



Futures Dialogue

Reinventing sustainability: The role of science, policy and space

Short documentation

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About "Leibniz Sustain"

The Leibniz Research Network "Knowledge for Sustainable Development" bundles and networks relevant research competencies in the Leibniz Association and contributes to the effectiveness and visibility of research for sustainable development. To this end, the network organises synthesis workshops, international conferences and summer schools in cooperation with other Leibniz institutions and external partners from science and practice, as well as future dialogues with influential personalities from politics, business and society.



To learn more about the network on its website: <https://www.leibniz-sustain.de/en>

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1 Background & objectives

"Sustainability" represents the dominant paradigm for overcoming the global social-ecological crises. It is the core guiding principle of overarching policy strategies at all levels (local to UN), as well as for the inter- and transdisciplinary field of sustainability sciences.

However, ever since its adoption on the international policy stage back in the 1990s the concept of "sustainability" has also always been subject to fundamental criticism. This ranges from questioning its ontological premises and ethical ambiguities (e.g. dualistic human-nature relation, vague justice notion, strong/weak variations, inherent growth orientation, unclear spatio-temporal reference etc.) to recognising its limited operational and procedural substance for guiding the transformation of complex socio-ecological-technological systems.

In the context of the Anthropocene, such criticisms have become further reinforced. In view of a rapidly declining habitability of the planet, calls for a paradigm shift to guide transformations have thus multiplied. At the same time, the sustainability sciences have fostered the reflection on the ways in which science-society interactions affect transformations - typically also requiring to de-/reconstruct notions of "sustainability".

In 2023, the Leibniz Association has set out to develop an umbrella strategy for mainstreaming "sustainability" across its member organisations (in management, research, transfer, human resources, operations), taking orientations from the LeNa guidelines. This reflects the profile of Leibniz and its strong commitment to responsible fundamental and application-oriented research of high societal relevance. But it also revives the question of what the reference to "sustainability" actually implies.

Against this backdrop, this Futures Dialogue aimed to advance the critical debate on "sustainability" as a science and policy paradigm, together with invited sustainability researchers and practitioners (cf. section 4). The discussion strived to identify ways forward that move beyond the diverse criticisms and offered options for coping with the existing range of institutions, practices and cultures linked to "sustainability", but also allowed to fill the gaps the concept had left open for the past decades. Our guiding question(s) were therefore:

How should future science and policy deal with "sustainability":

- conceptually (i.e. considering that it forms an empty signifier)?
- practically (i.e. considering its lack of reference to and orientation for action)?
- politically (i.e. considering its global to local institutionalization and status as a hegemonial discourse)?

2 Conceptualisations of sustainability

Diverse approaches to the conceptualisation of sustainability were discussed without aspiring for comprehensiveness, reflecting a historically evolving and multifaceted understanding of the term. Speakers differed in their emphasis on the role of normativity and justice, cultural dimensions, democratic processes, as well as on systems thinking, transdisciplinarity and regulation as approaches for implementation.

For this documentation and with a view to guiding further discussion, in the following the focus was put on overarching commonalities and differences, without attribution to the individual participants.

2.1 Conceptual constituents

A nuanced account was made of the **inherent dilemmas and conflicts** within sustainability. The concept identified competing societal goals (ecological, economic, social; intra-/intergenerational justice) and postulated the need for compromises. In practice, however, such goal conflicts were addressed by institutions and decision-making processes that were not fit to approach or resolve them, leading to results that contrasted starkly with the normative aspirations of sustainability. Despite this long-standing recognition there was still a need to acknowledge for this systemic failure to collectively handle these fundamental conflicts, and to develop context-sensitive strategies and practical approaches for shaping sustainable pathways.

Correspondingly, **cultural transformation** was highlighted as an indispensable correlate of sustainability, implying that new values, norms and practices must become established to strengthen acceptance and commitment to sustainable solutions. In conjunction, the role of education and learning at individual and collective levels in creating awareness and support for sustainability was emphasized, nourished by critical thinking and dialogue.

Participants converged in portraying sustainability as a highly contested and evolving concept that **inherently required continuous reflexivity, negotiation and coordination** across societal domains and levels, as well as **specific and contextualised operationalisation**. It demanded holistic and integrated approaches anchored in justice and freedom, informed by science and driven by inclusive collective agency in order to achieve fundamental changes of societal values, structures and knowledge systems. Therefore, a reconception of sustainability should focus especially on its **procedural dimension and requirements**. Apparently, this had particular implications for *politics*, *practical operationalisation* and *science*, as addressed in the following.

