2

Time demands in inter- and transdisciplinary collaboration

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Recognising time as a core resource enables more effective inter- and transdisciplinary collaborations.

Introduction

Time demands are one of the most significant challenges recurring in inter- and transdisciplinary research [1–5]. The inter- and transdisciplinary literature shows that integration across disciplines and with stakeholders requires substantial early investment of time for building shared language, trust, and new methods. The findings of the SSH CENTRE confirm this: both the SSH-STEM Policy Collaborations and the Transdisciplinary Knowledge brokerage Initiatives faced significant up-front and ongoing time requirements. As sufficient time was given to these activities, collaborations matured with this supporting the delivery of meaningful outputs.

This Briefing Note presents the challenge of time for inter- and transdisciplinary research, drawing upon existing literature. It then discusses this topic within the context of the SSH CENTRE project. The Briefing Note closes with recommendations on how to better account for time in inter- and transdisciplinary research at the individual, project, and systemic levels.

What did the SSH CENTRE project do?

SSH CENTRE (Social Sciences and Humanities for Climate, Energy aNd Transport Research Excellence) is a Horizon Europe project that focused on generating best practices for incorporating both Social Sciences and Humanities (SSH) and inter- and transdisciplinary research into the European Union's climate, energy, and mobility transition policy. The SSH CENTRE project deliberately created spaces for *epistemic experimentation* – i.e. structured collaborations that bridge different epistemic (knowledge) cultures to co-produce policy-relevant knowledge:

Interdisciplinary Collaborations for EU Policy Recommendations

The SSH CENTRE project facilitated nearly 30 novel collaborations between the SSH and STEM (Science, Technology, Engineering and Mathematics) disciplines, for strengthening European climate, energy, and mobility policy. These resulted in three edited books, whereby each Interdisciplinary Collaboration produced a chapter. For more see SSH CENTRE Interdisciplinary EU Policy Book Collection.

Transdisciplinary Knowledge Brokerage Initiative

The Knowledge Brokerage Initiative for sustainability transitions gathered 30 early- and mid-career SSH researchers working on themes of climate, energy, and mobility. These researchers actively engaged in accelerating the transition process towards a carbon-free society by working with six European cities on sustainability issues and brokering SSH knowledge. The researchers organised workshops and produced a range of reports that provided knowledge to support the cities' transitions. For more see Knowledge Brokerage Reports.

This Briefing Note is one of 10 that present the findings and recommendations from the evaluation of these epistemic experiments. For more, see the Introduction to the Briefing Note collection and the Formative Accompanying Research methodology.

Problem description and literature insights

Inter- and transdisciplinary research examines issues that cannot be adequately dealt with by a monodisciplinary approach [6]. The very nature of inter- and transdisciplinary research means that involving more disciplines or stakeholders increases the complexity of collaboration, which creates time demands. Monodisciplinary research often already has established ways in which it is conducted; researchers are able to share disciplinary jargon, theoretical frameworks or adopt different methodologies more easily. However, inter- and transdisciplinary work "does not just happen" [6] – it is not enough to simply bring researchers together and have them collaborate. As inter- and transdisciplinary research involves scholars and participants from diverse disciplines and social and work settings, they do not have a unified language, theoretical perspective, or overall approach to research. Consequently, the establishment of research approaches requires more time in inter- and transdisciplinary research than monodisciplinary research.

One broad area of time demands relates to **knowledge integration management**. Achieving genuine knowledge integration requires dedicated time and active management throughout the life of the project [7]. Integration is an iterative process and should happen as research is formulated and undertaken, rather than as an afterthought [1]. The management of inter- and transdisciplinary research should focus on supporting team work to achieve knowledge integration, and not be reduced to more administrative tasks like scheduling or handling the budget [6]. For example, a skilful leader can help ensure all team members sufficiently understand each other's contributions, mediate when misunderstandings arise between disciplinary perspectives, and facilitate ongoing dialogue across disciplinary divides. Due to the complexity of inter- and transdisciplinary work, it is necessary to take into account the various adaptations that occur during the research and possible delays when coordinating these projects. In transdisciplinary research in particular, flexibility in framing of the stakeholder engagement is key to better co-produced knowledge outcomes [8]. Briefing Note 7 (BN7) focuses on **coordination and leadership** in more detail, while allocating time for **developing shared vocabularies and understandings** is covered in BN6.

