

# The Nijmegen Agenda on Transformative Interdisciplinarity and Transdisciplinarity in Earth System Governance Research and Engagement<sup>1,2</sup>

## 1. Overview

The Nijmegen Agenda speaks to urgent global sustainability challenges marked by accelerated climate change, biodiversity loss, pollution and deepening social inequalities, and highlights the imperative of fundamental societal change to address these global sustainability challenges and to reshape societal structures for sustainability and justice. Building on the Earth System Governance Project's 2018-2028 Science and Implementation Plan<sup>3</sup>, the Nijmegen Agenda encourages earth system governance researchers to engage actively in transformative interdisciplinary and transdisciplinary research and engagement, and calls for more systematic knowledge sharing with the aim of addressing environmental, social and socio-ecological challenges.

Transformative research and engagement can help to break away from societal, cultural and economic conditions which perpetuate unjust and unsustainable development. One defining characteristic of transformative research and engagement is *interdisciplinarity*, i.e. breaking down academic silos, transcending traditional disciplinary boundaries and integrating insights and methodologies from diverse disciplines. Moreover, transformative research and engagement on sustainability challenges requires *transdisciplinarity* which surpasses collaboration between academic disciplines and actively involves collaborating with societal actors in research and action. Transdisciplinarity aims to integrate academic knowledge with other knowledge systems, meaningfully involving non-academic stakeholders, and fostering more holistic approaches that recognize diverse perspectives and values.

Earth system governance scholars largely agree that interdisciplinarity and transdisciplinarity are essential to integrate the breadth of values and knowledge available into just and sustainability transformations. The 2018 Science and Implementation Plan also notes the particular importance of research projects that engage both social and natural sciences (ESG, 2018), and the Earth System Governance Project is a member of the Future Earth research alliance, which has a strong emphasis on interdisciplinary and transdisciplinary collaboration. However, knowledge fields and disciplines are not equally represented in earth system governance research. For instance,

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<sup>1</sup> A first draft of this agenda was prepared by the Committee for the Nijmegen Agenda, as part of the 2023 Radboud Conference on Earth System Governance held at Radboud University in Nijmegen, The Netherlands. During the conference, input was collected through a survey targeting the whole Earth System Governance community and through an innovative panel during the conference. A second draft incorporated these inputs and was submitted to the steering committee of the Earth System Governance Project. Following this, a draft was made publicly available for comments from the Earth System Governance community. Additionally, academic and expert networks were invited to provide feedback. This final version (October 2024) reflects these comments

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<sup>3</sup> See in particular section 5.3 (“Disciplinary Depth, Interdisciplinarity and Transdisciplinarity”) and section 6 (“Earth System Governance in Society”).

research outputs on agency in earth system governance show strong engagement with certain fields within the realm of social sciences, including global governance, international relations and environmental politics (Betsill et al., 2020). Broader research on earth system governance has increasingly engaged with fields such as law, philosophy and geography. However, engagement with other fields, including some other disciplines and subdisciplines in the social sciences, humanities, natural sciences, engineering and technology, health sciences, veterinary and agricultural science, remains limited. Conversely, interdisciplinary research in sustainability science has often paid insufficient attention to insights from governance research, highlighting the need for a mutual commitment to deeper collaboration.

## 2. Aims and objectives

**The Nijmegen Agenda aims to foster collaboration among researchers and societal actors for accelerated sustainability transformations, and significantly contribute to the collective pursuit of a more sustainable, equitable and just future.** The Nijmegen Agenda emphasizes a *transformative* perspective, as inter- and transdisciplinary perspectives do not automatically foster just and sustainable development. Recognizing the need for integrating various forms of knowledge and experiences – particularly from vulnerable and underrepresented groups – to understand global challenges comprehensively, it emphasizes moving beyond isolated efforts within scientific disciplines or societal sectors. Acknowledging the contested nature of sustainability transformations, the Agenda underscores the importance of including diverse perspectives and the need to recognize and contribute to the rectification of historical injustices.

Serving as a roadmap for transformative interdisciplinary and transdisciplinary research and engagement on earth system governance, and complementing related sections of the Science and Implementation Plan, the Nijmegen Agenda's **four key objectives** are to

- (i) define principles for transformative inter- and transdisciplinarity which ensure that interdisciplinary and transdisciplinary collaborations contribute meaningfully to just sustainability transformations;
- (ii) identify and prioritize key areas and competencies for collaboration in research, education and outreach;
- (iii) explore barriers to, and limits and risks of, interdisciplinarity and transdisciplinarity, and identify ways to address or overcome them; and
- (iv) position the Earth System Governance Project as a catalyst for transformative collaborations.

