THESIS FOR THE DEGREE OF LICENTIATE OF PHILOSOPHY

Exploring desirable futures in the shell of the present: Prefiguration and metaphors of change for deep transformations.

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Prefiguration and metaphors of change for deep transformations.

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Abstract

Complex global challenges, from climate change to social inequalities and more, give origin to times of 'polycrisis'. To navigate these interconnected crises, deliberate and purposeful transformations towards just and sustainable futures are increasingly called for. Given the prevalence of pessimistic attitudes to futures, coupled with a general lack of transformative capacities, there is a quest for more hopeful and enabling approaches to transformations. With the aim of contributing to such, this thesis explores (1) how desirable futures are enacted in transformative efforts; and (2) what conceptual frameworks and practical tools can be co-created to support radical transformative processes.

Within transformation, futures, and anticipation studies in a broader context of sustainability science and political ecology, this thesis builds on relational perspectives to sustainability and takes a normative and critical stance to bring forth desirable futures through participatory experimentation. Specifically, it focuses on metaphors of change, as levers for deep transformations, and on prefiguration, as a transformative praxis to enact desired futures in the present with coherence between envisioned ends and adopted means. Through undisciplinary research underlaboured by critical realism, the appended papers focus on the 'how' of transformations by: (1) surfacing how the Degrowth movement uses metaphors of change to imagine desirable futures and form coherent strategies via distributed forms of prefiguration; (2) analysing and contrasting the prefigurative potential of metaphors used by the Degrowth movement, the EU mission 'Climate-Neutral Cities', and the Transition Towns community project; and (3) comparing and integrating how desirable futures are explored and enacted in prefiguration and backcasting.

The findings of Paper I suggests that the various currents of the Degrowth movement experiment with prefiguration by envisioning desirable futures across the planes of material transactions, human and more-than-human interactions, social structures, and inner being, while enacting symbiotic, ruptural, interstitial, intermingling, or enabling strategies. These ends and means are surfaced through metaphors as prefigurative devices that can help find balance between unity in directionality and openness to plurality. Analysing other case studies, Paper II shows how different worldviews, strategies, and resulting futures are explored through metaphors of 'moonshot missions' for large scale projectification in the EU Cities Mission, and by metaphors about 'community in harmony' for local regeneration in Transition Towns. Considering other ways of enacting desirable futures, Paper III compares the theoretical roots, conceptual positionings, and practical applications of prefiguration and backcasting. Building on their shared experimental, experiential, and learning-oriented approaches, it develops an integrative framework of prefigurative backcasting that can support transformative processes. Overall, this thesis advances theoretical and practical contributions in less researched discursive, cognitive, and embodied approaches to foster deep change within a normative and anticipatory frame.

Keywords: Just sustainability transformations, prefiguration, backcasting, metaphors of change, desirable futures, anticipation, deep change.

List of appended Publications

This thesis is based on the following papers:

Paper I

Saglietti, C., Brabant, C., Holmén, J. (2026). Snails Ahead! Metaphors of Change and Distributed Prefiguration in the Degrowth Movement. *Futures*, 103726. https://doi.org/10.1016/j.futures.2025.103726

All authors contributed to the conceptualisation of the article. Clara was primarily responsible for the organization of research design and methodological set up, curation of data, manuscript writing, coordination of contributions across co-authors, and collaboration with study participants. Cyprien and Clara collected the data and all authors contributed to the analysis, writing, and review. Johan supervised the work.

Paper II

Holmén, J., Saglietti, C., Holmberg, J. (2025). Exploring how metaphors of change prefigure futures in public policy, social movements, and community projects. In S. Sareen & S. Juhola (Eds.), *Societal Transitions to Sustainability. The prefigurative politics of present transformation*. Springer Nature. https://link.springer.com/book/9783032073945

Johan and Clara conceptualised the chapter. Johan was primarily responsible for the organization of research design, methodological set up, data curation and analysis, and manuscript writing. Clara contributed to writing and reviewing. John provided comments and feedback in the drafting and finalization of the manuscript.

Paper III

Saglietti, C., Holmén, J., Holmberg, J. *Walking together by asking questions: combining backcasting and prefiguration to invite a hopeful approach to desirable futures.* Manuscript submitted to Futures.

All authors contributed to the conceptualisation of the article. Clara was primarily responsible for the organization of research design, methodological set up, data curation and analysis, and manuscript writing. Johan and John supervised the work and provided comments and feedback in the drafting and finalization of the manuscript.

Outputs not included in this thesis

Saglietti, C., Holmén, J., Holmberg, J. (2023). Just Sustainability Transformations by Deliberate Social Collaboration: Furthering the Learning-oriented 'Docking Phenomenon' in Public Institutions to Enhance Engagement, Diversity, Equity and Inclusion. In Luksic, A. A., Jovanovska, S., Tepez, K. & Remic, B. (Eds.), *Overcoming the Inequalities of Green Transition* (pp. 63-82). Institut za ekologijo: Ljubjana.

Saglietti, C., Holmén, J., Holmberg, J. (2023). *Exploring how to "dock". An ongoing empirical study with public sector organisations to investigate "docking" as a sensitising concept in sustainability transitions.* Conference paper presented at the 14th International Sustainability Transitions Conference (IST). Utrecht, NL.

Saglietti, C., Holmén, J., Holmberg, J. (2024). *On the Interplay and Docking of Learning Logics in Sustainable Systems Transformation.* Manuscript submitted to Environmental innovation and societal transitions.

Williams, S., Saglietti, C., Holmberg, J. (2024). *No transition without institutional transformation: Lessons from an EU wide Regional Industrial Transformations project.* Manuscript submitted to Energy Research & Social Science.

Saglietti, C. (2024, January 5). "Ta Tillbaka Framtiden" – a Swedish youth climate movement and community. *Atlas of the Other Worlds.* https://occupyclimatechange.net/document/ta-tillbaka-framtiden-a-swedish-youth-climate-movement-and-community/

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1. Introduction

> …we can do better than merely coping or adapting to crisis upon crisis, including an existential crisis. To do better requires thinking differently, acting differently, and being different. By being different, I mean relating differently to ourselves, each other, the environment, and social change. […] As a researcher, I want to understand how we can transform society at the rate, scale, and depth that is called for at this moment in time. Not whether we can do it, but how. And since we know that not all transformations will lead to fair and just outcomes, I want to understand how we can do so in an equitable, ethical, and sustainable manner. This matters for all of us. How do we shift the cultures and systems that are currently perpetuating the climate crisis? How do we maintain species and ecosystems so that all life can thrive? Are we underestimating our collective capacity for social change? (Karen O'Brien, 2021)

The 'how' of deep transformations towards just and sustainable futures is at the core of this thesis. The next sections will introduce the research behind this licentiate by describing the problematic situation addressed in a context of polycrisis, pessimistic attitudes to futures, and lack of transformative capacities; the research positioning among hopeful approaches for transformations to desirable futures; and the research purpose, questions, and overall thesis structure.

1.1 Problem statement

There is increasing recognition of the need for fundamental changes to address contemporary sustainability challenges such as climate change, environmental degradation, geopolitical turbulence, social inequalities and injustices (Friedlingstein et al., 2025; IPBES, 2019; IPCC, 2023; Pfenning-Butterworth et al., 2024; Richardson et al., 2023; Ripple et al., 2024). As these challenges are persistent, complex, if not wicked, and interconnected (Andersson et al., 2014; Boulton et al., 2015; Glouberman & Zimmerman, 2004), they are often grouped under the umbrella term of polycrisis. The latter has been introduced by Morin et al., (1993,1999) to describe multiple, multidimensional, entangled, and co-occurring crises whose effects reinforce each other with synergistic and cascading effects on several systems (Bohn et al., 2025; Helleiner, 2024; Lawrence et al., 2024; Rakowski et al., 2025; Swilling, 2020). It is increasingly argued that such deep crises (Buch-Hansen et al., 2024) are crises of paradigms, goals, and values held at the foundations of a system (Bohn et al., 2025; Harmáčková et al., 2023), requiring re-shaping and re-purposing properties and mechanisms internal to the system, especially on a more profound level of structures, paradigms, and worldviews (Davelaar, 2021; Ison, 2017; Meadows, 2008).

The urgency and magnitude of the polycrisis calls for deliberate and purposeful transitions or transformations towards just and sustainable futures (Köhler et al., 2019a; Loorbach et al., 2017; Ripple et al., 2024; Scoones et al., 2020; Stirling, 2015; Swilling, 2020). However, a common approach towards appreciating the open-endedness of futures and transformation processes often refers to their Volatile, Uncertain, Complex, and Ambiguous (VUCA) nature (Nissen, 2025; Taskan et al., 2022). The concept of VUCA was developed in the US military for strategic leadership (Mackey, 1992) and, although criticisable for its managerial approach, it gained popularity to normalise modern anxiety in front of intensifying or unpredictable crises (Candy, 2025). Some like Johansen (2017) suggested more optimistic approaches to futures and leadership (e.g., redressing VUCA as Vision, Understanding, Clarity, and Agility). Others see the current state of the world and its future as BANI, meaning Brittle, Anxious, Nonlinear, and Incomprehensible (Cascio, 2020), pointing towards complex or wicked situations where values are disputed and facts uncertain (Funtowicz & Ravetz, 1993; Rittel & Webber, 1973). Among various interpretations, pessimism prevails in how futures are perceived, anticipated, and influenced in a broad set of mainstream and alternative discourses worldwide (Finnerty et al., 2025; Gallè et al., 2025; Kruglanski et al., 2025). This has led to what Candy (2010) has described as an apparently binary choice between an unimaginable utopia and an unthinkable dystopia when envisioning futures, with a tendency towards catastrophic, and (post)apocalyptic scenarios (Cassegård, 2023; Finnerty et al., 2025; Meissner & Smith, 2024; Swyngedouw, 2013).

Spreading senses of precariousness and fear around futures (Altstaedt, 2024) are accompanied by “a crisis of the imagination, or more accurately, crises of our social, economic, and political imaginaries” (Bendor, 2018, p.132). Such poverty or failure of imagination at the individual and collective level affects both the understanding of the current situation (i.e., the perceptual aspect of imagination) and the capacity to envision futures and transform presents (i.e., the creative side of imagination) (Facer & Potts, 2025; Finn & Wylie, 2021; Galafassi, 2018; Milkoreit, 2017; M.-L. Moore & Milkoreit, 2020; Prainsack, 2023; Yusoff & Gabrys, 2011). As in the case of imagination, transformative capacities and capabilities “to imagine, enact, and sustain a transformed world and a way of life that is in balance with the carrying capacity of our earth, and where all life flourishes” (Ziervogel et al., 2016, p.2) are crucial but often neglected (Vogel & O’Brien, 2022). Among these, futures thinking and futures literacies are of particular importance when working with temporal imagination to reflexively discuss temporal assumptions, and perceive, envision, anticipate, and embody the future in the present (Facer, 2024; Facer & Sriprakash, 2021; Horst & Gladwin, 2024; Mangnus et al., 2021). Not cultivating the capacities to envisage and enact futures, poses the risk of creating or perpetuating cognitive lock-ins, problematic structures, and crises (Friedrich & Hendriks, 2024).

