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Energy Ethics: Emerging Perspectives in a Time of Transition

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Reviews

Energy Equality and the Challenges of Population Growth

Andrea Natan Feltrin

University of Santiago de Compostela - Spain

DOI: http://dx.doi.org/10.7358/rela-2018-002-felt natan.feltrin@live.it

1. Population growth and its ecological meaning

Today, October 19th, 2018, the "U.S. and World Population Clock" shows that there are more than 7.5 billion humans on planet Earth, and counting. According to the United Nations' projections, the world population is expected to reach 8.6 billion by 2030, 9.8 billion by 2050 and 11.2 billion by 2100. What exactly is the rate of this growth? In terms of net gain, over 200,000 people are added to this planet every day, which is over 140 people every minute and over 75 million more people every year. This is more or less the population of Germany, which is currently about 80 million (*fig. 1*).

The real problem is that all these additional people are not going to reach a German way of life. This is because the core of this demographic growth is located outside "developed" countries. Projections foresee that between 2018 and 2050 half of the world's population increase will be concentrated in just nine countries: India, Nigeria, the Democratic Republic of the Congo, Pakistan, Ethiopia, the United Republic of Tanzania, the United States of America, Uganda and Indonesia [1].

These nations, except the USA, are struggling to handle widespread poverty and political turmoil. A key overarching goal of the 17 Sustainable Development Goals (SDGs) of the UN 2030 Agenda for Sustainable Development is "to end poverty and hunger, expand and update health and education systems, achieve gender equality and women's empowerment, reduce inequality and ensure that no one is left behind" (UN, "World Population Prospects", 5). But the marked "crowding" observed

[1] United Nations, Department of Economic and Social Affairs, Population Division, "World Population Prospects 2017, Key Findings and Advance Tables", 2017 revision, Working Paper ESA/P/WP/248, New York, 5 (https://www.compassion.com/multimedia/world-population-prospects.pdf).

in some of the poorest countries on Earth directly affects the ability of governments to implement the Agenda.

In this article, I suggest that population growth is a radical challenge to achieving energy and environmental justice in a world with finite resources. Accordingly, going beyond the capitalistic myth of never-ending growth becomes a moral duty.

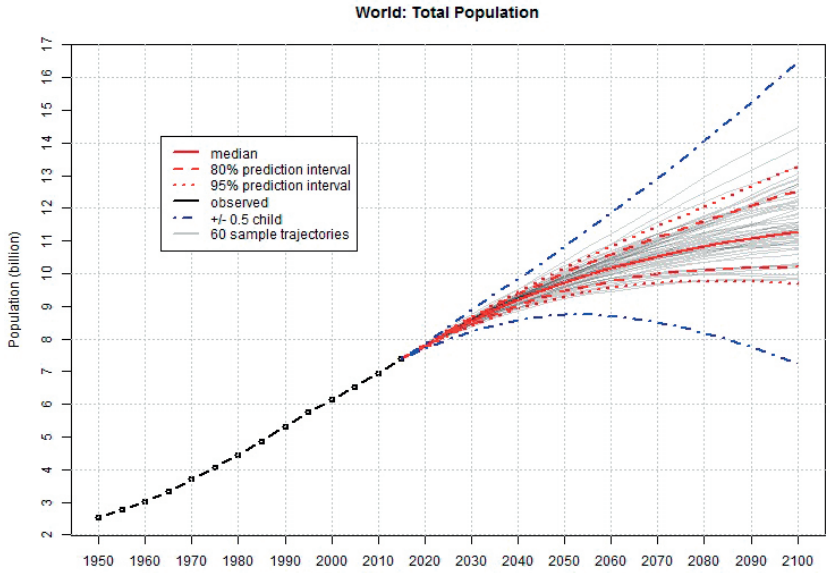

Figure 1. – Source: United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospetcs: The 2017 Revision. http://esa.un.org/unpd/wpp/.

