Preface

We are an initial and limited representation of a group of academics, educators and boundary organization representatives, who conduct and facilitate transdisciplinary collaborations (TDC) in the Netherlands. We present you this white paper about understanding and organising for quality in transdisciplinary collaborations. We came together due to our shared interest in understanding how to improve and support TDCs to maximize their potential for impact on complex societal challenges.

We hope that over time, this initial document can be enriched with additional perspectives from a diverse group of stakeholders in the field of TDC, whether experts, practitioners, policymakers or managers. Thus, this document represents the start of a discussion, not an end. We furthermore hope this document is accessible to readers who do *not* have experience in TDC, and who may wonder if and how to allocate resources to TDC.

Our aim is to unite practitioners and experts in the Netherlands around what constitutes quality, and around our shared ambition to see TDC make a real impact on these urgent issues nationally and internationally. The emerging Dutch Community of Practice NECTR (launched April 3rd 2025) is a platform towards that, and this draft paper (v3) is a starting point.

We invite you, reader of this paper, to join us in this ambition. You can do this by

- critically reading this paper (vs3) and share your feedback with us,
- submitting example transdisciplinary projects, to be added as an appendix on the NECTR website
- support this Dutch initiative of the TDC community by signing this paper (see www.transdisciplinairwerken.nl/whitepaper for the whitepaper and link) to publicly support our aim to recognise and foster quality in TDC.

For feedback, examples and questions, contact Marion Stenneke (m.stenneke@tudelft.nl).

Some notes about the writing process and contributors to this whitepaper

This endeavour, and the first concept of the white paper (v1), was initiated in various sessions in 2024-2025 by the following authors (in alphabetical order by first name, to stress the equal contribution of perspectives):

- Aniek van den Eersten, NWO
- BinBin Pearce, Delft University of Technology
- Corinne Lamain, former director of Centre for Unusual Collaborations (CUCo)
- David Abbink, FRAIM, Delft University of Technology
- Deborah Forster, FRAIM / RoboHouse
- Eva Verhoef, FRAIM / RoboHouse
- Josephine Sassen-van Meer, TNO
- Lotte Krabbenborg, Institute for Science in Society, Radboud University
- Marion Stenneke, Delft University of Technology
- Varsha Kapoerchan, NWO

These authors invited many others to contribute. In particular we wanted to seek the feedback and support of the universities of applied sciences (in Dutch “hogescholen”) that have a long history and rich experience in transdisciplinary collaborations. We see a shared mission for improving the quality and widen the impact of TDC projects by both the universities of applied sciences and other knowledge institutions. The authors acknowledge that universities of applied sciences are experienced TDC practitioners and therefore can be of huge relevance in understanding TDC quality, by sharing their knowledge, experience and network. We therefore also want to

acknowledge the much-appreciated feedback of Daan Andriessen at that stage.
In January 2025 we invited and received feedback from a critical sounding board during a half-day workshop. We gratefully acknowledge the feedback from these people who have helped us to improve our thinking, our network and this white paper for a second version (in alphabetical order by first name, to stress the equal contribution of perspectives):

- *Annelieke van der Giessen (AWTI)*
- *Barbara Regeer, Athena Institute VU Amsterdam*
- *Daan Andriessen, HU University of Applied Sciences*
- *Laurens Hessels, Rathenau Institute*
- *Liesbeth Noordegraaf-Elens, Erasmus University*
- *Michiel van den Hout, Dutch Climate Research Initiative (KIN)*
- *Mascha van der Voort, Twente University*
- *Nikki Brand, Delft University of Technology*
- *Wander van Baalen, Erasmus University*

After April 4 (when we published the first public version of our whitepaper (vs1) at the NECTR launch) we invited and incorporated additional insights from critical readers and community representatives who volunteered their feedback, including (in alphabetical order by first name, to stress the equal contribution of perspectives):

- *Anne Loeber, VU University Amsterdam*
- *Cynthia Liem, Delft University of Technology*
- *Guadalupe Peres-Cajías, Universidad Católica Boliviana*
- *Hilde Westera, former Ministry of Infrastructure and Water Management*
- *Lisa Andrews, KWR Water Research Institute*
- *Pieter Vandekerckhove, Delft University of Technology*
- *Tamara Metze. Delft University of Technology*
- *Wendy Aartsen, Centre for Unusual Collaborations*

On Jun 16th the paper was discussed at a NECTR meeting, and approved for publication on the site. On June 19th 2025, the next version of this white paper (vs2) was presented at NWO Teknowlogy Festival, during the keynote of David Abbink - one of the authors. The paper circulated and received 88 signatures from different Dutch stakeholders, including three additional lectors that provided the critical feedback to become co-authors of the paper:

- Patrick Huntjens, Hogeschool Inholland / Maastricht University
- Theo Niessen, Fontys Hogeschool Eindhoven
- Peter Troxler, Hogeschool Rotterdam

With this version (v3), we invite further signatures or critical feedback. We will present it at the yearly event of NECTR[1] on Nov 4th 2025, for a final iteration in the Dutch TDC community. We have strived for this document to be a concise representation of how the Dutch TD community thinks about recognising and fostering quality in TDCs, and remain open to suggestions how to better reflect this.

[1] www.transdisciplinairwerken.nl/agenda

White Paper

Recognising and Fostering Quality in Transdisciplinary Collaborations for Confronting Societal Challenges

Contents

1. The paradox of quality in transdisciplinary collaborations

How to create impact around the key societal challenges of our times?

Challenges like the energy transition, sustainable healthcare and dealing with labour shortages, are all highly complex. Addressing them is urgent, and requires fundamental transitions in the way we work, live, consume and organise ourselves. Despite the wish for knowledge institutes, governments, corporates and SMEs to organise themselves effectively for targeted societal impact, there are many barriers towards that. Specifically, it is widely accepted that the traditional ways of planning, performing and assessing research and innovation projects may no longer be sufficient. Next to these traditional ways, an additional approach needs fostering. A type of collaboration called **transdisciplinary collaboration (TDC)** is frequently mentioned as an important way forward, which could encompass education, research, innovation or all of these.

What constitutes TDC?

Transdisciplinarity typically sounds vague to people who have not experienced it, and it runs the risk of being used as a buzzword[2]. This is exacerbated by the fact that there are many definitions of transdisciplinarity[3]: even among those practicing and/or financing it, there is insufficient consensus on terminology, methodologies or assessment criteria. For the purposes of this white paper, we want to highlight three main elements of transdisciplinarity that are focused on collaborations which aim to contribute to societal challenges.

