Check for updates

Geo: Geography and Environment

WILEY | Open Access Geo Royal Geographical Society with IBG

REVIEW OPEN ACCESS

Place-Based Sustainability Transformations for Just Futures: A Systematic Review

Katie Keddie[1] | Sam Beaver[2] | Elizabeth A. Law[3] | Christopher D. Ives[1] | Nathan J. Bennett[4,5] | Jessica P. R. Thorn[6,7] | Rachel S. Friedman[8]

[1]University of Nottingham, Nottingham, UK | [2]Australian National University, Canberra, Australian Capital Territory, Australia | [3]Working Conservation Consulting, Fernie, British Columbia, Canada | [4]Global Science, WWF, Washington, USA | [5]People and the Ocean Specialist Group, IUCN CEESP, Gland, Switzerland | [6]Centre for Environmental Policy, Imperial College London, Fernie, UK | [7]Department of Environmental Sciences, University of Namibia, Windhoek, Namibia | [8]University of Victoria, Victoria, British Columbia, Canada

Correspondence: Katie Keddie (katie.keddie@nottingham.ac.uk)

Received: 8 October 2024 | **Revised:** 11 September 2025 | **Accepted:** 24 October 2025

Funding: K.K. acknowledges funding from the University of Nottingham's School of Geography scholarship during the writing of this paper.

Keywords: equitable transformations | just transition | place-based approaches | social-ecological systems | transformative change

ABSTRACT

The planet is facing enduring and intersecting challenges from climate change, land degradation, habitat and biodiversity loss, as well as social inequalities. To achieve sustainability in the face of these crises, transformative changes are essential. While the path towards a more sustainable future has the capacity to bring net social benefits, it also holds the potential to exacerbate vulnerabilities. As such, there is growing recognition that social equity and justice must be central to action for sustainability transformations. However, it remains unclear what characterises a 'just transformation' and how to achieve it. To develop a baseline understanding of how social justice is integrated into sustainability transformations and to help guide research and practice in this emerging field, we present a systematic literature review of 125 papers that explicitly account for social equity and justice in research on place-based transformations. Results reveal considerable variation and ambiguity in how the concepts of transformation and equity are employed, and highlight a focus on a narrow set of systems, with a large number of papers focusing on energy and urban transformations, located primarily in the Global North. While distributional and procedural dimensions of justice are frequently addressed, contextual and restorative justice remain underexplored. We identify key areas that require future attention in research and practice, including promoting interdisciplinary research that champions global inclusivity as well as a more explicit consideration of contextual justice and place.

1 | Introduction

Social and ecological systems are facing profound and interconnected challenges, including the effects of climate change, land degradation, habitat and biodiversity loss, as well as persistent structural and institutional discrimination, oppression and inequality (Thiery et al. 2021; Pörtner et al. 2022). In the light of these pervasive issues, we urgently require comprehensive and multi-dimensional solutions for a sustainable future (Patterson et al. 2018). The need for transformative changes to systems of human activity is increasingly acknowledged (Ripple et al. 2023), with calls for the creation of sustainable futures that

[Correction added on 18 February 2026 after first online publication: The Author list and Acknowledgements section have been updated.]

The information, practices and views in this article are those of the author(s) and do not necessarily reflect the opinion of the Royal Geographical Society (with IBG).

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2025 The Author(s). *Geo: Geography and Environment* published by the Royal Geographical Society (with the Institute of British Geographers) and John Wiley & Sons Ltd.

incorporate social equity and justice[1] to respond to environmental change (Bennett et al. 2019; Martin et al. 2020; Thorn et al. 2020).

1.1 | Conceptual Framework: Transformation, Justice and Place

Transformation involves deliberate, radical shifts in social, political, economic and ecological systems that may arise through forced, emergent or deliberate processes (O'Brien 2012). It encompasses not only practices and political structures, but also individual beliefs, values and worldviews (Gosnell 2022). Scoones et al. (2020) outline three complementary analytical lenses to help understand the complexity of transformations. Firstly, *structural approaches* emphasise managing, organising and implementing changes in production and consumption within society. These approaches entail altering the ideological underpinnings of politics, economy and society and include movements that shift dominant social paradigms such as replacing a normative view of economic growth with concepts of zero growth and degrowth, as well as movements for race, class or gender rights. *Systemic approaches* target the interdependencies of institutions, technologies and actors to steer systems towards desired goals. They identify particular features (elements, drivers and levers) of systems as targets for focused change. Changes are modulated by policy, and as such they align with more controlled 'transitions' and often follow multi-level governance and technological innovation frameworks. Finally, *enabling approaches* place a strong focus on human agency, values and capacities. They aim to empower individuals and communities to take action on their own behalf, with a greater focus on process and capacities rather than solely on outcomes (Scoones et al. 2020). These lenses offer complementary approaches to both understanding and enacting transformative change.

Amidst the growing discourse around transformations, it is essential that the concept does not become a buzzword used to justify superficial interventions and business-as-usual responses (Vogel and O'Brien 2022). Meaningful and lasting transformation requires strategies that centre on justice and equity, which are crucial in navigating potential pitfalls and unintended consequences of transformations (Bennett et al. 2019; Martin et al. 2020; Scoones et al. 2020), as well as for ethical reasons (Blythe et al. 2018). Global policy recommendations, such as the Sustainable Development Goals (SDGs) and the Intergovernmental Panel on Climate Change (IPCC) reports, have echoed the centrality of justice considerations. These recommendations underscore the principle of 'leave no one behind' and recognise the significance of 'climate justice' and 'rights-based approaches' in mitigation and adaptation strategies and projects (Pörtner et al. 2022).

Within the sustainability literature, justice has become increasingly considered within discourse. Recent scholarship has outlined fostering equity and justice as a main goal of sustainability science, alongside place-based transdisciplinary work (Sahle et al. 2025). Justice is commonly considered a trivalent concept, composed of distribution (of costs and benefits), procedure (who is involved and how) and recognition (of different cultures, needs and ways of knowing) (Schlosberg 2004; Bennett et al. 2019). Heffron and McCauley (2017) also consider a fourth dimension—restorative justice, which seeks to repair, compensate for and rectify injustices that have burdened individuals, communities or nature. As all of these dimensions are set within historical, geopolitical, cultural and other social contexts, it is also important to consider contextual justice dimensions, which remain underexplored in the literature (Friedman et al. 2018). The contextual dimension refers to how justice is understood and pursued differently across social, cultural, historical and political contexts (McDermott et al. 2013; Sikor et al. 2014; Sultana 2022; Lenzi et al. 2023). Indeed, McDermott et al. (2013, 419) argue that 'to uncover the origins of injustice it is necessary to understand political processes and distributive outcomes in their social context'. These contributions demand attention to pre-existing inequalities and power dynamics that shape what is considered appropriate or fair within different contexts.

Such frameworks of justice that integrate historical, political and socio-cultural contexts, therefore highlight the importance of considering notions of place (Massey 1994; Cresswell 2004), foregrounding local meaning and contexts. Place-based solutions consider identity and embrace the heterogeneity and diversity of various regions in order to drive transformative change (Horlings, Roep, et al. 2020), providing a powerful way to frame and contextualise solutions. Place has been conceptualised and assessed across disciplines in a variety of ways through constructs, such as senses of place, place attachment, place identity (Stedman 2002; Sampson and Goodrich 2009; Raymond et al. 2021), as well as the social and emotional sense of belonging or non-belonging to specific places. Beyond specific locations, place is produced by the flow of people, things and ideas across space and time, meaning it is not singular or fixed; instead, it is understood in relation to wider structural and systemic processes (Massey 1994; Cresswell 2004). Such relational understandings of place therefore challenge 'one size fits all' approaches that may inadvertently lead to adverse effects for justice and equity (Grenni et al. 2020).

The importance of place in its different forms is increasingly reflected within global policy. The 2022 IPCC assessment report (Pörtner et al. 2022) reiterates that to achieve just and transformational changes, cultural meanings, emotional attachments and identities that are deeply rooted in specific landscapes and places must be considered. As emphasised by Abson et al. (2017), the core of any sustainable and just transformation lies in how it restructures, reconnects and reshapes the meanings of relationships between individuals, communities and the ecosystems in which they are interwoven. In order to operationalise effective transformations, they need to be considered within specific contexts, meaning place is particularly integral to justice discussions in practice.

