Restricted and large-scale sustainability

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Abstract

This article argues for a new way of approaching sustainability, reconsidering its fundamental assumptions. It describes two contrasting stances, namely 'restricted' and 'large-scale' sustainability. Restricted sustainability, i.e. the current dominant approach, focuses mostly on *human* welfare and is still rooted in a dualistic (man/nature) conception and an underlying sense of separateness. Large-scale sustainability instead centres on the concept of interdependence, seeking to rediscover the multiple patterns of connections that typify the world, and to uphold an *overall* (thus not only human) enduring welfare. The article also illustrates how knowledge co-production, a methodology currently employed in sustainability science, can contribute to large-scale sustainability. Such a methodology fosters, in fact, the inclusion of alternative cultural perspectives and knowledge traditions, like indigenous ones, which can provide insight on the subject. In its last part, the article discusses the relation between knowledge, values, and behaviour, supporting the idea that sustainability science should combine the pursuit of knowledge with ethical engagement and commitment to action. This too would contribute to the development of large-scale sustainability. Indigenous epistemologies are explored in this context, as they provide models of ethically-oriented knowledge that should be translated into proper conduct towards the entire community of living beings.

Keywords: restricted sustainability; sense of separateness; large-scale sustainability; interdependence; knowledge co-production; indigenous knowledge; value commitment.

Introduction

Sustainability science is a relatively new field of study, which has mostly a practical orientation, focusing on actionable solutions (Caniglia et al. 2021; Miller et al. 2014), and a transformational intent, to be combined with policy-making processes and normative goals (Wiek et al. 2011); it also embraces inter- and transdisciplinary approaches (Lang et al. 2012; Leemans 2006), which urge us to rethink how science and its institutions are structured (Clark et al. 2016; Jerneck et al. 2011). Interdisciplinary, in fact, promotes a problem-solving interaction between different disciplines – bridging natural and social sciences (Phillipson et al. 2009) – with the purpose of developing an innovative, integrated approach (Andersen 2016). Transdisciplinarity, on the other hand, entails a broader participatory process in knowledge production, aiming to combine academic expertise with contributions and insights from non-academic actors (e.g. policy-makers, citizens, civil society, and representatives of other cultures) (Bernstein 2015).

In the attempt to tackle the multi-faceted complexity and critical relevance of the challenges at hand, sustainability science thus seeks to establish a new way of doing science. The field's evolution is still underway: its boundaries are not entirely defined and its basic core needs to be consolidated (Nagatsu et al. 2020). On the other hand, the idea of sustainability, critically reflecting on the current environmental and social situation, has progressively emerged as a key lens through which to envision a healthier future.

However, how should this idea itself be conceived? Is the classical notion of 'sustainability' an ending or a starting point? In answering these questions, first the article underscores the need to redefine our approach to sustainability, starting from the deeper level, i.e. worldview and root assumptions. Two distinct definitions are then compared and contrasted, i.e. restricted vs. large-scale sustainability, showing how their formulation largely depends on the overall underpinnings.

Next, it argues that knowledge co-production, i.e. a methodology currently employed in sustainability science, can contribute to progress towards large-scale sustainability. Through the involvement of different cultural perspectives and knowledge traditions, like indigenous ones, alternative conceptions of sustainability might in fact be explored, which do not merely respond to a contingent crisis, but directly emanate from specific cosmologies

Finally, the article delves into the relationship between knowledge, values, and behaviour, advocating the idea, today supported by many scholars (e.g. Horcea-Milcu et al. 2019; Wiek et al. 2011), that sustainability science should combine the pursuit of knowledge with ethical engagement and commitment to action. This would be another way to support the

development of large-scale sustainability. Indigenous epistemologies are explored in this context, as they provide models of an ethically-oriented knowledge that should be translated into proper behaviour towards the entire community of living beings.

Separateness and restricted sustainability

In the seminal Brundtland report (World Commission on Environment and Development (WCED) 1987), sustainability is defined as the condition that promotes enduring human welfare by striking a balance between the (social, economic, and environmental) needs of both present generation and future generations, thus involving the preservation of the earth's life-support system:

> (…) in the end, sustainable development is not a fixed state of harmony, but rather a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs (WCED 1987, p. 8).

