Where to start? – The interplay of what, who and where in phase-0 of transdisciplinary research

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ABSTRACT

Transdisciplinary research (TDR) is increasingly recognized as an important approach to make research on complex environmental and sustainability issues such as climate risks and biodiversity loss more societally relevant and actionable. Deliberately designing early stages of TDR– phase-0 – is considered essential to its overall success. However, limited knowledge is available about how to shape and undertake phase-0 of TDR. We provide a detailed account of TDR processes in the WildlifeNL project, which were designed with explicit and extensive attention to phase-0. We saw that designing and shaping the project was a constant process of decision-making about delineation; defining consortium composition and participation of others outside the consortium ('who'), selecting cases and sites ('where'), and determining model systems, questions, and approaches ('what'). We demonstrate the interwovenness and interdependency between these dimensions based on several examples from WildlifeNL. The WildlifeNL team primarily focused on diverse stakeholder representation and building on existing partnerships. They thereby prioritized the 'who' dimension, while leaving 'what' and 'where' more flexible to adapt. The interconnectedness and interdependency confront those designing and implementing TDR with the question how to balance and prioritize the different dimensions, which defines how they make decisions on who, where and what are included and excluded in their TDR. We advocate for reflection and transparency about these messy and power-laden processes and suggest our framework as a structure for doing this. We argue that different TDR objectives and impact orientations ('why') may also prompt assigning different relative weight to the 'who', 'where' and 'what' dimensions.

1. Introduction

Transdisciplinary research (TDR) is increasingly recognized as an important approach to address complex environmental issues such as climate risks (McClure et al., 2023), climate adaptation (Boon et al., 2014), biodiversity loss (Jolibert and Wesselink, 2012; Ortega-Álvarez and Casas, 2022), and the food-energy-water nexus (Zhuang et al., 2021). By conducting research together between academic and non-academic actors, TDR is thought to make research more responsive to societal needs, leading to more diverse (Belcher et al., 2019) and more actionable knowledge outcomes for sustainability transformations (Augenstein et al., 2024; Jacobi et al., 2022). With the increased uptake

and study of TDR approaches, there has been increasing interest in how TDR processes are designed and implemented (Lawrence et al., 2022).

Different frameworks, principles, and process descriptions have been put forward to guide TDR. In these frameworks the TDR process is commonly structured around three phases: problem identification and framing; co-creation of solution-oriented and transferable knowledge; and implementation and integration of knowledge (see for example Lang et al., 2012; Lawrence et al., 2022). The importance of early stages of TDR are emphasized across the literature, as already in the design and early implementation phase of TDR choices are made that shape the subsequent collaboration and knowledge co-creation processes (Andrews et al., 2024; Lux et al., 2019). Those processes, in turn, are

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found to have a strong influence on the transformative potential of TDR (Pärli, 2023). A recent study by Horcea-Milcu, Leventon and Lang (2022) introduced an additional phase – phase-0 – emphasizing the importance of these early design stages of TDR. This phase shapes the trajectory and outcomes of the TDR process and includes selecting case studies, gaining a thorough understanding of the context, and creating a safe space for collaboration (Horcea-Milcu et al., 2022). Therefore, deliberately designing phase-0 by allowing time for exploration and dialogue is essential to the overall success of TDR.

However, while these overarching TDR frameworks acknowledge the importance of phase-0, they provide limited insight into the practicalities of the early TDR, in particular negotiating the interactions between diverse partners about their roles in research projects, problem framings and confining research focus, and study locations. There is a lack of empirical studies detailing how researchers navigate phase-0, and what considerations are taken into account. This hinders the transparency, reflection, and justification of TDR design. In this study, we present an in-depth analysis of phase-0 of the WildlifeNL project – a large transdisciplinary project on human-wildlife interactions in The Netherlands – to examine how a TDR project was shaped during its initial design, proposal writing and early implementation stages.

We propose a framework that highlights the interplay between three core dimensions of the initial TDR phase-0 of designing and shaping the project: the 'what' (selection of research topics, phenomena, research subject, and methods), the 'who' (consortium composition and participation) and the 'where' (case study selection) and how those three dimensions are shaped by the intentions and impact orientation of TDR, the 'why'. We reconstructed the decision-making processes in the TDR design and early implementation of the WildlifeNL project by combining an analysis of documents produced in the proposal writing phase with experiences and reflections from the leading researchers. By doing so, we aimed to understand how interactions and trade-offs between dimensions were navigated in this process. Our findings demonstrate that decisions made in one dimension influence, and are influenced by, decisions in other dimensions. This illustrates the complexity of TDR project design and raises important questions on how to balance those different dimensions and competing interests in phase-0 of TDR that may hold relevance beyond this specific project.

2. Conceptual background: dimensions of delineating transdisciplinary research

To understand the early-stage dynamics of TDR design, we propose a conceptual framework that centers around three interconnected dimensions: the **composition of the consortium and participation of others** outside the consortium – the **'who'**; the **selection of case studies or local contexts** – the **'where'**; and the **definition of model systems and corresponding questions and approaches** – the **'what'**. We consider these three dimensions to represent the **delineation** of the TDR project; the drawing of boundaries between 'who', 'where', and 'what' are and are not included. The interactions between those three dimensions are in turn governed by the **overarching rationale and aspired impact** of the TDR – the **'why'**. We conceptualize these three dimensions as a triangle (Fig. 1), to emphasize their interdependence and the ways in which decisions in one dimension influence and are influenced by the other dimensions. The 'why' dimension functions on a more overarching level, shaping the TDR research design process as a whole.