First, TDC integrates a wide range of different types of methodologies, knowledge and perspectives: academic, as well as from practitioners and citizens. **Second**, in its sensitivity to societal needs, it is participatory and inherently value-driven. **Third**, in order to deal with complex societal challenges affecting diverse groups of actors over time, it also requires a flexible process that can include other stakeholders, actors and insights over time (often but not always using a systemic perspective). Some transdisciplinary projects are executed by large consortia involving researchers from multiple scientific disciplines and institutions, practitioners from several professions, policy makers, citizens, etc. Other transdisciplinary projects are small-scale, local initiatives that tend to local issues. Some transdisciplinary initiatives have already achieved success, some fail to live up to expectations, and many are still in progress. With this paper we invite practitioners in the Dutch community to submit example transdisciplinary projects/cases (see preface), to be added as an appendix in a final version of this white paper, to give an overview of where we stand as a Dutch community.

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[2] Zaga, C., Matos-Castaño, J., and van der Voort, M. (2024) Transdisciplinarity: Taking stock beyond buzzwords and outlining an agenda for design research, in Gray, C., Hekkert, P., Forlano, L., Ciuccarelli, P. (eds.), DRS2024: Boston, 23–28 June, Boston, USA. https://doi.org/10.21606/drs.2024.1566.

[3] The authors acknowledge that there is ample (empirical) experience within the Dutch TDC community, which we aim to collectively represent. We also acknowledge the body of academic knowledge around TDC quality, including Belcher, B. M., Rasmussen, K. E., Kemshaw, M. R., & Zornes, D. A. (2015). Defining and assessing research quality in a transdisciplinary context. *Research Evaluation*, **25**(1), 1–17. https://doi.org/10.1093/reseval/rvv025 ; Lux, A., Schäfer, M., Bergmann, M., Jahn, T., Marg, O., Nagy, E., Ransiek, A., & Theiler, L. (2019). Societal effects of transdisciplinary sustainability research—How can they be strengthened during the research process? *Environmental Science & Policy*, **101**, 183–191. https://doi.org/10.1016/j.envsci.2019.08.012 ; Schäfer, M., Bergmann, M., & Theiler, L. (2021). Systematizing societal effects of transdisciplinary research. *Research Evaluation*, **30**(4), 2021, 484–499. https://doi.org/10.1093/reseval/rvab019 ; Kny, J., Claus, R., Harris, J., & Schäfer, M. (2023). Assessing societal effects: Lessons from evaluation approaches in transdisciplinary research fields. *GAIA - Ecological Perspectives for Science and Society*, **32**(1), 178–185. https://doi.org/10.14512/gaia.32.1.17). To the best of our knowledge, there is no overview of basic characteristics of how quality around the process of TDC can be determined.

Why this white paper?

The authors and sounding board of this white paper – including researchers from Dutch academia with experience working with societal actors, practitioners from applied science, funding agencies and policy makers – have engaged in TDC and are aware of the barriers and facilitators involved in setting them up, executing them and sustaining them. Based on this shared experience across different domains, we notice we can readily discern quality in TDC amongst ourselves, but this may not be so easy for those who have not acquired this experience.

One might ask: why not simply define what constitutes quality? First of all, quality is perceived and assessed differently from different perspectives: "academic rigor", "practical implementation" and "long-term societal impact" to name a few. Also, answering this question reveals a paradox in defining quality, one that the authors and sounding board all recognise. Since TDCs are particularly geared towards the *process* of maximising opportunities for unexpected outcomes and impact to emerge over time, it is undesirable to aim for outcomes with exclusively quantitative or short-term metrics: this runs the risk of not understanding the emergent effects of such work over time, thereby stifling TDCs. On the other hand, keeping quality undefined and merely advocating to 'trust the process' is not sufficient to spark confidence in TDC. So how do we clarify how scarce resources could be spent adequately to contribute to societal impact?

Recognising system transformation as a core quality dimension

While the emergent and value-driven nature of TDC makes defining quality difficult, quality criteria should not be limited to process elements alone. TDC specifically aims to enable system transformations: shifts in institutions, relationships, governance, power structures, and underlying values that sustain pressing societal challenges (Huntjens 2021; IPBES 2024). High-quality TDC contributes to multiple value creation, rooted in social, ecological and economic sustainability (Porter & Kramer 2018; Visser & Kymal 2015; Huntjens 2021), which constitute measurable outcomes and impact, even though they may not be apparent early on in a TDC, or may even occur afterwards.

TDC also involves cultivating collective agency and institutional innovation, including new policy, regulatory and collaboration arrangements that underpin long-term change[4]. Explicit attention to justice is essential for assessing transformation impact. This includes distributional, procedural, capability, recognition and responsibility dimensions of justice[5], particularly in how vulnerable groups benefit from or are harmed by transitions. TDC quality therefore depends not only on how well collaboration processes run, but also on whether they meaningfully contribute to equitable and regenerative transformation pathways[6]. Recognizing transformation potential as a core dimension of TDC quality strengthens the capability to deliver deep impact over time.

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[4] Huntjens, P. and Kemp, R., (2022) The importance of a Natural Social Contract and co-evolutionary governance for sustainability transitions. Sustainability, 14(5), p.2976. Open Access: https://www.mdpi.com/2071-1050/14/5/2976

[5] Sovacool, B. K. (2021). Who are the victims of low-carbon transitions? Towards a political ecology of climate change mitigation. *Energy research & social science*, *73*, 101916.

[6] Huntjens, P., & Kemp, R. (2025). The Transformation Flower Approach for Eco-Social Contracting: Comparative insights from eight case studies in the Global South and North. Chapter 13 in: Huntjens, Mohamed, Hujo, Desai (Eds, 2025) Eco-Social Contract for Sustainable and Just Futures: Mobilising Collective Power to Deal with the 21ste Century Polycrisis. Open Access Edited Volume, Springer Nature, 2025. https://link.springer.com/book/9783031991080

Proposed key mechanisms

We propose key mechanisms that focus on *process quality,* in addition to *outcome quality,* across four important phases of TDC: when **initiating TDC** (Section 2), **doing TDC** (Section 3), **assessing TDC** (Section 4) and **enabling the right boundary conditions for TDC** (Section 5). We conclude each section with a set of recommendations in which we emphasise what constitutes quality in TDC for teams, organisations and ecosystems (see Figure 1, below). Because there is already much existing work about outcome quality in research and it is the process quality, especially for TD research, that has been underexplored, this paper will primarily focus on process qualities, without denying the importance of outcome qualities which should also determine a TDC. This means we assume that TDC projects should meet the commonly used outcome criteria associated with research meant to deal with societal challenges. The difference is in the process criteria which ensure that the needed outcomes are reached, even if they may not have been predicted. While ongoing work is underway to link up process qualities with the outcome of TDCs, there is little evidence available so far.