WCED's conception pivots on three key elements: (i) the focus on *human* well-being, (ii) a basically utilitarian attitude toward nature, and (iii) an underlying dualistic view that provides the rationalizing framework, also supporting a man-nature divide. Forthcoming human generations should have the same chances to exploit the natural environment but, given the non-renewable nature of many resources, certain limitations are required. The need for a change is hence admitted, but the overall framework remains largely unquestioned and implicitly taken for granted. This human-centric stance can be defined as *restricted sustainability*.

More recent readings of sustainability continue to revolve around an ensemble of notions and approaches which is basically in line with this trend. Concepts like 'ecosystem services' (Daily et al. 1997) or 'nature's contributions to people' (Díaz et al. 2015) portray the natural environment as a source of potential (although not necessarily material) commodities, perpetuating and reinforcing an overall sense of separateness.

As long as the existing framework remains unchanged, it is unrealistic to expect significant changes in how sustainability is conceptualized and practiced. We must not forget that the idea of man as 'possessorem et dominum mundi' has deeply permeated the Western tradition, exerting a major impact on the development of science too. Redefining the concept of sustainability should thus start from worldview and root assumptions, i.e. the most

fundamental categories and values that shape our perception and understanding of the world. However, assumptions of this sort are rarely investigated by science and their immanence within a specific sociocultural *milieu* is not easy to grasp.

Co-production of knowledge in sustainability research

At any rate, there is potential for innovative approaches within sustainability science itself, especially through knowledge co-production, which has been described as an "iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future" (Norström et al. 2020, p. 183).

Co-production promotes a pluralistic view of knowledge and action, as reflected in several interlinked approaches like post-normal science (Funtowicz and Ravetz 2018), participatory research (Chevalier and Buckles 2013), civic and citizen science (Vohland et al. 2021), as well as the aforementioned interdisciplinarity and transdisciplinarity. Its essence lies in the recognition that the involvement of different (e.g. disciplinary or cultural) points of view, types of expertise, social roles, and other features such as ethnicity, gender, and age, can have a significant impact; not only at the epistemic level – leading to an enriched understanding by compensating for each other's blind spots – but also at the ethical level – promoting social justice (Isgren et al. 2017).

The debate on this subject rests on premises, i.e. the situatedness of human knowledge and value systems, together with the relation between epistemic and social diversity in science, extensively discussed in philosophy (e.g. historicist approach to philosophy of science, feminist standpoint theory, and perspectivism). Here the plurality of historically and culturally bound viewpoints has been valued as the "the very engine of reliable knowledge production" (Massimi 2022, p. 695), and a way to contrast epistemic injustice (due to the marginalization of specific communities from the realm of knowledge) (e.g. Harding 2015; Koskinen and Rolin 2019). Postcolonial sciences studies have also reasserted the pivotal role played by cultural interactions in the historical development of scientific knowledge (e.g. Harding 1998).

Now, if one of the key purposes of knowledge co-production is to redefine the idea of sustainability starting from foundational assumptions, then the actors involved should be engaged accordingly (e.g. in proportion) to what is at stake. It would not be enough to merely enable their participation (e.g. as informants) to the discussion, perhaps to make the process a bit more democratic. On the contrary, the existence of multiple *actual* co-producers of

knowledge should be recognized, paying special attention to those who hold alternative worldview assumptions and knowledge practices (Turnbull 1997).

At any rate, co-production poses numerous challenges, and considering and including alternative ways of knowing does not automatically change the politics of knowledge production. It is also crucial to focus on the role played by power dynamics, unpacking and addressing the power imbalances at play. Indeed, as emphasized by Gaventa and Cornwall (2013, p. 181), "participation without a change in power relations may simply reinforce the status quo, adding to the mobilisation of bias the claim to a more 'democratic' face".

For instance, power asymmetries within the networks of agents involved in co-production are a concern (Strumińska-Kutra and Scholl 2022). A key feature of these networks is, of course, their heterogeneity, which however not only encompasses the level of worldviews, knowledge and values, but also the existence of diverse (and sometimes conflicting) interests, societal standings and overall resources (also in terms of the agents' ability to represent and realize their own goals). When these power dynamics are not properly addressed, bringing together 'dominant' and 'subordinated' agents, can result in creating highly unbalanced communities, to the detriment of subordinated groups that end up being disempowered or misrepresented (Hölscher et al. 2019).