We developed this framework abductively (for more details see the methods section) shaped by an ongoing interaction between our findings, observations and experiences in the WildlifeNL project and the existing literature. So, although we built on existing literature, we did not perform an exhausting literature review. Horcea-Milcu, Leventon and Lang (2022) emphasize the importance of decisions made in the early stages of TDR, such as the selection of case studies, the perceptions and framing of the problem, and navigating different expectations and negotiation of goals among the different actors. Similarly, Malmborg et al. (2022) provide a framework to analyze knowledge co-production in TDR projects by distinguishing between setting, synthesis, and diffusion. Within the setting phase, they identify three interacting elements: (1) research aims & methodology, (2) problem-framing, and (3) contributing knowledge-holders & approach to participation – which align closely with the three dimensions in our framework. Additionally, Fritz and Binder (2020) offer a theory of how participation in transdisciplinary collaboration is shaped. They distinguish between the agenda or problem-frame ('what'), the actors or knowledge holders ('who'), and the methods or rules of the game ('how').

In our framework, the 'who' resonates directly with the 'who' in the frameworks of Fritz and Binder's (2020) and Malmborg et al. (2022), i. e., the actors involved in the TDR and the negotiation of roles and goals among the different actors. Following the phase-0 framework (Horcea-Milcu et al., 2022), we also emphasize the spatial dimension – the 'where' which often plays a significant role in TDR projects and certainly did in the WildlifeNL project. Yet, we acknowledge that not all TDR projects have such a (pronounced) spatial component. We understand the 'what' to include the specific research aims and activities, including the model systems that are selected and studied and the approaches and methods used to study them. As such, this is a combination of what Malmborg et al. (2022) refer to as methodologies and the 'how' as defined by Fritz and Binder (2020) including the procedures in collaboration and participation.

We relate the more goal-related terminology in these frameworks, 'agenda' and 'research aims', to the 'why' dimension in our framework. We attribute the 'why' a different position in our framework, outside the triangle, governing the interactions among the other dimensions. With the 'why' we refer to the broader vision or motivation behind initiating a TDR project, such as democratizing knowledge production and sharing, driving societal changes, or addressing a particular societal challenge, which informs and shapes all other decisions. The 'what', 'who', and 'where' subsequently define the specific approach that is taken, the project framing and demarcation to make that contribution, and achieve that 'why'.

Although the three dimensions are separated for analytical purposes, in practice these cannot be seen as isolated or independent but rather as constantly shaping each other. It is exactly this interplay that we argue to be important to understand to achieve transparency in the research process and understand how considerations and decisions regarding these dimensions shape the design and unfolding of TDR.

3. Contextual background: the WildlifeNL project

This article reports on the TDR project WildlifeNL,[2] which was designed with specific attention for phase-0 of the TDR process. The WildlifeNL project is an eight-year project, funded by the Dutch Research Council (NWO), through a funding stream specifically supporting large research consortia (Nationale Wetenschapsagenda or NWA). It requires researchers to work together with non-academic partners to tackle a problem that is defined bottom-up in the "Dutch Research Agenda", which came about through a societal consultation.

From the outset, WildlifeNL aimed to contribute to a transformation in the Dutch wildlife management system and generate tangible societal impact at two different levels: (1) the systemic and national level, by contributing to the transformation of the Dutch wildlife management system through a deeper understanding of the systemic issues and the articulation of new directions of action; and (2) the concrete and local level, by responding to the lived experiences of practice partners in ways that directly inform their daily practices and decision making, or providing new strategic insights.

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[2] For more information about the project, including consortium composition, see the website: www.wildlifeNL.nl
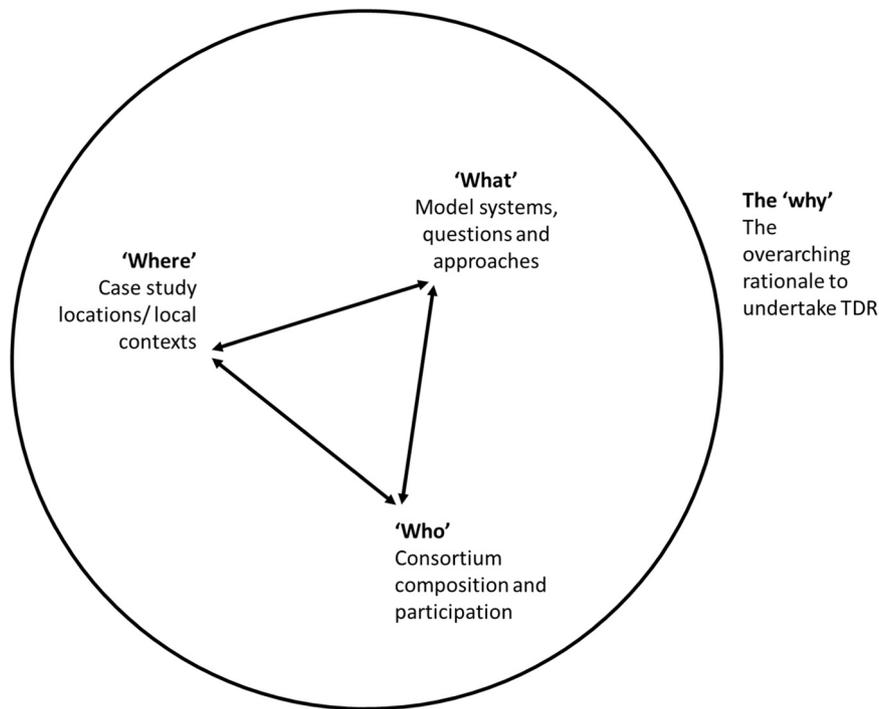
Fig. 1. Schematic representation of the conceptual framework in which TDR project delineation is understood as the dynamic process of defining the case study locations and local contexts – 'where' – model systems, questions and approaches – 'what' – and consortium composition and participation – 'who' – in interaction during the design and early implementation of projects, which is shaped by the overarching TDR rationale – the 'why'.

