



# Integrating post-growth economics into transformative adaptation: Property relations, capital, and democratic planning

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## ABSTRACT

Transformative adaptation (TA) is increasingly promoted as a way to drive systemic change beyond incremental adjustments. Yet many TA initiatives fall short of their transformative aims. This paper argues that this is not only due to implementation challenges, but also because of conceptual blind spots. We review TA literature and problematise three of its core assumptions regarding onto-epistemic and political shifts, root causes of vulnerability, and multi-level stakeholder engagement. Drawing on post-growth economics, we contend that TA tends to overlook some key dimensions of transformation. First, its focus on onto-epistemic and political shifts rarely challenges privatised property relations and sometimes reinforces scarcity narratives that justify exclusive control and management. Second, vulnerability is linked to a preoccupation with growth, efficiency, and commercialisation, yet these are not systematically tied to the structural dynamics of capital accumulation. Third, stakeholder engagement tends to foreground liberal notions of participation and governance, with little attention to democratic control over the economy. To address these gaps, we propose a set of reflective refinements based on post-growth principles: reorient development toward collective, deaccumulated ownership; link vulnerability to the structural tendencies of capital accumulation; and broaden participation and governance toward economic democratisation and planning. These dimensions are interdependent, with property relations and capital accumulation forming both structural arenas of transformation within, and obstacles to, democratic planning of the economy. We conclude by outlining key directions for future TA research.

## 1. Introduction

Climate change poses significant threats to ecological systems, human livelihoods, wellbeing, and public health (IPCC, 2023). In addition to mitigation efforts, the need for robust climate change adaptation is becoming increasingly urgent as the effects of decarbonisation will take generations to stabilise atmospheric changes. Consequently, vulnerable communities will continue to face harm despite mitigation efforts (Pielke et al., 2007). Policymakers and development practitioners must therefore expand climate change adaptation.

Adaptation involves adjusting to the impacts of climate change to minimise harm and leverage potential benefits, such as improved health and wellbeing, enhanced food security, and reduced damages from climate hazards (IPCC, 2023). This includes both proactive and reactive strategies across natural and human systems, ranging from constructing flood defences to improving decision-making processes for smallholder farmers (IPCC, 2023). Various frameworks have emerged to

conceptualise climate change adaptation, incorporating ideas such as vulnerability, resilience, coping, and adaptive management (Smit and Wandel, 2006; Adger, 2009; Pelling, 2011). While these approaches often involve incremental adjustments to restore or strengthen social-ecological systems, *transformative* adaptation (TA) has gained importance over the past decade.

TA stresses tackling the root causes of vulnerabilities and leveraging local, transdisciplinary knowledge to develop socially innovative, non-linear approaches (Ziervogel et al., 2022) – a need recognised by the IPCC since its Fourth Assessment Report (AR) and reaffirmed in AR5:

“Much of the existing adaptation literature examines gradual adjustment or accommodation to change. But a growing literature highlights the importance of transformative adaptation”

(IPCC, 2014)

In AR6, TA is further emphasised, with the IPCC using “transformational” and “transformative” adaptation interchangeably, though

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the glossary only defines transformational adaptation (see [Filho et al., 2023](#) on differences). Distinguishing it from incremental adaptation and introducing the concept of *Climate Resilient Development Pathways*, AR6 highlights the need for transformative changes that integrate mitigation and adaptation, while advancing sustainable development ([IPCC, 2023](#)).

However, many existing adaptation initiatives remain technocratic, top-down, and capital-intensive (See [et al., 2022](#)). For example, in their review of 34 national and local adaptation and vulnerability-reduction initiatives, ([Eriksen et al., 2021](#)) found that such programmes often redistribute or even exacerbate vulnerabilities, while excluding or inequitably involving stakeholders. They call for adaptation efforts that transcend mainstream development agendas and its focus on economic growth, market expansion, and profitability – priorities that often perpetuate the very conditions driving anthropogenic climate change.

Post-growth economics – an evolving field encompassing strands such as Degrowth and Post-Growth Political Economy (see [Hofferberth, 2025](#)) – has long critiqued such development agendas, exposing the social-ecological harm of (undirected) economic growth and capitalism ([Dengler and Seebacher, 2019](#); [Nirmal and Rocheleau, 2019](#); [Garcia-Arias and Schöneberg, 2021](#); [Kallis, 2023](#)). It advocates for a systemic reconfiguration of political economies to downscale energy and material use within ecological limits, while tackling inequality and enhancing wellbeing ([Kallis, 2018](#); [Hickel, 2021b](#); [Kallis et al., 2025](#)). Some strands within post-growth economics also draw on ‘Global Majority’ worldviews such as Buen Vivir, Swaraj, and Ubuntu ([Kothari et al., 2014](#)), though significant work remains to confront injustices rooted in South–North dynamics, including racism and colonial power ([Fiscella, 2024](#))<sup>1</sup>.

However, despite post-growth economics’ explicit focus on transformation and alternative development paradigms, there has been little dialogue with TA research. This disconnect is also evident in the IPCC reports. Although degrowth has been referenced in these reports since 2022 ([IPCC, 2023](#)), fragmentation across and within working groups appears to have hindered meaningful dialogue. This is unfortunate as both fields emphasise systemic causes of social-ecological inequalities and degradation in pursuit of transformative change. Yet, while sharing these overarching concerns, they often approach them through different theoretical lenses, rooted in distinct disciplinary traditions and intellectual histories. As such, they may articulate similar goals in divergent ways. This divergence is not exceptional but rather typical of interdisciplinary fields, and precisely for that reason, fostering dialogue between them is all the more important.

To begin such a dialogue, this paper uses a problematisation review method ([Alvesson and Sandberg, 2011](#); [Alvesson and Sandberg, 2020](#)), exploring the following questions:

1. What key assumptions underpin conceptual TA frameworks?
2. How are these assumptions reflected in empirical case studies of TA?
3. How can core principles of post-growth economics help explain – and problematise – potential gaps between the conceptual aspirations and the empirical realities of TA implementation?
4. What new research avenues emerge from bringing post-growth economics into dialogue with TA scholarship?

## 2. Methodology

This study employs a *problematisation review* methodology, which goes beyond traditional gap-spotting and narrative synthesis by critically examining and challenging the assumptions underlying existing knowledge in a field ([Sandberg and Alvesson, 2011](#); [Alvesson and](#)

[Sandberg, 2020](#)). It aims to catalyse theoretical advancements, questioning dominant perspectives and identifying opportunities for disruptive and transformative research.

Problematisation reviews are particularly suited to stimulate theory development, as they interrogate the assumptions, institutions, and structures shaping a domain of knowledge. They differ from systematic reviews in their emphasis on reflexivity, broad yet selective reading, problematisation rather than accumulation of knowledge, and prioritising depth over breadth ([Alvesson and Sandberg, 2020](#)). Our methodology can be summarised in four interconnected steps:

1. **Identifying a domain of literature:** This step involves identifying key works within TA. As detailed in [Section 3.1](#) and illustrated in [Figure 1](#), an initial pool of 2,177 articles was narrowed down to 13 *conceptual* papers and 20 *empirical* papers (case studies and concrete practices), which were analysed in detail. This selection reflects a deliberate emphasis on influential articles on TA, adhering to the principles of broad but selective reading and an analysis that prioritises depth over breadth ([Alvesson and Sandberg, 2020](#)). The appendix contains the list of papers selected for in-depth analysis.
2. **Identifying assumptions:** The selected *conceptual* literature was analysed through thematic coding to outline key assumptions that underpin TA frameworks.
3. **Unfolding assumptions in practice:** This involves examining how the identified assumptions play out in real-world TA initiatives. This means exploring whether they hold, are challenged, or reshaped in practice. By analysing *empirical* case studies of TA implementation, this step highlights potential tensions between theoretical assumptions and practical implementation.
4. **Integrating alternative assumptions to advance theory development:** Building on the tensions identified in step 3, we draw on post-growth economics to better understand how some of TA’s empirical limitations may stem from its own conceptual assumptions. In response, we integrate post-growth principles into conceptual TA frameworks to enrich and refine their focus.