Another area of concern regards the tendency to adopt social and institutional approaches that mirror and perpetuate existing power relations, including several top-down and centralizing patterns. To support co-production, there is the pressing need to create suitable environments and institutional infrastructures that promote more equitable interactions among the diverse social and cultural actors involved, and also facilitate conflict mediation (without necessarily striving for consensus as the ultimate goal) (Strumińska-Kutra and Scholl 2022).

However, 'co-production' projects are often approached with political and epistemic short-sightedness. Instead of recognizing the inherent value of multiple knowledge systems in their own right, the main focus is on how to 'integrate' the findings from alternative (e.g. indigenous) traditions into the framework of scientific understanding. Thus, what matter is their 'utility', i.e. their ability to provide data to Western science (Goldman et al. 2018). As a consequence, only specific components (essentially bits of information) of these knowledge systems are considered and valued, i.e. those in line with scientific methods and standards or that can be 'added' to scientific findings. In addition, alternative ways of experiencing reality and ontological categories (e.g. affective relationships with nature and the role played by non-human beings), which are integral to the world-making processes of other cultural traditions, are usually overlooked or misrepresented (e.g. Blaser 2014).

What is missing here is a more inclusive and genuinely pluralistic stance that values the existence of multiple perspectives. The greater the differences between them, the greater the potential for mutual enrichment and complementation: each perspective, in fact, is indeed unique and can shed light on something that the other perspectives are not able to grasp. If this is the case, then even the situations where different perspectives generate conflicting evidence or appear mutually exclusive should not be necessarily seen as a problem (to be solved by establishing the one that is 'really' trustworthy), but as an opportunity to produce a broader set of (culturally relevant) outcomes about the issue in question. [1]

Interdependence and large-scale sustainability

Actually, on the topic of sustainability, the Western world has much to learn from other cultural ways of being, especially those of local and indigenous communities. Indigenous stewardship of the land, widely recognized today (e.g. Berkes et al. 2000; Turnhout et al. 2012), positions them (i.e. their qualified representatives) as long-time experts in sustainable practices. This article, in particular, focuses on the traditions of Native Americans. [2]

Of course, taking seriously indigenous ideas should not entail their uncritical acceptance; rather, it involves considering their implications and substantial divergence from the common understanding of sustainability. What matters most is in fact not the practical effectiveness of specific indigenous methods, but the cultural frameworks behind them, which were fully working especially prior to colonization (Johnson et al. 2016); for instance, alternative ways of experiencing what we call 'nature', which is not perceived as separated from society. In many cases, the universe is portrayed as a web of highly interdependent and interpenetrated elements, as expressed for example by the Lakota prayer *mitakuye oyasin* (which can be translated as 'we are all related'). Their worldviews imply the existence of a genealogical network, where living organisms and physical systems are not seen as resources but as 'relatives'. No single component (man included) is allowed to dominate, and a sense a reciprocity and mutual belonging pervades human relationship with nature (e.g. Whyte et al. 2016; Whyte et al. 2018).

Indigenous views of sustainability are rooted in cosmologies of this sort, manifesting as a call to live mindfully and respectfully. Their focus extends beyond the present, in order to ensure for example that decision-making considers the well-being of the seventh generation (of both human and non-human beings) to come.[3] As put by the Onondaga scholar Oren Lyons (1995),

> We say that the faces of coming generations are looking upon the earth. So when you put your feet down, you put them down very carefully – because there are generations coming one after the other. If you think in these terms, then you'll walk a lot more carefully, be more respectful of this earth.