Another aspect of time demands concerns **investment in communication**. Such communication is not merely about sharing scientific findings but about communicating to create a functional inter- and transdisciplinary environment for collaboration. Inter- and transdisciplinary research connects not only different perspectives on a given topic, but also individuals from different research, work, and social cultures. Soft skills are essential for appreciation, recognition, and trust across different perspectives [6]. Therefore, the time demands of communication in inter- and transdisciplinary collaborations involve not only learning the terminology, methodology, and theoretical frameworks of other disciplines, but also becoming familiar with the participants' cultural and academic background, clarifying expectations to each other, and building trust [9,10]. In transdisciplinary work where non-academic participants are involved, an additional layer of time-intensive communication arises, requiring relationship-building, room for trial and error, negotiation, disagreement or even conflict, and ensuring that collaboration is a genuinely two-way process [11]. Regarding **spaces for communication**, see BN8.

The significant time demands of inter- and transdisciplinary collaboration frequently clash with **institutional and structural realities** [12]. Research projects are often confined to short lifespans due to funding patterns; this lack of protected time prevents researchers from building common ground effectively and limits the full development of collaborative practices. Short-term funding is widely deemed inadequate for the necessary long-term planning of inter- and transdisciplinary research [13,14]. Further institutional time constraints result in a conflict with research careers. Individual researchers, particularly early-career researchers, face challenges when trying to devote sufficient time to an inter- or transdisciplinary project while simultaneously meeting other demands and balancing disciplinary projects [15]. Additionally, students participating in inter- and transdisciplinary projects are often hired for a shorter period than the time needed for results to become visible [15].

Manifestation in the SSH CENTRE

Within the SSH CENTRE project, the time demands stemmed from the need to:

- establish a shared understanding and consensus across the inter- and transdisciplinary team;
- negotiate terminology and find a common language;
- develop new tools, methods, and approaches from scratch; and
- conduct extra coordination efforts.

The participants in the SSH-STEM Interdisciplinary Policy Collaborations and the Transdisciplinary Knowledge Brokerage highlighted the need for more time upfront to establish a shared understanding of each other's perspectives, and consensus regarding the expectations and goals of the research project. Time was seen as crucial for the success of the project; researchers repeatedly framed the build-up phase as a necessary investment to make knowledge integration possible. While such negotiations took time, potentially making the researchers struggle to see progress during early stages, they were invaluable in the long term. As researcher FEXP2 put it, the "entry barriers are quite high," requiring "a lot of time ahead," with returns only if the project is "long enough" to benefit from that investment.

> *For me, the time, this time is needed because if I was about to (…) do a project in my own discipline, I can build on my own research (…). But here, even though I had databases or stuff like that, I needed to start from nothing because, you know, I'm working with different people from different [disciplines]. So, we always… we will always need to start from nothing. And this is good, actually. But this time needs to be included in a future project (…). And it's not a lost time. For me, it's an investment because it will really be helpful for the deployment and the implementation of the project. We can be quicker, but we need more time at the beginning.* (FEXP2, Interdisciplinary Collaborations)

Similarly, developing a common language took time, with the terminology needing to be explained, sometimes

simplified, and agreed upon. Reaching a workable shared vocabulary cannot be rushed. Interviewees noted that even after one successful collaboration, subsequent collaborations will not be without such time demands. Developing shared terminology, as well as establishing a shared understanding remains an iterative process, proving that integration cannot be reduced to administrative coordination [1,6,7].