While the primary audience for the Agenda is members of the Earth System Governance research network individually and collectively, it is intended to be relevant more to researchers working in the general field of earth system governance and more broadly on sustainability governance and science, as well as to other research networks, universities, funding bodies and publishers working in these fields.

## 3. Principles for Transformative Inter- and Transdisciplinarity

The following principles aim to provide a framework for transformative collaboration to guide researchers and educators in fostering meaningful, impactful and socially responsible interdisciplinarity and transdisciplinarity:

- **Focusing on sustainability transformations**

In the context of sustainability research, the primary objective of transformative interdisciplinarity and transdisciplinarity should be to develop knowledge and implement actions that contribute to sustainability transformations. Therefore, researchers and educators should emphasize engaging in collaborations to accelerate real-world improvement, rather than doing so merely to meet funders' demands. In doing so they can stimulate rethinking economic, social and cultural structures and redefine connections between humans, nature and non-human animals, including contributing to the reconfiguration of power and structures that perpetuate unsustainable and unjust outcomes.

- **Recognizing positionality**

Achieving transformative interdisciplinarity and transdisciplinarity requires researchers and educators to reflect upon and understand their own personal perspectives and acknowledge the viewpoints held by others. Beyond mere acknowledgment of disciplinary diversity, transformative interdisciplinarity and transdisciplinarity entail challenging one's own preconceived assumptions about other disciplines and societal actors. Researchers and educators should critically consider their own theoretical and methodological approaches and avoid implicit biases that can hinder politically and socially engaged knowledge production.

- **Acknowledging and fostering pluralism and a multiplicity of knowledge systems**

Transformative inter- and transdisciplinarity require recognizing the value of a diversity of knowledge systems that encompass disciplines, cultural perspectives and different forms of expertise, understanding that each system brings unique perspectives. Decolonizing knowledge systems is crucial, as perspectives and approaches developed in the Global South have often been overshadowed by those from the Western world. Transformative inter- and transdisciplinarity seek to integrate insights from different knowledge domains and methodologies. Although challenging, sometimes uncomfortable and requiring time and close attention, differences of perspective need to be explored rather than avoided. By fostering an inclusive environment that acknowledges, respects and draws from this multiplicity and richness of diverse knowledge systems, transformative inter- and transdisciplinarity can help better understand and address complex sustainability challenges.

- **Embedding inclusiveness in research, education and action**

Transformative inter- and transdisciplinarity aim to involve all disciplines and actors relevant to research and education. This means involving not only disciplines whose insights are vital for a comprehensive understanding of the issue or problem at hand, but also a diversity of societal actors who may be affected and/or whose perspectives are indispensable for addressing sustainability challenges. These actors may encompass human and non-human community members, policymakers, practitioners and other stakeholders. By ensuring the inclusion of all relevant disciplines and actors, transformative inter- and transdisciplinarity aim to cultivate holistic and impactful approaches that draw upon a diverse spectrum of expertise and experiences. Inclusiveness should be embedded throughout all stages of research, education and action, including initial design, project implementation, knowledge production, project evaluations and outreach processes. Practical obstacles to achieving full inclusiveness within individual research projects make it vitally important that researchers working on a given field achieve a division of labour within and across their networks that ensures important groups are not marginalized across the broader field.

- **Addressing structural inequalities**

Transformative inter- and transdisciplinarity should work towards leveling the field for underrepresented, under-recognized and marginalized groups, particularly in the Global South but also in the Global North. Historical underrepresentations and injustices demand supportive and emancipatory action for nature, as well as for vulnerable and marginalized human and non-human groups. By connecting and empowering them, transformative inter- and transdisciplinarity aims to reshape power relations and generate beneficial outcomes for those groups. Moreover, in a context of vested interests it is important to consider – and challenge - the privileged position that some political and economic stakeholders have to define problems, solutions and objectives.