However, as this review highlights, there is currently a scarcity of research that examines place and its context in depth. To ensure a focus on actual transformative impact rather than abstract concepts, this review focuses on how the transformation literature intersects with notions of place. For the purpose of this review, we define a place-based approach as a situated and relational process, that is socially negotiated and produced within specific geographies, shaped by local cultural, ecological,

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

political and historical conditions (Barca et al. 2012; Horlings, Roep, et al. 2020).

1.2 | Research Gaps and Questions

Despite consensus around the importance of justice and equity within place-based sustainability transformations, operationalising and defining justice and equity remain a complex and challenging task (Sovacool et al. 2017; Friedman et al. 2018; Kothari et al. 2024). As the field of sustainability transformations and research on 'just transformations' continues to expand, it is important to consider how both 'transformation' and 'justice' are interpreted, applied in practice and integrated into the evolving landscape of environmental studies. Stark et al. (2023) highlight the need for more scholarship to consider the 'how' of sustainability transformations. Furthermore, Banerjee and Schuitema (2022) articulate the need to assess the degree to which justice concerns are actually upheld within processes of transformation, highlighting the discrepancies that exist between the interpretation of justice and its theoretical and practical application. This article aimed to provide such an assessment, examining the different methodologies, strategies and dimensions of justice considered in studies on place-based sustainability transformations.

The review explores how extant research on sustainability transformations considers issues of justice and equity, revealing the definitions/conceptualisations and methods of assessment, and touches on how these notions are implemented practically within place-based environmental research. In doing so, it aims to generate a better understanding of how principles of social and environmental justice can be applied successfully to place-based sustainability transformation efforts in practice, laying an important foundation for future scholarship and action towards sustainable futures that are just and equitable.

The review was guided by the following questions:

1. What are the thematic, methodological and geographical characteristics of research on justice, place and transformations for sustainability?
2. How is justice framed or conceptualised within sustainability transformations studies?
3. How have these factors contributed to the perceived success or failure of upholding justice and equity in sustainability transformations?

The following sections outline the systematic review methodology and present an integrated discussion of the findings. Following this, recommendations are made for advancing research and practice in the field of just place-based sustainability transformations.

2 | Methodology

This study takes a systematic approach to understand how justice and equity are considered within place-based sustainability transformation research across a range of disciplines, methodologies and regions. First, we conducted a structured literature search in July 2022, guided by 2020 PRISMA principles (Page et al. 2021), related to justice and equity in

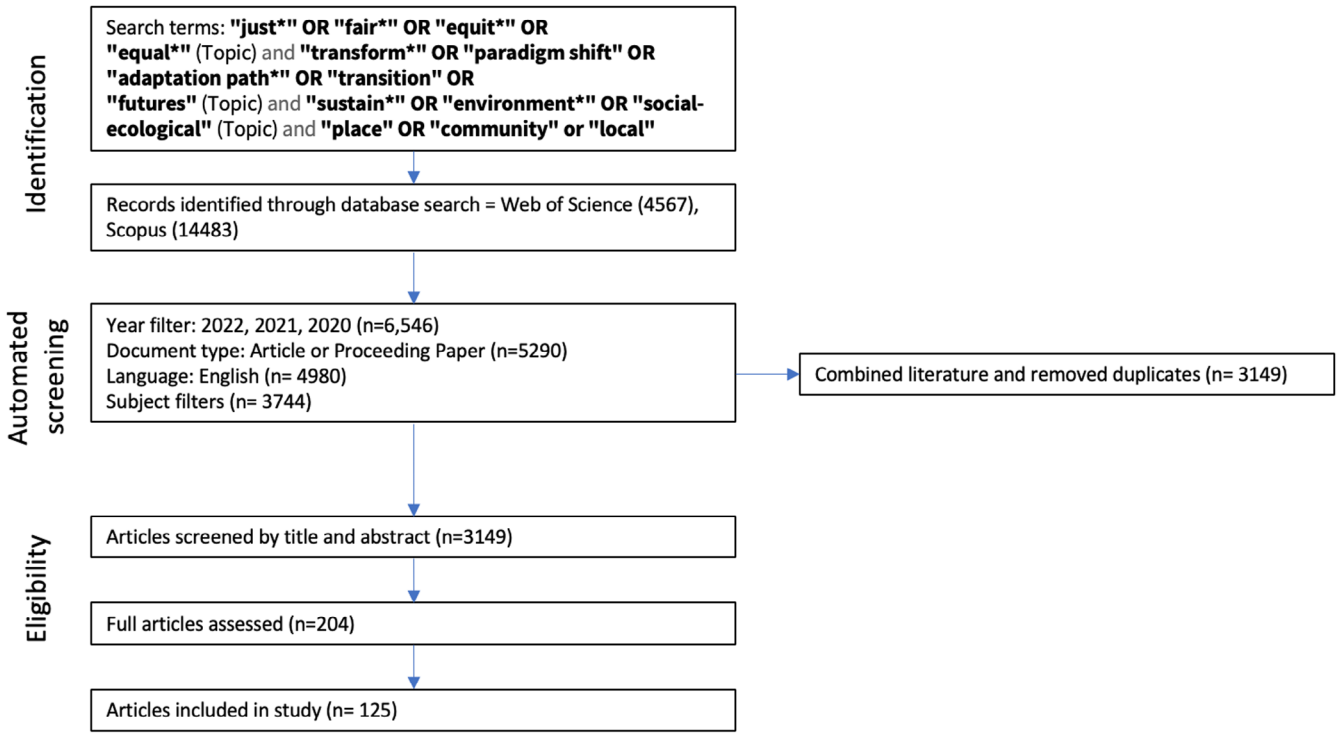


FIGURE 1 | Flow diagram of the screening and data extraction process (guided by 2020 PRISMA principles; Page et al. 2021). These figures are inclusive of the top 100 most cited articles, which were selected without the date range.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

place-based sustainability transformations, as summarised in Figure 1. During the initial screening phase, papers were excluded based on their title and abstract for one or more of the following reasons: (1) did not target social justice/equity as a topic; (2) did not relate social justice/equity issues to a *deliberate* transformation; (3) did not conduct empirical analysis; or (4) employed the search terms in an unrelated context. Studies were screened by the lead author, aided by the Rayyan software to expedite the screening process (Harrison et al. 2020). This resulted in a list of 204 studies for full-text review. We developed a codebook for data extraction, based on previous work by Friedman et al. (2018) and also drawing on the theoretical literature on transformations. The full coding framework used can be found in Data S4.

Three authors trialled the coding frame on a sample of nine studies (Data S5) and met online on two occasions to discuss any discrepancies and challenges faced during coding. The coding frame was modified based on these discussions and finalised through online consultation. Five reviewers then analysed the full texts using the coding frame, ensuring that each study still met the criteria, resulting in a final count of 125 papers (full list of papers in Data S2).

Synthesis and analysis of the literature included geographic variables, dimensions of justice, transformation approaches, social-ecological system and types of methods employed. Relevant variables were cross-tabulated using SPSS. Additionally, we identified a subset of 11 papers during the coding process for their strong alignment with the key themes of analysis (integration of social justice/equity as a main topic, strong focus on deliberate transformation and explicit mention of place). We then thematically coded these using NVivo to explore in more depth the implementation of justice within transformation efforts and assess their impacts. A full description of the methodology can be found in Data S1. The results and discussion below draw from the whole set of papers, with additional insight coming from the thematic coding.

2.1 | Methodological Limitations

A number of limitations must be considered when interpreting the results from this study. Firstly, the review largely considered a subset of papers, by publication year, due to the quantity of the literature. This pragmatic decision, while important for managing the scope of the review, may have inadvertently led to key papers being overlooked. We included the top 100 cited papers without filtering by publication year, in hopes of remedying this issue (see full methodological breakdown in Data S1). Future reviews could utilise emerging automated approaches in order to be able to analyse a wider range of literature, yet the variable terminology and conceptualisation of key concepts may act as a barrier to this approach's success and preclude more critical analysis of the field. The review also only considered English language papers and did not engage with the grey literature, both of which may have biased the coverage of our analysis. Finally, although efforts were made to ensure we carried out thorough, transparent and repeatable search, screening and review processes, there remains an element of subjectivity and inherent bias in both paper inclusion and interpretation.

3 | Findings

The following section presents an integrated analysis of the 125 studies reviewed, weaving together thematic patterns, descriptive trends and narrative insights to understand the current shape of the field and assess where gaps remain. A full summary of data collected can be found in Data S3.