This white paper thereby integrates actionable insights based on our combined experience and network – as well as our collective grounding in the TDC literature. We have contributed to setting up a Dutch community of practice around TDC (NECTR, launched on 3 April 2025), so that we can speak with one voice about how to foster quality in TDC. We hope this contributes to more high-quality coherent responses for confronting societal (and scientific) impact in research, innovation and education projects and activities.

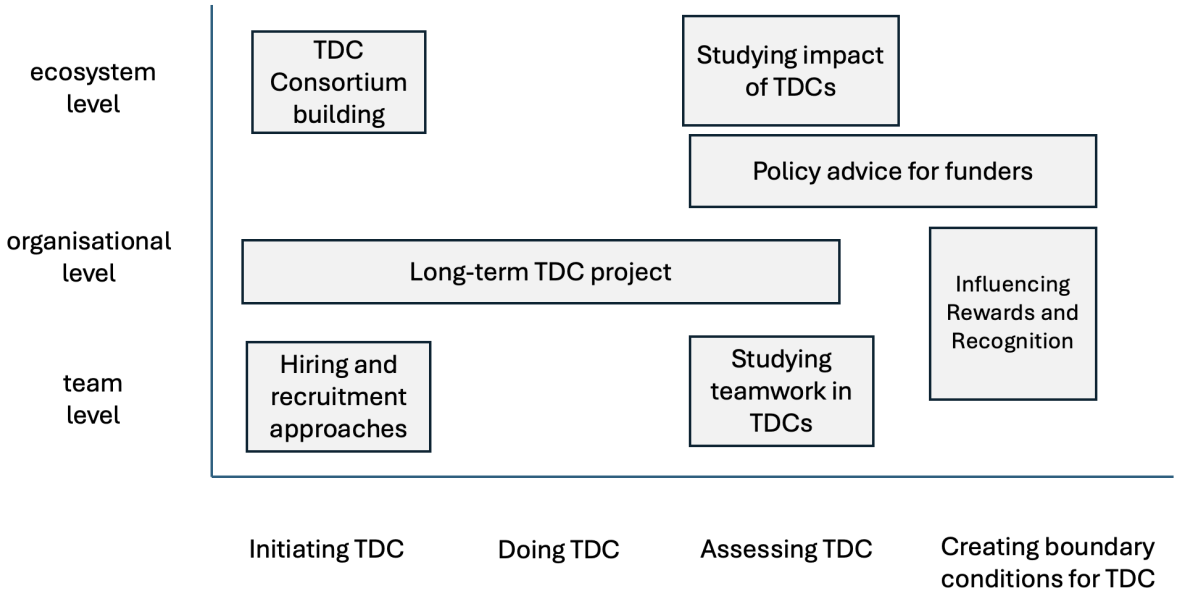

Figure 1. A simplified breakdown to help discuss and think about quality in TDC-related activities, in terms of four phases of TDC and three levels at which TDC quality plays out. Grey boxes show example activities/projects, illustrating a start of a framework in which to discuss and understand quality in different types of TDCs in the Netherlands, and understanding relationships and coherence between them.

2. Initiating TDC

Planned intentions towards emergent outcomes

TDC distinguishes itself from 'regular' projects in that it focuses on the process of integrating different perspectives and sources of knowledge towards addressing, over time, a complex societal challenge[7]. This integration is itself a valuable outcome, as well as the starting point for developing unexpected results that could contribute to confronting the societal challenge at hand. The outcomes of TDCs are not necessarily geared towards agreement and convergence, but much more towards a rich set of knowledge and (relationships between) stakeholders that can achieve one step forward towards systems change. Thus, through this integration, participants of the TDC create a renewed understanding which may transcend the original plan.

This process is also relevant in the preparatory phases of initiating a TDC, which include elements of proposal writing (where outcomes and activities need to be linked), consortium building (gathering a sufficiently rich group of people and expertise to start), and contracting (setting up the boundary conditions of a particular TDC project in research, innovation or education). All of these may also benefit from improving the overall boundary conditions for TDCs, which are addressed in Section 5.

In project proposals, expectations about the progress and outcomes of the project are often expected to be aligned with the planned activities and available resources during the proposal writing stage. Yet, TDC aims to encourage new pathways and transformative outcomes to emerge creatively and organically[8]. This requires openness, flexibility, a long-term commitment to address complex challenges, and a tolerance for uncertainty[9]. Setting SMART objectives and the promise of delivering predictable outcomes inspires confidence and helps monitor progress among funders and partners. This requires some form of structure, control, and accountability for sub-projects and the minimisation of risk and uncertainty.

This is where we encounter one of the **fundamental paradoxes** in TDC. On the one hand, if practitioners set the optimal conditions for emergence, they risk alienating participants and funders who need to account for the resources spent.This prevents much TDC research from ever getting started. On the other hand, if they emphasise predictability and achieving short-term outcomes, they risk stifling the emergent aspect of TDC, equally disappointing the funders of the research. Lack of awareness of this paradox will result in either TDC being implemented in undefined, unstructured and ad-hoc ways, or TDC being forced into the straight jacket of linear project planning. In either case, TDC will most likely not achieve its full transformative impact.

How might we work productively with this paradox? Rather than resolving it, TDC requires creating spaces where different understandings of 'progress' and 'quality' can be made explicit and negotiated in ongoing interactions. Clear goals in TDC processes and the emergence of novel directions can be combined by creating predictability in the process, while acknowledging that what constitutes 'quality' will be continuously renegotiated by participants..

We can **recognise high-quality TDC** when initiating TDC when the process of conducting TDC is made explicit and open to ongoing dialogue (see Section 3). Rather

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[7] Praktijkgids Transdisciplinair Werken - Tips en gereedschappen voor succesvol samenwerken bij de cocreatie van kennis en toepassingen. Het Groene Brein. See hyperlink.

[8] Hoverstadt, P. (2022). The Grammar of Systems: From Order to Chaos & Back. SCiO Publications.

[9] Agazarian, Y. M. (2006). SCT in Action: Applying the Systems-Centered Approach in Organizations. London: Karnac Books.

than a checklist, the following represent patterns that signal attention to quality:

1) pathways to impact are treated as hypotheses: the proposal includes plausible mechanisms/methodological approaches/practices for linking short-term actions in the proposed TDC to desirable outcomes and impact, for example by a Theory of Change approach or the 'Vliet model'[10];
2) consortium composition is justified and dynamic: the proposal includes plausible mechanisms/methodological approaches/practices for consortium building, clarifying which stakeholders need to be at the table, why, and how they affect or are affected by the TDC over time, the diverse knowledge contributions of each partner. It also explains how the partners reached alignment, and how new insights or stakeholders might be incorporated as the project evolves
3) power dynamics are acknowledged and addressed: the proposal explicitily addresses structures and support mechanisms for partners in the TDC to balance disparities in skills, experience, time or power (necessary to affect the activities and decisions around the TDC) to implement TD processes;
4) Communication is authentic rather than performative: the proposal demonstrates realistic expectations about pathways for societal impact, avoiding the use of TDC as fashionable window-dressing ('TDC-washing');

The authors of this white paper have found that participants in TDCs need to commit to a highly disciplined, interactive, reflective, iterative and explicit process. This allows for the emergence of novel and innovative ideas that would not have been possible while working in silos alone. Bringing together diverse perspectives, competing values and interests requires a rigorous process for 'radical' collaboration. The "Aspects of quality" below are heuristics that can be considered by those engaged in TDC, as well as funders who are evaluating TDC quality that reflects the perspective discussed. These "Aspects" pertain to three scales at which this quality can be considered: at the team, organisational, and "ecosystem" levels. The ecosystem pertains to the set of institutional actors, rules and constraints in which TDCs must take place.