The need to overcome the man-nature divide and embrace the idea of interdependence, especially in an ecological sense, has found resonance among several Western scholars. Examples include Barry Commoner's (1971) pioneering first law of ecology, i.e. 'everything is connected to everything else', the postdualist approach of feminist epistemologists (e.g. Hekman 1990), Timothy Morton's (2010) concept of a cosmic 'mesh', and somehow even the principles of complexity science, i.e. self-organization as the result of the local interactions between multiple interdependent agents and the world as a complex adaptive network (Bak 1996; Waldrop 1993). [4]

As pointed out by Bruno Latour (2021), if today's imperative is to maintain the conditions for life on earth, we need to understand, looking at the deep history of the planet, what created such conditions and allowed them to endure over the millennia: a multi-faceted and kaleidoscopic network – emerged from a long co-evolution – involving innumerable (living, non-living, and socio-technological) agents, relations and processes so entangled that altering one element impacts many others. However, when we started, especially after the scientific revolution and the emergence of modern physicalism, to reduce this network to a 'machine', we inevitably lost the sense of interdependence (e.g. Merchant 1980) and the awareness that human history is inseparable from the history of nature.

Some sort of convergence might thus be found between particular aspects of indigenous conceptions and contemporary understanding of the natural world's functioning. If so, then the idea of sustainability could be reconsidered through a postdualist lens, with interdependence at its heart. Admittedly, this notion needs to be further explored both in scientific and philosophical terms. However, even understood in its most basic sense, it calls for rediscovering the multiple patterns of connections that typify the world, and basically suggests a cosmological shift, making it clear that the functioning of the whole depends on a balanced interweaving of all its components. Moreover, it calls for rediscovering our bonding with the next generations, urging us to live in the present without compromising the future.

Hence, a new minimal definition of sustainability emerges: sustainability is the condition that ensures an *overall* (thus not only human) enduring welfare; its corollary is that human welfare itself cannot persist unless it is in consonance with the flourishing of the entire 'system'

(Mazzocchi 2020). This alternative way of approaching sustainability can be defined as *large-scale sustainability*.[5]

Sustainability science and value commitment

Conceptual change is vital for progress, but it alone is not sufficient. Merely introducing new notions is not enough to really make the difference. Another core concern of sustainability science should be how to combine the pursuit of knowledge production with ethical commitment and change in social behaviour.

However, here the trajectory of the Western tradition poses challenges, as it rarely integrates knowledge and values. Restricted sustainability too has developed in a conceptual framework centred on the value-free ideal of science. Many scholars have argued against such an ideal (Douglas 2009; Elliott and McKaughan 2014; Longino 1990), stressing for instance the need to surface implicit values. Such values might be ingrained in the scientific method itself or in assumptions about the ultimate purpose of scientific knowledge, e.g. aiming to obtain manipulative and predictive power based on a reliable representation of reality. If so, then science too must be seen as inherently value-laden, at least in the sense of bearing the imprint of a specific cultural standpoint.

On the whole, the common scientific approach lacks mature ethical self-reflection, a gap that sustainability science cannot ignore. The need to integrate value judgment into its very foundations is, in fact, increasingly acknowledged. Sustainability scientists should gain a type of knowledge "including concepts of justice, equity, socioecological integrity, and ethics" (Wiek et al. 2011, p. 209). Value commitment should thus be intrinsic to their motivation, recognizing its transformational potential and how changes in values can catalyze systemic shifts in social behaviour (Horcea-Milcu et al. 2019). This can be considered another way to accomplish large-scale sustainability.

In this regard, there is an aspect of indigenous (e.g. Native American) ways of knowing that has not been sufficiently explored, i.e. the link between the cognitive and ethical dimension: their epistemological stance is, in fact, ethically oriented (Hester and Cheney 2001). Knowledge is never an end in itself nor purely representational; rather it should translate into behavior, providing moral guidance. What matters most is knowing how to live in accordance with their view of the universe as a place where everything is interconnected and interdependent. Action, at least ideally, should stem from a profound respect for all life forms, refusing to intrude and instead making them flourish. In the words of the Lakota Sioux scholar Vine Deloria:

> The real interest of the old Indians was not to discover the abstract structure of physical reality but rather to find the proper road along which, for the duration of a person's life, individuals were supposed to walk. This colorful image of the road suggests that the universe is a moral universe. That is to say, there is a proper way to live in the universe: There is a content to every action, behavior, and belief (Deloria et al. 1999, p. 46).

At the heart of knowledge production there is thus ethical soundness and the pursuit of moral purpose. Notably, this approach to knowledge has allowed many indigenous communities to endure and thrive in their own environments (Mazzocchi 2018).

