

Letter

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Planetary sustainability: transitions of an idea

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Response to 'Is Transplanetary Sustainability a Good Idea? – An Answer from the Perspective of Conceptual Engineering'

The effort to analyse the concept and idea of planetary sustainability (Losch, 2018; Beisbart, 2019) from the perspective of conceptual engineering is very worthwhile. In the following response to this discussion and to Beisbart's proposal to rename the concept 'transplanetary sustainability', the questions he raised will be answered by first recalling the roots of the concept of planetary sustainability.

The idea of coining the expression 'planetary sustainability' was born through working on, and drawing on, the concept of planetary protection (Losch, 2016a). In accordance with the Outer Space Treaty (Article IX), planetary protection demands measures to sterilize spacecrafts passing through the vacuum of space, to avoid contamination of other celestial bodies with Earth life or *vice versa*. As Meltzer (2010, 1) puts it: '[i]f we irrevocably alter the nature of other celestial bodies, we compromise all future scientific experiments on these bodies and may also damage any extant life here. By inadvertently carrying exotic organisms back to Earth on our spaceships, we risk the release of biohazardous materials into our own ecology.' Planetary protection thus has a two-way orientation: it cares about forward contamination by spacecraft (such as Mars robots) touching other planets' 'bio'spheres, and about the potential backward contamination by those spacecraft returning to Earth (like the Apollo mission, Japan's Hayabusa probe, etc.). In this context, the original idea was to aim 'at extending the concept of sustainability into our solar system and safeguarding a sustainable development of life on earth and beyond, be it of human or of other origin' (Losch, 2016b, 1). The sustainable development of humankind should be reconsidered in the context of the Solar System (Losch, 2016b, 7).

Given this orientation, it made sense to connect the project to the existing NASA initiative, also called 'planetary sustainability' (Losch, 2016a, 2018), which aims at including in our planet's sustainable development the 'resources of the Solar System' (NASA, 2014). At the same time, the need for planetary protection was to be retained; the inclusion of a discussion of potential extraterrestrial life (ETL) or extraterrestrial intelligent life (ETIL) was always on the horizon of the concept, as my previous project had dealt with the anthropological, philosophical and theological implications of the potential existence of life beyond our planet (Losch, 2016c, 2017). Contrary to the focus of the previous project, the 'extraterrestrial beings' (Beisbart, 2019, 1) currently being discussed, however, are more likely to be microbes than intelligent entities.

Unfortunately, I do not agree with Beisbart that it is a 'new concept of sustainability' which I would want to introduce. It is not meant to replace the current earthbound notion of sustainability, as is stated by Beisbart in his article (Beisbart, 2019, 1). Rather, the idea is to extend the current notion of sustainability, which is how Beisbart paraphrases my efforts elsewhere. I believe the Brundtland definition of sustainability (which I regard as the most prominent and influential one) carries with it some implications which are taken for granted, but must be reconsidered, if discussing sustainability on a truly planetary scale. Let us recall this definition: sustainable development is a 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs', while these needs are 'in particular the essential needs of the world's poor' (World Commission on Environment and Development 1987, 16.41). The social dimension is not always recognized, but as quoted, it is there, as poor people will suffer first from resource shortages.

The most important tacit assumption underlying this definition is that the survival of humankind is of value. What may seem obvious at first sight, however, cannot be taken for granted, given the variety of stances in environmental ethics that exist and that have evolved over time parallel to the rising awareness that we are living on a possibly unique and in any case highly precious planet. One might ask whether other life on this planet does not also have the right to survive, and whether the disastrous consumption of humankind is not a sort of illness that plagues it. If there were ETL (or even ETIL), further ethical questions would have to be asked (Persson, 2012, 2018; Losch, 2019a): which life comes first? Do we judge according to the supposed level of intelligence? Does the ability to feel already imply moral status? Could a healthy ecosystem be of higher value than a species that behaves irresponsibly? Besides, one can even ask whether lifeless extraterrestrial 'bio'spheres have a right to exist and stay untouched, if one assigns, for example, cultural value to them.