Aspects of quality

Team level:

- Teams initiating the TDC invest in development of transdisciplinary attitudes and competencies, such as personal and group reflexivity, acceptance of unpredictability and uncertainty, a whole-system view and a willingness to engage with all partners on equal terms.
- Teams embrace mechanisms to ensure knowledge transfer/integration/translation from sufficiently different perspectives, mechanisms and tools for integrating knowledge (the cognitive and analytical competencies of TDC), developing interventions and navigating group dynamics.

Organisational level:

- Organisations develop and use reliable TDC processes and practices, grounded in knowledge integration and methodological pluralism across disciplinary and practice boundaries. Examples include joint problem framing, intentional design of collaboration processes, transformative learning and reflection-in-action.

[10] van Vliet, H. (2023). Lector Doorwerking Praktijkgericht Onderzoek. Eburon. https://www.hva.nl/binaries/content/assets/hva/nieuws/2023/de_voorbeschouwing_tweede_druk-harry-van-vliet.pdf?1678801693187

Ecosystem level:

- Transparency emerges when communication includes communicating the nature of TDC's inherent uncertainty to all stakeholders, framing it as a necessary part of achieving transformative results.
- Broad, flexible goals provide a sense of direction without being overly prescriptive. For example, focus is on process outcomes (collaboration quality, learning experiences) alongside product outcomes (specific results).
- Iterative planning allows reframing of initial goals as new insights emerge. This allows funders and participants to see progress without stifling creativity.

3. Doing TDC in practice

How does quality manifest itself in ongoing TDC projects, after the guidelines, mechanisms, starting point and initial consortium have been agreed on during the initiation phase (see Section 2)? Quality of doing TDC in practice is not something that can simply be 'recognised' from the outside, but something that participants experience and co-create through their daily interactions. We want to highlight that due to the long-term and persistent effort needed for TDCs to make an impact, different projects need to be "stitched together" over time, posing a special challenge to integrate and leverage insights from these related projects, potentially when various stakeholders may have left.

A practice of practices

Since the societal challenges are complex and may require many aspects of a system to change, an individual TDC that aims to address such a challenge may need to be aware of this complexity while setting a particular focus for the project. This requires not merely gathering actors with deep (disciplinary) expertise but also engaging with approaches which stimulate collaboration and cross-pollination to reduce blind spots and overcome knowledge gaps. Doing TDC is about safeguarding the *plurality* of stakeholders/actors rather than constructing an amalgam of perspectives and practices. In other words, we see TDC practice as an emergent 'meta-practice' of different 'communities of practice'[11] that each have their own culture of quality. High-quality ways of doing TDC thereby constitute a **'practice of practices'**, for which quality needs to be collectively determined. This collective determination happens not once, but continuously in the daily interactions between participants, where meanings of quality emerge and shift over time.

This is easier said than done. For example, disciplines retain distinct perspectives about what is considered good evidence, data structures, and analysis. Expert researchers and practitioners mostly identify with their own way of knowing, for which they can easily recognise quality. Overcoming such conceptual and methodological challenges requires a deliberate design of a mixed-methods process. A requirement for sufficient richness in contributing practices in TDCs will include at least methods that are process-dependent, oriented to systems-thinking, and are conducive to learning, knowledge creation and knowledge integration.

Roles and responsibilities

TDC integrates knowledge across disciplines from researchers, practitioners and other stakeholders. It is a hybrid science-society approach[12] for knowledge production. Following this definition, a transdisciplinary project consists of at least researchers from two different (academic) disciplines and a practitioner from professional practice (or policy). These actors are involved in a different but equal manner, and their contributions are different but of equal value by framing research questions and approaches through an agreed-upon lens whose answers will be equally valuable to all partners. All involved share responsibility for the quality of the TDC.

The paradox is that, on the one hand, fixed and clearly discerned roles and

[11] For more information on Communities of Practice, see https://www.wenger-trayner.com/introduction-to-communities-of-practice/ or van Turnhout, K., & Andriessen, D. (2024). 7. Experimenting with Novel Knowledge: a Plea for Communities of Practice. *Applied Design Research in Living Labs and Other Experimental Learning and Innovation Environments*. http://dx.doi.org/10.1201/9781003491484-9 .

[12] Celliers, L., Scott, D., Ngcoya, M. *et al.* Negotiation of knowledge for coastal management? Reflections from a transdisciplinary experiment in South Africa. *Humanit Soc Sci Commun* **8**, 207 (2021). https://doi.org/10.1057/s41599-021-00887-7 .

responsibilities are required for the quality of TDC. On the other hand, it is inherent to TDC that participants need to be **flexible** in defining and taking up roles and responsibilities. The quality of the project and collaboration between the parties within the project will diminish when parties are inflexible, but also when the collaboration is too incoherent. Quality lies in the team's capacity to make these role shifts explicit and discussable when tensions arise. It is crucial to recognize that researchers and funders are not external facilitators or neutral observers of TDC, but participants whose own assumptions, emotions, and experiences shape the collaboration from the outset. Researchers bring their own disciplinary cultures, career pressures, and personal stakes to the process. High-quality TDC acknowledges this entanglement rather than pretending researchers can stand 'outside' the process they are studying or facilitating.

The contribution of universities of applied sciences

Universities of applied sciences bring a distinctive and complementary strength to TDC: they work directly in and with practice, through practice-based and transdisciplinary action-oriented research, to generate knowledge while also implementing change (Andriessen 2024; Huntjens 2021). Their living labs function as hybrid learning environments where experimentation, co-creation and triple-loop learning reinforce each other (Hargrove 2002; Huntjens 2021). These institutions possess strong boundary-spanning and knowledge co-creation capabilities (Klein, 2021; Andrews et al. 2024), working with diverse social groups, including those often overlooked in traditional innovation trajectories, thereby reducing epistemic and societal injustice (Fricker 2007; Huntjens & Zhang 2016). By fostering collective ownership, multiple value creation and just governance arrangements in domains like energy, landscape transformation and food systems (Kivimaa & Kern, 2016; Huntjens & Kemp, 2025), universities of applied sciences help democratize sustainability transitions and enable community-centred transformation pathways. Recognizing their role as equal academic partners strengthens national capacity to deliver high-quality, just and sustainable transitions.