1.2 Research relevance and positioning

According to Gümüsay and Reinecke (2022), periods of (immanent) crisis might also serve as critical junctures to imagine alternatives and develop theories, methods, and tools that can support in navigating deliberate transformations towards preferable futures. Moving beyond forecasting probable, plausible, or possible futures, they suggest bringing forward another type of research and practice that fosters change through acts of imagination about futures, especially exploring alternatives with prefigurative potential that do not exist yet (Gümüsay & Reinecke, 2022). Prefigurative potential can be understood as opening possibilities to create, embody, or enact in the present the desired futures, with coherence between ends (e.g., futures imaginaries and transformative ambitions), means (e.g., the actual solutions, tools, and strategies), and manners (the ways of acting in transformative efforts, based on values and principles). Thus, also "research can be prefigurative in the sense that it actively tries to design alternative ways of thinking, doing, and organizing for just and sustainable systems and future societies" (Avelino et al., 2024, p.536).

Feola et al. (2021) point to the fact that sustainability transformation research has generally studied more the emergence of novelty, while undertheorizing the deconstruction of problematic systems and structures. Research on prefiguration has particularly tended to emphasize the positive side of the story by looking at the opening and embodiment of alternative futures in the present (Feola et al., 2021). While acknowledging the importance of both approaches, this thesis deliberately focuses on the constructive side and takes a hopeful stance based on concepts of active and radical hope to move beyond apocalyptic self-fulfilling prophecies, engage with uncertainty with openness, and work towards preferable futures beyond the likelihood of probable or possible ones (AtKisson, 1999, 2010; Macy & Johnstone, 2012; Meadows, 1999; Nickels & Tinnin, 2025; Solnit, 2005; Strazds, 2019). As Havel (1990) wrote, hope "is not the conviction that something will turn out well, but the certainty that something makes sense, regardless of how it turns out".

Importantly, this hopeful approach to futures as matters of choice (Robinson, 1988) still acknowledges the gravity of the polycrisis and its unfair impacts, both in terms of historical responsibilities and of the current uneven distribution of risks and capabilities to cope with challenges (Horst & Gladwin, 2024; Sokolova, 2023). Without falling in the risk of toxic positivity (Halberstam, 2011; Verlie, 2024), 'negative' emotions towards the future are not ignored but put into perspective and understood as manifestation of underlying patterns and structures that need to be worked on in transformative efforts. With a layered understanding of reality based on a critical realist ontology (Archer, 2019), this research focuses on deep, fundamental, or radical transformations (Buch-Hansen et al., 2024; Vogel & O'Brien, 2022). While maintaining a hopeful stance towards desirable futures, this positioning encourages appreciating the 'thickness' of the present (Barad, 2017; Facer, 2016; Haraway, 2016; Poli, 2017), trying to understand in depth its challenges and problematic issues, and experiment with transformative change by working at the systems' most profound levels (Davelaar, 2021; Hamilton & Ramcilovic-Suominen, 2023; Liang & Segalas, 2025).

1.3 Research purpose, questions, and thesis structure

In an attempt not to solely fill research gaps with an incremental approach to contributions to the literature (Sandberg & Alvesson, 2011), this research is driven by a research curiosity based on personal interests and societal relevance of the problems analysed as much as possible in collaboration with the actors involved, affected, or interested (Alvesson & Sandberg, 2013; McCrory, 2021). With the aim of exploring how to navigate deep transformations towards just and sustainable futures with hopeful and purposeful approaches, the following overarching research questions are asked:

1. *How are just and sustainable futures explored and enacted in various transformative efforts?*
2. *What conceptual frameworks and practical tools can be (co-)created to support deep transformative processes towards desirable futures, focusing on metaphors of change and prefiguration?*

Both research questions are addressed in the papers appended in this thesis. Paper I looks at how the Degrowth movement experiments with enacting desirable futures through distributed prefiguration. Paper II analyses and compares prefigurative attempts in the initiatives of the 'EU Mission: Climate-Neutral and Smart Cities', the Degrowth movement, and the Transition Towns community project. Paper III compares the theoretical roots, approaches to transformation, and practical applications in prefiguration and backcasting to understand similarities and differences in the ways they attempt to foster change. Considering the second question, Paper I and II focus on metaphors of change due to their prefigurative potential for deep transformations. It needs to be noted that the papers extensively elaborate on the metaphors currently in use and how they prefigure various imaginaries and strategies in relation to hegemony. However, reflections on how alternative metaphors can be co-created and/or used to support transformations are limited to the discussion section of these papers. Similarly, Paper III introduces an integrative framework for prefigurative backcasting, not yet tested in practice. As these research questions look at the 'how' of transformations, future research towards the doctoral thesis will focus on the 'what' and 'why' of deep transformations, as well as on the 'who' and 'for whom' of just and sustainable futures through more participatory approaches.

The next chapters of this thesis are structured as follows. The background section positions this work in a broader context of transformation and futures studies, with a focus on deep just sustainability transformations and desirable futures. Then, the methodology is presented by introducing the undisciplinary and transformative orientation guiding the methodological pluralism, and the critical realist philosophy of science underlabouring the work. In the Results section, the appended papers are summarised, and the discussion and conclusion provide an overview of the contributions in a scientific and societal context, as well as possible future research directions and curiosities.

2. Background

> I don't think we're ever going to get to utopia again by going forward, but only roundabout or sideways; because we're in a rational dilemma, an either/or situation as perceived by the binary computer mentality, and neither the either nor the or is a place where people can live (Ursula K. Le Guin, 1969).

Given the dichotomy between unattainable utopias and undesired dystopias (cf. Candy, 2010) and a general tendency towards the latter presented in the introduction, it is important to (re-)consider the prevalent ways of thinking about futures and transformations, and open up for alternative ones. Providing an overview of the research fields that this thesis builds on, the background chapter introduces key concepts, ideas, and frameworks from transformation, futures, and anticipation studies, borrowing and integrating additional perspectives from sustainability science and political ecology. With a focus on deep transformations towards just and sustainable futures, the following sections provide first an overview of transformations, presenting the debates around the concept, relational and radical approaches as the most aligned with this thesis' positioning, and the interplay with justice and sustainability. Then, how desirable futures are approached in this research is outlined by introducing key discussions around the plurality and inherent unknowability of futures, and how these are navigated by futures studies and the emergent anticipation studies. Lastly, more specific concepts and theories that this thesis works with in the appended papers (i.e., related to prefiguration, backcasting, and metaphors) are briefly presented in the final section.

2.1 Deep just sustainability transformations

Across different discourses and perspectives, there is growing recognition of the urgent need for transformations to address complex and persistent contemporary challenges (Davelaar, 2021; O'Brien et al., 2023; Scoones et al., 2020; West et al., 2024). As what is meant by transformation is often unclear or subject to multiple interpretations (Bentz et al., 2022; Blythe et al., 2018; Feola, 2015), the next paragraphs introduce some understandings, discussions, and concerns around the concept, as well as ways of enhancing the potential of this plurality through relational and deep approaches to transformations. With a focus on just sustainability transformations, this section concludes with an overview of the debates around sustainability and justice, and their combinations in transformative theories and practical experiments, which are the foundations or sources of inspiration for this thesis.

2.1.1 Transformations beyond a buzzword

The notion of transformation is increasingly used in sustainability discourses, giving origin to a rich variety of conceptualisations and translations into practice (Feola, 2015; Ketonen-Oksi & Vigren, 2024; Salomaa & Juhola, 2020). For example, in sustainability science different definitions and frameworks for social-ecological, multi-level, transformative adaptation, and pathways approaches have been developed to understand and work with transformations (West et al., 2024). Several categories and typologies have been developed to classify these approaches (see e.g., Evans et al., 2025; Feola, 2015; Hamilton & Ramcilovic-Suominen, 2023; Linnér & Wibeck, 2020; Scoones et al., 2020). Common across various approaches to transformations is the normative premise that fundamental systemic change is essential to address the root causes of the polycrisis and support the emergence of desirable futures (Blythe et al., 2018; Brand, 2016; Hölscher et al., 2018). Considering the etymological origin of transformation the prefix 'trans-' indicates movement across, over, or beyond a current situation in generative processes or journeys of becoming (Bentz et al., 2022; Geels & Schot, 2007; Vogel & O'Brien, 2022). Transformations can thus be understood, in general, as open processes in the making that aim to enact fundamental changes in existing structures and systems at different scales, from the societal level to the cognitive one, leading to new ways of being, doing, and relating (Hertz et al., 2025; Ketonen-Oksi & Vigren, 2024; Patterson et al., 2017).

Given the variety of interpretations and forms of experimentation with transformations, however, critical questions have been raised around the vagueness of what should be transformed, how, by and for whom, as well as what types of knowledge inform and support change, how the knowledge-action gap will be filled, and how the concept will translate from academic discourses to normative actions and influence socio-environmental issues (Bentz et al., 2022; Blythe et al., 2018; Braun, 2015). This poses the risk of reducing transformations to a buzzword for superficial interventions that support the status quo by suggesting limited techno-managerial solutions and individual behavioural changes, while ignoring systemic structures, reproducing injustices, and reinforcing uneven power dynamics (Feola, 2015; Vogel & O'Brien, 2022). Hence, it is deemed important to increase transparency about the political and cultural nature of transformation's discourses and practices (Blythe et al., 2018), and to discuss why and for whom certain transformations are desirable or threatening, as well as which and whose values shape and are shaped in transformative processes (Ketonen-Oksi & Vigren, 2024). In this way, the possible vagueness of transformations can be addressed by acknowledging the complexity of transformative change, understanding in depth the different approaches, and seeing them not as exclusive but complementary (Feola, 2015; Hölscher et al., 2018; Leach et al., 2010).

2.1.2 Plural, relational, and radical transformations

Enhancing the potential of this plurality of interpretations and approaches to transformations, relational ones suggest moving beyond universalistic theoretical frameworks, towards understanding and shaping transformations as matters of care and concern or 'shared spaces' for multiple ways of knowing, being, and doing (Martin-Booran Mirraboopa, 2003; Pereira et al., 2020; West et al., 2024). This recognition of multiplicity can help diversify and decolonise knowledge and action around transformations, and enact alternatives that foster a sense of interconnectedness and mutuality (Feola et al., 2021; Ramcilovic-Suominen, 2023; West et al., 2024). For cross-pollination across diverse approaches, transformations can be shaped as participatory and deliberative processes that facilitate the meeting between different worldviews and cultures, and open for equitable forms of collaboration where shared meanings and values are co-created (Bennett et al., 2019; Chambers et al., 2022). Through experimental, creative, and experiential approaches to generate change, relational approaches to transformations are increasingly exploring collective shifts in values, narratives, ways of being and doing, emerging from material-discursive practices in intra-actions with others (Barad, 2007; Galafassi et al., 2018; Hochachka, 2022; Rosenberg, 2022). In addition to discussing and negotiating the 'what' of transformations by finding a shared directionality (Stirling, 2024), these approaches facilitate continuous processes of social learning in navigating the 'how' of transformations by learning to see the world differently (Bentz et al., 2022; Holmén, 2020; Williams et al., 2024; Winter et al., 2015).