To reach this transformative goal, the process of the project is one of co-creation, with the aim of combining different viewpoints and knowledges already at the proposal writing stage, and it was understood from the beginning that the actors might differ widely on problem framing and understanding of the study's context. The project team therefore followed Horcea-Milcu, Leventon and Lang (2022) suggestion to pay attention to phase-0, with particular care given to employing activities during the first two years of the project that would support the goals of phase-0: understanding the research context, building collaboration and creating shared ownership.

The project is carried out by a consortium of twenty academic and non-academic partners. It includes researchers from five different knowledge institutions and from different disciplinary backgrounds, as well as societal partners linked to wildlife management, such as the forestry commission, nature conservation organizations, a hunting association, an association for animal welfare, conservation technology

developers, several government organizations, and farmers organizations. The project has four Principle Investigators (PIs) (JC, MD, GS, ID). They represent different academic institutions and academic fields.

The consortium of partners discusses the topic of human-wildlife interactions at a systematic and national level, while two living labs have been chosen to translate the national challenges and opportunities for change into concrete practices and innovations. One of the living labs is located in an urbanized area in the west of the Netherlands, National Park Zuid-Kennemerland. The other living lab is based in a more rural area in the south of the Netherlands, Unesco Man & Biosphere reserve KempenBroek. This latter living lab is a cross-boundary area, including both a Dutch and a Belgian part.

3.1. Timeline of the project

This section outlines the timeline of phase-0 in the WildlifeNL
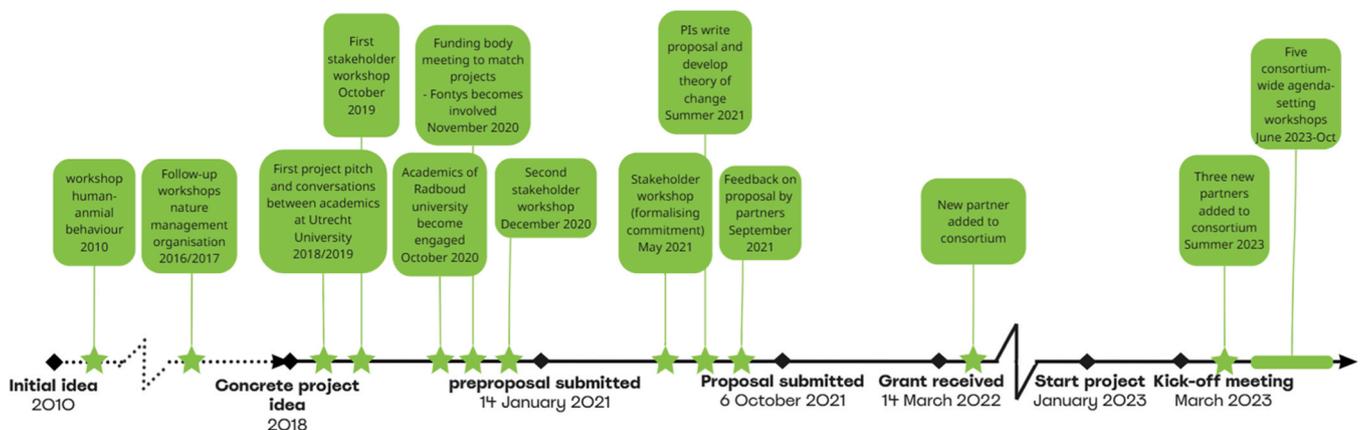
Fig. 2. Timeline of phase-0 of the WildlifeNL project, with key funding submission and decision moments indicated with black diamond shaped markers and text at the bottom of the timeline, and key decisions around project design with green star shaped markers and text boxes.

project, including its key project design, implementation and funding decisions. The timeline is also represented schematically in Fig. 2. The project responded to a funding call in 2021, but the initial shaping of the project already started earlier, going all the way back to an international workshop in 2010 on the role of human and animal behavior in wildlife management. One of the PIs of WildlifeNL developed and led this workshop and had follow-up conversations on this topic with several organizations that are now part of the WildlifeNL consortium (e.g., Ark Rewilding, PWN and Natuurmonumenten). In 2018, this PI wrote an initial proposal to pitch it to colleagues at Utrecht University, focusing on behavioral ecology.

In conversations with these colleagues, the aim of the project broadened and was shaped into the idea of a transformative transdisciplinary project. The period from 2018 to 2020 included conversations with other researchers (from other disciplines and universities) and societal partners, stakeholder inclusion and case study selections. Researchers and societal partners were invited to join the consortium of this project, and conversations with these partners were ongoing throughout the period of proposal writing (Jan-Oct 2021), where those that showed interest in participating were also invited to comment on the proposal. The project was awarded funding in March 2022, with a start date of January 2023.

After the project was awarded funding, one of the main Dutch farmers' associations contacted the project that they were interested in joining the consortium. Following an agreement of all already established consortium members, they formally joined the project before the start date. The official kick-off of the project took place in March 2023 during a meeting where all consortium partners came together for the first time. After the kick-off, two years were spent on the 'conceptualize' phase focusing on building collaboration, understanding the (case study) context and coming to a shared problem definition and research aim. A workshop series was developed to get all consortium partners together over the course of the two years, to discuss the project's focus, their own input and the research process. During this phase, the consortium members expressed the need to further diversify stakeholder representation, and three more partners, focused on animal welfare, farmers' representation and fauna management, were added to the consortium half a year after the kick-off of the project.