3.1 | Geographical Characteristics of Research on Justice, Place and Transformations for Sustainability

This section examines the distribution of reviewed studies, and identifies patterns where research is concentrated. There was a strong bias towards the Global North, with potential implications for just outcomes within reported transformations. Of the 125 studies reviewed (some containing multiple regions and countries), the majority of studies focused on Europe (46.4%, $n = 58$) and North America (19.2%, $n = 24$). Asia (15.2%, $n = 19$), Sub-Saharan Africa (14.4%, $n = 18$), Latin America and the Caribbean (12.8%, $n = 16$), Oceania (4%, $n = 5$) and North Africa and the Middle East (3.2%, $n = 4$) made up smaller proportions of the studies. The United States (12.8%, $n = 16$), the United Kingdom (11.2%, $n = 14$), Italy (6.4%, $n = 8$), Brazil (4.8%, $n = 6$), Kenya (4.8%, $n = 6$), the Netherlands (4.8%, $n = 6$) and Spain (4.8%, $n = 6$) were the most frequently studied nations (Figure 2).

Similarly, first authors of the reviewed studies were based largely at institutions in the United Kingdom (19.2%, $n = 24$), the United States (16.8%, $n = 21$), the Netherlands (7.2%, $n = 9$), Spain (5.8%, $n = 7$) Italy (4%, $n = 6$) and Sweden (4.8%, $n = 6$). The studies largely took place at either national (52%, $n = 65$) or local (44%, $n = 55$) scales. International (2.4%, $n = 3$) and cross-scale comparisons (2.4%, $n = 3$) were less common.

Such concentration of research in Europe and North America, and from authors in the same geographical regions, indicates a risk of overlooking justice challenges and contexts present within the Global South. Asia, Latin America and Sub-Saharan Africa collectively only make up about one-third of studies. This not only skews our understanding of 'just' transformations from a global perspective, but also perpetuates inequalities. This current geographical shortcoming may lead to overlooking emergent justice considerations or constraints specific to the Global South, posing important questions surrounding who is considered in just transformation discourse and what that means for just outcomes.

Within the reviewed papers, Sovacool et al. (2021) in particular highlight examples of how low-carbon transitions occurring in Europe can have negative consequences for regions in the Global South. For example, smart meters, which are being increasingly rolled out in homes in the United Kingdom to try and reduce energy usage, have a 5- to 10-year lifespan, meaning that they contribute to electronic waste production. In the case study, the e-waste ended up in Agbogbloshie, Ghana, where 40,000 inhabitants live and work around the scrapyard. The hazardous materials in e-waste are longer-lived and more potent than organic waste, posing severe risks for e-waste workers, women and children. Yet, in the absence of other opportunities, residents had no choice but

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

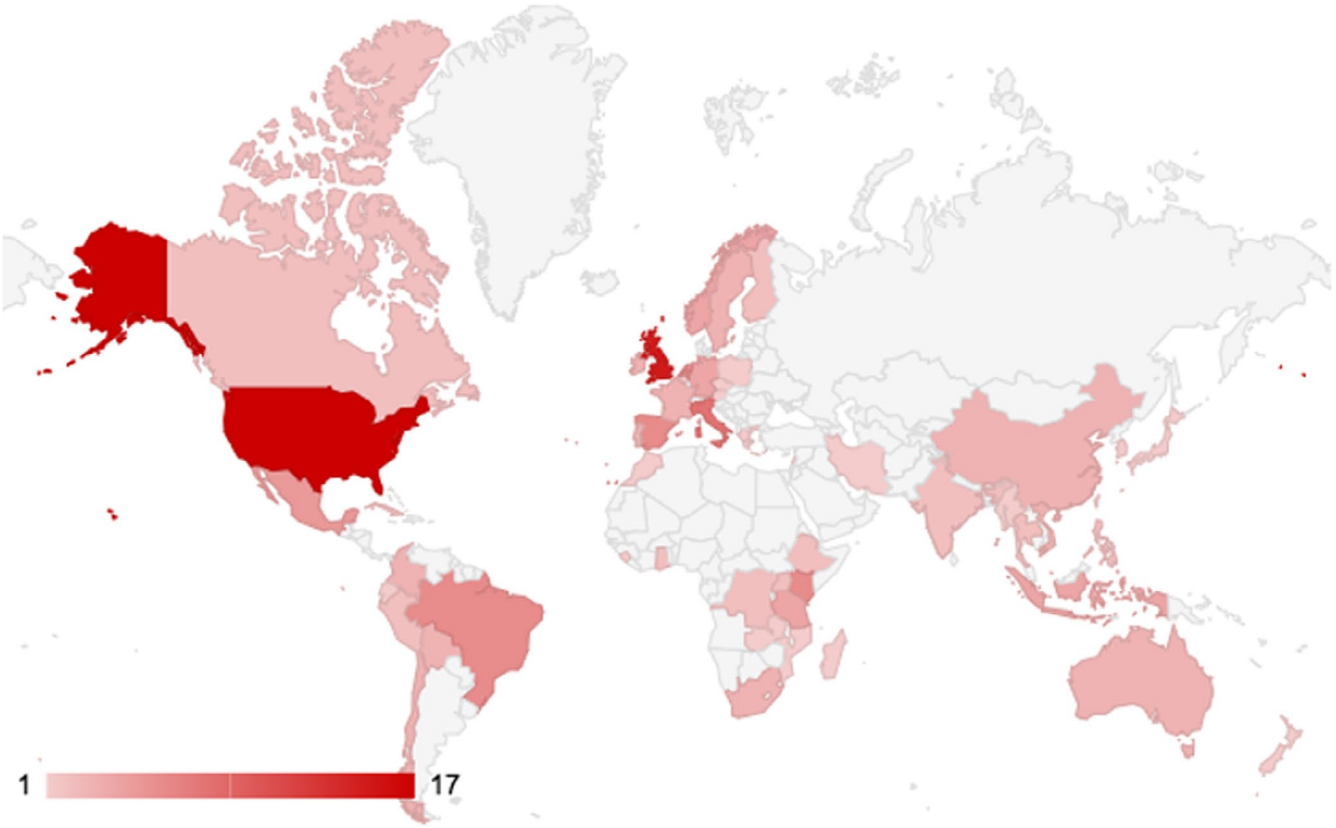


FIGURE 2 | Map of countries represented in the studies reviewed (colour scale reflects the number of papers).

to work and live in the area, highlighting injustices and power imbalances. Similarly, the paper highlighted how Congolese mining for cobalt for use in electric car batteries, largely for use in the Global North, impacted vulnerable children and women to a greater extent than adult men. These workers faced inhumane working conditions and exposure to toxic materials and diseases, and still barely made enough to survive. Consequently, nations such as Norway received 'green' and 'clean' electric vehicles, while mineral and metal extraction exacerbated dispossession, marginalisation and environmental degradation in the Democratic Republic of Congo (which also highlights 'more-than-human' injustices). Additionally, while Sovacool et al. (2021) provided one of the clearest examples of cross-scalar justice implications of transformations, the study is entirely authored by researchers in the Global North. This reflects a broader tension within the sustainability literature, where many injustices occurring in the Global South are documented and analysed through frameworks occurring in the Global North. This dynamic raises critical questions about epistemic justice such as whether and how western modes of thinking and knowledge creation become reinforced and reproduced by the very research activities that seek to reveal social and economic injustices.

Scholars are increasingly showing how energy transitions in particular can reflect colonial thinking, imposing Western models of energy knowledge and policy onto regions with different historic, social and cultural contexts (Broto et al. 2018; Okpanachi et al. 2022). Such issues have been underscored by broader theoretical scholarship, such as Collyer (2018), where the publication of academic knowledge was explored, highlighting how knowledges produced in the Global South are systematically marginalised, dismissed and undervalued. Ghosh et al. (2021) similarly argue that transition and transformation research largely continue to be shaped by hegemonic Western knowledge systems that fail to recognise and centre the agency of communities. Pereira et al. (2020) show how Global South perspectives can challenge the 'status quo' within transformation research, offering alternative viewpoints rooted in justice and history. Current patterns of geographical and epistemic dominance highlight the urgent need to disrupt such dominance to enable a greater diversity of perspectives to shape transformation research.

3.2 | System Focus

These results reveal the dominant socio-economic systems addressed within the literature, showing that the most common systems considered within the studies were energy systems (60%, $n = 75$), followed by urban (21.6%, $n = 27$), agricultural (15.2%, $n = 19$) and general (10.4%, $n = 13$) (these were transformations that did not focus on a specific sector). The remaining studies focused on marine, forest, conservation, transport or 'other' systems (14.4%, $n = 18$).