As "transformation is, at its heart, a deeply holistic, reflective, and relational process" (Vogel & O'Brien, 2022, p.657), addressing the root causes of problems and enact desirable alternatives requires fostering 'fundamental', 'deep', 'profound', or 'radical' change. Different research communities have developed theories, frameworks, and tools to work with this type of change (e.g., Buch-Hansen et al., 2024; Davelaar, 2021; Gaziulusoy et al., 2021; Liang & Segalas, 2025). For example, system thinkers use different iceberg models (Figure 1) as heuristic tools to analyse complex multilayered phenomena by illustrating how observable events emerge from less visible patterns and deeper systemic structures (Bosch et al., 2007; Kim, 1999; Maani & Cavana, 2007; Meadows, 2008; Sweeney & Meadows, 2010). Similarly, leverage points, areas of potential in a system where a small shift can produce bigger changes, can be used in transformative efforts to design interventions at different levels, working with shallow mechanisms like adjusting parameters, to deeper redesigning social structures and influencing goals and values that will shape the system's emergent direction (Abson et al., 2017; Dorninger et al., 2020; Leventon et al., 2021; Meadows, 1997). What is shared among these frameworks is a focus on discussing and re-shaping foundational mindset, values, worldviews, and paradigms to go beyond incremental improvements and transcend the status quo by radically transforming systems' bases (Hamilton & Ramcilovic-Suominen, 2023; O'Brien, 2018; Vogel & O'Brien, 2022; Woiwode et al., 2021). In this thesis, an important component of these deep layers is given by metaphors, understood not as simple linguistic devices but as

sense-making building blocks that can help navigate cognitive and societal landscapes and transform deeply rooted structures (Inayatullah et al., 2016; Lakoff & Johnson, 1999; Macgill, 2015).

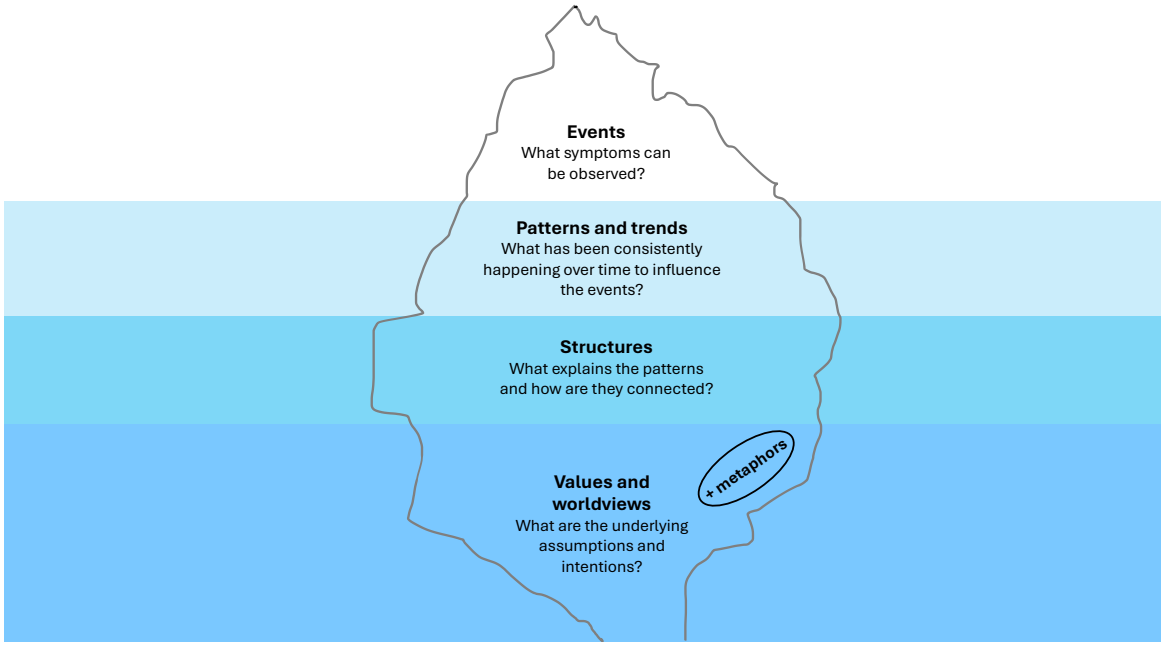

Figure 1: Example of heuristic tool to visualise deep transformations
Adaptation and integration of iceberg models to position metaphors as deep levers for change

2.1.3 'Sustainability' and 'justice' in transformations

Addressing the root causes of contemporary challenges usually translates into calls for transformations towards just and sustainable futures. As in the case of transformation, also sustainability is a broadly defined and contested concept (Hopwood et al., 2005; Scoones, 2015; Strazds, 2019). The term got popularised after the Brundtland Commission's report "Our Common Future", which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 35). Over time, a broad set of diverse perspectives contributed to nuancing and expanding the interpretations and applications of the concept, moving from the social, environmental, and economic pillars (Waas et al., 2011) or the divide between weak and strong sustainability (Daly, 1990; Solow, 1993), to a variety of approaches focused for example on human and planetary wellbeing, multispecies ethics, equity, and justice (Sneddon et al., 2006). The applications of the concept are also transforming from expert-led forecasting to depict imagined distant places, towards participatory processes that involve different actors in co-creating and embodying what they consider to be sustainability as a socially constructed matter of concern (Holmberg & Larsson, 2018; Strazds, 2019). At the same time, some critical voices raised questions around what is sustained, for and by whom (e.g., Scoones, 2015) or claimed a failure of

sustainability in becoming coopted by mainstream political discourses without being faithful to the radical aspiration of the 1960s and '70s ecological movements (e.g., Foster, 2017). Others suggested to focus on resilience or regeneration instead (e.g., Benson & Craig, 2014; Buckton et al., 2023; Edwards, 2010; Fischer et al., 2024), opening debates around what would produce shifts in thinking and what would rather create more confusion and delay transformative action, with likely unfair and unjust distributions of harms and benefits (Moore, 2016).

Justice is also considered an essentially contested concept (Avelino et al., 2024; Collier et al., 2006) and its origins are more complex to trace, going back to ancient Greek philosophy and the first conceptualisations of law systems in different cultures. In a context of sustainability transformations and transitions, the lenses of justice have increasingly been adopted when noticing that deliberate actions aiming at improving certain socio-ecological issues could have detrimental social impacts, for example considering the unequal distribution of costs and benefits of green energy projects (Bennett et al., 2019). 'Transition' and 'transformation' are often used interchangeably and have different definitions across research communities, but in an attempt of providing a basic understanding: a series of domain-specific transitions shifting from a dynamic equilibrium to another one, might contribute to more encompassing, fundamental, and long-term transformative processes (Brand, 2016; Hölscher et al., 2018; Loorbach, 2014; Stirling, 2015). In the case of transitions, Swilling (2020) advanced the concept of 'just transitions' with a dual commitment to sustainability and human wellbeing, and Avelino et al. (2024) furthered it describing change that would enable current and future generations of humans and more-than-humans to flourish, while eliminating and preventing injustices caused by unsustainability. The 'just transformations' literature has a slightly deeper focus on recognitional, procedural and distributional considerations (see Fraser, 2009; Williams & Doyon, 2019), and on planetary justice (see Biermann & Kalfagianni, 2020; Dryzek & Pickering, 2018; Pedersen et al., 2024). Due to its focus on prefiguration and coherence between ends and means, this thesis builds on a concept of justice that includes both outcome justice (fairness with regards to desired ends) and procedural justice (fairness with regards to means also involving how ends are negotiated) (see Thibaut & Walker, 1975) to care-fully catalyse radical change towards just and sustainable futures.

2.2 Desirable Futures

In a context of polycrisis, the future has become an ambivalent protagonist of various discourses and imaginaries, mostly seen as worrisome and intimidating (to the point of ignoring or resisting it in some cases) or sometimes glanced at with some hope. As multiple understandings characterise it, the next paragraphs discuss the term in its singular and plural forms, the debates around them, and the various approaches to futures. Then, how research in different fields has analysed and worked with futures is presented, with a brief

introduction to the history and key issues within the fields of futures and anticipation studies. Given the focus of this thesis on hopeful approaches to desirable futures, particular attention is given to normative approaches to preferable futures, explored through critical and experimental lenses in the present as in the case of backcasting and prefiguration.

2.2.1 Future(s): One, multiple, or still problematic?

In WEIRD[1] societies characterised by a linear approach to time, it is often claimed that there is only one future, "the Future" (Barad, 2003; Feukeu, 2024; Galtung & Inayatullah, 1997; Malaska, 2001). The term future "used alone, in the singular and without context, seems to suggest that it is all about looking ahead. The word itself does not suggest that looking beyond the horizon also involves being aware of what lies before and beneath the horizon" (Sardar, 2010, p.178). Nuancing and expanding this view, it is increasingly argued that temporal dimensions can be conceived in different ways across diverse cultures, and that futures are contingent and multiple (Inayatullah, 1993; Ketonen-Oksi & Vigren, 2024; Rowland & Spaniol, 2015). As stated in the first volume of the journal Futures, the future does not exist as predestined, but as "a limitless number of possible futures" (Editorial, 1969, p.2). It can be generally argued that the future cannot exist in the here and now, or it would be 'present' and no longer 'future' (Miller, 2018). More precisely, the future does not only exist in a manner open to prediction, but futures manifests in various presents through anticipatory processes where necessarily incomplete and limited futures imaginings or models influence present experiences, assumptions, ambitions, and actions (Facer & Sriprakash, 2021; Ketonen-Oksi & Vigren, 2024; Miller, 2018).

To assure the diversity of futures, Sardar (2010) suggests acknowledging and remaining open to all the potentials and possibilities of the fact that there are different ways to be human across cultures, histories, ways of knowing, being and doing, and different pathways towards realising what is deemed as desirable. Co-creating alternative futures requires a decolonized approach to futures that recognises and welcomes a multiplicity of pluriversal modes of thinking to go beyond dominant institutionalized frames, where the pluriverse is understood as a transcultural tapestry of worldviews, concepts and practices aiming to co-create preferable worlds in alternative to modernist universalism (Dator, 2005; Feukeu, 2024; Inayatullah, 1993; Jae, 2023; Sardar, 1993). This opens for 'lived' futures embedded in relations of care and entanglement (e.g., Kich'wa pedagogies seeing the future as "a story told between the people of the past and the people of the present and everyone/everything around" (Coello, 2020, p.45)) that move beyond 'empty' abstract futures that tend to flatten and linearise the future (Anderson & Barrineau, 2025; Barrineau et al., 2025; Facer, 2024; Groves, 2017).