#### **4. Key Areas and Competencies for Collaboration**

Based on the principles above, key areas for collaboration in transformative interdisciplinarity and transdisciplinarity can be derived:

- **Connecting with real-world societal and policy processes**

Researchers and educators engaging in interdisciplinarity and transdisciplinarity need to make explicit how their work aligns with sustainability transformations and real-world impacts and explore opportunities to work with community partners. To maximize potential for real-world improvements, researchers should identify relevant societal and policy processes that contribute most to just and sustainable transformations or represent challenges to such transformations. Research projects should actively strive to enhance processes that contribute to sustainability transformations or engage with alternatives when existing processes risk yielding ineffective or unjust outcomes.

- **Reflexive practices**

Reflexivity refers to the personal and collective methodical and critical examination of one's own perspectives, biases, assumptions, values and preconceived notions, together with a reconfiguration of values and practices in response. Reflexivity should be integrated into research project designs through co-design practices like stakeholder workshops, community-based participatory research, and iterative feedback mechanisms for adjustments based on participant inputs. By cultivating an atmosphere of open dialogue, active listening, and ongoing learning, collaborations among colleagues and societal actors can lead to the development of more transparent, balanced, and inclusive problem definitions, questions, methodologies, solutions, and interpretations, thereby addressing potential biases effectively.

- **Respectful and inclusive approaches**

No single discipline, societal actor, or decision-maker has the sole privilege to single-handedly determine problem definitions and solutions. Identifying and engaging with different knowledge systems involves respectful and inclusive approaches, while recognizing that currently dominant knowledge systems may fall short of addressing sustainability challenges, or even perpetuate such challenges. Objectives of research projects should be clearly communicated and research collaborations should engage in dialogue with local and Indigenous communities who are affected by sustainability challenges, research and proposed solutions, respecting their knowledge systems, traditions and cultural perspectives. To ensure diverse perspectives are represented, participatory research methods, including focus groups and community workshops, can be used. Nature and non-human animals should also be considered and represented (e.g. through intermediaries, such as environmental organizations) when they are affected. Community advisory groups comprising representatives from diverse knowledge systems may be established to seek input in the design, implementation and use of research findings. Approaches to

inclusion need to recognize and address power inequalities, not only among different societal actors but also between researchers and other actors.

- **Interdisciplinary and transdisciplinary communication and learning**

Communication and learning across disciplines and societal sectors are key challenges. Traditionally academic settings are organized and divided along disciplinary lines, with limited interfaces where researchers from different disciplines come together. Universities should provide training that equips academics with the skills needed for effective techniques and strategies for interdisciplinary communication and learning to engage with diverse audiences. For sustained collaborations, universities and funding agencies should allocate resources, such as funding opportunities or dedicated spaces, to support multiple forms of collaboration. This can incentivize academics to engage in collaborative projects. Within interdisciplinary and transdisciplinary research teams, efforts need to be made to develop shared understandings of terminologies and methodologies that help members from different disciplines and linguistic backgrounds understand each other.

- **Dismantling barriers to participation and addressing the structural nature of inequalities**

Addressing the persistent underrepresentation of researchers, educators, and stakeholders from the Global South and marginalized communities requires their increased engagement in inter- and transdisciplinary research. This necessitates being mindful of inequities and power imbalances between knowledge institutions, dismantling barriers to participation, and amplifying diverse voices. When used thoughtfully, virtual spaces, along with communication and translation technologies, can facilitate the exchange of experiences across different sectors. Embracing inclusivity in knowledge creation not only helps rectify long-standing imbalances but also strengthens our collective capacity to address global sustainability challenges.

The structural nature of underrepresentation and inequalities requires addressing deeply-rooted incentive structures within all knowledge institutions, including publishers, funding agencies and universities. For instance, *publishers* should waive publication fees and article purchase fees for scholars and stakeholders from developing countries. Moreover, to address inequalities in knowledge creation, journals should also provide editorial support for scholars from underrepresented regions, as well as develop publication formats that feature interdisciplinary and transdisciplinary co-creation. *Research funders* should promote the inclusion of underrepresented disciplines, voices and individuals from underrepresented regions through targeted grant programmes. Moreover, while funders demand societal engagement, they should still insist on transparency on whether research-based recommendations are arrived at through inclusive processes. *Universities* should enhance incentive structures and lay the groundwork for interdisciplinary and transdisciplinary research collaborations, beginning with the earliest stages of research training. This includes addressing the incentives and disincentives related to job retention, promotion, academic impact evaluation, and science metrics. By allocating ample time and resources for inclusive and collaborative efforts, co-creation, and coordination beyond traditional discipline-based administration, universities can better support these efforts. Additionally, adopting evaluation and science metrics that recognize these efforts and supporting researchers in pursuing roles beyond academia, such as in politics or activism, is essential. Moreover, universities can facilitate networking, trust, and capacity building by promoting South-South cooperation and implementing twinning programs that pair individuals from different world regions.