4. Methods

4.1. The overall approach

In this study, we conducted action research (Reason and Bradbury, 2012) and deployed an abductive reasoning approach (Cortés-Capano et al., 2025; Dubois and Gadde, 2002; Le Gall and Langley, 2015). This means that we, as co-authors, studied the process of the design and early implementation of TDR within WildlifeNL while we also comprised the core team of the project and co-implemented and co-facilitated five workshops during phase-0. We combined insights from our own reflections and observations about the dynamics and practices during the first two years of the project with a retrospective analysis of the process leading up to the formal kick-off of the project. We identify with the roles of reflective and self-reflexive scientists, while acting as process facilitators and knowledge brokers (Wittmayer and Schäpke, 2014). This combination of roles provided us with a rich insight into the TDR processes and allowed us to understand not only how the process was shaped, but also the underlying reasoning. It does, however, also mean that we studied our own TDR processes. Therefore, this study is explicitly not an evaluation of the effectiveness of the decisions we made, but rather provides thick descriptions of how delineation processes unfolded, what tensions we faced and how we dealt with those. Moreover, we separated roles and responsibilities, as the first two authors (IA and AH) led the analysis, while they had more distance from the (initial) TDR framing stages and were not involved in the proposal development.

4.2. Timeline development based on documents and interviews

In line with the abductive approach, we developed the framework through an ongoing interaction between our empirical insights and the literature. Our empirical insights followed from a combination of document analysis and own observations and reflections captured in two interactive co-working sessions led by the first and second author. We specifically focused on the process of designing of the project, between the emergence of the first written project idea (2016), and the submission of the full proposal (Jan-2021); and on the first two project implementation years after funding, which were specifically dedicated to phase-0 (from the kick-off (Mar-2023) till the end of the conceptualization stage (March 2025)). For this period, we constructed a timeline on which we indicated key moments in the design and early implementation of the project. We specifically included *key moments* such as the timing of specific workshops, or the submission of the proposal, and *key decisions* such as choices to include specific people in the project or to select a specific case study location. The timeline served as a central object in the analysis of the project as we constantly adapted and expanded it based on insights that emerged from the different analyses and sources. Patterns or observations that emerged from the timeline, in turn, informed subsequent data collection.

In order to reconstruct the development of ideas and plans in the pre-submission stage of project design, we collected all files and different iterations of files related to the project (proposal) from the personal file storage of all four PIs of the project. We scanned the oldest and most recent versions of files to identify the 'who', 'what' and 'where' and sampled versions in between to identify moments at which changes in those dimensions first emerged in those documents.

Two interactive sessions with the PIs served to validate the findings from the document analysis, as well as further explore the reasoning and possible tensions behind specific delineation decisions. During the session, we interactively further filled the timeline with key moments and decisions, focusing primarily on the phases prior to submission of the full proposal. In the second session we zoomed in on several key decisions in the timeline to understand how they were made and how the different dimensions (who, where, what) interacted with each other.

4.3. Abductive analysis and framework development

We started out from the phase-0 framework by Horcea-Milcu et al. (2022) and distinction between target, system and transformation knowledge for TDR (Hadorn et al., 2008; Lang et al., 2012). We were, however, struck by the highly interwoven nature of the who, what and where in the early stages of design and implementation in the WildlifeNL project, and the importance of selecting the 'where' of the research for shaping other decisions. This motivated us to organize our central timeline around three main categories of decisions that we referred to as: (1) choice of living labs and cases; (2) consortium composition; and (3) design of the goals of the project. Through the analysis and engagement with the frameworks by Malmborg et al. (2022) and Fritz and Binder (2020), these evolved into the 'where', 'who', and 'what' in the final iteration of the framework as we propose it here. Those three dimensions became the guiding principle for subsequent analyses and the identification of sets of key decisions on the framing dimensions, examples of which we describe in this article.

4.4. Ethics

For the research on the TDR process of the WildlifeNL project that this study is part of, ethical clearance was provided by the Science-Geo Ethics Review Board of Utrecht University under case number Geo S-23064. All consortium members provided consent for the collection and use of research data.

5. Results and discussion

We saw that phase-0 of the WildlifeNL project was characterized by a dynamic interplay between decisions on the three different dimensions of the TDR phase-0: 'who', 'what', 'where'. Both in the early stages of proposal writing and in the initial start-up phase of the project, decisions made at each of these dimensions influenced the choices made on others. In the following subsections we provide descriptions of several such interactions to illustrate the interwovenness of the dimensions in delineating the WildlifeNL project (see also Fig. 3). We end this section showing some common themes in these examples, demonstrating a strong emphasis on the 'who' in key decisions.

5.1. The early selection of a living lab and its cases based on a long-standing relationship

Already early on in the design of the WildlifeNL project, National Park Zuid Kennemerland (NPZK) was selected as one of the living labs. The early project ideas date back to informal conversations between one of the PIs and the main managing authority of the NPZK (PWN) from about 2014, based on ideas outlined in Cromsigt et al. (2013). These early conversations already included NPZK as a site 'where' research could take place and the corresponding local partner as organization and individuals 'who' would be involved in shaping and conducting the research. This early involvement followed from a long-standing relationship between one of the PIs, who initiated the project, and several people working at PWN through the PI's research on European bison in the NPZK since 2007 (research that was already done in close collaboration with PWN staff).

The idea of NPZK as living lab area remained a stable factor across all following iterations of the project proposal and in its execution. The decision to have NPZK as a living lab and involve its main managing authority PWN as partner in the consortium as well as in the process of shaping the project, also impacted the focus of the project in terms of issues and model species ('what'). Many of the questions that are of interest to the local partners at NPZK center around interactions between introduced semi-wild free roaming mammals – such as European bison, Scottish Highland cattle and Konik horses – and humans recreating in the area. With their involvement and the decision to adopt NPZK as one of the two living labs for the project, those topics also became important in the framing of the research project. The implication was that those species and questions remained central to the project, also when the consortium expanded and diversified, and other partners questioned whether those interactions should be subject of research within the project.