2. Energy distribution and its implications

A serious reflection about demography and welfare has to take into account the ecological frame in which human populations endeavour to thrive. That is why ecological indicators such as the ecological footprint are good proxies to understand the contemporary state of the human condition on this planet. According to the Global Footprint Network, the total global ecological footprint of human societies equals 1.7 Earths [2]. This means that most countries are currently running ecological deficits,

[2] Earth Overshoot Day: https://www.overshootday.org/newsroom/infographics/.

exhausting more resources than ecosystems within their borders can regenerate. This is called an ecological overshoot situation. As a matter of fact, each year we can anticipate the so-called Earth Overshoot Day, the day when humanity's use of ecological resources and services exceeds what Earth can regenerate in that year. On the basis of this data, the situation appears critical, especially considering that national footprints vary considerably worldwide. For example, the American way of life requires about five planets, while the Indian one currently demands 0.8 planets. This creates socio-political imbalances: one shared planet with shared responsibilities, but tremendous inequalities in the access to resources.

National differences in energy consumption can help us understand this unfairness in terms of resource use and environmental impact. While some countries consume too many resources, others are trapped in a state of poverty. This is especially important because industrialized nations, whose lifestyles are heavily based on non-renewable resources, are today the prime producers of greenhouse gasses, with effects on global warming and climate change that are beyond dispute. According to the International Energy Agency (IEA) and the International Atomic Energy Agency (IAEA), it is clear that the principle of *distributive justice* is far from being implemented: outside the Organisation for Economic Co-operation and Development (OECD), energy self-sufficiency is not common. For instance, in 2014 13.8 billion tons of oil were used worldwide, which is equivalent to 160.6 billion megawatt-hours (160.6 × 109 MWh). This amount of energy, corresponding to 13,805 Mtoe, could power 53,530 billion houses for an hour! For that year, 30.02% (4,144 Mtoe) of the world's oil was produced by OECD nations, followed by China with 18.78% (2,593 Mtoe), while the entire African continent produced only 8.18% (1,129 Mtoe).

Even if contemporary policies, both domestically and internationally, had the duty to deal with an asymmetrical allocation of energy resources worldwide, it wouldn't be easy to piece together human energy needs for a good standard of living while maintaining fundamental ecological balances. Furthermore, ecological resources can realistically be regarded as the core of every country's long-term welfare. In this direction, an ethical energy policy must aim to provide all individuals, across all areas, with safe, affordable and sustainable energy. But the point is that reaching a dignified condition of living spread all around the *ecumene*, beyond all sorts of energy monopolies, is essentially in contradiction with never-ending growth in both population and consumption.

3. Energy: the myth of never-ending growth

Even today the capitalist machine and its necessity of growth seem an adamant paradigm of the Western *Weltanschauung*. Thus, to address the socio-ecological challenges summarised under the name *Anthropocene*, the only reasonable course appears to be a wave of greenwashing: green capitalism. But it is just appearance because "business as usual" can no longer be valid: the trap hidden under this ephemeral attentiveness to biosphere health is the constant struggle to make the "wheel of the economy" run faster. Focusing utterly on GDP creates a misperception of what is prosperity and how to achieve well-being, particularly because in this abstraction *Homo sapiens* becomes an animal without environment. In fact, the human body is still as vulnerable as it was at the beginning of hominization millions of years ago. Humans are still organisms dependent on other organisms. There are only a few areas of the biosphere in which humans can survive without artefacts (technologies), and in these areas they are bounded (Wilson 2016).

It is well known that Earth has an effective resilience toward anthropic influences, but this elasticity has its limits. Population growth and consumption patterns are putting more pressure on this critical asset. Accordingly, in some areas of the world, the implications of ecological deficits are dramatic, leading to resource loss, ecosystem collapse, debt, poverty, famine, and war. Yet, there is a mainstream political-economic mindset that believes in a permanent state of growth based on a blind confidence in progress. As Garrett Hardin pointed out: "The myth of the limitless world is but one of the many myths that have grown up in the protective shadow of the insufficiently examined idea of progress". As a matter of fact, a never-ending growth in energy consumption is bio-physically impossible in a finite planet. From a thermodynamic viewpoint, the unavoidable increase of entropy and the degradation of energy in an isolated system are an "ontological" limit to growth. This is due to the transformation of energy into heat and work: an inexorable dissipation of resources restricting human possibilities of production. The Earth is commonly considered a closed system, in which no mass may be transferred in or out of its boundaries. Actually, Earth is not an isolated system, because it can maintain its homeostasis only through solar energy. Considering the factual possibility of interactions with asteroids, which are also able to change the course of life on the planet, it is reasonable to define Earth as a finite system with a finite number of "degrees of freedom". Following this definition, it becomes clear why the Stockholm Resilience Centre highlights a safe operative