Another time-consuming part of the project was the development of the research procedure itself. Inter- and transdisciplinary work often entailed the development of new tools, methods, or new approaches in general, as existing disciplinary research methodologies did not allow to deal with the research problem sufficiently. As one researcher described:

> *We get the result, and we see that the tools and the classical tools in classical methodology were not fit and pertinent for all the text and we need to define our own tools. We get the result, and we have a lot of iteration like this. It was very, very complicated also because the timing, (…) so we organised [biweekly] meetings to be able to define the different tasks, (…) to be very responsive, to correct the different difficulties and issues.* (MEXP1, Interdisciplinary Collaborations)

Between the two epistemic experiments conducted within the SSH CENTRE, there were differences in terms of the dynamics of time requirements. In the SSH-STEM Interdisciplinary Policy Collaborations, time demands clustered up-front (establishing shared understanding, negotiating common vocabulary, and developing new methods) and around chapter review and revision processes. In the Transdisciplinary Knowledge Brokerage Initiative, time demands reflected different working regimes: municipal cycles, seasonal shutdowns, and shifting availability of all parties. In one case, a city workshop occurred just before the summer holidays, postponing feedback on the workshop. The Knowledge Brokerage programme required dynamic time availability from the researchers:

> *I think it was expected to be more or less like this. The only tricky thing is I always forget that when there is like half a day per week, it doesn't really mean half a day per every week. It means like no work at some weeks and some weeks you need to work like four days on it.* (FECR4, Transdisciplinary Knowledge Brokerage Initiative)

Taken together, the SSH CENTRE epistemic experiments illustrate how time demands in inter- and transdisciplinary collaborations are front-loaded investments in integration and require flexibility on the part of researchers. Nevertheless, the project and systemic levels – the framework in which the research takes place and the support that comes from project funders and call designers – are crucial and fundamentally contribute to the success of research collaborations. For example, the Knowledge Brokerage program had a support system in the form of mentors, which was widely appreciated, and as the program lasted one year, it enabled researchers to spread the work.

> *When I applied, (…) I didn't remember that we were going to have a mentor that actually follow us and also direct in some way our activities. And this work was really fundamental in my opinion, because sometimes in other kind of projects and courses, the participants are completely left alone to do something completely new without any suggestion. And in this case, we were really accompanied, I don't know how to say it, with [Mentor3] in this case. (…) And because it was spread among one year, we could have enough time to organize, to get ready for the workshop, then to finish workshop and now to write the brief.* (FECR5, Transdisciplinary Knowledge Brokerage Initiative)

Further suggestions for supporting inter- and transdisciplinary research at various levels are presented in the following section.

Recommendations at individual, project, and systemic levels

Both the literature and the SSH CENTRE experience show that protecting time for integration transforms time from a barrier into an asset. The recommendations below set out how to better account for time demands at three levels of research practice.

Recommendations at the individual/researcher level

- Develop an understanding of all disciplines involved in the research project: personally commit time to learn other's concepts, methods, and terminology early on in the project.
- Be honest about time availability: plan around uneven weekly loads and signal constraints tied to seasonal cycles.
- Schedule personal reflection time: dedicate moments for reflexivity and reviewing integration progress so that collaborative time is used more effectively [16].

Recommendations at the project level

- Schedule time at the beginning for intensive team building and developing effective communication [9,17].
- Make a non-negotiable 4-8-week build-up phase (scale to project) to do framing, roles, and integration design, with explicit deliverables: shared glossary, problem-framing canvas, integration map, and decision log [9].
- Schedule regular "time check-ins": include short, recurring "are we still on the same page?" moments throughout the project to prevent small misunderstandings from compounding into delays [14].

Recommendations at the systemic/broader academia and funding level

- Fund time for explicit knowledge integration: make dedicated hours for inception, facilitation, mentoring, and reflection eligible in budgets and required in proposals [1,7].
- Provide training and support to coordinators so that they have the knowledge and skills to navigate interdisciplinary teamwork.