The choice for this living lab ('where') and the corresponding partnerships ('who') thus defined the questions and species ('what') considered in the project; the choice for site and partnership shaped the framing of the project and the formulation and selection of research questions (see Fig. 3). This choice for the 'where' and the 'who' was made very early on in the project, in which particularly the long-standing, strong relationship – 'who' – was defining. The choice for this partner co-occurred with the choice for the site; the further demarcation of the 'what' followed suit and keeps being framed by the possibilities (and limitations) at this location and in collaboration with these partners. The long-standing relationships with local partners in the area are perceived as a fruitful foundation for the collaboration around research topics in this area, as there is strong mutual trust that the research activities will create value for research as well as practice, also when there are no tangible outputs yet.

5.2. Defining cases around constructive local partnerships

Since early iterations of the project proposal, the intention was to include multiple living lab locations to ensure a more contextual diversity for gathering data and experimenting with interventions.

Whereas the NPZK was settled early on, the choice for a second living lab took longer to crystallize.

In an early document in which the initial research team compiled the research ideas (April 2019), the intention was to conduct research in the province of Gelderland ('where'). This area was chosen because it would allow the project to look at both the management of ungulates (hooved mammals), similar to NPZK, and wolves ('what'), a species not present in NPZK. During that phase of the project development, in 2018–2019, wolves were returning to the Netherlands from neighboring countries, which sparked an active public debate. This public attention for wolf management made it an interesting and relevant case for the researchers involved in developing the project, and they considered it a convincing case to convey the urgency of the project to funders and reviewers. In fact, in 2019, the PI who developed the first project ideas, co-led a publication on the role of managing wolf-human behavioral interactions (Kuijper et al., 2019).

The attention for the wolf as model species ('what') directed the attention of the project team towards Gelderland ('where'). Since none of the researchers who were involved at this stage had an active network in Gelderland, the next step was for the researchers to establish new collaborations with local partners in this province ('who'). However, at that time, local actors in this area were not eager to participate and co-develop the research proposal, some indicating sensitivities around the wolf as a hurdle for starting a large research program on wolf management in the province. Without participation of the key local partners ('who'), Gelderland became an infeasible location ('where') to conduct the research, and the wolf also became inaccessible as a case ('what') to study.

This opened up the opportunity to reconsider model species and local questions ('what') as well as study contexts ('where'). After exploring different options, from limiting the project to a single living lab to including a living lab area in the African context where they had experience and relationships, the PIs decided to include a second Dutch living lab. The chair of the research group at Utrecht University, involved in the process since 2018, suggested looking at KempenBroek (KB) as second living lab, as he had existing relationships in the area. In a first draft for the official pre-proposal application (Oct-2020), KB was included as living lab, mentioning two partners in the area as confirmed consortium members. Now that both living labs had been established, the focus of the study was further shaped around the contexts – wildlife, landscape characteristics, land uses – of these areas, as well as the needs and interests of the partners linked to those areas. The PI team reflects very positively on this earlier decision as the questions in the KB area are relevant and rich, and the partnerships supportive of studying them.

This demonstrates that in this example, the 'what' of the preferred model species of wolves and wild ungulates, initially informed the 'where' of aiming to conduct the research in Gelderland. When the required partnerships – 'who' – did not take off, the attention was switched to another area – 'where' – with corresponding partnerships ('who') and species and questions ('what').

5.3. The development of shared objectives in a diverse and diversifying consortium

The composition of the consortium ('who') was negotiated during the proposal writing stages, but also still considered during early implementation once the project had been awarded and started. Both during the kick-off meeting (Mar-2023) and first workshop (Jun-2023), the PIs asked the consortium whether any organizations were missing that should be represented in the consortium. Already at the kick-off meeting, some partners reflected that there was no representation of organizations focused on (the welfare of) the individual animal. From the first workshop with all consortium members (Jun-2023), and subsequent reflections among the PI team, another issue surfaced. During this workshop there was a general feeling of consensus on most key issues. This was something participants appreciated, but at the same time
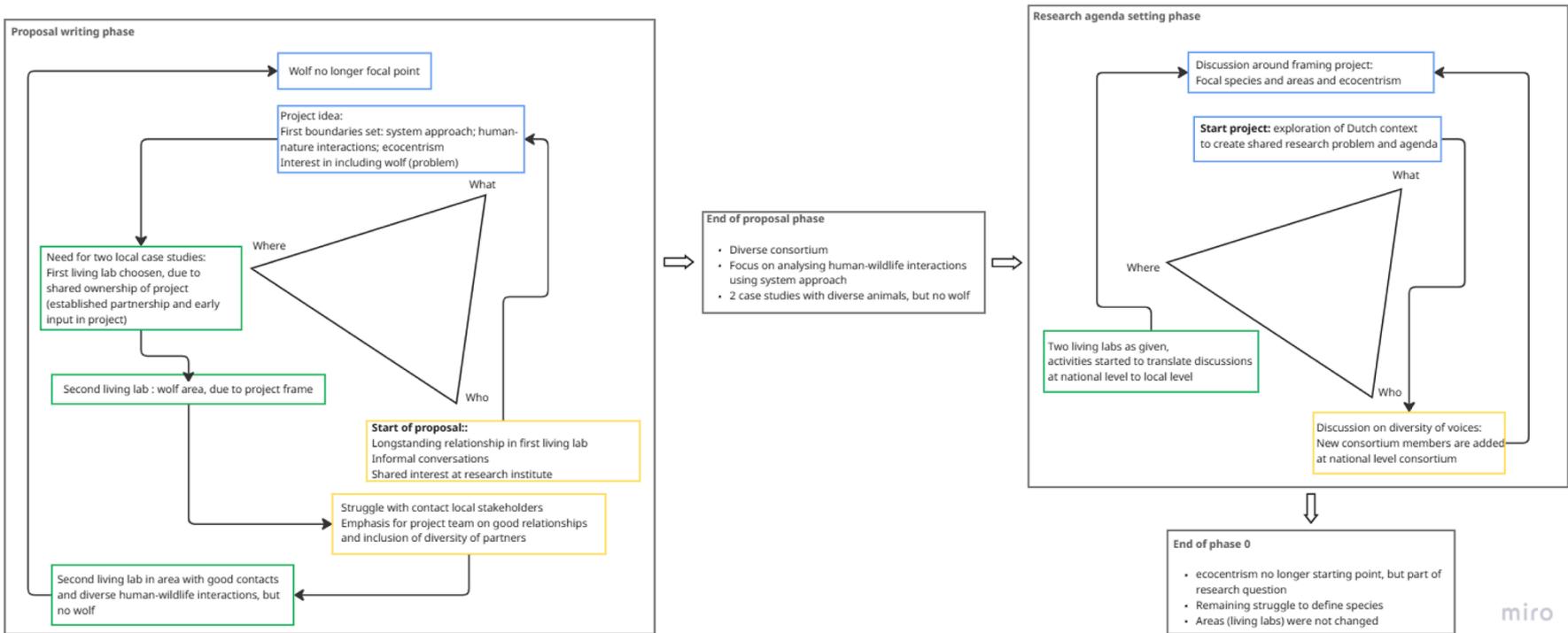
Fig. 3. Schematic representation of the key delineation decisions in phase-0 of the WildlifeNL project. Yellow boxes represent the 'who', green boxes the 'where', and blue boxes the 'what' and the arrows indicate the decision making process and relationships between decisions. The left plane depicts decision making processes during the proposal writing stage, the right plane during the research agenda setting stage when the project had started running.