Our approach, like any other, is not without limitations. While [Alvesson and Sandberg](#) advocate for deep engagement with a small sample of literature ([Alvesson and Sandberg, 2011](#)), this can risk underrepresenting the broader field ([Alvesson and Sandberg, 2020, 21](#)). To address this, we incorporated a systematic procedure for selecting the corpus, aiming to investigate a small sample of literature in depth while covering a broad range of perspectives that discuss TA. In addition, we modified the original six-step method (See [Alvesson and Sandberg, 2011](#)) – drawing on subsequent applications (e.g. [Matthews et al., 2016](#); [Dzhengiz et al., 2023](#)) – to simplify its procedure and presentation, while preserving its core analytical principles.

In what follows, [Section 3](#) (Results) focuses on steps 1 to 3, whereas [Section 4](#) (Discussion) operationalises step 4.

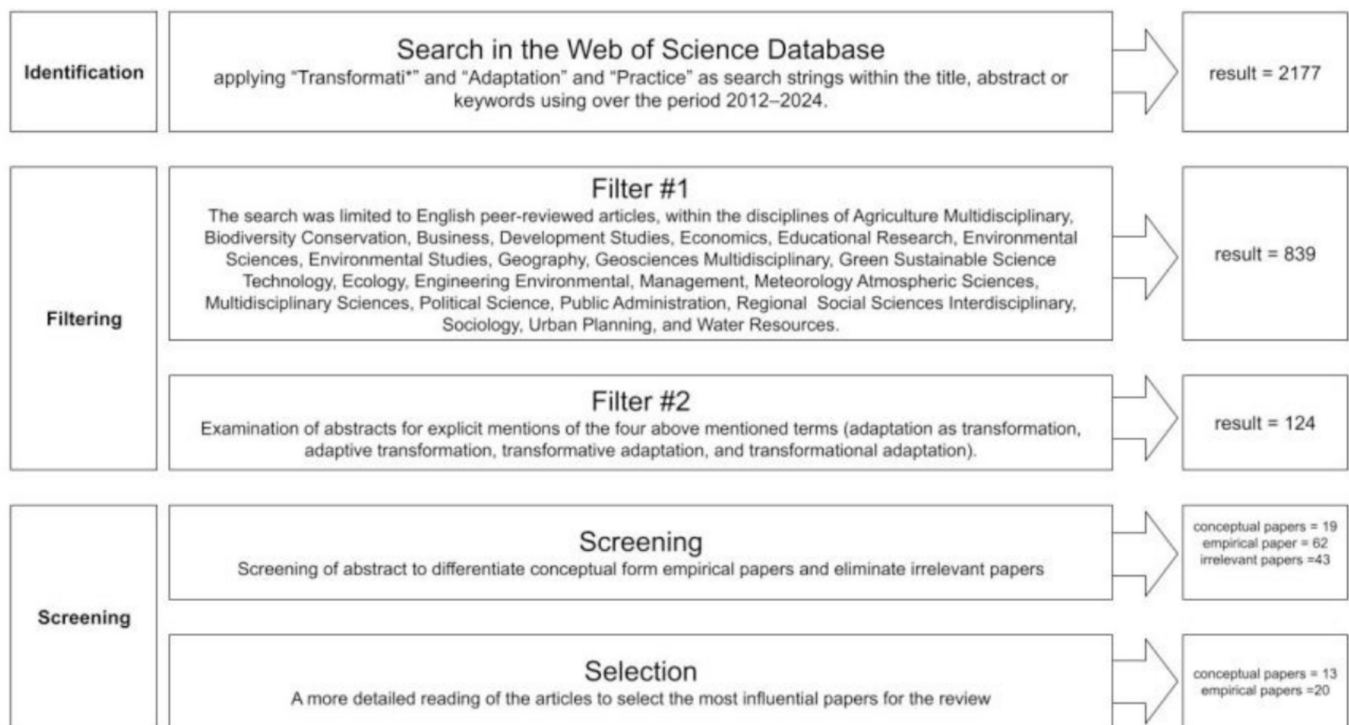
## 3. Results

### 3.1. Identifying a domain of literature

Following [Alvesson and Sandberg’s \(2011\)](#) principles, established reviews by [Lonsdale et al. \(2015\)](#) and [Deubelli and Mechler \(2021\)](#) were first reflexively analysed. These works highlighted that the concept of transformation in adaptation emerged in the IPCC’s Special Report on *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* (SREX) ([Pelling et al., 2015](#)). This marked a shift toward recognising the need for fundamental changes in social-ecological systems, distinguishing TA from incremental adjustments that primarily address immediate vulnerabilities without altering their systemic causes ([Lonsdale et al., 2015](#); [Deubelli and Mechler, 2021](#)).

The literature uses various terms to describe approaches that emphasise profound changes in response to climate risks – for example

<sup>1</sup> For more critiques of degrowth, see: [Warlenius \(2023\)](#) and [Savin and van den Bergh \(2024\)](#). For critical but constructive engagements from feminist, indigenous, post-development, and/or pluriversal perspectives, see, e.g.: [Nirmal and Rocheleau \(2019\)](#) and [Garcia-Arias and Schöneberg \(2021\)](#).



**Figure 1.** Process to derive systematic literature for the problematisation review.

"adaptation as transformation" (Pelling, 2011), "adaptive transformation" (Preston et al., 2013), "transformative adaptation" (Park et al., 2012), and "transformational adaptation" (Kates et al., 2012). We summarise them under the concept of TA. While the terms differ, they all underscore the limitations of incremental adaptation and the importance of tackling systemic vulnerabilities (Pelling, 2011; Park et al., 2012; Kates et al., 2012; Preston et al., 2013; Lonsdale et al., 2015; Deubelli and Mechler, 2021). However, the distinction between incremental and transformative practices often remains blurred, as incremental steps can create opportunities for broader transformation (Lonsdale et al., 2015; Colloff et al., 2021). In addition, Lonsdale et al. (2015) highlight that key aspects of TA remain ambiguous, including its purpose (e.g., addressing root causes of poverty, deliberate practice changes, learning through re-evaluation, shifts in power and representation), scale (e.g., system-wide or multi-system change), and the values to be transformed (e.g., personal, collective, relational, or institutional).

To delineate this domain, we conducted a search in the Web of Science Database for the period 2012–2024, reflecting SREX's introduction of transformation as an adaptation pathway (IPCC, 2012). The application of search strings (see Figure 1) returned 2,177 articles, which were filtered for relevance, reducing the number to 839. Abstracts were reviewed to identify articles explicitly mentioning one of the four terms ("adaptation as transformation", "adaptive transformation", "transformative adaptation", and "transformational adaptation"), yielding 124 entries after duplicate removal.

After reviewing the abstracts and screening the papers, these entries were categorised into 19 conceptual and 62 empirical papers. A total of 43 papers were excluded due to a narrow focus on specific topics like airport adaptation, religious studies, or sports studies (7), or because TA was only mentioned as a concluding recommendation without substantive discussion (36). This exclusion does not question the validity or legitimacy of these papers; rather it reflects the application of Alvesson and Sandberg's (2020) principle of prioritising depth over breadth in the problematisation process. The aim was to select a set of influential articles, rather than to exhaustively map the field. Hence, after a detailed reading of the conceptual papers, 13 were selected (see Appendix A) for

their representativity across disciplines (e.g., Development Studies, Environmental Studies, Green & Sustainable Science & Technology) and social-ecological systems (e.g., fisheries, urban spaces, agricultural systems), as well as their influence (considering citations). For the empirical papers, we applied the original selection criteria along with additional considerations: geographic diversity (e.g., Asia, Europe, Sub-Saharan Africa) and a balance between particular case studies and cross-case comparisons. These additions reflect our aim to explore how assumptions from conceptual papers manifest in, or are challenged and reshaped by, real-world practices. To achieve this, the corpus needed to reflect varied global contexts and both specific cases and comparative analyses. Lastly, papers relying solely on modelling or quantitative methods were excluded to ensure a focus on a nuanced, context-driven analysis of practices. As a result, 20 of the 62 empirical articles were selected (see Appendix A). Figure 1 summarises the procedure.