[1] WEIRD: Western Educated Industrialised Rich Democratic people often considered as standard representative subjects, while being an (influential) minority of the global population (Henrich et al., 2010)

As empty futures have historically been produced mostly in the Minority world[2] (Andersson, 2018; Facer & Sriprakash, 2021), the concept of futurity has been problematised by Afrofuturists, Indigenous, or Queer Anti-futurists as unjust, colonised, and marginalising linked to anthropocentric, white-washed, patriarchal, and hetero-normative imaginaries (Horst & Gladwin, 2024, p.44). This perspective can be linked to 'critical' approaches to futures that promote reflexivity and deconstruct problematic futures imaginaries (Mangnus et al., 2021). Providing a comprehensive picture of various futures traditions and practices, Mangnus et al. (2021) surfaced different approaches to analysing, understanding, and influencing futures. In addition to the critical one, they classified futures approaches as: 'predictive', assessing the likelihood of future eventualities with projections based on probabilities; 'plausible', addressing uncertainty through different future scenarios; and 'experimental', opening up for co-creating and exploring imaginative alternatives with potential to transform presents (Mangnus et al., 2021; Oomen et al., 2022). According to a literature review by Juri et al. (2025), predictive and plausible approaches are still dominant in the literature, although the fields of futures and anticipation studies are still evolving.

2.2.2 Futures and anticipation studies

Attempting to foresee and/or influence what will happen next has been for centuries an important aspect of various societies and communities, for instance with prophecies, utopias, or visions (Kristóf & Nováky, 2023; Schultz, 2015). Although these example go way back in history, scientific-based futures studies have started developing into a research field from the 1940s, and developed in various streams to approach futures in different ways and with different purposes (see Amara, 1974; Andersson, 2018; Bell, 2015; Dator, 2019; Inayatullah, 2013; Malaska, 1993; Son, 2015). Considering the varying degrees of likelihoods or preference, futures can be classified in the following not mutually exclusive categories of futures: projected' futures focus on default extrapolations assuming business as usual to continue; 'probable' futures identify futures likely to happen; 'plausible' futures describe futures that could happen; 'possible' futures maps futures that might happen; 'preposterous' futures are futures deemed impossible; and 'preferable' futures discuss and co-create futures that are desirable (Candy, 2010; Hancock & Bezold, 1994; C. Taylor, 1993; Voros, 2003). Thes types of futures are usually represented with visual aids (Figure 2) like Future Cones (Gall et al., 2022), Cones of Everything that consider the relations between different futures, pasts, and the present (Christophilopoulos, 2021), or the Entangled Time Tree interweaving multiple futures, presents, and pasts through rhizomatic relations (Terry et al., 2024).

[2] Majority and Minority worlds are here preferred to conventional classifications based on Global South and Global North, non-West and West, Third World and First World, or rankings based on levels of development, to rather show the distribution of population in comparison to power, privilege, and responsibility (Alam, 2008)

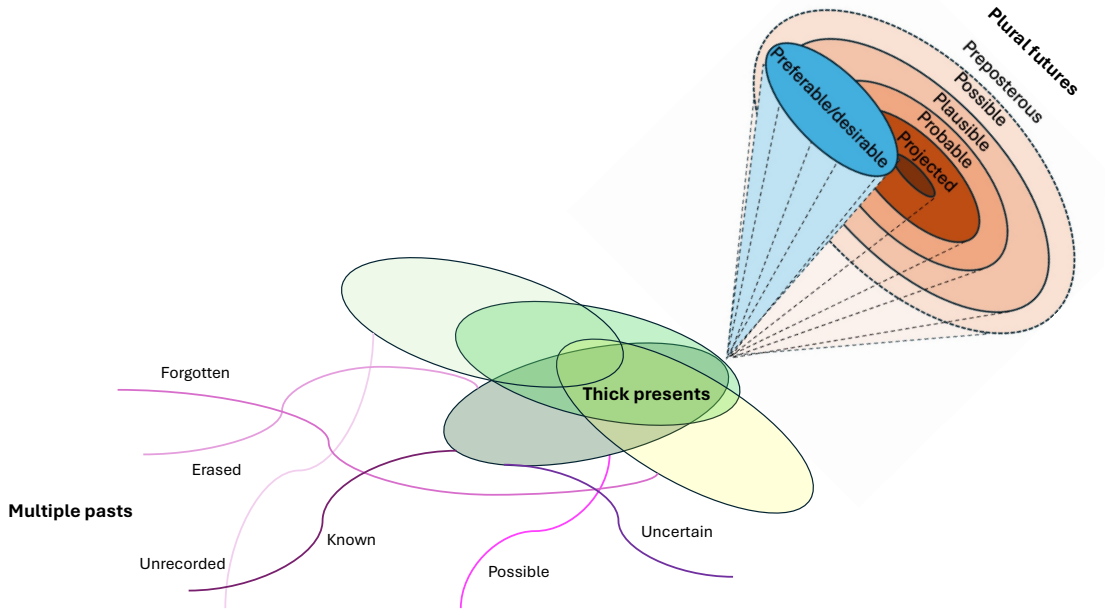

Figure 2: Integration of futures visual aids
Combination of Futures Cones, Cones of Everything, and the Entangled Time Tree to represent different ways of visualising time dimensions, including different levels of likelihood and preference for futures; nested and layered presents; and multiple pasts. These dimensions are interwoven to show the interconnections among pasts, presents, and futures, and accommodate non-linear interpretations of time.

With a non-pre-deterministic approach, futures studies acknowledge that predictions, forecasts, scenarios, and so on, do not offer knowledge of the future per se, but can only hint at limited possibilities or explore alternatives (Candy, 2010; Gall et al., 2022; Sardar, 2010). In other words, following Dator's First Law of Futures, it is not possible to predict the future, but alternative futures can be forecasted and preferrable futures can be envisioned or invented (Slaughter, 1996). Building on this, Sardar's four laws of futures studies claim that futures studies are: (1) wicked as they address complex interconnected problems; (2) MAD or characterised by Mutually Assured Diversity in recognising and being open to the diversity of futures and approaches to futures; (3) sceptical of simple one-dimensional solutions and dominant ideas, asking what else is possible, what will be the impacts of certain futures and who would benefit from them; and (4) futureless as all the futures explorations happen and are meaningful in the present. Following the developments of the field, backcasting offers an example of a normative approach that explores alternative desirable futures and ways to get there through experimentation with present interventions.

In connection to futures studies, the emergent field of anticipatory studies particularly focus on the interplay between temporal dimensions to see how desirable futures can be enacted in the present and go beyond forecast and foresight modelling (Muiderman et al., 2022; Poli, 2019; Swilling et al., 2018). According to Poli (2024), the relation between futures studies and anticipation can be exemplified by the analogy between economics and mathematics, where the latter is broader and is at the same time partially exploited and sometimes furthered by the former with issues that might trigger new developments.

Sharing some similarities with the normative strands of future studies, anticipation comprises formal or informal processes that try to make sense of uncertain futures and navigate transformations towards preferable ones (Poli, 2019; Vervoort & Gupta, 2018). Anticipatory governance is used in and for sustainability transformations to foster futures literacies and enact the desired changes in the present through productive and generative practices (Boyd et al., 2015; Horst & Gladwin, 2024; Muiderman et al., 2020; Tschakert & Dietrich, 2010). Depending on how futures are approached, anticipation has been classified as 'anticipation for the future' that plans and prepares for an expected future, and 'anticipation for emergence' that opens possibilities for novel alternatives to manifest in the present (Facer & Sriprakash, 2021; Miller, 2018). Thus, going back to the initial discussion around the existence of the future in the here and now, futures can take the form of anticipation in the present (Miller, 2018). Anticipation shares similarities not only with backcasting but also with prefiguration, with its focus on embodying desired futures in the here and now.

2.3 Theoretical and conceptual starting points

Prefiguration, backcasting, and metaphors have been mentioned earlier in connection to hopeful, purposeful and deliberate approaches to desirable futures, and in relation to deep or radical transformations. Zooming in on these theoretical and conceptual starting points for this thesis, here a short overview of the concepts is provided but, to avoid excessive redundancy, detailed explanations of each can be found in the respective research papers (see Paper I and II for a deeper dive in metaphor theories and frameworks; Paper I, II, and III for different aspects of prefiguration or prefigurative politics, and Paper III for backcasting).

2.3.1 Prefiguration and backcasting

The term prefiguration comes from the Latin 'praefigurare', meaning to anticipate something that might happen or is desired to happen in the future (Monticelli, 2021; Monticelli & Escobar, 2024). Among the various definition that have been developed to describe it, prefiguration is here understood as an approach to just sustainability transformations focused on co-creating and enacting in the present the desired social structures, practices, and relations, with coherence between the ends envisioned and the means adopted to achieve such ends (cf. Avelino et al., 2024; Chertkovskaya et al., 2024; Dinerstein, 2016; Raekstad & Gradin, 2020; Schwittay, 2025; Van de Sande, 2013). Prefiguration has been classified as 'situated' when experimentation with alternative ways of being, doing, and relating takes place in clearly bounded spaces; or 'distributed' when it develops across broader socio-spatial settings, among initiatives that share common goals and/or practices (Chertkovskaya et al., 2024). The various forms of prefiguration belong to

a pluriversal tapestry of hegemony-transcending experiments embodied by different actors in a multiplicity of processes and practices (cf. Escobar, 2020; Sokolova, 2023). Examples include famous cases like the alter-globalisation movement, the Zapatista movement in Chiapas, the Zones to Defend in France, or the Rojava movement in Kurdistan, as well as different workers' unions or social movements related to feminism, peace, or civil rights in the 90s, and more contemporary eco-villages and intentional communities, permaculture gardens, mutual aid initiatives, and bike-repair cafes around the world.

As another normative approach to transformations with significant internal variety of forms and definitions, backcasting can be considered a systems-oriented approach, framework, method, or tool to guide transformative processes towards desirable futures (Dreborg, 1996; Holmberg & and Robert, 2000; Holmén, 2020; Quist & Vergragt, 2006). Considering the etymological origin, to 'backcast' means looking back from the future, with a specific focus on what futures should happen, not on which ones are likely to happen (Robinson, 1990). Indeed, it emerged in the 70s among futuring approaches in alternative to forecasting and planning based on trends extrapolation (Vergragt & Quist, 2011). Often connected to complex sustainability challenges, it has been applied to a variety of processes, addressing for example energy planning, climate change, mobility, or land use (Kishita et al., 2024). Different forms of backcasting have emerged since the 90s, with an increasing focus on participation and experimentation (Holmberg, 1998b; Quist & Vergragt, 2006; Robinson, 2003; Vergragt & Jansen, 1993). In particular, this thesis builds on backcasting from principles due to its purposeful, systematic, and reflexive approach to transformations and its similarities with prefiguration. This type of backcasting focuses on co-developing normative and ethical frames based on shared principles that can provide guidance in coordinating various societal actors and sectors towards a common direction, and eventually construct desirable futures in the present (Holmberg, 1998b; Holmberg & and Robert, 2000; Holmberg & Larsson, 2018).