also raised the question whether key perspectives were being overlooked. Not all non-academic consortium members were present at this workshop, and we observed that this translated in the absence of their perspectives in the conversation. Particularly wildlife management and agricultural perspectives were absent. Reflecting on this, the PIs concluded that there was a disbalance in the perspectives represented among the consortium members, with more of a redundancy among nature- and forest management actors compared to partners from the wildlife management and agricultural sectors. This uneven distribution of perspectives placed pressure on the organizations and people representing the less prominent perspectives to be present and bring their possibly divergent views. This posed a risk of those perspectives remaining underexplored in the project. The consortium, therefore, decided to broaden the consortium and invite organizations representing the agricultural and wildlife management perspectives, and the perspective of individual animal rights and wellbeing.

The new composition of the consortium subsequently shaped the interactions during the following workshops (see Fig. 3). Differences and disagreements became more explicit in the interactions, and some of the newer partners were critical about the direction of the project. Particularly in aligning the external communication about the project, it became clear that the way different partners framed the objectives of the project ('what') did not always fully align. In response, the PI team decided to open up conversation about some of the decisions about the framing of the project that were made earlier, going back as far as the proposal writing. The project framing had previously been or seemed to be shared among the whole consortium and was still supported by the partners who were involved since the conception of the project. But now with the expanded consortium, they turned out to be contested. In an additional third workshop, one of the PIs presented the work on ecocentrism that was foundational to the original project plan. This caused some pushback by some of the partners, as this was too strong a normative stance for them to defend to their constituency, members or colleagues. In the workshop, the consortium collectively reached a decision to frame the implications of a more ecocentric view on wildlife management as a research question of the project, rather than the main assumption the project was built upon. This meant a reframing of the project ('what') compared to the original project proposal in order to respond to the more diverse perspectives that had become more pronounced in the project interactions, at least in part due to the changed composition of the consortium ('who').

The same holds true for the choice of the term "wildlife" as a central concept of the project, and its definition and demarcation. In the research proposal, this term was used for both wild and semi-wild ungulates. This conceptualization was partly based on the implicit premise that semi-wild ungulates can or should be seen as an integral part of the ecosystem. But that premise was not shared by some of the newer partners. Some explicitly objected to treating semi-wild cattle as 'wildlife'. Moreover, the inclusion of these large semi-wild herbivores, a central focus of the study from the start of the project, was deemed a less important issue for some of the new partners. In response, the PIs decided to use alternative terms in external communication (for instance on the project website). First, they proposed 'wild animals and large grazers', or 'wild animals and free-roaming animals', later they decided to use the even more neutral term 'large mammals'. Defining large herbivores as integral "wild" part of the ecosystem (which had been an implicit goal before) is no longer an explicit goal of the project. Instead, the status of semi-domesticated large mammals has become part of the research questions addressed in the project. Yet, including research questions around the interactions between semi-wild large grazers and recreating people remained a key component of the project, and even though some of the newer partners were not particularly interested in those questions, this part of the framing of the project, was communicated to be not negotiable.

This demonstrates the interaction between the 'who' and the 'what' dimension of the project. The PIs found it important to have diverse and balanced perspectives on the project, but this also meant that there was a need to adjust the 'what', i.e., the questions and species studied in the project. At the same time, the living lab locations had at that point been decided, and this also set boundaries to the possible questions, model subsystems, and model species that could be studied. For instance, interest in studying the wolf as a model species and questions about the relevance of semi-domesticated herbivores resurfaced in subsequent workshops, but were not adopted, as it had already been established that the wolf case did not yet apply to the selected areas, and the semi-wild cattle and horses were very central to the local partners in both living lab locations.