These results may reflect how the themes of justice and sustainability transformations have emerged within the literature, as there has been a strong emphasis on 'just energy transitions' to date within both research and policy, due to the urgent need to move away from fossil fuels to renewable energy sources

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

to mitigate the effects of climate change. Similarly, urban areas amass considerable attention as they are responsible for around 70% of global carbon emissions, 75% of global energy consumption, and by 2050 it is estimated that 7 billion people will live in urban areas (Ritchie and Roser 2018). Therefore, achieving sustainability depends largely on action within the urban sphere (Torrens et al. 2021). This may also be why many novel, experimental (action or participatory) research methods have occurred in these contexts. Raymond et al. (2021) also identified urban areas as an important locus for the politics of place, identity, representation, recognition and legitimacy, linking closely with notions of justice and equity. Although it is clear that these systems are extremely important for actualising just transformations, such emphasis may also produce blind spots, meaning that important insights from other systems may be missed.

3.3 | Methodological Approaches for Place-Based Just Transformations

This subsection explores the methodological tools and approaches used to study place-based sustainability transformations, focusing on the balance between qualitative, quantitative, spatial and mixed studies, reflecting on how methodological choices impact study insights.

The research methods found within the analysed papers were mainly qualitative (72.8%, $n = 91$), with the remaining papers categorised as mixed (12%, $n = 15$), quantitative (12%, $n = 15$) or spatial (3.2%, $n = 4$) (Figure 3). The most common qualitative methods of data collection were interviews (including structured, semi-structured and informal) (70.8%, $n = 75$), observation (33%, $n = 35$) and document analysis (27.4%, $n = 29$). Methods such as action research, citizens assemblies and participatory workshops were found in 41.5% of qualitative or mixed-methods studies ($n = 44$). The remaining qualitative or mixed-methods studies employed focus groups, questionnaires, site visits, stakeholder analysis and creative methods (42.4%, $n = 45$).

Although all approaches to transformation employed qualitative methods most frequently, systemic transformation had greater representation of quantitative (13.1%, $n = 13$), mixed (12.1%, $n = 12$) and spatial (4.0%, $n = 4$) methods than other transformation categories. Although qualitative methods were used most frequently to examine all the dimensions of social justice, quantitative methods are better represented in distributive studies (14.6%, $n = 15$) than for other dimensions. Mixed methods were comparatively better represented in studies on recognitional justice (11.4%, $n = 5$), and spatial methods were proportionately more common in studies considering restorative (15.4%, $n = 2$) or contextual (10.0%, $n = 2$) justice. Overall, the heavy lean towards qualitative research, which typically allows for more liberty and nuance than quantitative methods, may reflect the messiness and pliability of transformation, justice and place as concepts. The intricacies of these concepts may elude the 'neat' frameworks that quantitative methodologies seek. Many of the 'transformations' investigated within this review were presented as incomplete processes with no definitive endpoint (e.g., Williams and Doyon 2020), necessitating a more dynamic approach to understanding and progressing them. The qualitative and mixed methods used throughout these studies allow researchers to explore narratives, emotions and perceptions, capturing the lived experiences of the people and places undergoing transformations, relaying not only what is happening but also how it is felt, interpreted and experienced on the ground. When considering just transformations, this is invaluable, as it can help to illuminate both positive and negative aspects of interventions, such as empowerment or disenfranchisement. Qualitative methods capture these nuances and conflicts, where quantitative data might simplify the story.

However, quantitative research is useful in conveying a greater breadth of information and overarching trends that are often influential for policy-making. Taking a mixed-methods approach, incorporating both qualitative and quantitative elements, may therefore prove valuable for marrying the richness of qualitative insights with the rigour and breadth of quantitative analysis. For example, Zollet et al. (2021) showed how

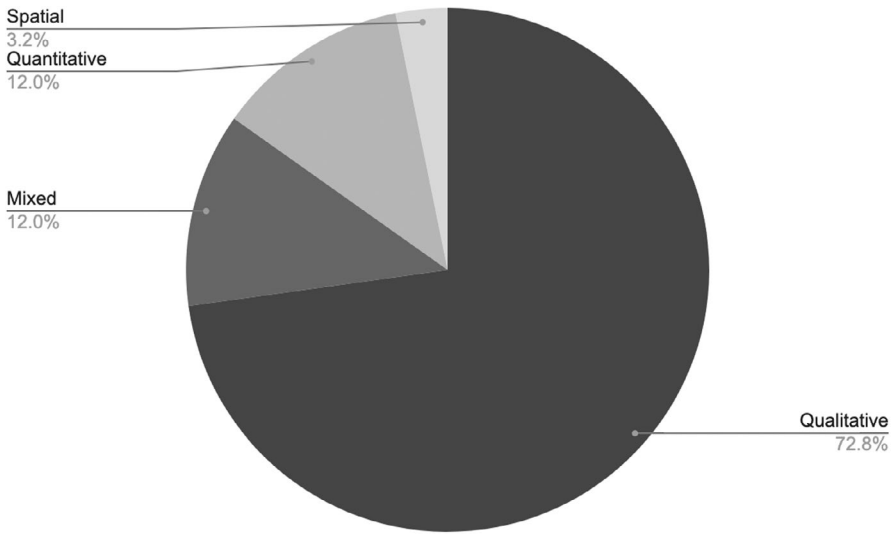


FIGURE 3 | Breakdown of method types employed in the papers reviewed.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

taking this approach could be useful in the context of place-based, just sustainability transformations. The paper showed how national data and statistics on energy poverty, in conjunction with qualitative stakeholder workshops, could combine to make strong policy recommendations. They argued that using a number of indicators and metrics, both qualitative and quantitative, was essential to capturing the complexity of energy poverty (and just energy transitions) in a way that would ensure policy interventions address the multi-dimensional nature of the problem. Only 11% of papers reviewed used mixed methods, supporting conclusions from previous studies that quantitative data could be used more effectively as a complementary form of analysis within research on social equity (Friedman et al. 2018).

3.4 | Conceptualising Justice in Sustainability Transformations

The following section explores how justice and equity are conceptualised and operationalised across the reviewed studies, highlighting the dimensions most commonly addressed. Studies typically had justice or equity as their primary or whole focus (41.6%, $n = 52$) or as a component of the analysis (44.8%, $n = 56$), yet only 46.4% ($n = 58$) of the studies provided an explicit definition for justice or equity. This lack of definition may relate to the plurality of dimensions and meanings justice and equity embody, making them difficult concepts to capture within single, concise definitions. The lack of clear definition, however, means that it might be harder to operationalise and describe how concepts are applied in practice. Despite this, 91.2% ($n = 114$) of reviewed papers did provide some sort of rationale within the study as to why justice or equity was explored. This was a much larger proportion than articles from the conservation science literature reviewed in 2018 (Friedman et al. 2018).

Out of the papers studied, 65.6% ($n = 82$) explored more than one dimension of justice, highlighting how justice dimensions are often closely linked. Distributional justice was the most commonly considered dimension (82.4%, $n = 103$) followed by procedural (69.6%, $n = 87$), recognition (35.2%, $n = 44$), contextual (16%, $n = 20$), restorative (10.4%, $n = 13$) and 'other' dimensions (1.6%, $n = 2$) (Figure 4). This reflects much of the justice literature to date (especially concerning energy justice), which typically focuses on three tenets of justice (Wood 2023).

Many studies did consider a combination of dimensions concurrently rather than focusing on one; however, few explicitly considered the role of restorative or contextual justice, perhaps because these dimensions were not explicitly considered in foundational theorisations of environmental justice (Schlosberg 2004). This limited attention to restorative and contextual dimensions suggests that important factors, such as historical harms and sensitivity to local social and cultural contexts, may remain underexplored (Fitz-Henry and Klein 2024).

Barragan-Contreras (2022), for example, shows that the historical marginalisation and discrimination linked to colonial and postcolonial heritage has led people to lack the confidence to express their opinions during public events about energy projects in Yucatán, Mexico, exacerbating procedural injustices. This created an imbalance in decision-making towards governments and developers that 'produces and reproduces injustices, inequalities, and power dynamics that risk the cultural and socio-environmental local context' (388). This study also highlights how dimensions interact and often reinforce injustices—a lack of procedural justice in the Mayan region resulted in a lack of distributional and recognitional justice, where loss of biodiversity and degradation of the environment also placed ancient traditions and culture at risk. This finding also illustrates how attachment to place might be put at risk when justice considerations are neglected.