### 3.2. Identifying assumptions

The second step involved analysing the selected conceptual literature to outline shared assumptions that underpin TA frameworks. This reflective approach sought to avoid presuppositions while identifying key aspects of TA rooted in broader theories (O'Brien, 2012; Pelling et al., 2015). A cross-reading of conceptual papers, accompanied by an interpretative coding process, resulted in three core assumptions, summarised in Table 1.

The three assumptions are closely interconnected, reinforcing the need for holistic approaches while offering concrete entry points for critical evaluation.

### 3.3. Unfolding assumptions in practice

The third step builds on the previous one by conducting a reflexive analysis of the selected empirical papers, assessing them against the key assumptions identified in the conceptual literature.

**Table 1**

Core assumptions in transformative adaptation practices literature.

Assumption	Examples from Sample Literature	Reference
Onto-epistemic and political shifts	"... these can include the transformation of energy and agricultural systems, financial systems, governance regimes, development paradigms, power and gender relations, production and consumption patterns, lifestyles, knowledge production systems, or values and world-views."	(O'Brien, 2012)
	"... shifts in paradigms, norms, world views, interests and values by decision-makers and practitioners are needed to foster changes in societal rules relating to adaptation and the emergence of innovative governance systems for [TA]"	(Colloff et al., 2017a, 90)
	"... several changes to social structures or values, goals and world views of actors (i.e. "deep leverage points") are more effective."	(Fedele et al., 2019, 121)
Addressing the latent root causes of vulnerability	"[TA] emphasizes the importance of understanding the causal structure of vulnerability in different political-economic and environmental contexts as the basis of adaptation planning."	(Bassett and Fogelman, 2013)
	"[TA] attempts to address the roots of vulnerability through action "that changes the fundamental attributes of a system in response to climate and its effects."	(Eriksen et al., 2015)
	"[TA]: more radical changes that seek to address underlying structural inequities, while also reducing vulnerability to climate risks."	(Berkhout and Dow, 2023)
Stakeholder engagement on multiple levels and scales	"... create cross-scale partnerships to implement transformative adaptation; engage with multiple levels of governance to spread transformative adaptation."	(Fedele et al., 2019, 121)
	"... the capacity to develop adaptive, transformative governance is relative to the type of change that is intended and the position of the people within the system who are seeking the change".	(Colloff et al., 2017b, 88)
	"Enabling such [TA] will necessitate consensual schemes of international cooperation, efficient information flow into local-to-regional normative frameworks, and setting mechanisms for stewardship and traceable evidence of compliance".	(Lluch-Cota et al., 2023)

### 3.3.1. Onto-epistemic and political shifts

TA assumes that adaptation requires what we refer to as onto-epistemic and political shifts: transformations in the foundational assumptions about being and knowing that are deeply entangled with political structures, power relations, and ecological realities. While some intellectual strands associated with TA tend to link the onto-epistemic with the *personal sphere of transformation* and separate it from the *political sphere of transformation* – albeit acknowledging their interactions and embeddedness (O'Brien, 2018) – feminist traditions in ecological economics and beyond have generally been critical of such separations (e.g., Nelson, 2009; Salleh et al., 2017), with some referring to the *personal-political* (González-Hidalgo and Zografos, 2020). These traditions highlight that the onto-epistemic is political. During the interpretative coding process, we therefore chose to integrate the onto-epistemic and political into a single category. This decision clearly foregrounds the political-onto-epistemic nexus, without, however, fully dissolving the distinctions between them – hence, the category: onto-epistemic and

political.

In TA, the onto-epistemic and political involves challenging institutional and developmental paradigms – values, beliefs, rules, and governance mechanisms – to achieve systemic change (O'Brien, 2012; Colloff et al., 2017a). This is often underpinned by a shift from anthropocentrism to ecosystem stewardship (O'Brien and Sygna, 2013). Frameworks like Regenerative Agriculture (RA), Nature-Based Solutions (NbS), and VRK (values, rules, knowledge) are meant to illustrate how changing values and knowledge systems can align governance with TA goals (Colloff et al., 2017b; Gosnell et al., 2019). For example, a case study from the French Alps highlights how evolving local governance incorporated diverse forms of knowledge to foster locally adapted systems while promoting values like place attachment and community solidarity (Colloff et al., 2020). This example shows how aligning VRK elements can challenge conventional adaptation perspectives and open pathways for transformation. The framework underscores reframing values, reforming rules, and co-producing knowledge, aligning with the need for a paradigm shift in addressing climate change and adaption needs (see also Warner et al., 2019; Colloff et al., 2020; Islam et al., 2021 for examples of TA practices that demonstrate the potential to advance alternative institutional paradigms).

However, despite the emphasis on onto-epistemic and political shifts in TA, related practices are often limited in their ability to shift world-views toward genuine ecosystem stewardship or foster a deeper recognition of the interconnectedness of human and ecological systems (Garimella and Prakash, 2023). Furthermore, dominant practices rarely emerge from equitable political processes or provoke broader institutional changes in state and development paradigms. For instance, an analysis of the Global Climate Fund's TA interventions found that most funded projects align closely with mainstream development frameworks, influenced by corporate and financial institutions, that tend to treat practices such as RA and NbS primarily as market-driven opportunities (Kuhl and Shinn, 2022). Eriksen et al. (2021) highlight that such practices are frequently framed as profit-making ventures or rely on carbon-capture technologies rather than being understood as pathways to tackle root causes of vulnerability (see Section 3.3.2). While RA and NbS practices have been promoted for their potential to alter values and worldviews, they mostly operate within an adaptation discourse that prioritises productivity, profit, and economic growth over systemic transformation (Kotsila et al., 2021; Anguelovski and Corbera, 2023; Gordon et al., 2023). For example, corporate agri-food systems have begun investing in RA practices, not primarily for their ecosystem benefits or potential to challenge dominant paradigms, but for their capacity to boost agricultural productivity and generate profit (Gordon et al., 2023; Bless et al., 2023).

Such a market-centric approach was also evident at COP28, where over 160 parties endorsed the *Action Agenda on Regenerative Landscapes* – a document developed by corporate entities such as the World Business Council for Sustainable Development (WBCSD) and the Boston Consulting Group, reflecting the profit-oriented concerns of private investors (WBCSD, 2023). Similarly, despite their potential co-benefits for adaptation and mitigation, NbS practices often risk exacerbating inequalities, for example through "green grabbing", involving the appropriation of land and resources (Locatelli et al., 2022). The growing interest of private investors in NbS highlights this trend. At COP26, a report presented by the global law firm Clifford Chance outlined how asset management firms leverage NbS to align with lucrative private investment strategies (Anguelovski and Corbera, 2023). In 2022, the Intercontinental Exchange (ICE) launched a financial product commodifying NbS into credit contracts, creating new markets around these initiatives (Anguelovski and Corbera, 2023). While these mechanisms aim to attract private investment, they largely fail to foster environmental protection or resilience and often sideline critical distributional concerns, such as equitable benefit-sharing (Kotsila et al., 2021; Anguelovski and Corbera, 2023).



### 3.3.2. Latent causes of vulnerabilities

Another key TA assumption is the need to tackle root causes of vulnerability – such as systemic inequities in resource access and decision-making – rather than simply adapting to (visible) symptoms of climate impact (Filho et al., 2022; Lamb et al., 2023). Associated practices in the literature include ecosystem restoration (e.g., grasslands, wetlands), sustainable land management (e.g., agroforestry, prescribed fires), and livelihood diversification (e.g., eco-tourism, payment for ecosystem services) (Fedele et al., 2020; Colloff et al., 2021). For example, in an Australian case study on grazing systems, local actors were empowered to take a greater role in research and decision-making (Colloff et al., 2021). This shift created a more balanced power dynamic in resource access and livelihood management, illustrating how adapting governance structures can enhance sustainability and promote more equitable resource outcomes to mitigate structural vulnerabilities.