2.3.2 Metaphors

As mentioned before, to support the deep transformations navigated in backcasting and prefiguration, different heuristics and models for systemic change suggest working with paradigms, worldviews, mental models, myths, and metaphors (Davelaar, 2021; Inayatullah, 1998; Inayatullah et al., 2016; Meadows, 2009). Metaphors are common in all languages and are not only rhetorical devices used in poetry or figurative speech (Gibbs, 1994; Thibodeau et al., 2019). Rather, they are characterised by linguistic, cognitive, affective, physical, and cultural dimensions (Cameron et al., 2009), and can influence thoughts and actions by structuring imaginaries and discourses at the individual and societal level (Inayatullah et al., 2016; Macgill, 2015). Building on cognitive or conceptual metaphor theory, metaphors can be understood as cognitive projections between an abstract or unstructured 'target domain' and a more tangible 'source domain' that can help understand and make sense of the former (Lakoff & Johnson, 2003). For example, the

metaphor ‘life is a journey’ uses a source domain associated to the process of exploring and traveling across time and space, to describe the broader and more abstract target domain of life that is more mysterious and difficult to explain (Figure 3). Furthermore, some metaphors have transformative potential to restructure problematic worldviews and suggest alternatives for the creation of more desirable futures (Macgill, 2015). Thus, this thesis (specifically in Paper I and II) focuses on ‘metaphors of change’ inspired by the field of organisational studies (e.g., Marshak, 1993; Morgan, 1986; Smollan, 2014) and brings forward the concept by applying it to the field of just sustainability transformations to help grasp and envision how change can happen ontologically, and/or how change can be navigated and enacted.

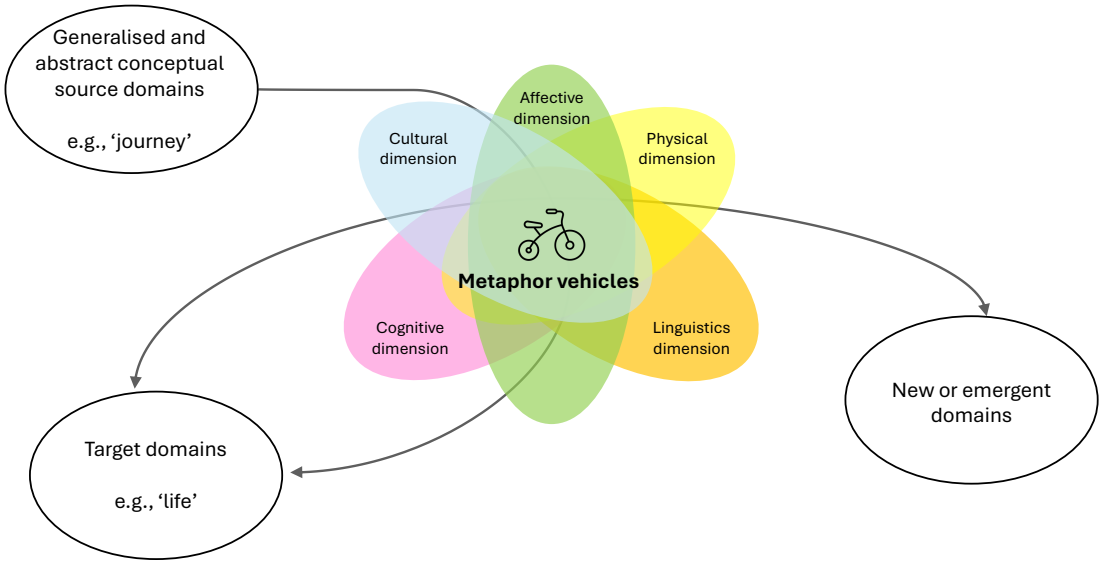

Figure 3: Representation of metaphorical mappings
Generalised source domains can be used to illustrate a given target domain through metaphor vehicles characterised by different dimensions. Metaphors can also explain target domains by mapping from and opening for emergent domains.

3. Methodology

> It matters what matters we use to think other matters with; it matters what stories we tell to tell other stories with; it matters what knots knot knots, what thoughts think thoughts, what descriptions describe descriptions, what ties tie ties. It matters what stories make worlds, what worlds make stories (Donna Haraway, 2016).

In a context of relational sustainabilities, participatory transformations, and normative orientations towards desirable futures, it matters what methodology are used to develop methods with. It matters what philosophy of science underlabours such methodology and influences how current reality and future possibilities are approached. The following sections will clarify the author's positionality and justify the choice of an undisciplinary and transformative orientation and methodological pluralism, as well as the adoption of critical realism for this research.

3.1 Undisciplinary and transformative methodological pluralism

The research included in this thesis is explored and brought forward with an undisciplinary or undisciplined approach, described by Sardar (2010) as an 'unshameful' characteristic of future studies. In the context of this licentiate thesis, an undisciplinary PhD journey is understood as "(1) the space or condition of early-career researchers with early interdisciplinary backgrounds[3], (2) the process of the journey, and (3) the orientation which aids scholars to address the complex nature of today's sustainability challenges" (Haider et al., 2018, p.1). Undisciplinarity does not replace multi-, inter-, or trans-disciplinarity, rather it is an emergent personal process and a mode of collaboration across disciplines and non-academic forms of knowledge with a problem-based, integrative, interactive, collaborative, and reflexive orientation, combining epistemological agility and methodological groundedness (Haider et al., 2018; Robinson, 2008). In this thesis, undisciplinarity describes not only the journey's space or process, but also its transformative orientation.

[3] [3] Mini positionality statement: the author of this thesis has an interdisciplinary background in sustainability science and global governance, and is an early career researcher coming from and working in a WEIRD context. Aware of the privileges and risks of this positionality, the author has a strong commitment to reflect upon and try to limit associated biases, working collaboratively at the interface between multiple worldviews, knowledge practices, normative orientations, and interests, towards shared transformative ambitions. Although this work is the product of collaborative efforts, the author takes full responsibility for any shortcomings within this 'kappa' and the appended papers. At the risk of sounding impersonal, the use of the first singular person is deliberatively avoided, hoping to move beyond the centrality of the individual researcher and trying to explore alternative forms of collective research. Since this research is plural and participatory, the "we" is instead adopted in the appended papers, discussed and positioned case by case, and considered as a situated invitation rather than a universalistic claim.

Transformative research addresses complex challenges by co-developing socially robust scientific knowledge and interventions together with actors from different scientific disciplines and societal domains, to facilitate intentional change towards just and sustainable futures (Augenstein et al., 2024; Horcea-Milcu et al., 2024; Wittmayer et al., 2021). According to Wittmayer et al., (2021), transformative research should be systemic, reconstructive, plural, collaborative, iterative, and reflexive, to draw on different forms of knowledge, account for various normative orientations, increase legitimacy, accountability, and responsibility for problems understanding and solutions development from all the actors involved. Similarly, Horcea-Milcu et al., (2024) identified six key characteristics of transformative research involving (1) a focus on interventions and theories of change; (2) collaborative modes of knowledge production, experimentation, and learning; (3) systems thinking literacy and contextualization; (4) reflexive, normative, and inner dimensions; (5) local agency, decolonization, and reshaping power; (6) new quality criteria to rethink impact. Thus, transformative research does not only build knowledge about, but knowledge for transformations, with a focus on actionable knowledge in pursuit of sustainability (Fazey et al., 2018; Horcea-Milcu et al., 2024; Lam et al., 2021; West et al., 2019).

Adopting collaborative methods for qualitative research inspired by transdisciplinary research and participatory action research, this thesis embraces methodological pluralism. The latter has been described as the theory and practice of combining methods from different disciplines and knowledge domains, by acknowledging various methodologies as theories that justify particular methods, and by using different methods as specific techniques to achieve certain purposes (Midgley et al., 2017; Norgaard, 1989). As it engages with plural or even conflicting ways of understanding complex challenges, methodological pluralism is often used to expand ways of analysing or intervening in complex systems' transformations (Midgley, 2000). Furthermore, it is often employed in sustainability science to better tackle challenges by avoiding deterministic, functionalistic, or overly rationalistic approaches, while opening for collaboration and social learning with flexibility and a balance between generality and specificity (Fitzpatrick et al., 2024; Isgren et al., 2017; Jerneck & Olsson, 2020). In this thesis, the different research papers outline a variety of methods from comparative analysis of integrative literature reviews in Paper III to metaphors analysis based on cognitive and discursive frameworks in Paper I and II, underlaboured by a critical realism as anti-reductionist and inclusive meta-theory.

3.2 Critical realist underlabouring

The focus of this thesis on the 'depth' of change and transformations is based on a critical realist understanding of reality as layered, laminated, or levelled. With a realist ontology, critical realism shifts primary attention from epistemology to ontology by claiming that an objective world exists independently of human observations and experiences (Bhaskar, 2008; Danemark, 2019). Building on immanent critique of logical empiricism and social constructivism, it describes reality as stratified in three nested domains (Figure 4): the

empirical domain includes the experience or observation of events that happen; the actual domain consists of the events or phenomena that happen; and the domain of the real refers to the causal powers or generative mechanisms that produce different events (Bhaskar, 2008). Furthermore, combining ontological realism with epistemological relativism and judgemental rationalism, critical realism suggests that knowledge is fallible, contingent, and mediated, but there are rational grounds to choose among competing descriptions of the world (Archer et al., 1998; Bhaskar, 2008; Collier, 1994; Mendelsohn, 1977). To analyse in depth and possibly explain what happens in the world, it is necessary to understand not only the transitive domains (the actual and empirical) but also the intransitive domain (the real), for example uncovering the workings of deeper structures and mechanisms by asking questions around what qualities must exist for something to be possible, via various modes of inference and methods (Bhaskar, 2008; Danemark, 2019).