Competencies

TDC requires the input of various experts who can have radically different (disciplinary, cultural and/or demographic) backgrounds. Compared to mono- or interdisciplinary projects, the variety of the backgrounds of the participants is wider. But more importantly, the challenge of TDC is to **integrate and build from different perspectives and knowledge**, rather than have them co-exist as in multidisciplinary collaborations. Consequently, participants in TDC can have widely differing views on science, work, life, truth and the norms. Values they uphold can be radically different. Bringing together the perspectives of all participants is pivotal for the quality of TDC projects, but not self-evident nor easy to achieve[13]. Ideally, the same relational and systemic approach is already applied while initiating TDC. This creates a state of mutual trust within the system that helps bringing in the different perspectives and strengthens the collaborative element.

To successfully integrate perspectives, certain **competencies** are needed for the participants in TDC. Numerous literature studies have come up with various sets of competencies, such as self-awareness, self-reflection and self-regulation; emotional and mental resilience; analytical and creative thinking; systemic thinking; flexibility, adaptive behaviour and tolerance for ambiguity; motivational ability and communication skills &

[13] Sassen-van Meer, J.P., Lamain, C., Gemerden van, F. (2023). Transdisciplinary Research: If it's so important, why aren't we all doing it? From attractive conceptual notion to real-world applied practice. AWTI Newsletter, June 2023. See: https://repository.tno.nl/SingleDoc?find=UID%20e30d6d65-e2fc-47fa-97fb-aa1043cda93e.

ability to collaborate effectively. To this list we might add the competency of *paradoxical thinking*: the ability to simultaneously hold two opposing truths and resist the urge to choose one-sidedly or to compromise, but instead to look for reconciliation between the polarities[14]. Important to note here is that these competencies should not only have to reside within each individual but should be cultivated within the consortium as a whole.

For researchers specifically, TDC competence includes the capacity for reflexivity about their own position: recognizing how their disciplinary background, institutional pressures, and personal experiences influence what they notice, value, and propose. For example, it important to recognize that 'transdisciplinarity' itself may hold different meanings for different participants: a researcher may see it as 'broad consultation', a process facilitator as 'co-creation', and a citizen as 'genuine involvement'. These different meanings need not be fully aligned, but require regular reflective moments where the team makes explicit how they understand their collaboration and how it is evolving.

Rather than striving for neutrality, quality TDC involves researchers being explicit about their own stakes and perspectives, making these discussable within the team. This can be done, for example, by actively working on epistemic intelligence to create understanding among disciplines to recognise their differences and ask the right questions. These competencies are needed to accommodate different ‘languages’ and ‘thought-styles’ belonging to different ‘thought collectives’ to which every professional and expert belongs[15].

While teams can develop and sharpen their TDC competencies as they work together, TDC also requires *unlearning:* skills and habits that guarantee successful careers in business or academic contexts may be counterproductive in TDC contexts. Both learning and unlearning of competencies can be actively organised for with onboarding and training[16].

A TDC involves, on the one hand, **specialists** with deep and focused expertise in each of the domains of the system that is being considered. On the other hand, it also involves **generalists** that can take a step back, zoom out and see the bigger picture of the system that is being considered. Few people know how to do both at the same time, at sufficient depth and breadth. To increase the quality of TDC, both specialist and generalist experts should be present, and team skills for iteratively zooming in and zooming out should be honed. The generalist and specialist perspectives ideally merge and enhance each other, instead of staying separated. In other words, the quality of knowledge integration in a TDC team cannot be outsourced or offloaded, it needs to be owned by the TDC team[17].

In order to successfully do TDC, holding and enabling a flexible but structured project planning is necessary. It needs to be practical and fitting to all stakeholders and to the process of doing TDC. When unexpected insights emerge, the planning needs to allow for adaptation. More fixed go/no-go and key decision moments are evidently needed to keep TDC going.

An example of a coherent transdisciplinary, action-oriented method designed to

[14] Smith, W. K., & Lewis, M. W. (2011). Toward a theory of paradox: A dynamic equilibrium model of organizing. Academy of management Review, 36(2), 381-403.
[15] Fleck, L. (1929) Erfahrung un Tatsache, collected essays edited and introduced by L. Schäfer and Th. Schnelle (Frankfurt: Suhrkamp, 1983), ISBN 3-518-28004-X.
[16] See for example the training available at the Centre for Unusual Collaborations: https://unusualcollaborations.ewuu.nl/tools-methods/training/.
[17] Bouman, M., Van Erven, W., ‘t Hart, M., Wieclawska, S., Sassen-van Meer, J.P. (2025). *Meer vooruitgang, minder vastlopen. Samenwerken aan complexe vraagstukken.* ISBN 9789059865150

support systemic transformation by linking values, capabilities, governance arrangements and institutional change: The Transformation Flower Approach (Huntjens & Kemp, 2025; IPBES, 2024). This approach operationalizes quality in TDC as the ability to rewire systems, strengthen collective action, and align transformation with equity and ecological integrity. The approach is currently being applied in Dutch living labs within national transformation programmes (NGFs) such as NL2120, RE-GE-NL and Werklandschappen voor de Toekomst.

Aspects of quality

Team level:

- The various roles, responsibilities, tasks, as well as what everyone involved contributes in the project are co-defined and clearly described[18].Special attention is paid to diversity, flexibility (switching, replacing or redefining roles), and attempts to move towards epistemic justice (equality, power dynamics) and inclusive leadership.
- Teams take time to develop *epistemic intelligence*[19] as required for productive collaboration across practices. In short this means learning to know the limitations of your own way(s) of knowing, as well as being sufficiently aware of other ways to be able to decide when and how to call them into the TDC, and when to offer yours when it's not called in by the other team members.
- Teams proactively search for and construct *boundary objects*[20] (objects that hold different meanings in different communities and a common meaning to facilitate cooperation between these communities). They engage in boundary spanning activities that help connect and integrate different expertises and experiences.
- After acknowledging differences, developing a common language, using protocols for communication and agreeing on deliberate ways of working, the teams develop and sharpen their TDC competencies throughout the collaboration.
- Teams allow time and incorporate processes for trust-building, reflection, dialogue and dealing with discomfort[21].
- Teams plan for iterative learning and incorporating emergent insights into ongoing plans.
- Team members practice reflexivity about their own role and influence, recognizing they are not neutral facilitators but active participants whose disciplinary habits, career concerns, and emotional responses co-shape the collaboration. Teams create space to make these influences explicit and discussable.