However, despite TA's focus on addressing the root causes of vulnerability, many interventions fail to achieve – or even pursue – this goal. Rather than tackling causal drivers of vulnerability, they prioritise scaling up and replication, often emphasising market solutions, new technologies, and technical processes (Kuhl and Shinn, 2022). In doing so, they remain susceptible to perpetuating or even exacerbating vulnerabilities and risks for local communities over the long term (Warner and Kuzdas, 2017).

For example, in the empirical studies on flood risk, adaptation is often incremental (e.g., constructing higher flood barriers, elevating houses), modifying the system to accommodate change while leaving its fundamental vulnerabilities intact (Clarke et al., 2018; Warner et al., 2019; Clarke and Murphy, 2023). A case study in Nepal highlights how interventions to reduce flooding in the lower basin focused on building dams and expanding channels (Warner et al., 2019), addressing symptoms rather than the causes – such as the dynamic interaction of climate, land use, and societal change. As development continues in the upper basin, flood risk returns. A more transformative response would tackle root vulnerabilities, for example by restoring wetlands upstream (Clarke et al., 2018).

### 3.3.3. Stakeholder engagement on multiple levels and scales

TA is assumed to operate across multiple scales (e.g., local to global) and levels (e.g., jurisdictional), emphasising stakeholder engagement that involves diverse knowledge systems (Colloff et al., 2017b; Fedele et al., 2019). Recognising epistemological pluralism is crucial to understanding the socio-political dimensions of climate adaptation (Eriksen et al., 2015; Bosomworth et al., 2017). Incorporating the voices of those directly affected, known as knowledge co-production, involves interactive processes that generate context-specific knowledge. For example, empirical cases point to initiatives related to NbS that employ such processes in planning and implementation (Lavorel et al., 2019; Colloff et al., 2020; Colloff et al., 2021; Scolobig et al., 2023).

Despite the emphasis on stakeholder engagement and multi-level and multi-scalar governance, TA practices are often limited by institutional path dependencies, political legitimacy, and everyday politics (Bosomworth et al., 2017; Fedele et al., 2020; Zografos et al., 2020). For example, the superblock initiative in Barcelona illustrates the socio-political complexities of urban transformation. Implemented by a newly elected left-wing mayor with limited authority, the project encountered resistance due to political opposition and broader ideological contestations, competing claims for credit among stakeholders, and conflicts over distributional justice and local engagement (Zografos et al., 2020). The superblock initiative, like similar projects (Käyhkö et al., 2020; Colloff et al., 2021; De Rosa et al., 2022), underscores the challenges of navigating socio-political tensions in pursuing TA.

Another critical issue is the nested interdependence of scales in TA initiatives, where actions at one level can influence or undermine outcomes at others (Park et al., 2012). For instance, Käyhkö et al. (2020) found that transformative measures in Nordic agrifood systems, while successful at the farm and regional levels, failed to influence national

frameworks due to institutional incompatibilities. Farmers recognised the benefits of practices like planting trees on marginally productive land to align mitigation and bio-economy goals, but national regulations in Sweden and Finland discouraged such efforts, creating a barrier to broader adoption. Similarly, Scolobig et al. (2023) examined NbS projects and highlighted that long-term impacts were limited by a failure to affect institutional frameworks, underscoring the necessity of collaboration across scales.

Knowledge co-production, central to understanding vulnerabilities and promoting deliberative multi-scalar governance (Garcia and Tschakert, 2022), faces challenges. While co-production processes aim at inclusivity and context-sensitivity (Norström et al., 2020; Vincent, 2022), they are often hindered by power imbalances. Elite institutional actors typically initiate these processes with greater resources and cultural capital than participating groups, particularly in North-South collaborations marked by historical inequities (Turnhout et al., 2020; Vincent, 2022). Such dynamics can marginalise less connected groups, with elite actors shaping participation and outcomes to align with their priorities (Flinders et al., 2016; Turnhout et al., 2020). This focus on “knowledge created [as an output] rather than users [and the process of knowledge creation]” (Vincent, 2022, 892) risks perpetuating existing power asymmetries.

## 4. Discussion: integrating post-growth economics into TA frameworks

This section addresses step four of the problematisation review, emphasising that the limitations of TA practices (see Section 3.3) are not *solely* the result of implementation constraints, namely the challenges of translating conceptual aspirations into real-world contexts shaped by existing structures; a common issue for any theory. Instead, we argue that the ways these limitations are currently playing out are *also* shaped by the assumptions embedded in TA frameworks themselves. These assumptions omit, sideline, or obscure some critical aspects of social-ecological transformation, even as they effectively highlight others.

While acknowledging that, like any theoretical approach (including post-growth economics), the actualisation of conceptual goals is always constrained by pre-existing political, economic, and socio-cultural structures – what Bob Jessop (2005) refers to as the ‘strategic selectivities’ of structures – we emphasise that outcomes also depend on how crises and challenges are conceptually construed (Jessop, 2015). That is: while concepts are structurally constrained, they also play a role in structuring agency. It is this structuring role of conceptual assumptions that we focus on here.

Against this background, we examine how post-growth economics can help explain TA's transformational limitations and inform the refinement of its underlying assumptions, thereby advancing TA theory. To be clear, we neither ‘compare’ TA and post-growth economics as such, nor argue that one is superior to the other. Rather, we use post-growth perspectives to better understand and reflect on specific conceptual assumptions that influence agency.

Post-growth can be defined as a planned reduction of aggregate energy and resource use aimed at aligning the economy with ecological limits while improving human wellbeing and reducing inequality (Kallis et al., 2025; Kallis, 2018; Hickel, 2021b; Hickel et al., 2022). Unlike economic recessions, which are uncontrolled contractions that harm essential services and exacerbate inequality, post-growth aims to selectively scale down sectors and activities that are less necessary, wasteful, or environmentally harmful – such as fossil fuels, industrial agriculture, and extractive finance – while strengthening essential (public) services like healthcare, education, and renewable energy. The goal is not to indiscriminately shrink GDP but to redirect productive capacity away from activities that are most profitable – yet less necessary, wasteful, or environmentally damaging – and toward those essential for wellbeing and social-ecological transformation. This requires democratic economic planning to reallocate resources, labour,

and credit in ways that prioritise collective needs and ecological sustainability over market-driven profits (Bärnthaler et al., 2025).

Post-growth economics also aims to foster decolonised economies, addressing the lingering impacts of (neo-)colonial exploitation (Ramcilovic-Suominen et al., 2025). These impacts persist through low wages and resource prices in the Global South and deeply unequal trade agreements, reinforced by Western military powers and geopolitical dominance (Dorninger et al., 2021; Hickel, 2021b; Hickel et al., 2022; Hickel et al., 2024). These exploitative world-system relations perpetuate the transfer of wealth and resources from the South to the North, from peripheries to the capitalist core, undermining economic sovereignty and the prioritisation of local needs, as well as exacerbating inequalities and vulnerabilities.

In what follows, we introduce three – closely interlinked – key assumptions that inform post-growth economics: prioritising decommodification and collective forms of ownership that challenge dominant property relations as a development goal; addressing the dynamics of capital accumulation as root cause of vulnerabilities; and enabling democratic economic planning. Through this, we aim to demonstrate how post-growth economics can enrich and refine TA frameworks.

#### 4.1. *Onto-epistemic and political shifts: transforming property relations through ‘radical abundance’ as development goal*

As discussed in Section 3.3.1, a key assumption in the conceptual TA literature is the necessity for onto-epistemic and political shifts, including changes to prevailing institutional paradigms and development frameworks. However, what these shifts entail – both conceptually and in practice – has remained somewhat ambiguous in the TA literature. While it emphasises the need to focus on *deep leverage points*, critical dimensions of these have received limited attention. Notably, challenging private property relations – a cornerstone institution of capitalist development (Harvey, 2014) – has not emerged as a *constitutive* feature of TA. In some cases, TA practices have even reinforced these relations, operating on the notion that resources are inherently scarce and therefore require exclusive control and management to ensure their efficient use and preservation.