space for humanity within nine main planetary boundaries: stratospheric ozone depletion, loss of biosphere integrity, chemical pollution and the release of novel entities, climate change, ocean acidification, freshwater consumption and the global hydrological cycle, land system change, nitrogen and phosphorus flows to the biosphere and oceans and, atmospheric aerosol loading. Understanding these limitations means to figure out the finitude of human material production and societies' dependence on the biophysical and ecological biosphere. But this realization is not all that new. In the 1970s the Club of Rome pointed out the hazards of this global economic trend with *The Limits to Growth* (Meadows et al. 1972). Nevertheless, after years of studies and debates, nothing seems to have seriously changed. There is no effective political awareness of limits, and those whose still talk about "population bomb", "overpopulation", and "family planning" are merely criticized for an excess of negativism and neo-Malthusianism. Boulding's warning goes unheard: "Anyone who believes that exponential growth can go on forever in a finite world is either a madman or an economist". Someone might say, not without reason, that the Anthropocene is the Age of "Mad-men". Or, along these lines, call it *Capitalocene*, as Jason Moore has (Moore 2016).

4. Population, energy, and environment ethics beyond growth

To change the attitude toward a naive belief in a future without boundaries is complex. Especially, the ghost of Malthus' principle of population appears denied by contemporary history: after growing very slowly for tens of thousands of years, world population has grown very rapidly in the last few centuries and continues to do so. In fact, the "great acceleration" of the last century seems to be the symbol of humanity's emancipation from natural rates of growth (Colville 2017). This "growth utopia" is founded on the idea that technological progress releases economic activities from the limitations imposed by nature.

Actually, there is no evidence to support this "growth utopia". Nobody can prove that progress will be limitless and able to solve every socio-ecological drama. For most of the history of humankind technology was too late to save lives. Thus, it cannot be the only answer to avoid awful catastrophes or even the extinction of *Homo sapiens*. Natural disasters remind us of the fragile condition of humanity on this planet. Considering technology to be a *deus ex machina* is a terrible mistake. As

Angus Deaton said: "Necessity may be the mother of invention, but there is nothing that guarantees a successful pregnancy".

In any case, even if one takes into account the significant role of innovation in leading to a more rational use of resources, there are plenty of other concerns. A widespread human civilization based entirely on renewable resources can't keep growing. For example, space left for biodiversity has to be taken into consideration. In this direction, Tverberg pointed out that, "If humans use increasingly more resources, other species necessarily use less. Even 'renewable' resources are shared with other species. If humans use more, other species must use less. Solar panels covering the desert floor interfere with normal wildlife; the use of plants for biofuels means less area is available for planting food and for vegetation preferred by desirable insects, such as bees". In this other sense, the rate of growth is a threat not only to human prosperity but it also a matter of justice between species. That is why human population acceleration is interlinked with the phenomenon known as "Sixth Extinction". More humans means more energy demand, more consumption, and less biodiversity (Kolbert 2014). But thinking about biodiversity becomes almost impossible where people have no access to energy resources: no energy means no food, and no food means short-term responsibility. In the words of Richard Leakey: "To care about the environment requires at least one square meal a day" (1992, 135).

Thus, the moral duty to leave space for other species cannot be achieved without fairer global access to energy.

5. Conclusion: energy justice is demographic justice

If we accept that this world is a finite system, then the way in which we handle energy becomes, even more fundamentally, the way in which we determine our lives. Energy is anything but abstract. Maybe, following Feynman, we can say that "in physics today, we have no knowledge of what energy is". But we live because of energy. Thus, when we talk about access to food, freshwater, heating, or even education, it is important to realize that we are talking about energy access. Currently, we are living the consequences of an unprecedented transformation of fossil fuels into human biomass. That is why in a broader sense overpopulation is the result of an irresponsible use of energetic resources, mainly by Western countries.

Understanding this broader perspective can support us in thinking about how to get out of this mess. Thus, in a discussion of a more ethical

distribution of energy, it is necessary to mention a political and cultural approach to stabilize the population. In this sense, if effective worldwide access to energy resources is possible only within a zero-growth society, a more equal allocation of resources is the first step to face this growth. As Vandana Shiva said: "Giving people rights and access to resources so that they can regain their security and generate sustainable livelihoods is the only solution to environmental destruction and the population growth that accompanies it".

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