2.2 Implications for politics

Despite broad societal agreement on the need for sustainability, actors usually faced **dilemmas and conflicting priorities** when confronting implementation. The political sphere faced

the challenge to develop **shared visions and integrated strategies** to address such barriers, including by providing normative and legal orientation, by disseminating and multiplying best practices, and through communication and mutual exchange, which in combination could help to build consensus, strengthen agency and resolve conflicts.

There was a need for inclusive, adaptive, and **justice-oriented governance**, demanding multi-level coordination, critical engagement with power, and long-term, participatory strategies to navigate complex socio-ecological challenges. Broad **stakeholder engagement and participation** should be further developed, including especially the active involvement of marginalised groups and those negatively affected by transformations, to enhance legitimacy, relevance and effectiveness of sustainability strategies. Given the complexity of sustainability challenges, rigid governance structures seemed inadequate. **Flexibility of institutions** was important to be adaptable, capable of learning, and open to revising strategies in response to evolving conditions. Effective sustainability governance also required a **multilevel approach**, linking global regulations (e.g. international climate agreements) with local grassroots initiatives and community engagement as essential parts for translating abstract goals into meaningful practice.

The **nation-state** was found to form a key arena for sustainability governance. Through democratic accountability, nation states remained crucial for defining, legitimising and supporting sustainability policies. Here, **democracy was seen as a necessary condition** for achieving sustainability. Democratic participation and pluralism were critical to navigate the complex trade-offs that sustainability entailed. Political processes that responded to short-term economic interests were susceptible to undermine long-term sustainability goals. In the light of a broad agreement on the urgency of climate action, this bore the risk of bypassing **democratic deliberation**. Balanced approaches were needed, allowing for timely responses without sacrificing inclusivity and thoughtful planning. The political sustainability debate had to bear in mind the value of **political stability** avoiding to lose voters to political parties that denied the necessity for climate protection, energy transition or biodiversity.

Fragmentation and polarization of the sustainability discourse were observed as threatening for coherent action. **Broad societal alliances** and the bridging of political and social divides over key questions of sustainability became thus a necessary political task. Creating **inclusive spaces for dialogue** and to embrace diverse perspectives while shaping sustainability policies was highlighted as foundational.

Sustainability policies needed to address the full diversity of public, private and civil society actors. They should be **empowering agents of sustainability transformation** (to choose, act, participate) and support agency and freedom. Actors such as governments, corporations or individuals possessed rather different means to influence societal pathways. Addressing these power asymmetries as part of sustainability governance was vital to achieve sustainability transformations. Raising awareness and fostering sustainability literacy were emphasised to empower citizens to engage in such dialogues and adopt more responsible behaviours. **Operational normative standards** were required that can integrate ethical considerations into sustainability policies. The **assignment of responsibility** across sectors (public, private, civil) and levels of government was essential for the coherence and productivity of policies. Regulatory

frameworks therefore had to include carefully designed accountability mechanisms, while allowing for context-sensitive and flexible action.

While a core aim of sustainability – to secure human living conditions – was widely accepted in societies, the need for **persuasive narratives** to build consensus on the means to achieve this remained. Conflicting approaches like “degrowth”, “ecomodernism”, and “green communitarianism” highlighted unresolved tensions. A key difficulty lay in balancing efficiency and sufficiency strategies. Technical innovation was seen as key in this but had to be accompanied by inclusive, socially and politically grounded approaches and had to reflect the complex interdependence of human and natural systems in order to adequately allocate responsibilities and fairly distribute burdens and gains. Political action should always remain sensitive for the lived realities of people, thus avoiding perceptions of sustainability as an elitist project. Shaping of inclusive and positive narratives was both a great challenge and chance with the potential to support societal consensus.

Consequently, **social justice** was emphasized as an underrated but central pillar in the conceptualisation of sustainability. Those most affected, marginalized as well as (unrepresented) future generations needed to be in focus for a long-term oriented sustainability strategy. The importance of distributive justice both temporally and spatially was stressed. As a lever for implementation sustainability politics may increasingly draw on constitutionally guaranteed freedoms (autonomy, self-determination). Since critical social-ecological thresholds were rapidly approaching, current decisions need to be justified with a view to secure the **freedom of choices** for others and for the future.

Participants also converged in their **critique of the prevailing economic model** based on quantitative growth and resource consumption. The traditional paradigm of infinite economic growth in a finite world was explicitly challenged for its fundamental unsustainability, given its disregard for ecological boundaries and apparent social inequalities, calling for a reassessment of current economic systems.