Organisational level:

- Organisations are contracted to participate as co-creators of relevant knowledge, from beginning to end. By committing a larger group of stakeholders (outside of one project alone) to participate in periodic knowledge sharing sessions about experiences in running TDCs, whole-system insights emerge that defy/counterbalance everyday hierarchical power relations.

[18] De Jong, J. (2021). Competente mensen, incompetente teams: Handboek voor het interveniëren met impact in samenwerking. Amsterdam: Boom;

[19] van der Bijl-Brouwer, M. (2022) Design, one piece of the puzzle: A conceptual and practical perspective on transdisciplinary design, in Lockton, D., Lenzi, S., Hekkert, P., Oak, A., Sádaba, J., Lloyd, P. (eds.), *DRS2022:* Bilbao, 25 June - 3 July, Bilbao, Spain. https://doi.org/10.21606/drs.2022.402 .

[20] Leigh Star, S. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science, Technology, & Human Values*, **35**(5), 601-617. https://doi.org/10.1177/0162243910377624 .

[21] Huntjens, P. (2021). *Towards a natural social contract: Transformative social-ecological innovation for a sustainable, healthy and just society* (p. 205). Springer Nature. https://doi.org/10.1007/978-3-030-67130-3

- Organisations develop shared cultural sensibilities that can contest and/or leverage the emerging knowledge from transdisciplinary teams.
- Time and effort spent on honing TDC competencies is reckoned for and the budgets needed to regularly practice these competencies and discuss the collaboration is seen as an essential part of TDC.

Ecosystem level:

- Creating a TDC community of practice across a number of TD projects would allow for widespread circulation of best practices (hence our efforts in NECTR).
- Ecosystem-level training opportunities ensure career pathways for disciplinary, professional practitioners as well as TDC knowledge integrators[22].
- The complexity of TDC requires funding bodies to take on a broader role than for basic research[23]. They can incentivise as well as broker new transdisciplinary teams[24].
- High-quality transdisciplinary collaborations must not only coordinate effective cooperation, but also explicitly address structural inequalities and multiple value creation across social, ecological and economic dimensions[25].

[22] See for example the “gluon” role: https://convergence.nl/launch-gluon-making-knowledge-integration-work/

[23] Schneider, F., Patel, Z., Paulavets, K., Buser, T., Kado, J., & Burkhart, S. (2023). Fostering transdisciplinary research for sustainability in the Global South: Pathways to impact for funding programmes. *Humanities and Social Sciences Communications*, **10**(1). https://doi.org/10.1057/s41599-023-02138-3;

[24] Woods, H.B., Rafols, I., Wilsdon, J. (2024). UNDISCIPLINED: How do research funders define transdisciplinary research? (RoRI Working Paper No. 12). Research on Research Institute. Preprint. https://doi.org/10.6084/m9.figshare.27088756.v1.

[25] Huntjens, P. (2021) Towards a Natural Social Contract: Transformative Social-Ecological Innovation for a Sustainable, Healthy and Just Society. Springer International Publishing, March 2021. https://www.springer.com/gp/book/9783030671297

4. Assessing TDC

Recognising high-quality TDC projects

The assessment of project proposals, process, outputs, outcomes and impact is of great importance to ensure the quality of TDC. However, 'impact' itself is not a singular, objectively measurable outcome but emerges relationally: different stakeholders construct different narratives about what the TDC has meant and achieved. A researcher might highlight knowledge contributions, a policymaker the influence on decision-making, a citizen the experience of being heard, and a practitioner the new collaborations formed. Quality assessment recognizes and values this multiplicity rather than seeking to reduce impact to a single metric or story.

To monitor and assess TDC quality amongst other proposals and types of collaborations, the TDC collaborators - whether they are the funding bodies (through governmental subsidies, or direct funders) or contributing partners - should agree on and set up assessment procedures adjusted to the characteristics of TDC. This entails setting a different focus in *who* assesses, *what* is assessed and *when* assessment takes place.

TDC projects need to be assessed by a **heterogeneous committee** in which relevant disciplines and societal actors are represented, and where sufficient experience in TDC is available amongst the committee. Such transdisciplinary assessment groups encounter similar difficulties as transdisciplinary teams, due to their cultural, linguistic and epistemic differences[26]. Quality in assessment lies not only in what is assessed, but also in how the assessment committee itself navigates these different perspectives. This requires time for the committee to understand each other's quality concepts and to make explicit where tensions exist between different quality criteria.

The process design and the set-up and diverse contributions of the team members (including perspectives of diverse stakeholders) are key quality indicators for TDC and need to be taken into account in the assessment process. When funders provide the opportunity to discuss these elements in an application and how the project design fits the programme goals and envisioned impact, TDC consortia can plan for sufficient time and responsibility for the TDC process in terms of facilitation of the collaboration, integration activities and evaluation. Examples of a coherent strategy for demonstrating how proposed activities towards outputs, outcomes and impact are related include the Theory of Change approach[27], but there are many other approaches[28]. It is important to recognize that these are not linear prediction tools but rather hypotheses about possible pathways, which will be reinterpreted and revised as different stakeholders experience and make sense of the project's effects over time.

TDC evaluation is important during the entire scope of a collaboration process. Since TDC needs to plan for flexibility and emergent criteria, it also requires more intensive monitoring and evaluation *during* the project to make sure it stays on track for impact while changes are being made. Monitoring, in addition, needs to consider the process as well as the tangible outputs, as in TDC the process of collaboration is part of

[26] Zuiderwijk, J., Kaltenbrunner, W., & Krabbenborg, L. (2023). *Exploring the evaluation of inter- and transdisciplinary research proposals: Lessons from Dutch research funding reform.* https://doi.org/10.55835/6442c1344c613a12228926e8 ; Franssen T. (2022) *Enriching research quality: A proposition for stakeholder heterogeneity.* Research Evaluation, Volume 31, Issue 3, July 2022, Pages 311–320, - https://doi-org.proxy-ub.rug.nl/10.1093/reseval/rvac012

[27] For example incorporated in NWO's Impact Plan Approach, see impact.nwo.nl/en.

[28] See for example the recently organised conference "Making a Difference – creating societal impact through collaborations", https://impact.dataschool.nl/, or the Impact Alliance (https://www.linkedin.com/groups/9092817/)

the outcome of a project and good collaboration is essential for reaching the envisioned impact. This impact is generally realised beyond the scope and timeline of the project itself. The TDC process design should therefore also make room to plan for collaborative actions beyond the end of the project that increase the chance that project outcomes contribute to the envisioned impact. In addition, the TDC team needs to plan for evaluations. Funders can provide supportive monitoring tools; advisory committees of experts can also play a role here.