For example, Wamsler (2015) highlights how ecosystem-based adaptations in German municipalities were constrained by private property protections and temporary funding schemes, prioritising tourism-driven growth while limiting equitable resource access and long-term collective management. Similarly, concepts like NbS and RA have promoted market-based developments (see Section 3.3.1), while “ecosystem stewardship” has sometimes been appropriated to justify and extend claims for private property and land ownership (Shrubsole, 2024). This tends to perpetuate environmental degradation and structural vulnerabilities rather than mitigating them, intensified through land grabbing and the displacement of communities (Spash, 2015; Spash, 2022). While such patterns undoubtedly reflect the strategic selectivities of existing structures, they also suggest that challenging private property relations may have received too little conceptual emphasis as a constitutive feature within TA frameworks – highlighting the need for greater reflexivity regarding how this shapes TA practices and strategies.

The concept of *radical abundance* is central to post-growth economics (Hickel, 2019; Paulson, 2023) and draws on earlier debates, such as the Lauderdale Paradox (Maitland, 1804; see also Hupfel and Missemmer, 2023), which argues that increases in ‘private riches’ often come at the expense of ‘public wealth’. It also emerges from diverse intellectual traditions, including feminist thought (e.g., Mehta and Harcourt, 2021), as well as anthropological (Sahlins, 1976) and economic (Galbraith, 1998) critiques. It is particularly useful for refining TA frameworks, as it *directly* confronts privatised property relations, positioning their transformation as a constitutive feature of alternative development paradigms.

Rather than accepting scarcity as a natural condition, radical

abundance reframes access to resources as a matter of collective entitlement and shared stewardship. Historically, such scarcities were manufactured through mechanisms such as the enclosure of common lands and colonial expropriation, which forcibly displaced communities and entrenched exploitative wage labour systems. In contemporary contexts, these dynamics persist through land grabbing – particularly in the Global South – as well as through privatised healthcare, exorbitant housing costs, and restricted public services (Hickel, 2019).

Radical abundance envisions an economy centred on the equitable restoration of public goods, commons, and shared wealth – enabling people to meet their needs collectively and thrive without dependency on high incomes and perpetual growth in energy and material throughput. In doing so, it challenges the legitimacy of exclusive ownership, enclosure, and commodification, and instead fosters new property relations grounded in decommodified, equitable resource distribution, universal public services, and collective ownership. For example, a case study in the United States examines the cooperative ownership model of resident-owned manufactured housing communities, illustrating how collective land ownership can transform tenants’ relationships with land by prioritising community wellbeing over profit (Lamb et al., 2023). While this model does not necessarily mitigate the physical vulnerabilities of flood-prone housing, it enhances residents’ adaptive capacity by improving access to resources, fostering community cohesion, and reducing housing insecurity in the face of market pressures (Lamb et al., 2023).

This shift from privatisation to collective wealth undermines the logic of commodification and austerity, which impose scarcity to drive productivity and growth. Instead, the focus on radical abundance prioritises meeting essential needs collectively – for example through communalised agricultural land, public ownership of essential infrastructure, and seed commons (e.g. Bollier and Helfrich, 2019; Bärnthaler and Hickel, 2025). Centring radical abundance within TA’s development paradigms not only directly challenges private property relations but also articulates a specific vision for transformative change – grounding TA in principles that tend to be more resistant to co-optation.

#### 4.2. *Latent causes of vulnerability: bringing capitalism into the debate*

As outlined in Section 3.3.2, a key assumption in conceptual TA work is the focus on tackling root causes of vulnerability, such as poverty, social inequality, and exploitative social and society-nature relations. In this context, some TA scholars highlight the “dominant preoccupations with economic growth, efficiency and private sector commercialisation” (Eriksen et al., 2021, 9). However, while these conceptual interventions are important, the concrete dynamics of capital accumulation as key drivers of vulnerability often remain underexplored (see Pirgmaier and Steinberger (2019) for a similar critique in the context of ecological economics). Capitalism’s drive for endless accumulation fuels an ever-expanding spiral to extract resources, turn them into commodities, and reinvest the surplus into further rounds of extraction and accumulation (Pineault, 2022; Bärnthaler et al., 2024). This ever-intensifying and expanding process of surplus-value maximisation reconfigures and undermines both society and nature, creating systemic vulnerabilities (Fraser, 2014).

As outlined below, post-growth economics – embedded in the tradition of Marxist political economy – can enhance the framework of TA by foregrounding structural features of capital accumulation that TA practice must avoid reproducing. To be clear, the emphasis on structural and latent causes in TA frameworks is a critical strength, even though it is often constrained by the strategic selectivities of existing structures – such as entrenched techno-economic solutionism and market-based governance (see Section 3.3.2). At the same time, TA practices are also shaped by conceptual TA frameworks that, to date, have paid insufficient attention to political economy in their analysis of structural and latent causes. This underscores the need for greater theoretical reflexivity to avoid inadvertently reinforcing the very systems TA seeks

to transform.

In a recent contribution to this journal, Elena Hofferberth (2025, 8) underscores the need for a “more comprehensive and systematic appreciation of the constituent relations and dynamics of capitalism” in post-growth economics. She advances this effort by developing a synthetic framework for understanding 21st-century capitalism. In this endeavour, she follows other post-growth scholars who have similarly emphasised the importance of grounding post-growth in Marxian political economy. For example, ecological economist Elke Pirgmaier (2018) identifies various tendencies that manifest at different points of the circuit of capital and give rise to harmful “environmental impacts and barriers to societal change” (Pirgmaier, 2018, 130). Drawing on her work, along with related conceptualisations (Gerber and Gerber, 2017; Schmid, 2019; Bärnthaler and Dengler, 2023; Nelson, 2024; Bieler, 2025), various such tendencies can be outlined that span across the realms of re/production and consumption. *Overproduction*, *technological dynamism* (i.e., the profit-driven evolution of technology under capitalism, where innovations prioritise efficiency and market growth), *exploitation* (of labour), and *appropriation* (in the sphere of reproduction) primarily fall within the realm of re/production. *Overconsumption* pertains to the realm of consumption, while *commodification*, *acceleration*, *alienation*, and *financialisation* extend across the entire circuit. These analytical categories can enhance the conceptualisation of TA, which otherwise may (inadvertently) reinforce harmful underlying tendencies tied to the circuit of capital.

For example, *overproduction* and *overconsumption* can result from large-scale, capital-intensive investments in “green infrastructure” without the simultaneous implementation of just demand reductions (Millward-Hopkins et al., 2020; Creutzig et al., 2022; Barrett et al., 2022; Wiese et al., 2024). These dynamics contribute to *acceleration* by reinforcing the extraction of critical materials, infrastructure expansion, and global supply chains. *Exploitation* intensifies as these large-scale investments often rely on precarious labour conditions, particularly in the Global South, where workers in mining, construction, and manufacturing face poor wages, dangerous working environments, and limited rights. *Technological dynamism* often prioritises profit-driven technologies – such as desalination plants and carbon capture and storage – that frequently sideline equity and ecological concerns, intensify land-use conflicts (Levien, 2025), and perpetuate overproduction and overconsumption (Malm and Carton, 2024). The *appropriation* of Indigenous lands for projects such as NbS often displaces local communities, while *commodification* transforms essential resources into marketable goods – for example, water through private desalination plants or markets for “climate-resilient” crops – undermining equitable access (see Section 4.1). *Alienation* may arise when top-down implementation of TA measures, such as managed retreat or renewable energy projects, excludes local communities from decision-making processes (Paavola and Adger, 2006). *Financialisation* is further reinforced by increasingly linking adaptation measures to financial markets, such as commodity futures and indexed insurances (Bigger and Millington, 2020; Clapp and Isakson, 2023). De-risking strategies to finance climate adaptation also exacerbate this trend (Gabor and Sylla, 2023). Again: these outcomes are not an intended feature of TA concepts. Rather, they emerge from a combination of the strategic selectivities of existing structures and a relative lack of political economy in how crises are conceptually construed within TA frameworks.