So, why should we coin a new term for this and qualify the ‘sustainability’ talk about it as ‘planetary’? When sustainability is discussed these days, following the United Nations decision on 17 Sustainable Development Goals (SDGs) it is often emphasized that the SDGs have a global scale and impact, which is of course important and true. Hence, they are also called #GlobalGoals (United Nations 2015). The concept of Earth as a globe, however, is a very old one, and already part of the Aristotelian world view (Russell, 1991, 13ff). It does not recognize the fact that no celestial spheres around the Earth exist, but that Earth is a planet situated in a vast universe that does not have any privileged parts. An asteroid could threaten life on Earth any day. Planetary Defence – the effort to scan, catalogue and potentially counteract the threat of asteroids of different sizes, if possible – makes sense.

Also, the Sun is growing, and will even swallow up Earth one day in the distant future. While Earth has existed for around 4 billion years, in ~500 million years it will become too hot to host life. Contrary to the assumption of prominent ethicist Hans Jonas, I believe that we cannot translate an imperative responding to the challenges of our days with ‘Do not compromise the conditions for an indefinite continuation of humanity on earth’ (Jonas, 1985, 11), as there is no such thing as the eternal existence of Earth. I would prefer to say that with our present knowledge of the development of our Solar System, we have to translate the imperative with ‘Act so that the effects of your action are compatible with the permanence of genuine human life’ (Jonas, 1985, 11), with Jim Pass’ words that: ‘without our expansion of our instruments and people into space, humanity could conceivably perish’ (Pass *et al.*, 2006, 5). Within a larger time-frame, this threat to perish unfortunately becomes certain for sure, because of the development of the Sun – if we do not move into outer space to counter it¹.


In coining the phrase ‘planetary sustainability’ I aim to make humankind somewhat aware of this outlook. I do not deny that within the Anthropocene, human-caused climate change is of course a much more pressing issue than the slowly growing heat of the Sun. I am often asked whether we should not first take care of anthropogenic problems, and I actually agree. I just think that because of the development of our Solar System and the threat of asteroids, a small but significant portion of research and effort also has to be directed into the development of space technology, for the sake of the long-term survival of humankind. Last but not least, space is already valuable today as a place to station satellites that monitor Earth’s development. Given this fact, and the current very concrete plans for space mining or a ‘moon village’, I call for an 18th SDG, to facilitate discussions concerning the sustainable development of our Earth’s space environment.

Our space environment currently only serves a subsidiary function to the development of Earth itself, so the remote position of the proposed additional SDG as the very last of the SDGs is actually the best place for these efforts, and also there are indeed more pressing sustainability concerns on Earth itself in our time. The evolving situation in space, however, needs to be dealt with now; the sustainability of our space programmes must be assessed urgently. The example of space debris has been mentioned, and besides, for once we have the opportunity to avoid causing

substantial damage to a new environment, viz., our space environment, from the start.

One could still ask: Is ‘planetary sustainability’ not a misnomer? Do I not cover many interplanetary issues (Losch, 2019b)? Do I not aim with my considerations at a transplanetary domain, when I want to go beyond the globe? Beisbart’s analysis is, I would say, at least partially correct. The current focus of the planetary sustainability project is space environment sustainability ethics, for which ‘transplanetary’ sustainability would be a better designation. The direction of the project’s discussion is, however, aimed at including the impact of space on the earth-bound sustainability discussion (Rockström *et al.*, 2009; Di Pippo, 2018), which is worthwhile for obvious reasons. I aim at an understanding of sustainability that is aware of the fact that Earth is a planet. So I do believe that the proposed ‘planetary sustainability’ remains the best and most encompassing term to express an overarching and long-term concept of sustainability, including awareness that Earth is not only a globe, but a planet, which includes a space environment. To some degree, I follow the nomenclature of the planetary protection concept here, which – as stated initially – includes Earth and also other celestial bodies.

In this regard, I focus my ethical thoughts on sustainability issues. One could reasonably ask whether all space-related ethical concerns can be discussed under this sustainability umbrella. Although I would like to see planetary sustainability as including global and space-environment ethics, of course I do not want to tackle all ethical concerns relating to Earth or even outer space – for the latter, such an approach could better be termed ‘astro-ethics’ or similar (Peters, 2014).

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¹Because of the predicted heat (or cold) death of the universe, this, of course, also ‘only’ buys us time. Contrary to the cosmic limit, the death of humankind with the perishing of Earth is, however, not inevitable, I would say.

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