Aspects of quality

Team level:

- In their application, the team details how the logistics and administration of 'doing TDC' will take place, and how this fits the programme goals and their project (taking into account the 'epistemic gaps' in knowledge, the size of the consortium etc.)
- In their application, the team also makes clear that they spent sufficient time to create a 'common vocabulary' and identified plausible pathways toward the desired impact, for example through a Theory of Change.
- Each aspect of the project (i.e. each work package) demonstrates how they take responsibility for knowledge integration or other aspects of TD, rather than delegating TD to one particular actor or work package.
- The application makes clear that the value of the proposal lies in TDC and the envisioned societal impact, not just in the topic (urgency, scientific impact, methodology).
- It can be shown, for example through the governance structure of the project, that the quality of the collaboration will be continuously monitored by the team.
- A vision is developed on how the TDC evolves beyond the funding timeframe of the project, potentially affecting the organisational or ecosystem levels.
- The process of how an application was set up demonstrates that a joint problem framing[29] has been adequately considered. This includes a description of how, e.g., partners from science and society have been equally involved in co-defining the research questions and aims of the project.

Organisational level:

- Applicant teams are supported during the application process, and are given feedback throughout the proposal development stages to build up TDC expertise.
- Organisations support applicants during the project to ensure high-quality monitoring. This entails support for and recognition of the fact that this kind of monitoring and possible adjustments to maintain effective collaboration take time, and are part of the academic achievement of the researchers involved.

Ecosystem level:

- Adequate time is provided in funding schemes to ensure realistic implementation potential.
- Calls for proposals clearly indicate the programme goals and the impact expected from the TDC applications to ensure fit-for-purpose assessment.
- Assessment criteria are clear and cover aspects important for quality TDC: the plans for doing TDC (the process), the balance in the roles in the team, and the quality of joint problem framing.

[29] Pearce, B. J., & Ejderyan, O. (2020). Joint problem framing as reflexive practice: Honing a transdisciplinary skill. *Sustainability Science*, *15*(3), 683–698. https://doi.org/10.1007/s11625-019-00744-2.

- Assessment panels are diverse and cover the main disciplines related to the call with sufficient TDC experience, and also include other actors such as citizens and practitioners. They are facilitated in working together and bringing together different viewpoints, recognizing that tensions between viewpoints can be productive when made explicit rather than avoided..
- Both reviewers and assessment panels have been trained on the design of the assessment, and are aware what the programme goals are, and what kind of projects are desired to meet these goals, to avoid a more conservative stance than that of the call for proposals.
- Reviewers and assessment panels acknowledge that the assessment of TDC asks for different evidence or concerns different skills than a monodisciplinary project, and funders offer consortia dedicated and sufficient room to discuss this in their application.
- Funders support project teams in monitoring the quality of their collaboration.

5. Enabling the right conditions for TDC

Barriers for high-quality TDC

When setting up TDC, ample institutional barriers exist that limit the impact potential of TD processes and outcomes. These barriers are not simply external obstacles but emerge from established patterns of interaction and meaning-making within institutions. We see these barriers manifest in at least four contexts:

1) Although the paradigm has been changing slowly, organisational cultures may still primarily focus on **short-term outcomes, accountability, deliverables and 'solutions'**. However, strategies that address complex societal issues require longer-term perspectives, as well as an openness to piloting a set of strategies over time. A simple solution is usually not available, and different kinds of complexities in TDC need to be addressed simultaneously (see for example the outcomes of a recent workshop[30], which lists approaches to address value alignment complexities, process complexity, participatory complexity and system complexity). In other words, addressing complex challenges through TDC means that the process of working towards outcomes needs to be open to yield *emergent* insights which contribute to a deeper and richer understanding of future actions. This process is characterised by practices of co-learning, co-creating and learning-by-doing across knowledge domains, which require more patience for knowledge integration. Additionally, it requires better recognition and rewards for establishing fruitful collaboration processes than today's organisational cultures are often comfortable with. These cultures are not simply given constraints but are continuously reproduced in everyday interactions, requiring deliberate attention to how quality and progress are discussed in daily practice.
2) TDC is rooted in an extensive body of knowledge. However, many **organisations do not facilitate access** to specialised boundary organisations or to Integration & Implementation Science specialists or Integrators[31] to increase the quality of TDC. There often is limited or no TDC training available for participants who are not yet familiar with the field of transdisciplinarity to increase the quality of the TDC they are about to engage in.
3) Despite promising developments in **Recognition & Rewards** policies across Dutch universities, early and mid-career academics continue to run into barriers when embarking on TDC journeys[32]. Due to the extra time and effort required for TDC that are not supported or incentivised by institutions, TDC is not an attractive or

[30] See: 2nd Workshop on Worker-Robot Relations https://sites.google.com/view/2nd-wrr-workshop/home

[31] See: Bammer G. (2012) Disciplining interdisciplinarity: integration and implementation sciences for researching complex real-world problems. ANU Press, Canberra; Hoffmann S., Deutsch L., Klein J.T. et al. (2022) Integrate the integrators! A call for establishing academic careers for integration experts. *Humanit Soc Sci Commun* 9:147; Hendren C.O., Ku S.T. (2019) The interdisciplinary executive scientist: connecting scientific ideas, resources and people. In: Hall K, Vogel A, Croyle R (eds). *Strategies for team science success*. Springer, Cham. pp. 363–374

[32] See for example: CUCo. Finding joy, creativity and meaning through unusual interdisciplinary collaborations. *Humanit Soc Sci Commun* **11**, 1159 (2024). https://doi.org/10.1057/s41599-024-03634-w ; Müller, R., & Kaltenbrunner, W. (2019) Re-disciplining Academic Careers? Interdisciplinary Practice and Career Development in a Swedish Environmental Sciences Research Center. *Minerva* **57**, 479–499; Daniel, K.L., McConnell, M., Schuchardt, A., Peffer, M.E. (2022) Challenges facing interdisciplinary researchers: Findings from a professional development workshop. *PLoS ONE* **17**(4): e0267234. https://doi.org/10.1371/journal.pone.0267234; Carolan, M. (2024) Do universities support solutions-oriented collaborative research? Constraints to wicked problems scholarship in higher education. *Humanit Soc Sci Commun* **11**, 382. https://doi.org/10.1057/s41599-024-02893-x. ; KNAW's The Young Academy will publish a relevant project-based report in oct 2025 "*Collectieve Kennisontwikkeling tussen wetenschap en samenleving: Het bouwen van een werkomgeving die transdisciplinair onderzoek stimuleert en faciliteert"*

even viable way of working for researchers looking for a permanent home in institutions. Due to the disciplinary organisation of most universities, those who fall in between disciplines or who work outside of the norm of specific disciplinary norms have a more challenging time finding a place to do innovative new work which incorporates TDC seriously. A recent report by Rathenau[33] found that despite high ambitions hardly any change is happening. These barriers also hold for all other (societal and industrial) partners involved. Their organisations also need to acknowledge and incorporate TDC and their way of working. Moreover, engaging authentically in TDC can be emotionally demanding for researchers: navigating uncertainty, managing tensions between different stakeholders, and dealing with the discomfort of having one's own assumptions challenged. Current academic cultures rarely acknowledge or support the emotional labour involved in TDC, treating it as unprofessional to discuss how the work affects researchers personally. This creates an additional burden where researchers must manage both the substantive challenges of TDC and the emotional work of appearing unaffected by it.