Williams and Doyon (2020), in their exploration of the Energy Futures Lab in Canada, highlighted how contextual and restorative justice considerations may have improved recognition and procedural justice for First Nations people. In their meetings, only one First Nation representative was invited, despite the fact that there are 45 nations on 140 reserves, each with unique histories and social contexts that are likely

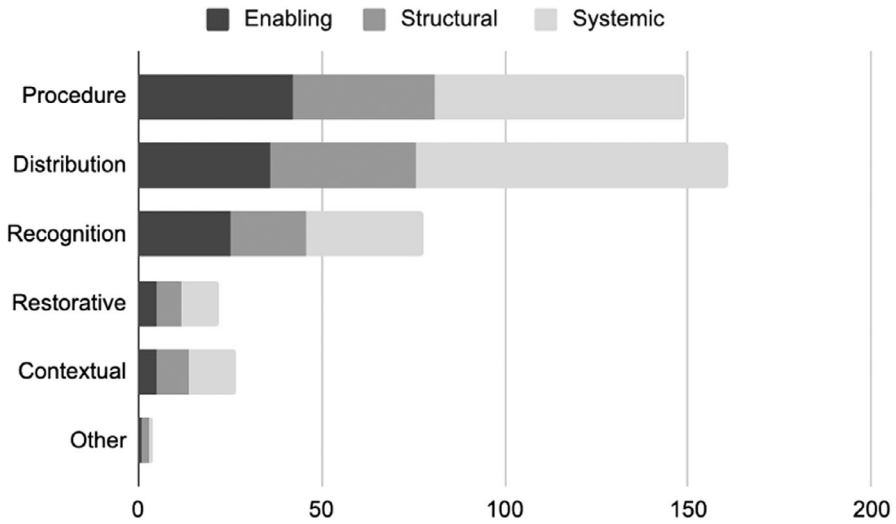


FIGURE 4 | Dimensions of justice included in studies reviewed.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

to impact perspectives of sustainability transformations. The one representative was said to have felt pressure by being in this situation and echoed the fact that a single indigenous worldview does not exist. These situations exemplify the need to try and repair historical harm to create spaces where marginalised voices can be heard, emphasising the importance of incorporating contextual and reparative dimensions into 'just' transformation discourse.

3.5 | Transformation Categorisation and Integration With Justice

Drawing on the categorisation from Scoones et al. (2020), this section examines approaches to transformation within the reviewed studies. The majority of papers took a systemic transformation approach (79.2%, $n = 99$). Structural transformations appeared in 39.2% ($n = 49$) of reviewed studies and enabling transformations in 38.4% ($n = 48$). Nearly half of the papers focused on more than one facet of transformation (40.8%, $n = 51$). For instance, 16% ($n = 20$) of studies considered all three approaches, showing that researchers are increasingly attempting to address transformation at various scales through a variety of techniques.

Of studies examining systemic transformations, most occurred in energy (66.7%, $n = 66$) and urban systems (18.2%, $n = 18$). Although studies considering enabling transformations most frequently looked at energy (43.8%, $n = 21$) or urban (31.3%, $n = 15$) systems, general transformations (25.0%, $n = 12$) and conservation (6.3%, $n = 3$) were more common contexts for enabling than for other approaches. Structural transformation studies most frequently took place in energy systems (51.0%, $n = 25$), followed by agricultural systems (24.5%, $n = 12$). Additionally, more than for distributional justice, studies examining procedural and recognitional justice dimensions had a greater focus on enabling (48.3%, $n = 42$ and 56.8%, $n = 25$, respectively) and structural (44.8%, $n = 39$ and 47.7%, $n = 21$) transformations (Figure 5).

Numerous other terms for 'transformation' were used interchangeably within the papers (some of which were found within our search string) including: transition ($n = 106$), change ($n = 8$), pathway ($n = 5$) and futures ($n = 5$). Only 33.6% of studies ($n = 42$) provided a definition of transformation (or other terms relating to transformation). The diversity of combinations of approaches highlights the plurality of ways that scholars are grappling with transformations in their research, both in terms of what is being transformed and the language used to convey the changes. It may also reflect a degree of conceptual vagueness within the field.

3.6 | Place in Transformation Theory and Practice

Notions of 'place' were mostly considered implicitly within studies (80.8%, $n = 101$), with fewer studies explicitly mentioning place as a topic or analysing it (19.2%, $n = 24$). Only 32% of studies ($n = 40$) provided a rationale for their exploration of place. The lack of explicit discussion and analysis of place highlights that studies may be overlooking important context and nuance, especially around power, histories and community dynamics.

Although all of the studies were inherently 'place-based' as per the inclusion criteria, there was a conspicuous lack of explicit

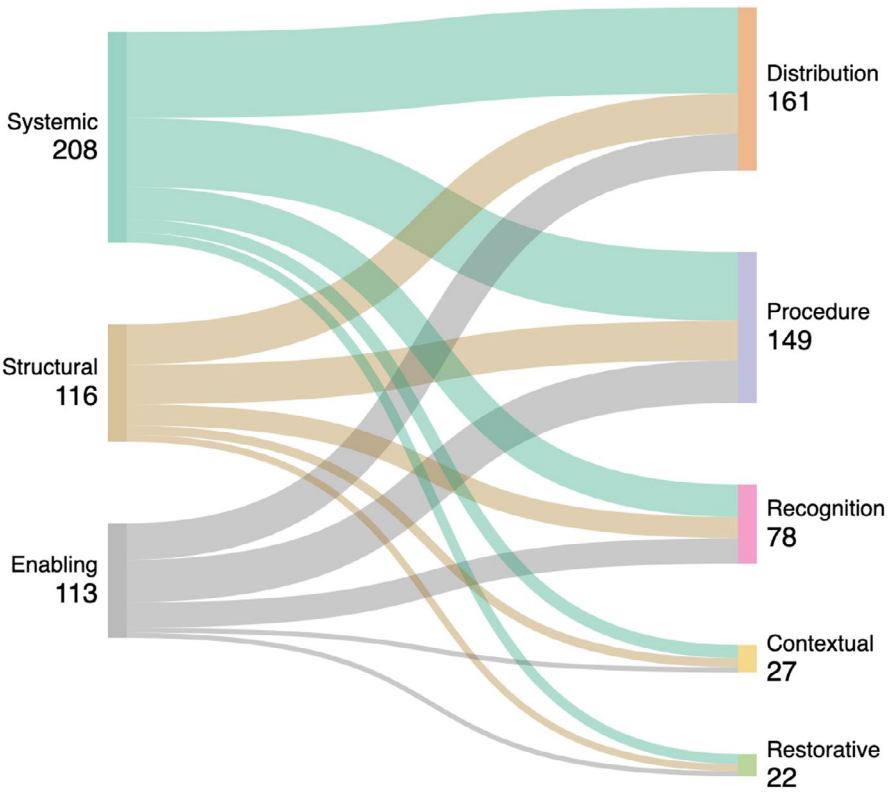


FIGURE 5 | Visualisation of transformation categories and justice dimensions.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

discussion about place theories, despite many papers grappling with them implicitly.

The lack of explicit engagement with place theory, including concepts like senses of place, place attachment, place identity, belonging and meaning-making, may therefore limit the field's ability to understand how spatial, emotional, cultural and historical dimensions shape transformation processes. Without this theoretical grounding, analyses may risk overlooking deeply situated values, attachments and identities that often underpin justice claims and influence how communities engage with, experience and respond to sustainability transformations. For example, Sanz-Hernández (2020) highlights the importance of place identity and culture in coal-reliant communities, showing that resistance to transformation can only be overcome when a new territorial project is socially rooted in local identities and cultural histories. This underscores how transformation strategies that ignore place-based belonging may face local resistance, reinforcing the need for context-sensitive and culturally grounded approaches to change. Lai (2021) echoes this in their exploration of community energy in Taiwan, critiquing research that fails to consider site-specific context and 'geo-historical' entanglements.