5.4. Prioritization of partnership and representation for transformation

The examples of key decisions in the previous subsections demonstrate that the three different dimensions bidirectionally affected each other and jointly shaped the project. What particularly stands out, is that consortium composition and partnership ('who') were emphasized in designing and shaping the WildlifeNL project in phase-0. Prioritizing strong partnerships and representing diverse perspectives often had a decisive role in decisions, also when that meant limiting or having to rethink choice for study contexts ('where') or precise questions and model species ('what'). In the example of selecting NPZK as a living lab, building onto the long-standing partnership was an important rationale. In the case of moving away from the area of Gelderland and abandoning wolf management as a case study, this reflects a perceived lack of partnership as a decisive factor to redirect attention. The example of expanding the consortium reflects the PIs' belief that it was important to diversify and more equally empower different perspectives. The PIs expressed repeatedly that diverse representation in the consortium – including diverse knowledge, interests, and visions – was of importance to them. So, the 'who' was an important driving force in those key decisions.

This focus on the 'who' can be linked to the overall goal ('why') of the project. WildlifeNL aims to be transformative and bring about a system change that is broadly taken up in wildlife management. The PIs argued that in order to enable a system transformation, they needed diverse perspectives, including all actors that are needed to achieve and implement change. Biased perspectives in the consortium and limited participation of partners would limit the applicability of findings, whereas a vision endorsed by diverse partners would possibly support broad acceptance among societal actors and thereby improve chances of societal uptake. Besides the diversity and representativeness of perspectives, they also emphasized the intensity of collaboration, high commitment and trust to make such systemic transformation. So, in response to their transformative ambition, they prioritized the 'who' of the project, in terms of diversity and relationship.

Although the 'what' and 'where' were also very important for the project, they experienced a bit more leeway to develop those in response and relation to the 'who'. In a reflection on the choice of the two living labs, one of the PIs mentioned that although an analysis of areas in the Netherlands to identify which area would fit best to the questions would have been possible, they preferred to build onto existing partnerships, because of the trust such partnerships require. The PIs reflect that they would not expect that the project would have looked very different if the wolf had been a case, apart from making it more politically sensitive. So, the PIs experienced that the project could be successful in several locations, and studying several model species or specific questions, so they could adapt the selection of living labs to the places where they considered their partnerships most promising.

6. Implications

6.1. Using the framework

Our study focuses on phase-0 of TDR processes. This phase has not

yet received a lot of attention, and in their formulation of this phase, Horcea-Milcu et al. (2022) point out that what is often not captured is the 'how-to' of initiating TDR processes. At the same time, it is a crucial phase for the direction of the project as it sets boundaries for who is involved, what is studied where and how much room for maneuver there is for participants in the project to influence the next step of the co-creation process (Bennich et al., 2022). It has been found that exactly those process factors strongly influence the outcomes of TDR (Pärli, 2023).

Where previous studies have tried to capture this phase of TDR through its main principles, stages, or lessons learned (see, for example, Horcea-Milcu et al., 2022; Scholz et al., 2024), the framework we have introduced is aimed at showing the dynamic interplay in making TDR delineation decisions. Specifically, we stress the importance of reflection on the relationship between the overall objective of TDR ('why') and the three dimensions of delineation decisions ('what', 'who', and 'where'). In our case we saw that 'who' was very central, and we linked this to the transformative impact orientation of the project. Yet, TDR practices are highly diverse (Vienni-Baptista et al., 2022) and different degrees and forms of TDR are distinguished (Jahn et al., 2022). We hypothesize that different TDR projects will also prioritize the three dimensions in phase-0 differently. As initial evidence in support of this hypothesis, the project on which Horcea-Milcu et al. (2022) base their phase-0 framework, they started out from a research project with a clearly demarcated approach ('what') and subsequently developed the criteria that case studies had to meet, and selected cases – both the locations ('where') and the associated partners ('who') – based on those. We interpret their approach as starting from the 'what', with the 'where' and 'who' following.

6.2. The messy nature of TDR

The process in phase-0 is a messy one, where some choices are made consciously, while others arise ad hoc or circumstantially, and may be made unconsciously or remain implicit. Moreover, we saw in the examples of the WildlifeNL project that many choices had unforeseen consequences. The statement that TDR processes are messy will come hardly as a surprise to those who engage in TDR, and the messiness of TDR is also reported repeatedly in literature (Crofts et al., 2024; Milberg Muñiz et al., 2025). We consider it to be inherent to TDR, as uncertainties, reactiveness to ever-changing real-world circumstances and diversity in interests, views and perspectives cannot be dealt with in a neat, linear process. We note, however, that when reporting the findings from TDR, there is often little attention for the messiness of the process leading to those findings. And even more so, publishing formats and practices, and (implicit) expectations about how 'good' research is to be done and reported, may incentivize retrospectively describing research activities are less messy and more linear than they were in reality.

We argue that there are several values in increasing the transparency around the messiness of TDR processes. First, providing insight into the processes during the early design phase of TDR provides readers with the ability to critically appraise findings against the background of the process through which they were acquired. This allows for better judgments of relevance to their own contexts, and thus of greater transferability of findings to other contexts (Drisko, 2025). Second, propagating an image of TDR as a neater and more linear process than it is in practice, may create unrealistic expectations among researchers as well as policy makers (Horn and Krabbenborg, under review; Lyall et al., 2013; Milberg Muñiz et al., 2025). This may lead to an underestimation of the resources and efforts necessary to design and implement TDR, including a robust, inclusive, and responsive phase-0. Therefore, we advocate for increased transparency and legitimacy of the inherent messiness of the early design processes during phase-0 of TDR and propose that our framework can provide direction and structure to reflect on those processes and provide transparent reports of TDR framing processes and choices. Additionally, this requires transparency

from those engaging in TDR to open up about the messy processes of TDR, and potentially a culture shift in conducting and reporting TDR supportive of such transparency.