2.3 Implications for practice and action

Despite a high degree of urgency, **democratic legitimization of sustainability action was pivotal** with a focus on participation, learning and long-term transformation. At the same time, such action reached across political, institutional, social, and cultural domains, equally requiring time for knowledge integration and learning. Therefore, the practical **operationalisation of sustainability was a complex, iterative, and context-specific process** at the interface between science and society. But it was through such practical implementation that sustainability can become a tangible and meaningful concept for guiding societal transformations. This demanded a **multidimensional, participatory and reflexive approach** that translated abstract sustainability frameworks into concrete and context-sensitive action. Sustainability had to be operationalised in ways that a) supported implementation by various actors with shared responsibilities, b) were legitimate in democratic terms and c) were socially acceptable.

There was a need to **integrate sustainability into regulatory frameworks and political decision-making** across all governance levels. This required laws, regulatory instruments and incentive structures that promoted sustainable action while balancing conflicting priorities. Moreover, institutions should **allocate responsibility for sustainability at higher levels**, such as through dedicated sustainability officers in administrative leadership. The implementation of **(SMART) indicators, monitoring and evaluation** frameworks was essential to keep track of progress across environmental, economic and social dimensions, to ensure transparency and accountability and to enable learning and adaptation.

This structural anchoring should be complemented by **reflexive learning processes** within organisations and social subsystems, involving support for changes in mindsets, priorities, decision-making routines and skills. Such learning was central to sustainability transformations, which not only required new policies and technologies but also new ways of thinking and acting. Particularly in central policy areas such as energy transition or nature preservation, establishing **deliberative arenas** in which stakeholders – including experts, civil society, businesses, and citizens – collaboratively shaped and evaluated sustainability measures was considered key. Such inclusive processes were particularly relevant to prevent legitimacy crises (e.g. where environmental regulations were perceived as overly restrictive or technocratic).

Also in practical terms, adopting a **holistic systems perspective** was essential, addressing the interconnectedness of ecological, economic and social systems where fragmented sectoral approaches turned out inadequate. **Long-term orientation** should be ensured through co-creating **strategic future visions**, as well as scenario and backcasting approaches. **Green technologies** were acknowledged as indispensable to achieve sustainability goals, which could have become impractical and unrealistic without using the potentials of technological innovation. Nonetheless, the necessary technological transformations had to be tempered by reflexivity, allowing for the integration of diverse forms of knowledge, continuous learning, and adaptation. Perhaps most importantly, the implementation of sustainability required dedicated resource allocation and **financing mechanisms**, such as public funding, private investment and innovative instruments (e.g. green bonds) to support infrastructure developments, research and communication processes.

2.4 Implications for science

Sustainability science was distinguished by its unique ontology, teleology, and epistemology, demanding **systems thinking and an orientation toward practical societal outcomes**. The complexity and interconnectedness of current challenges had led to the development of diverse systemic approaches that could connect between social, economic, ecological and technological dimensions. Against this backdrop, a reconception of sustainability along the lines above would underscore the importance of sustainability science to be **ethically informed, participatory and attuned to societal struggles over sustainability**, thus focusing especially on how knowledge was produced, applied and evaluated.

A necessary condition for this was seen in the pursuit of **interdisciplinary research** (involving e.g. environmental, engineering, social and political sciences) to better capture the complex nature and dynamics of the systems addressed. Furthermore, **transdisciplinary research** was underlined as a sufficient condition to additionally ensure that scientific findings were not only theoretically robust but also socially relevant and grounded in practical contexts. This involved the integration of multiple knowledge systems (e.g. local and indigenous knowledge). It also underscored the importance of **public engagement and communication** in research processes – including those that were not transdisciplinary. The complexity of sustainability related issues required new formats for involvement and exchange. Science was expected to deliver actionable solutions for coping with grand challenges, but that presupposed engaging with stakeholders.

Overall, this called for more **solution-oriented and impact-driven research agendas** (e.g. missions), and a substantial strengthening of transdisciplinary approaches in the science system, especially regarding research assessment. A **long-term perspective** was equally needed for guiding sustainability science, but the field had to always remain **adaptive** (capable of responding to dynamic socio-ecological changes), **reflexive** (critically examining assumptions, methods, roles, and potential biases) and sensitive to questions of **responsibility, equity and justice** in its research practices.

3 Core factors for re-conceptualising sustainability

Based on the different inputs and ensuing discussion, a final session was dedicated to distilling several core factors that future conceptualisations of sustainability should focus on in order to address key deficits of current sustainability theory and practice. They could provide a first orientation for assessing ongoing sustainability debates and subsequently also informed a more systematic approach to de- and reconstructing the concept and deriving corresponding agendas for research, policy and practice:

Human/nature relations: Any approach to sustainability had to start from an explicit account for how human/nature relations were understood, including related ethical positions (e.g. inherent worth and interspecies justice). Differences between stakeholder views needed to be articulated transparently. Decisions on goal conflicts and future pathways fundamentally depended on this understanding and called for a societal consensus, democratic prioritisations and/or conscious plurality and trade-offs at this level.