As post-growth, social ecology, and social-ecological economics highlight, these harmful tendencies are further deeply embedded in the global dynamics of the capital circuit, which has profound world-system implications. Capitalism operates on a framework of *unequal exchange* (Hornborg, 2014; Hickel et al., 2022; Kallis, 2023; Olk et al., 2023; Hickel et al., 2024) wherein wealth, resources, and labour are extracted disproportionately from the Global South and peripheries to fuel the economies of the capitalist core. For example, initiatives like climate-smart agriculture often create dependency on Global North corporations, extract resources through carbon markets, and impose debt-

financed solutions. This asymmetric relationship perpetuates systemic inequalities, as resources and ecological burdens are *necessarily* unequally distributed. Capital accumulation in wealthy nations depends on cheap labour and raw materials from peripheries and poorer countries, reinforcing global hierarchies and ecological disparities and deepening vulnerabilities. As such, post-growth-informed TA aims to address (neo) colonial dynamics of unequal exchange by advocating fair wages, equitable resource pricing, just trade agreements, climate reparations, and loss-and-damage compensation (Fanning and Hickel, 2023). Crucially, it calls for reducing energy and material throughput in the Global North, enabling the Global South to prioritise human and ecological wellbeing over servicing actors and economies in the capitalist core (Hickel, 2021a).

#### 4.3. Stakeholder engagement on multiple levels and scales: reviving democratic planning debates

As shown in Section 3.3.3, a central assumption in conceptual TA papers is strong stakeholders integration across levels and scales, emphasising inclusive participation and governance. TA literature often highlights participatory approaches such as community-based decision-making and multi-stakeholder platforms designed to incorporate diverse perspectives into planning and policy. For instance, the VRK (values, rules, and knowledge) framework helps explain how evolving social-ecological systems shape future adaptation decisions by analysing how diverse stakeholder values, existing formal and informal rules, and the integration of scientific and local knowledge enable or constrain decision-making within adaptation pathways. However, as Inea Lehnert (2023) highlights in her exploration of the potential role of citizens' assemblies in radical food-system transformation, even well-designed stakeholder engagement frequently remains embedded in a framework of capitalist realism (see Fisher, 2009) – the pervasive belief that capitalism is the only viable political and economic system, making alternatives hard to imagine or pursue. This avoids deeper confrontations with entrenched property relations (see Section 4.1) and systemic root causes of vulnerabilities (see Section 4.2).

For instance, despite stakeholder engagement and potentially transformative elements, the TA outcomes of the superblock initiative in Barcelona have been strongly framed in a logic of (globalised) competitive urbanism (Zografos et al., 2020). Such attempts to democratise urban planning through stakeholder consultations thus often fail to challenge underlying market economic logic that presupposes profitability and global competition. Similarly, in the Écrins National Park, adaptation pathways combined participatory processes and diverse knowledge systems but relied heavily on payment for ecosystem services (PES) and private investment, prioritising short-term economic gains in tourism and farming subsidies over collective ownership and ecological restoration (Lavorel et al., 2019). Hence, initiatives to involve local communities in climate adaptation planning may succeed in amplifying local voices but often operate within governance systems that continue to prioritise market-based solutions. These outcomes are not intended by conceptualisations of TA and are, to a considerable extent, shaped by the strategic selectivities of existing structures. However, they are also influenced by a conceptual orientation within TA that places strong emphasis on liberal notions of participation and governance, while giving comparatively less attention to democratic economic planning.

Post-growth economics – particularly strands rooted in eco-socialist traditions (see, e.g., the special issue on planned degrowth in the *Monthly Review*, 2023) – offers critical entry points to challenge capitalist realism by reinvigorating the role of democratic planning in economic decision-making (Durand et al., 2024; Bärnthaler, 2024; Koch, 2024). A hallmark of capitalist realism is the entrenched separation of the economic and political spheres. This historical development has largely excluded democratic decision-making from the economic domain, allowing participation and stakeholder engagement only insofar as it does not challenge private economic power (Steinberger et al.,



2024). As Meiksins Wood (1981) argues, this separation allowed the economic domain, particularly control over production and resource allocation, to remain in the hands of private interests, even as formal political systems democratised civil and social rights. Post-growth economics challenges this paradigm by advocating a structural reallocation of productive capacity – including labour, biophysical resources, and time – from profit-driven activities (e.g., fossil energy, livestock farming, biodiversity markets) to those essential for social-ecological transformation (e.g., renewable energy, agroecology, directly regulating biodiversity destruction). Market-based governance channels resources toward areas of high expected profitability under the guise of ‘efficient allocation’ (Spash and Hache, 2022; Christophers, 2024), reinforcing capitalist realism and sidelining transformative social-ecological priorities. To challenge these dynamics, post-growth economics calls for democratic economic planning to redirect productive capacities toward these priorities, reasserting the possibility of democratic control over the economy to achieve transformative goals.

For example, Durand et al. (2024) propose a multilevel ecological planning model for post-growth, a “fractal architecture” that balances coordination across scales with context-specific adaptation and post-capitalist experimentation. At its core, higher levels set broad ecological and social priorities – such as carbon quotas, biodiversity goals, soil artificialisation limits, and essential public service indicators – which cascade down to inform local actions, while lower levels contribute insights that shape iterative adjustments. This dynamic combine top-down directives with bottom-up autonomy: higher-level bodies define overarching constraints, including downscaled planetary boundaries and sectoral priorities, guided by scientists, workers, social movements, Indigenous groups, and affected communities. These constraints provide a flexible framework rather than rigid rules, allowing local entities – such as local communities, worker councils, and citizen assemblies – to set their own goals and strategies within social-ecological limits. Interlocking economic governance and participation, this fractal architecture provides a framework for democratic planning with the potential to reimagine provisioning systems beyond the constraints of capitalist realism. It relies on deliberation and tools such as in-kind ecological calculations rather than cost-benefit analyses (see also Koch, 2024) while encouraging the exploration of new pathways, such as the systematic integration of agroecological principles into food systems (Lehner, 2023).

Hence, a key contribution of eco-socialist post-growth economics is its revival of democratic planning debates as a precondition for transformative change (see also Bellamy Foster, 2023). It offers aspirational frameworks to identify concrete entry points. TA frameworks should facilitate pathways toward such configurations, recognising this as a gradual and messy process, but with a clear direction toward economic democratisation and planning. Here, current debates on green economic planning – indicative and intersectoral – within the constraints of near-term political horizons, state agency limitations, and existing power structures provide valuable insights and concrete entry points for gradually advancing economic planning and democratic input here and now (see Ban and Hasselbalch, 2024). However, these debates have been largely neglected in TA scholarship or reduced to “participation”, often separated from the control over the economy.

## 5. Conclusion: new research avenues

TA has gained prominence as a framework for addressing social-ecological crises and building resilience. This paper employed a problematisation review methodology to critically examine its conceptual assumptions: a focus on onto-epistemic and political shifts; the need to address latent causes of vulnerability; and the importance of multi-level stakeholder engagement.

Empirical evidence suggests that TA practices rarely achieve their stated transformative ambitions. We argued that this is not *only* due to implementation challenges – such as institutional inertia, political

constraints, neoliberal contexts, power imbalances, and funding limitations – but also due to certain assumptions (or the lack thereof) embedded in TA frameworks themselves. These assumptions obscure, marginalise, or exclude critical aspects of social-ecological transformation, even though they critically illuminate others. Hence, rather than viewing the limitations of TA practices solely as failures of application, we argue that they also *partly* reflect their conceptual framing. While all theories and concepts operate within the ‘strategic selectivities’ of existing structures – that is, pre-existing political, economic, and socio-cultural contexts that condition what is possible – they also shape how crises and challenges are construed. In this sense, conceptual frameworks are not only structurally constrained but also structure agency and, by extension, TA practice. In response, we examined how post-growth economics can help elucidate these embedded limitations and refine key assumptions, thereby contributing to the ongoing development of TA theory.