4) Finally, the voices of societal partners in TDC are often not included in meaningful ways in the framing of research questions or knowledge agendas. A lack of adequate settings and underutilisation of methods for joint problem framing and value elicitation leads to the framing and knowledge agendas of projects to be primarily defined by (Western) donors and academics[34]. This raises the potential for **epistemic injustice**[35], where those most affected by research outcomes are not represented or included in shaping the objectives of the research. In addition, blind spots caused by an overrepresentation of certain perspectives (e.g., mostly academic or mostly technical expertise[36] etc.) may block the relevance and therefore the uptake and implementation of knowledge outputs.

Addressing these types of barriers will strengthen TDC professionalism, experience and expertise, improving the potential for quality when initiating, doing or assessing TDC.

Institutional innovation and systemic learning as enabling conditions

The mentioned barriers illustrate that high-quality TDC requires institutional environments that allow for experimentation, adaptation and shared ownership of solutions. This involves supporting not only project-level learning, but also systemic learning: changes in how organisations and governance systems understand problems and work together (Argyris & Schön, 1996; Huntjens, 2021). Institutional innovation is critical in this regard. It refers to the evolution of rules, relationships, narratives and power arrangements that shape how decisions are made and whose values and knowledge matter (Kivimaa & Kern 2016; Beunen & Patterson, 2019; Huntjens et al. 2025). Without such institutional work, many successful pilots and living labs fail to scale or sustain their impact.

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[33] Van der Lee, R. et al., Balans van de Wetenschap 2024. https://www.rathenau.nl/nl/werking-van-het-wetenschapssysteem/balans-van-de-wetenschap-2024

[34] Triyanti, A., Lamain, C., Duncan, J. and Student, J. *Understanding exclusion, sharing benefits and building in reflection in transdisciplinary collaborations*. (2024, July 1). Integration and Implementation Insights. https://i2insights.org/2024/06/25/improving-transdisciplinary-collaborations/.

[35] Triyanti, A., Paassen, B., Lamain, C., Duncan, J., Student, J., Colen Ladeia Torrens, J. and de Roo, N. *Towards fair transdisciplinary collaborations that honour epistemic justice*. (2024, June 25). Integration and Implementation Insights. https://i2insights.org/2024/05/28/fostering-epistemic-justice/.

[36] See, for example, AWTI (2024). *Natural Connections. Embed social sciences and humanities research in innovation*. Den Haag, Adviesraad voor Wetenschap, Technologie en Innovatie.

Aspects of quality

Team level:

- Knowledge about transdisciplinary processes and best practices (quality, methods, approaches etc) are shared with others engaging in TDC (e.g. through peer-reviewed publications, but also through more engaging and accessible formats like blog posts, white papers, videos, visuals or podcasts, or direct forms like personal contact and mentorship)
- The organisation (and ambassadors) supporting TDCs allows for space, time and resources to cultivate in the TDC team members the attitudes conducive to TDCs, like curiosity, patience, a reflective stance and ability to deal with uncertainty.
- Process coaches and integration specialists are involved to strengthen processes and outcomes.
- “Fail Forward” - Explicit acknowledgement of events that could never have been planned or controlled, as a result of the TD nature of the collaboration, and its impact on the project, and what was learned as a result.

Organisational level:

- Process coaches and integration specialists are structurally embedded and engaged, for example in a pool where TD teams can turn to when seeking support or advice.
- Expect and allow additional time and resources for the enactment of real co-creation, co-learning, and learning-by-doing processes. Slow down timelines to its realistic proportions when impact, rather than results, are the focus.

Ecosystem level:

- Organisations involved in TDC need to acknowledge and incorporate TDC as one of the approaches in their modus operandi.
- Organisations that engage in TDC (or have the ambition to do so) need to have methods to distinguish when TDC is necessary and when not (not all challenges benefit from TDC). Similarly, they need to develop expertise in understanding when TDCs are actually used in their organisation and when not, and to what level of quality. Concretely, organisations should invest in understanding where TDC expertise is available in members of their organisation, and appoint, support and strengthen where needed. We invite organisations to appoint TDC ambassadors that can advise and link to the Dutch TDC network NECTR (www.transdisciplinairwerken.nl).

Final considerations

We advise researchers, practitioners and organisations to consider making a sharper distinction between (and explore the connections between):

- a) *disciplinary or interdisciplinary activities*;
- b) *transdisciplinary* activities that are specifically organised to shape societal impact for complex challenges, with sufficient attention to the aspects of transdisciplinary quality mentioned in this white paper.

We believe such a distinction is not only useful for a researcher's or organization's *internal processes* (including strategy, resource allocation, and other aspects mentioned in section 5) but are also much needed for clear and honest *external communication*. In other words, we urge people to avoid public communications that over-promise "*that* activities *will* contribute to societal impact". Instead, when an individual, team or organisations aims to organise themselves for realising such societal impact, we advise engaging with the TD community to help reflect about the quality in all the elements we aimed to describe in this whitepaper. This advice holds for those who have no experience in TDC yet, as well as for practicing members of the TDC community, including the authors of this whitepaper.

Finally, in internal or external communication we advise individuals and organisations to be careful with using the term "transdisciplinarity" too loosely, without considering and clarifying the aspects of quality we are aiming to establish together. We recognize that these quality aspects are not fixed criteria but conversation starters, inviting ongoing dialogue where different perspectives on quality can coexist and enrich each other.

Throughout this whitepaper, we have attempted to walk a fine line: providing concrete guidance while avoiding rigid prescription. This reflects our recognition that quality in TDC emerges from the particular constellation of people, contexts, and challenges in each project, rather than from following a universal template. As such, the 'aspects of quality' we describe are better understood as *patterns to attend to* rather than boxes to tick. They represent themes that have proven significant across many TDC projects, but their meaning and relative importance will vary. To arrive at concrete recommendations for particular contexts, the authors will offer to help organise specific workshops with and for stakeholders in need of such concrete recommendations – feel free to reach out to us for this.

In the mean time we invite readers to publicly sign this document if they agree with the content[37], reach out to us for feedback and suggestions to further improve it, and help nurture the growing community that jointly contributes to fostering high-quality TDCs in the Netherlands.

[37] www.trandisciplinairwerken.nl/whitepaper