- Fund training centres, seed grants, or team-teaching that give researchers "slow time" exposure to other fields before proposal deadlines [6].
- Encourage informal interactions between SSH and STEM colleagues within same institutions so they get a better understanding of their research interests and abilities

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References

1. Harris F, Lyon F, Sioen GB, Ebi KL. Working with the tensions of transdisciplinary research: a review and agenda for the future of knowledge co-production in the Anthropocene. Glob Sustain. 2024;7:e13.
2. Ignatieva M, Eriksson F, Eriksson T, Kätterer T, Tidåker P, Wissman J, et al. Pros and cons of transdisciplinary research: A case study of Swedish lawns and their sustainable alternatives. Urban For Urban Green. 2020 Dec;56:126799.
3. Deutsch S, Keller R, Krug CB, Michel AH. Transdisciplinary transformative change: an analysis of some best practices and barriers, and the potential of critical social science in getting us there. Biodivers Conserv. 2023 Sep;32(11):3569–94.
4. Felt U, Igelsböck J, Schikowitz A, Völker T. Transdisciplinary Sustainability Research in Practice: Between Imaginaries of Collective Experimentation and Entrenched Academic Value Orders. Sci Technol Hum Values. 2016;41(4):732–61.
5. Angelstam P, Andersson K, Annerstedt M, Axelsson R, Elbakidze M, Garrido P, et al. Solving Problems in Social–Ecological Systems: Definition, Practice and Barriers of Transdisciplinary Research. AMBIO. 2013 Mar;42(2):254–65.
6. Di Giulio A. Implementing Interdisciplinarity: Connecting the Mindset of a Worrier, a Dreamer, and a Bookkeeper. In: Practicing Interdisciplinarity [Internet]. Germany: Walter de Gruyter GmbH; 2024 [cited 2025 May 6]. p. 1–6. Available from: https://www.degruyter.com/document/doi/10.1515/9783111339849-001/pdf
7. Lyall C, Bruce A, Marsden W, Meagher L. The role of funding agencies in creating interdisciplinary knowledge. Sci Public Policy. 2013;40(1):62–71.
8. Bracken LJ, Bulkeley HA, Whitman G. Transdisciplinary research: understanding the stakeholder perspective. J Environ Plan Manag. 2015 Jul 3;58(7):1291–308.
9. Gilligan JM. Expertise Across Disciplines: Establishing Common Ground in Interdisciplinary Disaster Research Teams. Risk Anal. 2021;41(7):1171–7.
10. Elixhauser S, Boni Z, Gregorič Bon N, Kanjir U, Meyer A, Muttenzer F, et al. Interdisciplinary, but how? Anthropological Perspectives from Collaborative Research on Climate and Environmental Change. Environ Sci Policy. 2024;151:103586-.
11. Cook BR, Overpeck JT. Relationship-building between climate scientists and publics as an alternative to information transfer. WIREs Clim Change. 2019;10(2):e570.
12. Salmela M, Vienni-Baptista B, Cheas K. Towards the Recognition of Interdisciplinary and Transdisciplinary Researchers. Minerva [Internet]. 2025 Feb 28 [cited 2025 May 14]; Available from: https://doi.org/10.1007/s11024-025-09578-y
13. Välikangas A. The Limited Role of Social Sciences and Humanities in Interdisciplinary Funding: What are Its Effects? Soc Epistemol. 2024 Mar 3;38(2):152–72.
14. Pischke EC, Knowlton JL, Phifer CC, Gutierrez Lopez J, Propato TS, Eastmond A, et al. Barriers and Solutions to Conducting Large International, Interdisciplinary Research Projects. Environ Manag N Y. 2017;60(6):1011–21.
15. Singh P. Understanding Researchers' Positionality in Integrating and Designing the Transdisciplinary Research Process and Outcomes: A Case Study of Thriving Agriculture Project. PennState University; 2025.
16. Steger C, Klein JA, Reid RS, Lavorel S, Tucker C, Hopping KA, et al. Science with society: Evidence-based guidance for best practices in environmental transdisciplinary work. Glob Environ Change. 2021;68:102240-.
17. Bracken LJ, Oughton EA. 'What do you mean?' The importance of language in developing interdisciplinary research. Trans Inst Br Geogr [Internet]. 2006 Sep 30 [cited 2025 May 21];31(3). Available from: https://durham-repository.worktribe.com/output/1584800/what-do-you-mean-the-importance-of-language-in-developing-interdisciplinary-research

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