Spatiotemporal continuum: Sustainability could only be addressed meaningfully in reference to boundaries in space (local to global) and time (past to future) that were situated on a continuum (i.e. any delimitation remained embedded in other spatiotemporal scales). Articulating these references and their scalar dependencies was therefore crucial as different choices (e.g. city or region; historical or current activities of industrialised nations) had major implications for assessing responsibilities, goal conflicts and taking action.

Knowing and doing: Sustainability placed particular requirements on the modes of knowledge production and their relation to practical action. Inter- and transdisciplinary knowledge diversity, integration and co-creation were preconditions that enabled systemic awareness and understanding, but also informed practical interventions. In turn, practical action and performance drove the demand for new knowledge and offered insights on key drivers and barriers for systemic change. Sustainability thus called for establishing tight loops between developing *knowledge and action*, establishing formats and methods that strengthened reflexivity and (triple-loop) learning in science and society.

Justice and equity: As the central normative category of sustainability, justice (inter- and intragenerational) remained essential but needed to be addressed in all its core dimensions to enable operationalisation: Recognition, procedural and distributional justice had substantive implications for system delimitations, process and research designs that should be acknowledged transparently and addressed accordingly. Reference to equity as a norm may also be indicated, especially if it is rooted in regulations (e.g. equal living conditions in German spatial planning act).

Freedom: In contrast to the relatively weak leverage of norms, fundamental rights and in particular freedoms can offer an effective instrument for the practical pursuit and acceleration of sustainability transformations. Safeguarding freedom of choices had become a fundamental policy task in the context of the global social-ecological crisis. In turn, freedom was also always

tied to responsibilities of individuals or collectives for the impacts of their choices and actions. Both could be used to enforce sustainability policies and practices.

Responsibility: Although central for the implementation of sustainability, questions of responsibility mostly remained unattended in current debates so far. Attributing responsibility entailed intergenerational obligations, recognised the different contributions and resources of stakeholders to a sustainability problem and its solution, and called for policies that empowered and promoted responsible behaviour of individuals and collectives. A progressive understanding of responsibility thus closely related to agency.

Agency and empowerment: Sustainability demanded individual and collective agency at all levels, fostering participatory approaches, building capacity, and challenging existing power structures to transform systems. Such agency was however often structurally deprived and stakeholders also often lacked basic capabilities and skills. This underscored the need to place empowerment at the core of sustainability conceptions in order to ensure that the necessary diversity of perspectives could effectively engage and advocate for their interests.

Transformation: Addressing systemic challenges that required comprehensive change in natures, cultures, structures and practices required to refer to *transformation* as the core process necessary for sustainability, thus also abandoning reference to “development” with its historical burden of colonial and growth-centred discourse.

4 Format: Futures Dialogue

4.1 Agenda 20.09.2024

08:30 Arrival and Coffee/Tea

09:00 Welcome and objectives

Marc Wolfram

9:10 Participant introductions & exploration

Perspectives I

9:30 Inputs I & Discussion

Sustainability in the Anthropocene

Manuel Jesus Arias-Maldonado

Dilemmas of Sustainability

Anna Henkel

10:30 – 10:45 Break

Perspectives II

10:45 Inputs II & Discussion

The transformative potential of sustainability science and of core human values

Ioana Andra Horcea-Milcu

Sustainability and the new concept of freedom

Felix Ekardt

12:00 – 13:00 Lunch break

Reinventing sustainability: Propositions

13:00 Propositions & discussion

14:50 Concluding remarks

Marc Wolfram

15:00 End of workshop

4.2 List of Participants

<i>Name</i>	<i>Affiliation</i>
Arias-Maldonado, Manuel; Prof. Dr.	University of Malaga, Professor of Political Science, International Public Law and Procedural Law
Bockhorn, Kerstin	City of Hamburg, Department of the Environment, Climate, Energy and Agriculture, Sustainability Unit
Ekardt, Felix; Prof. Dr. Dr.	Research Unit Sustainability and Climate Policy, Leipzig; Director
Henkel, Anna; Prof. Dr.	Universität Passau, Chair of Sociology of Technology and Sustainable Development at the University of Passau
Horcea-Milcu, Ioana-Andra; Prof. Dr.	University of Kassel, Institute for Sustainability, Professor of Cultures of Sustainability
Leuterer, Julia	Local Agenda Dresden, Management Director
Olfert, Alfred	Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden; Scientific Assistant to the Director
Wolfram, Marc; Prof. Dr.	Leibniz Institute of Ecological Urban and Regional Development (IOER), Dresden; Director

The Leibniz Research Network “Knowledge for Sustainable Development” thanks all participants for making themselves available, preparing individual contributions and engaging with their particular insights and expertise in this constructive discussion.