Despite advancements in the field of biodiversity conservation, Cafaro et al. (2022, 2023a, 2023b) echo the Malthusian hyperfocus on population size, obscuring nuanced perspectives that highlight mechanistic drivers of biodiversity loss (IPBES, 2019). Instead of responding to each argument point by point, our response reinforces our original arguments and clarifies our position that a central focus on population is neither necessary nor sufficient to ensure biodiversity conservation across diverse ecological contexts.

2. Consumption as a driver of biodiversity decline: who and how vs how many

Whilst Cafaro et al. (2023a, 2023b) state that they recognise that curbing human population growth alone is not sufficient for conservation, we maintain (Hughes et al., 2023) that biodiversity conservation does not *require* a decrease in human populations. We assert that the singular focus Cafaro et al. (2022, 2023a, 2023b) place on human population only acts as a distraction from developing the solutions we need to meet future conservation targets. Their supporting evidence

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generally fails to consider how consumption patterns, as a main driver of biodiversity decline are spatially and socially distributed. The response states, "*Global biodiversity decline is best understood as too many people consuming and producing too much and displacing other species.*" We argue that a more accurate problematization of biodiversity decline should be restated: "*Global biodiversity decline is best understood as some people consuming too much*". This reflects that consumption is uneven between and within countries, and species displacement through habitat loss is not the sole driver of biodiversity decline.

Many studies cited by Cafaro et al. (2023a, 2023b) are many decades old, and do not consider recent work that demonstrates more nuanced relationships between population growth, spatial distribution of population, and increasing per-capita consumption. It fails to recognise that consumption frequently relates to per-capita wealth rather than population (fashion, pets, and dietary footprint). Furthermore, the simplification that "more people need more" obscures the fact that a small number of people consume many orders of magnitude more than others, and average per-capita consumption differs by a factor 30 between the most-consuming and least-consuming countries (World Population Review, 2023). Thus, decreasing the number of people in least-consuming countries will not dent the impact on global biodiversity, yet if people in least-consuming countries grow their footprint to that of the most consuming countries, there would be clear implications for biodiversity conservation.

The continued assertion of Cafaro et al. (2022, 2023a, 2023b) that curbing the population should be the priority action in conserving biodiversity also fails to consider trends in demographic transition that are already occurring globally (Hughes et al., 2023). No country that has efficiently reduced its population growth rate did so due to an ecological demand. In fact, advances related to development programs, improvements in equity, and urbanization were the driving factors of individual choice to have more or fewer children (Aassve et al., 2005). Despite this, many of the countries with the lowest birthrates are the same ones that lead environmental degradation indices (World Population Review, 2023). Further, these arguments assume that "the population grows geometrically while its food supply only increases arithmetically", without providing a clear explanation for the proposed geometric and arithmetic ratios. Yet regions currently showing the highest rates of population growth will very likely increase their per capita consumption as population growth slows, possibly even increasing our global consumption footprint even once population growth has plateaued (Hughes et al., 2023). Thus mechanisms to sustainably increase life quality are urgently needed, and countries with the largest per-capita footprints must work to reduce their footprint to counterbalance the nesessary increases in living-standards as countries demographically transition. Furthermore, spatial distribution of population also plays a role: urbanization trends are more clearly linked to rural depopulation than overall population growth, and may have negative impacts on both rural and urban biodiversity.

2.1. Ethical issues of population control as suggested in Cafaro et al

At a time when the world is facing a rapid and alarming escalation in food prices, generating insecurity and conflicts in various regions of the planet, there is a growing risk that governments will propose simplistic and inhumane solutions. This scenario can be seen as fertile ground for the resurgence of neomalthusian ideas that have historically justified dangerous social-Darwinist and eugenic movements. Also, many important social aspects, such as the cultural and spiritual values of the local population, are not recognized in the planning conditions for biodiversity conservation or offset areas, and the suggestion of general policies to end population growth tends to silently advocate for the expansion of imperialism. Thus, we argue that focusing too narrowly on population size alone may embolden the far-right political spectra to embrace dictatorial regimes that ignore human rights, drive femicide, obstetric violence, and misogyny. For example, biased male: female ratios can occur from such practices and the 34 million fewer women than men in China, is largely attributed to the killing of female infants during the one child policy (Ebenstein, 2010).

Advocating that reducing human population is a priority only distracts from the technological and cultural changes needed to reduce continued biodiversity loss. Approaches that prioritize health, well-being, and capacity building among low-income groups are likely to slow population growth rates as a result of healthcare and human service provision. Unless this approach is grounded in sustainable transformation, and accompanied by reduced per-capita consumption in the high-income economies, then they will likely continue to exacerbate biodiversity losses.

2.2. Shifting focus to equitable consumption and fair governance for biodiversity conservation

The binary proposed by Cafaro et al. (2023a, 2023b) continues to scapegoat developing economies, underestimates the present and historical impacts of inequitable consumption, and imperialistically perpetuates the myth that population growth is solely to blame for ecological decline. Conservation strategies that reiterate a narrow "focus on human population decrease" constrain imaginative policy solutions needed to equitably and sustainably reduce consumption, and neglect a long history of scholarship highlighting opportunities for polycentric governance of our global commons, whilst being aware that no system is perfect. We suggest a renewed focus on solution driven governance approaches that include accounting for the complex web of global trade, consumption patterns, the lifecycles of goods, and how resources are distributed inequitably across and within populations. We believe stopping the focus on human population will free resources to conserve global biodiversity, and holistically support necessary sustainable transitions across all sectors and societies.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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