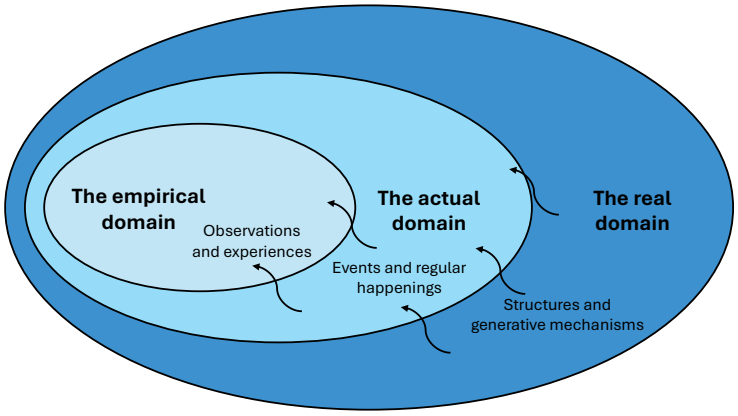

Figure 4: Representation of critical realist ontology
Overview of the empirical, actual, and real domains and their relations

Critical realism has been recognised as a useful approach in transformative and 'strong transdisciplinary' research, due to its explicit orientation towards methodological pluralism and its commitment to facilitating transformative societal change (Cockburn, 2022; Fletcher, 2017; Holden et al., 2019; Ross & Mitchell, 2018). By transcending boundaries between disciplines and between science and society to inquire into different levels of reality, a critical realist approach to undisciplinarity can help developing novel frameworks, theories, and ways of seeing and knowing the world (Bhaskar, 2010; Cockburn, 2022; Nicolescu, 2014). The resulting knowledge integration and co-production can unlock new understandings through processes of epistemic emergence that depict a more complete picture of reality and generate new ideas and practices at the interfaces of disciplines and other forms of knowledge (Cockburn, 2022; Danermark, 2019; Max-Neef, 2005). In

addition to the benefits of mutual learning in knowledge co-creation, a critical realist approach encourages to use care and reflexivity not to fall in a normative acceptance of integration that ignores potential tensions and power dynamics among different understandings and perspectives (Cockburn, 2022; Klenk & Meehan, 2015). Critical realism is also emancipatory, with its focus on lifting marginalised perspectives and people to agents of transformation, and promoting equal partnerships of researchers and societal actors in 'knowledge alliances' (Stigendal & Novy, 2018). This offers a 'potential-oriented' approach that shifts focus from actual events to the generative mechanisms or causal powers behind these events, and highlights potential for desirable change rather than problems or obstacles (Stigendal & Novy, 2018; Zierhofer & Burger, 2007).

To better support processes of co-creation and collaboration, critical realism has also explored relational, interconnected, or interwoven approaches to ontology that emphasise the importance of interdependence in the dynamic web of reality, especially in sustainability discourses and practices (Archer, 2020; Donati, 2015; Jessop, 2017; Kempton, 2022). Differently from strong relational (meta)theories, critical realism recognises intrinsic properties and characteristics to entities, which can be shaped by relations to other entities or by other mechanisms (Kempton, 2022). However, relations are still considered fundamental to the constitution of reality through interactions, spatiotemporal positionings, intentions or projections made on the world (Kempton, 2022). This includes both social relations in strategic-relational or morphogenetic approaches (e.g., Archer, 2020; Donati, 2015; Jessop, 2017), and a growing interest in relations with more-than-humans (see Price et al., 2026). Considering the relation to time, critical realism describes time as an external real (Jae, 2023), which might seem in contrast with some views of futures as socially constructed within futures studies (e.g., Sardar, 2010). However, more detailed explanations of the relations between critical realism and temporal dimensions show how the organisation of time and action-constituting anticipation of futures takes place simultaneously at different levels (Patomäki, 2006). A critical realist approach is thus suitable to work with transformations to desirable futures as, according to a realist ontology, there are multiple possible futures, and in the actual domain there are non-actualised possibilities and unexercised powers that can transform present structures and make certain futures real (Aligica, 2011; Patomäki, 2006).

4. Summary of appended papers

> A good question is never answered. It is not a bolt to be tightened into place but a seed to be planted and to bear more seed toward the hope of greening the landscape of idea (John Ciardi, 1972).

Building on Ciardi's metaphors, the findings of this thesis should not be seen as an end point but rather as initial answers to stimulate emergent questions, or seeds for further enquiry and exploration as suggested in the discussion. The following sections summarise the three papers selected for the thesis, with a focus on how they address the overarching questions posed in the introduction (i.e., (1) how just and sustainable futures are explored and enacted in transformative efforts; and (2) what conceptual frameworks and practical tools can be (co-)created to support deep transformative processes towards desirable futures, with a focus on metaphors of change and prefiguration). Detailed research designs, results, and discussions can be found in the papers appended.

4.1 Snails Ahead! Metaphors of Change and Distributed Prefiguration in the Degrowth Movement

This paper explored how pluriversal alternatives aiming for radical hegemony-transcending transformations enact and embody just and sustainable futures in the here and now. With a focus on the Degrowth movement, the study aimed to understand and unpack how metaphors of change, as levers for deep transformations, are employed across the movement's various currents with respect to distributed prefiguration. The coherence between means and ends and the balance between unity and plurality have been assessed by analysing the shared imaginaries of desirable futures and the transformative strategies suggested by the metaphors of change in use. Building on transformation studies and cognitive metaphor theory, the discourse dynamics framework was adopted to surface and interpret the metaphors of change collected from an international survey, a participatory activity at 11th International Degrowth Conference, and interviews with activists and researchers in the Degrowth movement.

From the analysis, it emerges that the imaginaries and strategies among degrowth proponents draw mostly on relational root metaphors and ecological or societal domains related to interconnectedness, hope, and sustainability, with limited associations made with mechanistic and war domains. The imaginaries suggest that degrowth can inspire deep transformations on the interrelated planes of material transactions, human and more-than-human interactions, social structures, and inner being, with metaphors referring to societies as 'snails', 'turtles', or biodiverse 'oak trees', structures as 'mosaics' or 'webs of life', and individuals as 'flourishing plants'. The combinations of imaginaries give origin to a partly

shared and partly disputed variety of desirable futures, with differences originating from the political and ethical foundations of each current. Then, the transformative strategies have been classified according to Wright's symbiotic, ruptural, and interstitial categories, with the addition of intermingling and enabling strategies. These have been respectively described by metaphors suggesting a 'recalibration' of existing systems, a 'rupture' with the growth society, the need to 'pull the emergency break' and 'exit' capitalism, 'groundbreaking mental shifts', or 'holding hands' and 'building bridges' across initiatives. Some internal variation and divergence among strategies was identified in the first three categories, while the two additional ones are more cross-cutting and offer common ground to prefigure collectively desired futures across different currents.

The combinations of imaginaries and strategies (Figure 5) have been discussed by looking at the coherence between means and ends in distributed forms of prefiguration, without drawing any definite matching. Instead, as the metaphorical framing of change is not neutral, the discussion focused on the transformative power of different (combinations of) metaphors in prefigurative processes. Considering how these metaphors can help go beyond or risk maintaining and reinforcing the dominant paradigms criticised, the paper concluded with some open questions to offer insights and stimulate reflections that can support experimental processes aiming to address the root causes of unsustainability and promote change towards more desirable futures (e.g., with questions around how metaphors can be used as discursive devices to rearticulate common senses and transcend hegemony, or how to engage with imaginaries and strategies with openness and not in a polarising over-invested manner).

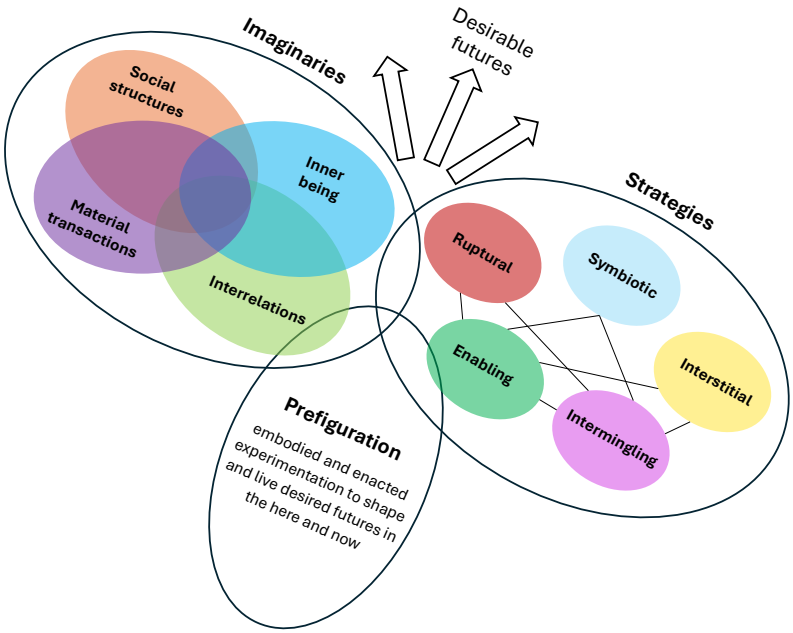

Figure 5: Summary of Paper I results
Imaginaries and transformative strategies surfaced through metaphors of change, to prefigure desirable futures by maintaining coherence between means and ends.

4.2 Exploring how metaphors of change prefigure futures in public policy, social movements, and community projects.

Building on and expanding the first paper, this book chapter explored how metaphors of change prefigure futures in the enactment of change across different initiatives in public policy, social movements, and community projects. Selecting the EU Cities Mission, the Degrowth movement, and Transition Towns as case studies, it compared how the different metaphors used in each shape cognitive frames, help conceptualise change, and mobilize or guide action in various approaches to transformations (Figure 6). Drawing on conceptual metaphor theory to analyse documents, reports, press releases, and literature about the three initiatives, the chapter described how metaphors can purposefully facilitate deep transformations and dissolve temporal boundaries by making actors see, value, and live the envisioned futures in the present.

The chapter suggested that all the three initiatives aim to address contemporary sustainability challenges and drive systemic transformations, but their metaphorical framings diverge in terms of style, scope, worldviews, underlying assumptions about agency and change, transformative strategies, and resulting futures. The EU Cities Mission employ metaphors of 'moonshots' or 'pilots', drawing from technical, goal-oriented, and strategic concepts that emphasise large-scale, top-down, and bureaucratic projectification through goal-oriented planning. In contrast, the Degrowth movement challenges dominant paradigms about growth and progress through critical and reconstructive language to reframe economic and social norms (e.g., portraying growth in affluent societies as an 'addiction', 'disease', or 'pathological attachment' to endless accumulation, and suggesting instead to metaphorically 'detox', 'slow down', or 'live well with less'). As a third way, Transition Towns combine culturally resonant and emotionally supportive metaphors depicting transformations as 'regenerative journeys' for inner transformation at the community level, and towns as 'living systems', thriving through 'care-full interconnections', 'local rootedness', and 'circularity'.