Spontaneous stewardship towards nature

Indigenous approaches to sustainability correspond to the lived practices of specific cultural understandings. More precisely, they often emerge at the intersection of a way of knowing and feeling, which is then translated into action by implementing a system of responsibilities.

An interesting aspect is, in fact, that many features of the indigenous perspective, especially the sense of intimacy with nature, [6] are usually so deeply ingrained that they *spontaneously*, i.e. without the need of further reasons, develop a sense of stewardship towards nature. Conversely, when separation is experienced,

> such a spontaneous action does not take place even when it may be held as a moral, ethical, or rational ideal (. . .) neither moral ideals nor rational arguments or scientific evidence have the power to persuade one to care for the other but there remains a fateful gap between how individuals, corporations, and governments may think they 'should' act and how they, in fact, act with respect to nature (Puhakka 2014, p. 11)

This shows, once again, that often *understanding* situations is insufficient for adopting specific types of behavior; the involvement of collective and individual emotions is equally crucial.

It also shows the ability of human beings to internalize experiences, value systems, and norms, passed down through social learning. Such a process of internalization can generate 'intrinsic' (i.e. driven by personal commitment) motivations, which lead to collectively behave in specific ways and favour the creation of a stable social identity (Davis et al. 2018).

Factors and conditions that influence the rise of this type of motivations should thus be explored to promote sustainable behaviour on a larger scale as well as a different perception of sustainability, i.e. from something that only imposes limits and restrictions to a natural expression of our sense of belonging to the world.

Conclusion

The article has illustrated two different perspectives on sustainability. 'Restricted' sustainability basically corresponds to WCED's idea that sustainability should ensure the enduring well-being of human societies and communities. It embodies a dualistic worldview and still emphasizes the instrumental values of nature. However, this classical idea of sustainability is insufficient to cope with today's challenges, and has constantly failed to enable transformative changes. 'Large-scale' sustainability instead promotes (not only human but) overall enduring well-being; for its emergence and implementation, a substantial shift should occur starting from the level of foundational assumptions. It has also been argued that insights could be gained from indigenous cultural traditions, which recognize the interconnection and interdependence of all elements of the universe, and adopt a way of knowing rooted in ethical engagement and commitment to action.

Notes

1. Among the few approaches that have embraced a similar stance, the idea of 'two-eyed seeing', elaborated by the indigenous (Mi'kmaw) scholar Albert Marshall, is worth mentioning (Reid et al. 2021).

2. Indigenous cultures, worldviews, and knowledge systems are diverse and should not be reduced to a homogenous body. Each has in fact emerged and developed within specific (e.g. natural, historical, social, and linguistic) contexts, which inevitably shaped its unique features and functioning. However, resemblances between them (though not a common essence) should also be acknowledged. Many indigenous cultures have similar philosophical underpinnings and conceptions of the human-nature relationship (McGregor 2018; Nelson and Shilling 2018). For example, principles like interdependence can be found in numerous indigenous cultures worldwide (e.g. Mazzocchi 2020): the idea that 'everything is related' is echoed in expressions like *hishuk'ishtsawalk* ('everything is one') of the Nuuh-chah-nulth (Pacific Northwest Coast in Canada), *iwigara* ('all life-forms are interconnected and share the same breath') of the Rarámuri (northern Mexico), and *ukama* ('relatedness') of the Shona language (Southern Africa).

3. The Haudenosaunee seventh generation principle applies to both past and future generations. Owing to genealogical bonds, there are moral obligations to the ancestors too.

4. “In complexity there is no duality between man and nature (…) We are part of nature ourselves. We’re in the middle of it. There is no division between doer and the done-to because we are all part of this interlocking network” (Waldrop 1993, p. 333).

5. It is important to note that the aspects discussed here are necessary but not sufficient conditions for achieving large-scale sustainability.

6. This sense of kinship with nature is encapsulated in many traditional sayings (e.g. by Native Americans, Aboriginal Australians, and Maori of Aotearoa/New Zealand), expressing the idea that people are part of (or cannot exist without) the land, just as the land is part of (or cannot exist without) people.

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