Reflecting this, many of the papers that outlined successful transformative actions were sensitive to the local context, adaptable and employed egalitarian approaches within decision-making and implementation. For instance, Lacey-Barnacle (2022) focused on an activist group in Bristol, Residents Against Dirty Energy (RADE), that effectively lobbied the local council for battery storage units rather than diesel generators. The proposed diesel generators were to be situated within two areas of high deprivation that also had low engagement with consultation processes. RADE realised that residents in these areas might need extra help in preventing the potentially unjust projects proposed for their area, recognising the importance of how, even within one city, there are differences in terms of appropriate action. The study underscored that 'understanding the spaces and places in which injustice takes place, can then give rise to recognition and procedural justice, which can then assist the realisation of distributional justice' (963). This demonstrated how space and place intertwine with the traditional tenets of justice in ways that can enrich and reinforce their transformative potential.

Other studies also highlighted how considering 'place' at municipal and local levels is crucial to enabling successful energy transformations. For instance, Lee et al. (2023) showed how aligning macro-level policies with public values was crucial for achieving equitable outcomes in four 'smart city' initiatives around the globe. The study advocated for flexible, contingent and practical strategies tailored to the specific challenges of each city rather than a 'one size fits all approach', allowing for more inclusive and adaptable approaches in urban development processes. In doing so, each of the four cities studied have had largely positive outcomes on their transformation journey thus far.

The success of many of the grassroots initiatives found within the analysed studies points to the importance of contextual and place-based frameworks in promoting justice. Place-specific approaches ensure that transformations are grounded in the social, cultural and historical contexts of the communities involved. Nicol (2020) emphasises the role of supportive legislative frameworks alongside grassroots action to support the scaling-up of sustainable food systems. Similarly, Barragan-Contreras (2022) stresses the importance of incorporating energy sovereignty concepts into energy justice frameworks, arguing that transformative action becomes more effective by aligning decisions about energy infrastructure with local community needs and values which is likely to reduce opposition to projects, and sentiments also mirrored by Vanhulst et al. (2022) who argue that place attachments, meanings and 'subjective territorial identity' are important tenants with transformation frameworks. Yet, even within such frameworks, it remains pertinent that researchers are mindful of the power asymmetries that shape which local voices are heard and legitimised or sidelined (Avelino and Wittmayer 2016).

A deeper exploration of the role of place within environmental transformations may therefore support more just outcomes, as it aids in understanding how justice is conceptualised, negotiated and enacted. Understanding transformation in place helps ground the often abstract and ambiguous nature of transformation in lived, situated experience. The consideration of how people and places are impacted by transformative change is integral and closely linked with justice concerns (Grenni et al. 2020; Horlings, Roep, et al. 2020).

3.7 | Implementation and Impact of Justice Within Sustainability Transformations

This section explores the reported outcome of transformations and the strategies used to implement justice within reviewed papers. Of the 125 studies analysed, the reported impacts of sustainability transformations were variable. Negative impacts were reported in 20% of studies ($n = 25$), alluding to challenges in the transformation process, including exclusion of communities, injustices in implementation and unintended harmful outcomes. Positive impacts were seen in 28.8% of studies ($n = 36$), where efforts led to more equitable outcomes, including community empowerment, improved livelihoods and improved education. Mixed impacts were identified in 20% of studies ($n = 25$), indicating success in specific areas, but facing limitations and setbacks in achieving just outcomes for all. Hypothetical impacts were also presented in 24% of papers ($n = 30$), where transformation processes were incomplete, but researchers modelled or presented expected outcomes, often focusing on future-oriented scenarios. In nine studies (7.2%), no impacts were discussed, with research more focused on process and frameworks rather than transformation outcomes. The mixed and sometimes negative outcomes reported in some studies highlight the complexity of achieving equitable transformations, reinforcing the need for context-sensitive and inclusive approaches.

The majority of papers provided recommendations or guidelines for implementing justice into transformations (88.8%, $n = 111$). The most common recommendation was the use of participatory processes (47.7%, $n = 53$), which largely focused on the inclusion of community groups and a wide range of stakeholders within

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

decision-making and transformation processes. Policy interventions (21.6%, $n = 24$) were also frequently suggested, often involving explicit justice-oriented objectives. A further 21.6% ($n = 24$) of studies recommended knowledge sharing and upskilling, for example through education programmes and capacity-building projects. Finally, a variety of grassroots community-led action was advocated across several studies (16.2%, $n = 18$). This suggests that the literature is action-oriented, though the effectiveness and uptake of recommendations remain unclear.

The results show the critical role of participation, co-production and community empowerment in promoting justice and equity within transformations. Empowering communities to actively participate in decision-making processes was a central theme across several papers due to the role of effective participation and co-production in ensuring that transformations are inclusive, context-specific, and address the needs and values of those impacted. The importance of inclusive decision-making was highlighted in Lacey-Barnacle (2022) where close collaboration with and lobbying by communities ensured that they were not burdened with new fossil fuel-based technologies. Lehigh et al. (2020) also emphasise the use of capacity building, open communication and context-specific partnerships to include diverse community voices, ensuring more equitable redevelopment outcomes. However, power imbalances and historic injustices persist, and without addressing these challenges, the participatory processes outlined previously may be ineffective. Lehigh et al. (2020) found that a redevelopment project, despite engaging in multiple intersecting engagement efforts with the community, was negatively influenced by structural and organisational power imbalances, suggesting deeper changes are needed to truly empower communities. Similarly Barragan-Contreras (2022) exposes how indigenous communities were excluded from key decision-making processes regarding large-scale energy infrastructure, violating their right to self-determination. The study argues for moving away from reliance on top-down approaches, emphasising the need for frameworks that recognise collective rights and empower communities.

Grassroots, people-centred and cooperative approaches emerge from the literature as a promising alternative to entrenched power dynamics. Cooperative ways of working including community-supported agriculture (CSAs) have been recognised as effective mechanisms for driving sustainable and just food systems (Nicol 2020), albeit on a small scale. Zollet et al. (2021) similarly describes how proactive grassroots action has driven transformative change towards just food systems in Italy when compared with reactive institutional responses that focus on short-term issues. These models enable community ownership and economic empowerment by providing communities with access to resources, training and land, while offering a more democratic form of governance by allowing for truly collaborative decision-making.

At the governance level, effective policy frameworks are crucial for embedding justice within transformations. Policies that address power asymmetries and promote inclusive, multi-stakeholder participation may help in creating more equitable transformations. Zollet et al. (2021) calls for policies that explicitly address power asymmetries in food systems, recognising the need for bottom-up approaches that empower local communities over corporate interests. Feenstra et al. (2021) similarly highlight the importance of 'humanising the energy transition' by developing policies that ensure energy poverty is integrated into national energy frameworks to ensure that vulnerable populations are not left behind by the transition. Williams and Doyon (2020) introduce the use of tools, such as a 'justice and system transitions framework'. To assess how well justice is incorporated into transitions, advocating for more comprehensive evaluations. These tools are useful for governance bodies seeking to ensure that principles of justice and equity are upheld in transformation processes. The findings across studies highlight several key themes for integration of justice within sustainability transformations, suggesting the need for a multi-scalar approach that combines grassroots, place-based efforts with robust policy and governance frameworks that address historical inequalities and power asymmetries to pave the way for more inclusive and equitable transformation processes. As emphasised by Monaco (2025), the most successful sustainability initiatives are those that are co-produced with local actors, adapted to the specific socio-ecological contexts in which they are situated and co-designed with community groups with formal shared governance mechanisms, therefore contributing to more democratic and inclusive transformations.

4 | Conclusions and Recommendations

This review explored how justice and place are conceptualised and operationalised within the sustainability transformation literature, a quickly growing and evolving field of research. Our findings highlight several key patterns and limitations. The literature on 'just' place-based transformations has a heavy focus on energy and urban systems, particularly within Europe and North America, showing disparities in the way the field has emerged. This reveals the potential to exacerbate existing social injustices and vulnerabilities. It also highlights the lack of explicit acknowledgement of the concept of 'place', despite local contexts being crucially important in the way transformations occur—an expanded and more critical engagement with place theory could therefore deepen understanding of how such transformations play out in context. The literature reviewed offers insights into how transformations are unfolding in a variety of contexts, with both positive and negative justice outcomes, emphasising the differences in conceptualisation, implementation and contestation across different settings. Many studies championed approaches that prioritise local communities, placing importance on people-centred and participatory methods of decision-making in order to empower people and promote equitable outcomes. The review also shows that there is a lack of explicit definitions when considering both transformation and justice, highlighting the need for a greater level of clarity within policy and interventions. Addressing this gap is essential within future research to enable progress to be monitored effectively. To support more equitable transformation research and practice, we propose the following recommendations based on findings from this review:

1. Promote epistemic justice—supporting local scholars, fostering global partnerships and integrating different types of knowledge through more inclusive authorship may help in creating a more equitable and globally relevant research agenda (Collyer 2018).