By integrating post-growth principles, we propose reflective refinements to TA frameworks. First, drawing on longer-standing intellectual traditions and debates, post-growth economics challenges privatised property relations that underpin scarcity-based frameworks of resource control and management. The concept of radical abundance – central to refining TA’s development priorities – promotes alternative property relations grounded in decommodified, equitable resource distribution, universal public services, and collective ownership. Second, post-growth economics, rooted in Marxist political economy, critiques the systemic drivers of vulnerability rooted in capital accumulation, advocating for a TA framework that challenges the structural tendencies that emerge throughout the capital circuit and both shape and reinforce processes of unequal exchange: overproduction, technological dynamism, exploitation, appropriation, overconsumption, commodification, acceleration, alienation, and financialisation. Third, (eco-socialist) post-growth reinvigorates democratic planning as a requirement to facilitate transformative change by shifting productive capacities from what is most profitable to what is essential for social-ecological transformation. This perspective encourages TA to move beyond narrow, liberal notions of participation and governance toward a broader vision of economic democratisation and planning. These three dimensions help address key blind spots in current conceptualisation of TA; and they are deeply interlinked, as property relations and capital accumulation constitute both structural arenas of transformation within, and barriers to, democratic planning of the economy.

While both TA and post-growth engage with social-ecological transitions, they can be understood as distinct yet complementary schools of thought, with differing primary orientations. For example, while democratic questions do arise within TA – particularly in the context of contested land-use decisions – the transformation of political economic structures and institutions is not its central concern. This divergence in focus suggests a productive complementarity. Integrating post-growth economics into TA frameworks opens up new research avenues across evaluative, explorative, and prescriptive dimensions. Specifically, this raises questions such as: To what extent, and in what ways, have past or ongoing TA practices challenged, ignored, or reinforced the transformation-inhibiting tendencies outlined above (evaluative)? How might concrete post-growth-informed TA practices take shape across different contexts and sectors (explorative)? How can these principles inform and guide policymaking (prescriptive)?

These considerations give rise to a set of interlinked, non-exhaustive research questions that can guide future inquiry into TA:

1. In specific cases, who are the key actors reinforcing and maintaining existing property relations, and through what mechanisms and strategies can these structures be challenged? What ownership models are best suited to particular contexts to restore collective ownership, promote decommodification, and ensure equitable access to resources?



- How do tendencies of the capital circuit manifest in concrete adaptation measures, who benefits from them, and how do they create barriers to transformative change? Additionally, how do processes of unequal exchange influence adaptation efforts, and what strategies can be employed to counter these dynamics?
- What can different models of economic planning – such as socialist, wartime, and capitalist planning – teach us about incorporating participation and/or non-market-based governance into TA frameworks, and how can these insights support concrete steps toward a broader vision of economic democratisation?

Embedding post-growth economics into TA frameworks can help future research and practice advance toward more transformative, justice-oriented visions of adaptation – visions that not only mitigate vulnerabilities but also challenge the structural inequalities and

capitalist imperatives underpinning social-ecological crises.

### CRediT authorship contribution statement

**Oussama Chaabouni:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Richard Bärnthaler:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Conceptual papers

Author Full Names	Article Title	Journal	Year	DOI Link
Park, S. E.; Marshall, N. A.; Jakku, E.; Dowd, A. M.; Howden, S. M.; Mendham, E.; Fleming, A.	Informing adaptation responses to climate change through theories of transformation	Global Environmental Change	2012	<a href="https://doi.org/10.1016/j.gloenvcha.2011.10.003">https://doi.org/10.1016/j.gloenvcha.2011.10.003</a>
O'Brien, Karen	Global environmental change II: From adaptation to deliberate transformation	Progress in Human Geography	2012	<a href="https://doi.org/10.1177/0309132511425767">https://doi.org/10.1177/0309132511425767</a>
Kates, Robert W.; Travis, William R.; Wilbanks, Thomas J.	Transformational adaptation when incremental adaptations to climate change are insufficient	Proceedings of the National Academy of Sciences	2012	<a href="https://doi.org/10.1073/pnas.1115521109">https://doi.org/10.1073/pnas.1115521109</a>
Bassett, Thomas J.; Fogelman, Charles	Deja vu or something new? The adaptation concept in the climate change literature	Geoforum	2013	<a href="https://doi.org/10.1016/j.geoforum.2013.04.010">https://doi.org/10.1016/j.geoforum.2013.04.010</a>
Eriksen, Siri H.; Nightingale, Andrea J.; Eakin, Hallie	Reframing adaptation: The political nature of climate change adaptation	Global Environmental Change	2015	<a href="https://doi.org/10.1016/j.gloenvcha.2015.09.014">https://doi.org/10.1016/j.gloenvcha.2015.09.014</a>
Nagoda, Sigrid; Eriksen, Siri; Hetland, Oivind	What Does Climate Change Adaptation Mean for Humanitarian Assistance? Guiding Principles for Policymakers and Practitioners	IDS Bulletin	2017	<a href="https://doi.org/10.19088/1968-2017.157">https://doi.org/10.19088/1968-2017.157</a>
Colloff, Matthew J.; Lavorel, Sandra; van Kerkhoff, Lorrae E.; Wyborn, Carina A.; Fazey, Ioan; Gorddard, Russell; Mace, Georgina M.; Foden, Wendy B.; Dunlop, Michael; Prentice, I. Colin; Crowley, John; Leadley, Paul; Degeorges, Patrick	Transforming conservation science and practice for a postnormal world	Conservation Biology	2017	<a href="https://doi.org/10.1111/cobi.12912">https://doi.org/10.1111/cobi.12912</a>
Colloff, Matthew J.; Martin-Lopez, Berta; Lavorel, Sandra; Locatelli, Bruno; Gorddard, Russell; Longaretti, Pierre-Yves; Walters, Gretchen; van Kerkhoff, Lorrae; Wyborn, Carina; Coreau, Audrey; Wise, Russell M.; Dunlop, Michael; Degeorges, Patrick; Grantham, Hedley; Overton, Ian C.; Williams, Rachel D.; Doherty, Michael D.; Capon, Tim; Sanderson, Todd; Murphy, Helen T.	An integrative research framework for enabling transformative adaptation	Environmental Science & Policy	2017	<a href="https://doi.org/10.1016/j.envsci.2016.11.007">https://doi.org/10.1016/j.envsci.2016.11.007</a>
Fedele, Giacomo; Donatti, Camila I.; Harvey, Celia A.; Hannah, Lee; Hole, David G.	Transformative adaptation to climate change for sustainable social-ecological systems	Environmental Science & Policy	2019	<a href="https://doi.org/10.1016/j.envsci.2019.07.001">https://doi.org/10.1016/j.envsci.2019.07.001</a>
Magnan, Alexandre K.; Schipper, E. Lisa F.; Duvat, Virginie K. E.	Frontiers in Climate Change Adaptation Science: Advancing Guidelines to Design Adaptation Pathways	Current Climate Change Reports	2020	<a href="https://doi.org/10.1007/s40641-020-00166-8">https://doi.org/10.1007/s40641-020-00166-8</a>
Garcia, Alicea; Tschakert, Petra	Intersectional subjectivities and climate change adaptation: An attentive analytical approach for examining power, emancipatory processes, and transformation	Transactions of the Institute of British Geographers	2022	<a href="https://doi.org/10.1111/tran.12529">https://doi.org/10.1111/tran.12529</a>
Lluch-Cota, Salvador E.; del Monte-Luna, Pablo; Gurney-Smith, Helen J.	Transformational adaptation in marine fisheries	WIREs Climate Change	2023	<a href="https://doi.org/10.1016/j.cosust.2022.101235">https://doi.org/10.1016/j.cosust.2022.101235</a>
Berkhout, Frans; Dow, Kirstin	Limits to adaptation: Building an integrated research agenda	Current Opinion on Environmental Sustainability	2023	<a href="https://doi.org/10.1002/wcc.817">https://doi.org/10.1002/wcc.817</a>
Empirical Papers Author Full Names Wamsler, Christine	Article Title Mainstreaming ecosystem-based adaptation: transformation toward sustainability in urban governance and planning	Journal Ecology and Society	Year 2015	DOI Link <a href="https://doi.org/10.5751/ES-07489-200230">https://doi.org/10.5751/ES-07489-200230</a>