These different metaphorical framings not only describe approaches to transformations, but crucially help constitute prefigurative practices by translating them in different ways of experimenting with the enactment of desirable futures in the present. The moonshot-related metaphors position the policy initiatives of the EU Cities Mission as a (post-)historic achievement that requires institutional alignment and mobilisation of technical expertise through systemic prefiguration within existing structures. Even if this initiative seeks to stimulate innovation, it risks reinforcing technocratic control and ecological modernisation towards green growth if its framings are not critically examined. In the Degrowth movement, prefiguration is enacted by embodying post-growth futures through everyday 'slow' practices, while also attempting to change dominant institutions through macro-scale economic transformations and different strategies from within or outside of the system. This paradigmatic critique might struggle with broader resonance partly due to critical or provocative metaphors. Similarly, Transition Town projects resonate with many degrowth

ideas and practices. However, on the one hand, they offer more practically grounded pathways and, on the other hand, they lack structural leverage or sufficient engagement with institutional power. In fact, they tend to explore prefigurative practices alongside dominant systems, in the day-to-day ways of being, relating, and co-creating in the community life at the grassroot level.

Considering the strengths and limitations of each initiative's approaches to transformations, the chapter discussed how metaphors, as symbolic and strategic tools, render futures imaginable and emotionally resonant, create shared language and cognitive frames, mediate tensions between individual agency and systemic change, and motivate commitment and action in transformative efforts. Furthermore, emerging metaphors can challenge established domains and make the unimaginable imaginable or distant futures close. As metaphors are powerful tools for how futures can be imagined, communicated, and enacted, the chapter concluded with some reflections on how metaphors of change might prefigure transformations from backcasting and anticipation perspectives.

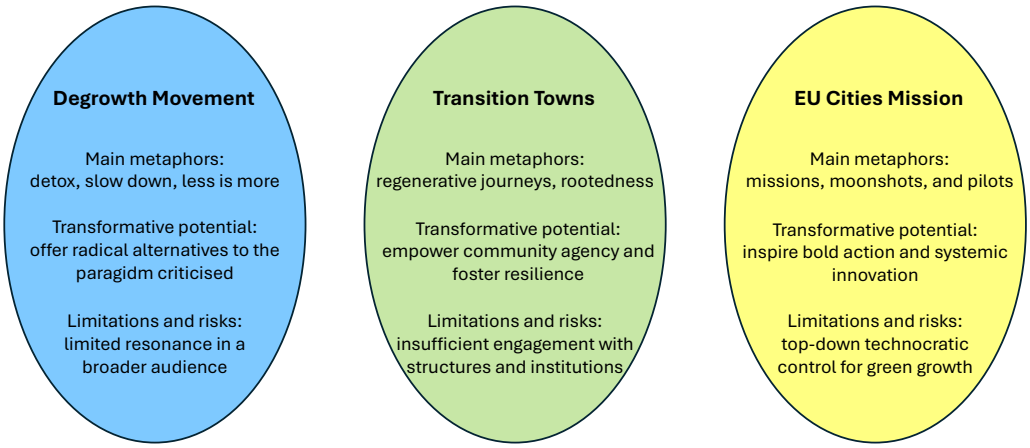

Figure 6: Summary of Paper II results
Representation of key metaphors across the three case studies and their related transformative or prefigurative potential, limitations and risks.

4.3 Walking together by asking questions: combining backcasting and prefiguration to invite a hopeful approach to desirable futures

Expanding the perspectives, conceptual frameworks, and tools to enact desired transformations, this paper continued from the conclusions of the book chapter and further investigated the relation and potential for cross-pollination between prefiguration and backcasting, as two inspiring examples of hopeful, purposeful, and proactive approaches to futures. Focusing on different aspects that characterise how just and sustainable futures can be explored and enacted through backcasting and prefiguration, a comparative analysis based on an integrative literature review was conducted. Through the comparison, the paper illuminated their similarities and differences, and discussed their compatibility across their theoretical roots and historical development, the conceptual positionings around transformations, and the practical application areas.

The analysis showed how backcasting and prefiguration originated in the second half of the 20th century in Europe and North America from different theories of change and actors, respectively scientists and strategic planners, and anarchist and socialist political strategists. Over time and across different phases, they both developed by becoming more inclusive and varied in terms of scopes, participation, and application areas. Prefiguration and backcasting share a similar aim to bring desirable futures to life in the present via experimental and learning-oriented approaches that build on various transformative strategies, means-ends relations, and practices. Noticeable differences can be identified regarding their approaches to transformation. Prefiguration tends to focus more on 'walking the talk', by embodying the desired ends in the here-and-now through experiential praxis, and backcasting on 'talking the walk', with more analytical and systematic approaches to set transition agendas, design and evaluate interventions, and foster reflexivity. Moreover, also in the practical applications there are significant differences in terms of what is explored, by and for whom, and with what levels of rigour. Backcasting offers a rich variety of well-developed and often extensively tested methodologies and tools, while prefiguration belongs to a pluriverse of less systematised grassroot experiments embodied in a multiplicity of transformative efforts.

Considering how actors from the two traditions can learn from each other and make backcasting and prefiguration metaphorically 'walk together', the paper asked a broad set of questions to stimulate dialogical reflections (e.g., around the benefits of more structured methods for prefiguration, or a focus on more embodied, relational, and affective practices to bridge gaps between knowing and doing in backcasting). Integrating backcasting from principles and prefiguration, the paper brought forward a framework for 'prefigurative backcasting' so that they can enhance each other and better support deep transformative processes towards desirable futures (Figure 7). The framework is based on three spaces that might help guide transformative processes: (1) 'desirable futures' to co-create a shared and open-ended directionality by discussing what is important or should be; (2) 'lived reality' to identify gaps, challenges, cracks, and leverage points in the thick now by investigating

what is and is not, why, and what could be different and where; and (3) 'prefigurative being' to experiment with prefigurative invitations that explore what can be and how by integrating and embodying present concerns and future desires through praxis. The paper concluded with an invite to experiment in practice and test these ideas in transdisciplinary collaborations, as it will be discussed in the next section when considering the limitations of the current work and possibilities for future research.

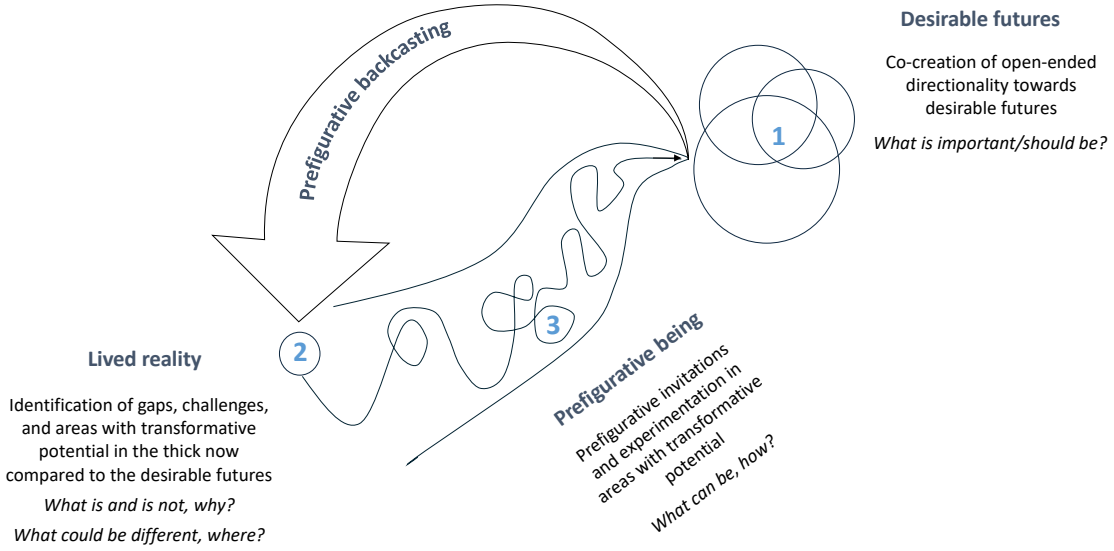

Figure 7: Summary of Paper III results
Framework for prefigurative backcasting suggesting an integration of the two approaches by outlining three spaces that can support transformative processes.

5. Discussion

Caminante, no hay camino
Se hace el camino al andar

Walker, there is no path
The path is made by walking
(Antonio Machado, 1912)

'Walking' has been used extensively as a metaphor in various discourses and is also recurrent in this thesis to indicate experimental processes and associated theories of change or transformative strategies. This discussion goes back to the prefigurative approach of 'walking by asking questions', exploring directions where there is not necessarily an established path, and co-creating the way(s) in the process of wandering and wondering. The next sections will walk the reader through the theoretical and practical contributions of the study and its limitations, before opening up for new questions, ways, and horizons.

5.1 Contribution to research and practice

Given the aim of the study to explore how to navigate deep transformations towards just and sustainable futures with hopeful and purposeful approaches, this section takes a step back to see how the research questions have been answered, what is left to address or could have been addressed better, and what is interesting to further explore.

5.1.1 Contribution to the 'how' of transformations

Considering different ways of exploring and enacting just and sustainable futures in transformative efforts, this thesis contributed to advancing the 'how' of transformations. Specifically, it focused on (a) less researched discursive, cognitive, and embodied approaches to foster deep change (e.g., by seeing how metaphors of change can prefigure); and (b) on less mainstream normative anticipatory approaches that have potential to challenge the status quo and propose viable alternatives (e.g., by comparing and integrating backcasting from principles and hegemony-transcending forms of prefiguration). The appended papers expanded the literature by offering a deeper understanding of how different transformative processes are navigated, their theories of change, approaches to futures, imaginaries, and strategies. With implications for both theory and practice, these findings can offer new perspectives for researchers, and be helpful for people engaged or interested in transformative processes to reflect, initiate dialogues, and reconsider their ways of embodying or catalysing change.

Paper I and II exemplified how the Degrowth movement, the EU Cities Mission, and the Transition Towns community project experiment with deep transformations through metaphors of change and prefiguration. In addition to bringing forward the knowledge on the topics, the findings can increase awareness among people involved or connected to the initiatives, and possibly inspire reflections around the metaphors currently in use within each initiative, their transformative potential, resonance in a broader public, and impact. For example, the presentation of Paper I at the 11th International Degrowth Conference in Oslo stimulated a discussion among activists part of different social movements in Norway, which are currently reconsidering the language used to frame their campaigns, moving away from war-related metaphors and analogies. The discussions of both papers encouraged to think critically about the relationship between hegemony and the cognitive-discursive frames evoked by metaphorical language, which can transcend, maintain, or reinforce dominant paradigms, and the resulting levels of coherence between ends, means, and manners in how transformative efforts unfold in practice.

In a similar way, Paper III analysed how prefiguration and backcasting relate to, provide tools for, and experiment with transformations across temporal dimensions. This advanced not only the knowledge about hopeful and purposeful approaches within the field of transformation, futures, and anticipation studies through the integrative review, but it also provided useful insights for practice. Given the praxis-orientation of backcasting and prefiguration, the reflections of Paper II and the results of Paper III can support different societal actors to explore and enact preferable futures in their transformative efforts, for instance in discussing shared or contested ambitions and directionality, underlying assumptions and understandings of present systems, and how anticipatory processes can be navigated in different contexts.