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

2. Expand conceptualisations of justice to include contextual and restorative perspectives—moving forward, research should shine a critical light on transformation processes to ensure that justice for *all* is at the fore. Without greater consideration of contextual and restorative elements, notions of justice may risk being simplified, reducing them to easily measurable factors while neglecting deeper, more systemic inequalities that lie at the root of such injustices (Barragan-Contreras 2022).
3. Integrate place theory more substantially into transformation frameworks—it is important that policy makers and researchers treat place as an integral consideration within just transformation research and practice (Grenni et al. 2020).
4. Adopt interdisciplinary and mixed-methods approaches—promoting interdisciplinary research and weaving together varied methodological approaches may help to strengthen recommendations provided by researchers. Quantitative evaluation within transformation research may help to make transformative change more tangible and less abstract, while qualitative insights help to add depth and nuance (Zollet et al. 2021).
5. Broaden systems focus—research in the field would benefit from a greater amount of scholarship that considers a wider range of interdependent systems, along with interconnections between different systems, echoing the importance of taking a nexus approach (Liu et al. 2018) to promote more holistic and justice-oriented solutions.
6. Support grassroots, community-led approaches alongside policy and governance mechanisms (Monaco 2025).

Taken together, these findings suggest that without deeper theoretical engagement and more inclusive, context-sensitive research practices, scholarship on sustainability transformations may risk reproducing the injustices it seeks to address. A more comprehensive understanding of transformation and justice, coupled with targeted place-based actions, policy and interventions can create a path towards a more just and environmentally sustainable future.

Acknowledgements

K.K. acknowledges funding from the University of Nottingham's School of Geography scholarship during the writing of this paper. The authors would like to extend thanks to Carla Archibald their insights and recommendations provided on earlier versions of this project.

Ethics Statement

This research was carried out in accordance with the University of Nottingham's Code of Research Conduct and Research Ethics.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Data supporting this study are included within the article and Supporting Information.

Endnotes

[1] Justice and equity are two distinct, but related concepts, that are often used synonymously (particularly outside of academic circles). Although it is important to recognise this distinction, because of the overlap in use in the literature, for the purposes of this paper we use the two terms interchangeably to refer to the same concept of fairness.

References

Abson, D. J., J. Fischer, J. Leventon, et al. 2017. "Leverage Points for Sustainability Transformation." *Ambio* 46: 30–39. https://doi.org/10.1007/s13280-016-0800-y.

Avelino, F., and J. M. Wittmayer. 2016. "Shifting Power Relations in Sustainability Transitions: A Multi-Actor Perspective." *Journal of Environmental Policy & Planning* 18, no. 5: 628–649. https://doi.org/10.1080/1523908X.2015.1112259.

Banerjee, A., and G. Schuitema. 2022. "How Just Are Just Transition Plans? Perceptions of Decarbonisation and Low-Carbon Energy Transitions Among Peat Workers in Ireland." *Energy Research & Social Science* 88: 102616. https://doi.org/10.1016/j.erss.2022.102616.

Barca, F., P. McCann, and A. Rodríguez-Pose. 2012. "The Case for Regional Development Intervention: Place-Based Versus Place-Neutral Approaches*." *Journal of Regional Science* 52, no. 1: 134–152. https://doi.org/10.1111/j.1467-9787.2011.00756.x.

Barragan-Contreras, S. J. 2022. "Procedural Injustices in Large-Scale Solar Energy: A Case Study in the Mayan Region of Yucatan, Mexico." *Journal of Environmental Policy & Planning* 24, no. 4: 375–390. https://doi.org/10.1080/1523908X.2021.2000378.

Bennett, N. J., J. Blythe, A. M. Cisneros-Montemayor, G. G. Singh, and U. R. Sumaila. 2019. "Just Transformations to Sustainability." *Sustainability* 11, no. 14: 3881. https://doi.org/10.3390/su11143881.

Blythe, J., J. Silver, L. Evans, et al. 2018. "The Dark Side of Transformation: Latent Risks in Contemporary Sustainability Discourse." *Antipode* 50, no. 5: 1206–1223. https://doi.org/10.1111/anti.12405.

Broto, V. C., I. Baptista, J. Kirshner, S. Smith, and S. N. Alves. 2018. "Energy Justice and Sustainability Transitions in Mozambique." *Applied Energy* 228: 645–655. https://doi.org/10.1016/j.apenergy.2018.06.057.

Collyer, F. M. 2018. "Global Patterns in the Publishing of Academic Knowledge: Global North, Global South." *Current Sociology* 66, no. 1: 56–73. https://doi.org/10.1177/0011392116680020.

Cresswell, T. 2004. *Place: A Short Introduction*. Blackwell Publishing.

Feenstra, M., L. Middlemiss, M. Hesselman, K. Straver, and S. Tirado Herrero. 2021. "Humanising the Energy Transition: Towards a National Policy on Energy Poverty in The Netherlands." *Frontiers in Sustainable Cities* 3: 645624. https://doi.org/10.3389/frsc.2021.645624.

Fitz-Henry, E., and E. Klein. 2024. "From Just Transitions to Reparative Transformations." *Political Geography* 108: 103004. https://doi.org/10.1016/j.polgeo.2023.103004.

Friedman, R. S., E. A. Law, N. J. Bennett, C. D. Ives, J. P. Thorn, and K. A. Wilson. 2018. "How Just and Just How? A Systematic Review of Social Equity in Conservation Research." *Environmental Research Letters* 13, no. 5: e053001. https://doi.org/10.1088/1748-9326/aabcde.

Ghosh, B., M. Ramos-Mejía, R. C. Machado, S. L. Yuana, and K. Schiller. 2021. "Decolonising Transitions in the Global South: Towards More Epistemic Diversity in Transitions Research." *Environmental Innovation and Societal Transitions* 41: 106–109. https://doi.org/10.1016/j.eist.2021.10.029.

Gosnell, H. 2022. "Regenerating Soil, Regenerating Soul: An Integral Approach to Understanding Agricultural Transformation." *Sustainability Science* 17, no. 2: 603–620. https://doi.org/10.1007/s11625-021-00993-0.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Grenni, S., L. G. Horlings, and K. Soini. 2020. "Linking Spatial Planning and Place Branding Strategies Through Cultural Narratives in Places." *European Planning Studies* 28, no. 7: 1355–1374. https://doi.org/10.1080/09654313.2019.1701292.

Harrison, H., S. J. Griffin, I. Kuhn, and J. A. Usher-Smith. 2020. "Software Tools to Support Title and Abstract Screening for Systematic Reviews in Healthcare: An Evaluation." *BMC Medical Research Methodology* 20, no. 1: 7. https://doi.org/10.1186/s12874-020-0897-3.

Heffron, R. J., and D. McCauley. 2017. "The Concept of Energy Justice Across the Disciplines." *Energy Policy* 105: 658–667. https://doi.org/10.1016/j.enpol.2017.03.018.

Horlings, L. G., D. Roep, E. Mathijs, and T. Marsden. 2020. "Exploring the Transformative Capacity of Place-Shaping Practices." *Sustainability Science* 15: 353–362. https://doi.org/10.1007/s11625-020-00787-w.

Kothari, A., L. Temper, I. Rodríguez, et al. 2024. "Towards a Just Transformations Theory." In *Just Transformations*, 315. Pluto Press. https://doi.org/10.2307/jj.8501592.16.

Lacey-Barnacle, M. 2022. "Residents Against Dirty Energy: Using Energy Justice to Understand the Role of Local Activism in Shaping Low-Carbon Transitions." *Local Environment* 27, no. 8: 946–967. https://doi.org/10.1080/13549839.2022.2090534.

Lai, H.-L. 2021. "Foregrounding the Community: Geo-Historical Entanglements of Community Energy, Environmental Justice, and Place in Taihsi Village, Taiwan." *Environment and Planning E: Nature and Space* 5, no. 2: 666–693. https://doi.org/10.1177/25148486211000745.

Lee, J., J. Babcock, T. S. Pham, T. H. Bui, and M. Kang. 2023. "Smart City as a Social Transition Towards Inclusive Development Through Technology: A Tale of Four Smart Cities." *International Journal of Urban Sciences* 27, no. sup1: 75–100. https://doi.org/10.1080/12265934.2022.2074076.