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Author Full Names	Article Title	Journal	Year	DOI Link
Bosomworth, Karyn; Leith, Peat; Harwood, Andrew; Wallis, Phillip J.	What's the problem in adaptation pathways planning? The potential of a diagnostic problem-structuring approach	Environmental Science & Policy	2017	<a href="https://doi.org/10.1016/j.envsci.2017.06.007">https://doi.org/10.1016/j.envsci.2017.06.007</a>
Clarke, Darren; Murphy, Conor; Lorenzoni, Irene	Place attachment, disruption and transformative adaptation	Journal of Environmental Psychology	2018	<a href="https://doi.org/10.1016/j.jenvp.2017.12.006">https://doi.org/10.1016/j.jenvp.2017.12.006</a>
Gosnell, Hannah; Gill, Nicholas Gill; Voyer, Michelle	Transformational adaptation on the farm: Processes of change and persistence in transitions to 'climate-smart' regenerative agriculture	Global Environmental Change	2019	<a href="https://doi.org/10.1016/j.gloenvcha.2019.101965">https://doi.org/10.1016/j.gloenvcha.2019.101965</a>
Lavorel, Sandra; Colloff, Matthew J.; Locatelli, Bruno; Gorddard, Russell; Prober, Suzanne M.; Gabillet, Marine; Devaux, Caroline; Laforgue, Denis; Peyrache-Gadeau, Veronique	Mustering the power of ecosystems for adaptation to climate change	Environmental Science & Policy	2019	<a href="https://doi.org/10.1016/j.envsci.2018.11.010">https://doi.org/10.1016/j.envsci.2018.11.010</a>
Warner, Koko; Zommers, Zinta; Wreford, Anita; Hurlbert, Margot; Viner, David; Scantlan, Jill; Halsey, Kenna; Halsey, Kevin; Tamang, Chet	Characteristics of Transformational Adaptation in Climate-Land-Society Interactions	Sustainability	2019	<a href="https://doi.org/10.3390/su11020356">https://doi.org/10.3390/su11020356</a>
Kayhko, Janina; Wirehn, Lotten; Juhola, Sirkku; Neset, Tina-Simone	Integrated framework for identifying transformative adaptation in agri-food systems	Environmental Science & Policy	2020	<a href="https://doi.org/10.1016/j.envsci.2020.10.002">https://doi.org/10.1016/j.envsci.2020.10.002</a>
Colloff, Matthew J.; Wise, Russell M.; Palomo, Ignacio; Lavorel, Sandra; Pascual, Unai	Nature's contribution to adaptation: insights from examples of the transformation of social-ecological systems	Ecosystems and People	2020	<a href="https://doi.org/10.1080/26395916.2020.1754919">https://doi.org/10.1080/26395916.2020.1754919</a>
Fedele, Giacotno; Donatti, Camila I.; Harvey, Celia A.; Hannah, Lee; Hole, David G.	Limited use of transformative adaptation in response to social-ecological shifts driven by climate change	Ecology and Society	2020	<a href="https://doi.org/10.5751/ES-11381-250125">https://doi.org/10.5751/ES-11381-250125</a>
Zografos, Christos; Klaus, Kai A.; Connolly, James J. T.; Anguelovski, Isabelle	The everyday politics of urban transformational adaptation: Struggles for authority and the Barcelona superblock project	Cities	2020	<a href="https://doi.org/10.1016/j.cities.2020.10.2613">https://doi.org/10.1016/j.cities.2020.10.2613</a>
Islam, Md. Monirul; Rahman, Md. Asadur; Khan, Mohammad Shahneawz; Mondal, Gouri; Khan, Makidul Islam	Transformational adaptations to climatic hazards: Insights from mangroves-based coastal fisheries dependent communities of Bangladesh	Marine Policy	2021	<a href="https://doi.org/10.1016/j.marpol.2021.10.4475">https://doi.org/10.1016/j.marpol.2021.10.4475</a>
Colloff, Matthew J.; Gorddard, Russell; Abel, Nick; Locatelli, Bruno; Wyborn, Carina; Butler, James R. A.; Lavorel, Sandra; van Kerkhoff, Lorrae; Meharg, Seona; Munera-Roldan, Claudia; Bruley, Enora; Fedele, Giacomo; Wise, Russell M.; Dunlop, Michael	Adapting transformation and transforming adaptation to climate change using a pathways approach	Environmental Science & Policy	2021	<a href="https://doi.org/10.1016/j.envsci.2021.06.014">https://doi.org/10.1016/j.envsci.2021.06.014</a>
Ziervogel, Gina; Enqvist, Johan; Metelerkamp, Luke; van Breda, John	Supporting transformative climate adaptation: community-level capacity building and knowledge co-creation in South Africa	Climate Policy	2022	<a href="https://doi.org/10.1080/14693062.2020.1863180">https://doi.org/10.1080/14693062.2020.1863180</a>
De Rosa, Salvatore Paolo; de Moor, Joost; Dabaieh, Marwa	Vulnerability and activism in urban climate politics: An actor-centered approach to transformational adaptation in Malmö? (Sweden)	Cities	2022	<a href="https://doi.org/10.1016/j.cities.2022.10.3848">https://doi.org/10.1016/j.cities.2022.10.3848</a>
Leal Filho, Walter; Wolf, Franziska; Moncada, Stefano; Salvia, Amanda Lange; Balogun, Abdul-Lateef Babatunde; Skanavis, Constantina; Kounani, Aristeia; Nunn, Patrick D.	Transformative adaptation as a sustainable response to climate change: insights from large-scale case studies	Mitigation and Adaptation Strategies for Global Change	2022	<a href="https://doi.org/10.1007/s11027-022-09997-2">https://doi.org/10.1007/s11027-022-09997-2</a>
Garimella, Pranav Prakyhat; Prakash, Anjal	Sustainable socio-ecological transformations in agriculture: cases from South Asia	Journal of Integrative Environmental Sciences	2023	<a href="https://doi.org/10.1080/1943815X.2023.2228393">https://doi.org/10.1080/1943815X.2023.2228393</a>
Leal Filho, Walter; Salvia, Amanda Lange; Balogun, Abdul-Lateef; Pereira, Mario Jorge Verde; Mucova, Serafino Afonso Rui; Ajulo, Oluwadunsin Moromoke; Ng, Artie; Gwenzi, Juliet; Mashonjowa, Emmanuel; Aina, Yusuf A.; Li, Chunlan; Totin, Edmond; Pinho, Patricia; Campbell, Donovan; Chanza, Nelson; Setti, Andreia F. F.	Towards more sustainable responses to natural hazards and climate change challenges via transformative adaptation	Cities	2023	<a href="https://doi.org/10.1016/j.cities.2023.10.4525">https://doi.org/10.1016/j.cities.2023.10.4525</a>
Lamb, Zachary; Shi, Linda; Silva, Stephanie; Spicer, Jason	Resident-Owned Resilience: Can Cooperative Land Ownership Enable Transformative Climate Adaptation for Manufactured Housing Communities?	Housing Policy Debate	2023	<a href="https://doi.org/10.1080/10511482.2021.2013284">https://doi.org/10.1080/10511482.2021.2013284</a>
Scolobig, Anna; Linnerooth-Bayer, JoAnne; Pelling, Mark; Martin, Juliette G. C.; Deubelli, Teresa M.; Liu, Wei; Oen, Amy	Transformative adaptation through nature-based solutions: a comparative case study analysis in China, Italy, and Germany	Regional Environmental Change	2023	<a href="https://doi.org/10.1007/s10113-023-02066-7">https://doi.org/10.1007/s10113-023-02066-7</a>
Clarke, Darren; Murphy, Conor	Incremental adaptation when transformation fails: The importance of place-based values and trust in governance in avoiding maladaptation	Journal of Environmental Psychology	2023	<a href="https://doi.org/10.1016/j.jenvp.2023.102037">https://doi.org/10.1016/j.jenvp.2023.102037</a>

## Data availability

Data will be made available on request.

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