6.3. Inclusivity and power

As shown by the interconnections between the 'who', 'where', and 'what' dimensions, choices in one dimension are bound to have effects on others. TDR design decisions cannot be postponed indefinitely, and hence researchers designing and engaging in TDR have to "start somewhere"; prioritization of choices and dimensions is inevitable. These decisions shape the TDR project and its outcomes and are inherently subject to power (Fritz and Binder, 2020). Herberg (2020) evaluates phase-0 of TDR as an opportunistic process, where the framing of the problem and project (the 'scripts' people use to define the project) is flexible and continuously rearranged. However, latecomers in the project who might have alternative narratives can fail to find space for renegotiation, particularly when phase-0 has passed. For Herberg (2020), this shows the difficulty with the inclusivity of co-designed processes.

Our own case shows that latecomers indeed wished to open up new negotiations on the framing of the project, but that efforts in process design, focused on extending the phase-0 process beyond proposal writing and emphasizing the participation of diverse voices, can help to prevent the development of a controlling narrative. However, the space for flexibility is not unlimited and choices will have to be made. In the case of WildlifeNL, we had the possibility to add partners to the consortium, also after the project was awarded. But this may not be possible or feasible for all projects. And even when such decisions can be postponed, like in the case of the WildlifeNL project, decisions need to be made at some point, closing down the delineation process.

Our case example shows that the WildlifeNL team emphasized the dimension of 'the who', giving the inclusion of diverse voices and the building of strong, reliable and long-standing relationships a leading role in the decisions made. This relational priority is in line with the importance of trust reported in literature on TDR (Harris and Lyon, 2013; Kliskey et al., 2023) and climate negotiations (Schroeder et al., 2025). But the involvement of societal partners has also been considered an important challenge, with the risk of participation ending up being symbolic rather than effective (Elzinga, 2008). Even when partnership and relationship building are prioritized, as in the WildlifeNL project, tensions will still arise in the decision-making process. Another question that follows from our research, is how to balance diversity and inclusion on the one hand and direction of the project on the other. In including and strengthening more diverse perspectives, we saw we also had to broaden the aims of the project. A very diverse consortium may loose its agility and speed of decision making, and diversity in perspectives may make it hard or even impossible to reach decisions. How do we prevent this from halting the project? How to make decisions under dissensus? And how to decide on the "appropriate" level of consortium diversity for a given project and its goals?

There is also a disbalance in power, often present in TDR projects (De La Rosa et al., 2024; Kareem et al., 2022; Strumińska-Kutra and Scholl, 2022), as the project starts from a research perspective. The WildlifeNL project was shaped by funding requirements that required the involvement of non-academic actors, including guarantees in the project proposal from at least some of them to partially co-fund the project. While this encouraged a focus on participation and building relationships, it also set boundaries, as the lead investigators for this funding application for example have to be academic researchers and non-academic actors could not receive funding, and some even brought funding to the project instead. When decision-making power is imbalanced, it raises questions about whether inclusion truly further empowers stakeholders or merely demands greater – or even disproportionate – investment from them. WildlifeNL considered giving non-academic actors a large and decisive role in the project, a key TDR principle, but at the same time the partners

were required to take this role at their own expense.

So, even when following TDR principles and with ample time and attention devoted to the "who" framing dimension, no such thing as absolute inclusivity, diversity or a non-messy TDR process exists. Instead, the framework may serve to stimulate reflections on the choices, priorities, and trade-offs that are inherent to TDR framing in phase-0.

6.4. Outlook and further research needs

We argue that different TDR projects are likely to go through different delineation processes, attributing different relative weight and priority to the three dimensions. The next, important follow-up research to this study and proposed framing would be to examine several other cases to see under what circumstances the 'what' and the 'where' are more dominant in phase-0, and whether there are also projects in which two dimensions or even all three are equally leading. We speculate that the local focus of stakeholders or funding schemes may lead to forms of TDR in which the 'where' is leading. Conversely, TDR projects with a tangible, a-priori defined output – such as technologies or medication – may start out more from the 'what' and frame the 'where' and 'who' in accordance. Further research is necessary to better understand the relationship between TDR rationales and delineation decisions. Studying this requires an approach beyond a single case study, comparing the phase-0 processes and their delineation decisions for a larger number of TDR projects with different orientations.

While the framework we propose is explicitly not intended as the sole prescription of how to shape phase-0 of all TDR processes, it can be a valuable tool to reflect on these early processes and to make decisions and priorities more explicit, as we have shown in this study. We aspire the use of the framework to contribute to increasing the transparency of TDR processes and projects. While general TDR (design) principles can provide a first building block to help TDR projects reach their goal of generating both scientific and societal impact (Lang et al., 2012), TDR processes also require to be context-specific (Malmborg et al., 2022) and an understanding of why design choices were made and how this impacted other dimensions in the process.

CRediT authorship contribution statement

I. Arts: Conceptualization, Methodology, Investigation, Writing – original draft, Visualization. **A. Horn:** Conceptualization, Methodology, Investigation, Writing – original draft, Visualization. **J.P.G.M Cromsigt:** Conceptualization, Writing – reviewing & editing. **M.A.M Drenthen:** Conceptualization, Writing – reviewing & editing. **G. Schouten:** Conceptualization, Writing – reviewing & editing. **I. Dorresteijn:** Conceptualization, Supervision, Writing – reviewing & editing.

Declaration of Competing Interest

The authors Irma Arts, Annemarie Horn, Joris P.G.M. Cromsigt, Martin A.M. Drenthen en Ine Dorresteijn declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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