5.1.2 Contribution through frameworks and tools for deep transformations

Shifting to the second research question, this thesis aimed to (co-)create conceptual frameworks and practical tools to support deep transformative processes towards desirable futures, with focus on metaphors of change and prefiguration. Starting from the focus on metaphors, the research in Paper I and II contributed to the literature by introducing the concept of metaphors of change in transformation studies. Paper I also suggested new classifications of imaginaries of desirable futures and transformative strategies by integrating and furthering previous ones from sociology and sustainability science. In some cases, as for the imaginaries organised according to the critical realist four planes of being, these new categorisations have been suggested by study participants through transdisciplinary forms of collaboration. Enhancing the societal relevance of the research, the resulting alternative combinations of imaginaries and strategies can be useful for actors who need to decide upon what ends are desirable and what means might be adopted to achieve them. For example, the integration of categories suggested in Paper I could support ongoing debates among different currents of the Degrowth movement, which suggest

accepting diversity and overcoming fragmentation around common pluriversal visions of transformation and related strategies.

In addition to introducing new concepts and organisation of categories, Paper I contributed to advancing the methods available to work with metaphors by integrating conceptual metaphor theory and the discourse dynamics framework. This adaptation offers several advantages for both methodological innovation and practical experimentation. First, it can enable examining and working with metaphors as both analytical and performative devices in the prefiguration of desirable futures. Second, it can facilitate transformations at deep levels in system by analysing and experimenting with the root metaphors underneath each metaphor of change. Third, it can suggest a shift from seeing and operating with metaphors as static and fixed mappings to novel possibilities open to change, which emerge from the interactions between interconnected systems of socially situated language use and cognitive activity taking place in broader cultural landscapes.

With a focus on prefiguration in the second research questions (i.e., about developing conceptual frameworks and practical tools), Paper III suggested a novel framework for prefigurative backcasting. The latter is based on an integrative review and expanded the literature with new interpretations that can promote independent and combined developments for backcasting and prefiguration. In fact, the steps described in the framework have potential to inspire and support practical processes that aim at embodying just and sustainable futures with more systematic prefigurative methods and/or more experiential and situated approaches for backcasting. Some elements of the framework have been tested with some students in the Master course "Leadership for sustainability transitions" at Chalmers University, who have explored more embodied approaches in backcasting activities, e.g, by knitting and weaving while working on a case study about sustainable textiles production and consumption. Lastly, the framework also advanced the newest directions in prefiguration, backcasting from principles, and anticipation studies that reconsider the relation between imaginaries and strategies and rather suggest open ended experimentation through 'beginnings without ends'.

5.2 Reflections upon limitations

As described by the walking metaphor, this thesis can be considered as an initial exploration that would benefit from deeper and broader enquiry and experimentation to further develop theories, concepts, and frameworks. Two main limitations are identified: (a) a more traditional and analytical approach to topics that would benefit from more experiential methodologies; and (b) the lack of sufficient transdisciplinary collaborations to co-develop the research and test in practice some of the findings.

In general, a more prefigurative approach to the research itself would have increased the coherence between the aims and the tools used. Given the topics, a more creative research

design would have been useful to explore more deeply the desired directions by embodying and enacting them along the research process, with openness to rediscussing directionality and approaches. This could have also opened for interesting advances to methodologies for research with a transformative orientation. For instance, Paper I could have further inquired into and experimented with the transformative potential of metaphors by testing hegemony-transcending ones in cases of real-existing degrowth.

Then, a more participatory approach would have been better suited in terms of more participation and more diverse participation. For example, Paper III would have benefitted from co-developing, testing, and furthering the framework through transdisciplinary forms of collaboration. In the comparative analyses of Paper II and III, engaging with societal actors to complement the literature would have opened for different perspectives and enriched the understandings of the phenomena studied. This would have been particularly important in the case of prefiguration, which is a less established academic topic with a lot of non-theorised experimentation, often from marginalised groups in society. Considering the latter, a more diverse participation from people not representing mostly WEIRD societies would have contributed to giving legitimacy to different worldviews and values in the pursuit of *just* sustainability transformations, possibly expanding the conversation to other pluriversal alternatives.

5.3 Future research

Building on the limitations listed above and on new curiosities emerging from the research process, this section sketches some ideas for future research, which can be described through three directions of exploration. The first set of ideas is related to broadening the current work, by expanding the transdisciplinary participation to more (diverse) actors, and opening for creative forms of collaboration. The second set focuses on deepening the foundations of this research to better understand and conceptualise radical transformations. The last set of ideas suggests exploring rhyzomatically by connecting to other interesting research stems.

5.3.1 Broadening

Addressing the major limitation of this thesis, future research could broaden, expand, and nuance the current understandings and tools by opening for more participation, including more diverse participation through methods inspired by transdisciplinary research or participatory action research (cf. Bradbury et al., 2019; Pohl & Hirsch Hadorn, 2007; Polk, 2015). For example, alternative metaphors of change could be co-created by inviting a broader set of societal actors, including most affected and usually less represented people. Going beyond analysing existing metaphors, new ones could be developed, forgotten ones

rediscovered, and problematic ones composted (cf. Lockton, Chou, et al., 2019; Lockton, Singh, et al., 2019). Following the same reasoning, the framework for prefigurative backcasting would benefit from being tested, improved, or radically transformed on the ground, possibly in participatory processes that explore open-ended futures. These two ideas could also be integrated by collaboratively experimenting with the transformative potential of metaphors in prefigurative backcasting.

Going a bit further than these three examples that aim at improving the current work, a more participatory approach could also be applied to new strands of research. For instance, it could be asked whether it is enough to 'change the story', or whether we need something more performative in addition to metaphorical framings. It would be particularly interesting to expand the understanding of metaphors as linguistic devices and invite the use of other senses (e.g., introducing visual metaphors) or approaches (e.g., worldmaking practices) and explore the integration and potentials of different forms of art (cf. Chambers, 2025; Nikoleris et al., 2017; Stripple et al., 2021; Vervoort et al., 2024). As the latter is likely going to enhance imagination and other transformative capacities, future research could also inquire into how to foster the development of futures literacies, social learning, relationality, and transformative agency in addition to providing tools and frameworks.

5.3.2 Deepening

Future research could also explore another direction and discuss how to go deeper. The current study has focused on the 'how' of transformations, but equally important are the 'what', 'why', 'when', 'where', 'by and for whom'. How can these perspectives help better understand and conceptualise deep transformative change? Metaphors are often positioned at the deepest levels of heuristic models for deep transformations, but is there something more foundational and related to more ontological dimensions (i.e., not to epistemological ones like worldviews, values, mental models, etc.)? Answering similar questions would give a more solid foundation to the conceptualisations of deep transformations, as well as helping develop more accurate and useful tools for practice (cf. Davelaar, 2021; Bornemark et al., n.d.)

Going deeper in how this could look like in future research, possible guiding questions could include illuminating the limits, problematic assumptions, and unexplored potential in existing conceptualisations of deep change, and further develop them in theory and practice. Moreover, considering also how futures could be approached in a deeper way, future research could surface implicit assumptions and see how they could be navigated in the thick now. For example, it would be interesting to shed light on consensus-based or tension-oriented approaches (cf. Olsson & Jerneck, 2018) in distributed forms of prefiguration within the pluriverse, when it comes to discussions around unity within diversity, the hegemony of non-hegemony, or kintsugi against fragmentation.

5.3.3 Exploring rhyzomatically

Lastly, going beyond linear directions, future work could explore rhyzomatically different research stems that are still not connected or underdeveloped. Examples include the similarities, differences, and potential for synergies between deep transformations towards just and sustainable futures and:

a) The fourth generation of cultural historical activity theory (CHAT) with its focus on critical societal problems like sustainability challenges, which can be addressed by heterogeneous coalitions engaging in formative interventions, expansive learning, and the development of transformative agency by double stimulation (cf. Engeström, 2024).

b) The morphogenetic approach within critical realism viewing transformation as occurring in a complex interplay between structure, culture, and rounds of agency in ways that stabilise or change the status quo, whilst opening for more systemic perspectives that consider not only individuals' transformative or agential disposition but also institutional ones and related potentialities (cf. Archer, 1995, 2020; Nikoleris, 2018).

c) Broadly speaking more relational approaches that open for considerations about more-than-human and inter-species ethics in the ways futures are envisioned and enacted, as well as considering nature-culture hybridity in the material-discourses dynamics that characterise deep transformations (cf. De La Bellacasa, 2017)

6. Conclusions

Offering alternatives to increasingly pessimistic attitudes to futures and lack of transformative capacities to deal with the polycrisis, this thesis is positioned among hopeful approaches to radical transformations towards desirable futures. Specifically, it explored how just and sustainable futures are enacted in transformative efforts, and what conceptual frameworks and practical tools can be (co-)created to support deep transformative processes by working at the levels of structures, paradigms, and worldviews (i.e., with a focus on prefiguration and metaphors of change)

Building on transformation, futures, and anticipation studies, in a broader context of sustainability science and political ecology, the thesis provided an overview of the key ideas, and discussions around relational and deep transformations, the contested concepts of justice and sustainability in transitions and transformations, the plurality of futures and approaches to futures, as well as basic insights about prefiguration, backcasting and metaphors as foundational concepts in the appended papers.

Adopting an undisciplinary and transformative orientation to methodological pluralism, underlaboured by a critical realist philosophy of science, the first two papers adapted the discourse dynamics framework and conceptual metaphor theory to analyse metaphors of change, and the third paper conducted a comparative analysis based on an integrative literature review of backcasting and prefiguration.

Contributing to advancing knowledge and practices for transformative change, each paper furthered different aspects focused on the 'how' of transformations in terms of depth and directionality of change, various approaches to futures, and transformative tools or frameworks. Specifically, Paper I critically surfaced how the Degrowth movement uses metaphors of change to imagine desirable futures and coherent strategies across distributed forms of prefiguration. Building on the first article, Paper II analysed and contrasted the prefigurative potential of metaphors used by the Degrowth movement, the EU mission 'Climate-Neutral Cities', and the Transition Towns community project. Paper III compared theoretical and historical roots, conceptual positionings around transformations, and practical application areas of prefiguration and backcasting to integrate them in a framework for prefigurative backcasting.

Bringing this work further, future research could explore three directions. First, broadening participation to more transdisciplinary forms of collaboration could allow co-creating alternative metaphors, e.g., testing in practice the framework for prefigurative backcasting, and focus on more creative practices. Second, deepening the theoretical foundations could help better understand and conceptualise radical transformations. Lastly, exploring rhyzomatically by connecting to other research stems could foster cross-pollination with fourth generation Cultural Historical Activity Theory, the critical realist morphogenetic approach, and/or more-than-humans relational approaches to deep transformations.

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