## 5. Limits and Risks of Inter- and Transdisciplinarity

The value of interdisciplinarity and transdisciplinarity does not exclude the value of disciplinary approaches and theoretical or non-applied research. Among other things, a disciplinary foundation can provide researchers and students with a strong reference point to compare and apply insights from other disciplines, as well as contribute to transformative outcomes. Interdisciplinarity and transdisciplinarity may complement disciplinary approaches and hence work together.

Interdisciplinarity and transdisciplinarity are not ends in themselves, nor are they automatically benign instruments. Mere instrumental or performative applications of interdisciplinarity or transdisciplinarity may empower (already) powerful players rather than help to emancipate underrepresented actors. Participatory and co-creation methods in transdisciplinary collaborations have limited value or may even become problematic when they uncritically engage (already) powerful non-academic actors, such as multinational corporations. Interdisciplinarity and transdisciplinarity could then wittingly or unwittingly consolidate the status quo and be counterproductive for sustainability transformations.

Moreover, transformative interdisciplinarity and transdisciplinarity demand the establishment of open and dialogical environments. These stand in contrast to the many current institutional contexts of knowledge creation, which are frequently characterized by insufficient recognition and rewards for inclusive and collaborative efforts, competitive dynamics, distrusting top-down control, and hierarchical relations. By cultivating mutual trust, compassion and humility, academics and academic institutions can alleviate competitive and non-cooperative cultures and create favorable conditions to engage with diverse disciplines and societal groups.

## 6. The Earth System Governance Project as a Catalyst for Transformative Collaboration: Practical Steps Forward

The Earth System Governance Project can be a catalyst for transformative interdisciplinarity and transdisciplinarity by fostering a culture and community that encourages co-creation and integrates non-academic knowledge and perspectives. To this end, we propose various opportunities for the scientific leadership, management, administration and research community to meet these aims:

*Introducing a membership category for non-academics (e.g. practitioners/policymakers) and featuring non-academic experts and practitioners in events and publishing could widen the inclusiveness and profile of the network.*

*Sufficient and well-aligned management capacity in network coordination teams is important to overcome barriers to inter- and transdisciplinary cooperation. When recruiting staff (within and beyond the Earth System Governance Project), interest in and capacity for interdisciplinarity and transdisciplinary management and forming and sustaining partnerships should be a key consideration.*

The Earth System Governance Project (e.g. International Project Office, or task forces and working groups,) can provide *in-kind support for inter- and transdisciplinary proposal development*, for instance by tracking international calls and funding opportunities related to inter- and transdisciplinary research and making existing and past transdisciplinary research accessible through a 'register of best practices' and create a database of educational material that can serve researchers to develop their own inter- and transdisciplinary working skills and provide inspiration to lecturers that want to teach these skills to students.

To incentivize more co-creation and partnerships between the ESG community and societal stakeholders, the Earth System Governance Project (e.g. International Project Office, task forces, working groups, or research centres) can provide *science communication support* and prominently feature publications with non-academics, civil servants, NGO representatives in its communications channels. Moreover, conference and workshop organizers in the Earth System Governance Project should consider ways to better include the perspectives of NGOs, South-based researchers and other underrepresented groups.

The ESG community can develop *publication formats* and feature research methodologies that highlight co-creation, beginning with the *Earth System Governance* journal and ESG flagship publications series, and also by creating more public-facing communications, including audiovisual content, policy briefs and blogs.

## **7. Cultural Transformation**

For a sustainable and equitable future, it is essential to foster a culture of transformative inter- and transdisciplinarity. This involves embracing and valuing diverse voices grounded in varied normative, ontological, and epistemological assumptions. In such a culture, these voices coexist, are valued, and occasionally converge. Key steps in achieving this transformation include examining biases, deconstructing and accepting different views of reality, and navigating potential conflicts and tensions.

Global networks such as the Earth System Governance Project can be a catalyst for such a transformative cultural shift through setting an example in their activities, inclusiveness and cross-pollination. However, a cultural transformation cannot depend on just one or multiple research networks. Academics and academic institutions, policy makers and other societal actors play an important role in fostering this culture.

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