Lehigh, G. R., E. C. Wells, and D. Diaz. 2020. "Evidence-Informed Strategies for Promoting Equitability in Brownfields Redevelopment." *Journal of Environmental Management* 261: 110150. https://doi.org/10.1016/j.jenvman.2020.110150.

Lenzi, D., P. Balvanera, P. Arias-Arévalo, et al. 2023. "Justice, Sustainability, and the Diverse Values of Nature: Why They Matter for Biodiversity Conservation." *Current Opinion in Environmental Sustainability* 64: 101353. https://doi.org/10.1016/j.cosust.2023.101353.

Liu, J., V. Hull, H. C. J. Godfray, et al. 2018. "Nexus Approaches to Global Sustainable Development." *Nature Sustainability* 1, no. 9: 466–476. https://doi.org/10.1038/s41893-018-0135-8.

Martin, A., M. T. Armijos, B. Coolsaet, et al. 2020. "Environmental Justice and Transformations to Sustainability." *Environment: Science and Policy for Sustainable Development* 62, no. 6: 19–30. https://doi.org/10.1080/00139157.2020.1820294.

Massey, D. 1994. *Space, Place, and Gender*. University of Minnesota Press.

McDermott, M., S. Mahanty, and K. Schreckenberg. 2013. "Examining Equity: A Multidimensional Framework for Assessing Equity in Payments for Ecosystem Services." *Environmental Science & Policy* 33: 416–427. https://doi.org/10.1016/j.envsci.2012.10.006.

Monaco, S. 2025. "The Other Side of Sustainability: Contradictions and Risks in Contemporary Green Innovations." *Sustainability* 17, no. 10: 4687. https://doi.org/10.3390/su17104687.

Nicol, P. 2020. "Pathways to Scaling Agroecology in the City Region: Scaling out, Scaling up and Scaling Deep Through Community-Led Trade." *Sustainability* 12, no. 19: 7842. https://doi.org/10.3390/su12197842.

O'Brien, K. 2012. "Global Environmental Change II." *Progress in Human Geography* 36: 667–676. https://doi.org/10.1177/0309132511425767.

Okpanachi, E., T. Ambe-Uva, and A. Fassih. 2022. "Energy Regime Reconfiguration and Just Transitions in the Global South: Lessons for West Africa From Morocco's Comparative Experience." *Futures* 139: 102934. https://doi.org/10.1016/j.futures.2022.102934.

Page, M. J., J. E. McKenzie, P. M. Bossuyt, et al. 2021. "The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews." *International Journal of Surgery* 88: 105906. https://doi.org/10.1136/bmj.n71.

Patterson, J. J., T. Thaler, M. Hoffmann, et al. 2018. "Political Feasibility of 1.5 C Societal Transformations: The Role of Social Justice." *Current Opinion in Environmental Sustainability* 31: 1–9. https://doi.org/10.1016/j.cosust.2017.11.002.

Pereira, L., N. Frantzeskaki, A. Hebinck, et al. 2020. "Transformative Spaces in the Making: Key Lessons From Nine Cases in the Global South." *Sustainability Science* 15, no. 1: 161–178. https://doi.org/10.1007/s11625-019-00749-x.

Pörtner, H. O., D. C. Roberts, E. S. Poloczanska, et al. 2022. "IPCC, 2022: Summary for Policymakers." https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FullReport.pdf.

Raymond, C. M., L. C. Manzo, D. R. Williams, A. Di Masso, and T. von Wirth. 2021. *Changing Senses of Place: Navigating Global Challenges*. Cambridge University Press. https://doi.org/10.1017/9781108769471.003.

Ripple, W. J., C. Wolf, T. M. Lenton, et al. 2023. "Many Risky Feedback Loops Amplify the Need for Climate Action." *One Earth* 6, no. 2: 86–91. https://doi.org/10.1016/j.oneear.2023.01.004.

Ritchie, H., and M. Roser. 2018. "Urbanization. Our World in Data." https://ourworldindata.org/urbanization.

Sahle, M., S. A. Lahoti, S. Y. Lee, et al. 2025. "Revisiting the Sustainability Science Research Agenda." *Sustainability Science* 20, no. 1: 1–19. https://doi.org/10.1007/s11625-024-01586-3.

Sampson, K. A., and C. G. Goodrich. 2009. "Making Place: Identity Construction and Community Formation Through "Sense of Place" in Westland, New Zealand." *Society & Natural Resources* 22, no. 10: 901–915. https://doi.org/10.1080/08941920802178172.

Sanz-Hernández, A. 2020. "How to Change the Sources of Meaning of Resistance Identities in Historically Coal-Reliant Mining Communities." *Energy Policy* 139: 111353. https://doi.org/10.1016/j.enpol.2020.111353.

Schlosberg, D. 2004. "Reconceiving Environmental Justice: Global Movements and Political Theories." *Environmental Politics* 13, no. 3: 517–540. https://doi.org/10.1080/0964401042000229025.

Scoones, I., A. Stirling, D. Abrol, et al. 2020. "Transformations to Sustainability: Combining Structural, Systemic and Enabling Approaches." *Current Opinion in Environmental Sustainability* 42: 65–75. https://doi.org/10.1016/j.cosust.2019.12.004.

Sikor, T., A. Martin, J. Fisher, and J. He. 2014. "Toward an Empirical Analysis of Justice in Ecosystem Governance." *Conservation Letters* 7, no. 6: 524–532. https://doi.org/10.1111/conl.12142.

Sovacool, B. K., M. Burke, L. Baker, C. K. Kotikalapudi, and H. Wlokas. 2017. "New Frontiers and Conceptual Frameworks for Energy Justice." *Energy Policy* 105: 677–691. https://doi.org/10.1016/j.enpol.2017.03.005.

Sovacool, B. K., B. Turnheim, A. Hook, A. Brock, and M. Martiskainen. 2021. "Dispossessed by Decarbonisation: Reducing Vulnerability, Injustice, and Inequality in the Lived Experience of Low-Carbon Pathways." *World Development* 137: 105116. https://doi.org/10.1016/j.worlddev.2020.105116.

Stark, A., F. Gale, and H. Murphy-Gregory. 2023. "Just Transitions' Meanings: A Systematic Review." *Society & Natural Resources* 36, no. 10: 1277–1297. https://doi.org/10.1080/08941920.2023.2207166.

Stedman, R. C. 2002. "Toward a Social Psychology of Place: Predicting Behavior From Place-Based Cognitions, Attitude, and Identity."

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Environment and Behavior 34, no. 5: 561–581. https://doi.org/10.1177/0013916502034005001.

Sultana, F. 2022. "Critical Climate Justice." *Geographical Journal* 188, no. 1: 118–124. https://doi.org/10.1111/geoj.12417.

Thiery, W., S. Lange, J. Rogelj, et al. 2021. "Intergenerational Inequities in Exposure to Climate Extremes." *Science* 374, no. 6564: 158–160. https://doi.org/10.1126/science.abi7339.

Thorn, J. P., J. A. Klein, C. Steger, et al. 2020. "A Systematic Review of Participatory Scenario Planning to Envision Mountain Social-Ecological Systems Futures." *Ecology and Society* 25, no. 3: 6. https://doi.org/10.5751/ES-11608-250306.

Torrens, J., L. Westman, M. Wolfram, et al. 2021. "Advancing Urban Transitions and Transformations Research." *Environmental Innovation and Societal Transitions* 41: 102–105. https://doi.org/10.1016/j.eist.2021.10.026.

Vanhulst, J., K. Gonzalez Tapia, A. E. Beling, R. Rivas, and R. Elfant. 2022. "From NIMBY to Transformation? Lessons From Four Case Studies in the Maule Region in Chile." *Local Environment* 27, no. 8: 988–1006. https://doi.org/10.1080/13549839.2022.2091529.

Vogel, C., and K. O'Brien. 2022. "Getting to the Heart of Transformation." *Sustainability Science* 17, no. 2: 653–659. https://doi.org/10.1007/s11625-021-01016-8.

Williams, S., and A. Doyon. 2020. "The Energy Futures Lab: A Case Study of Justice in Energy Transitions." *Environmental Innovation and Societal Transitions* 37: 290–301. https://doi.org/10.1016/j.eist.2020.10.001.

Wood, N. 2023. "Problematising Energy Justice: Towards Conceptual and Normative Alignment." *Energy Research & Social Science* 97: 102993. https://doi.org/10.1016/j.erss.2023.102993.

Zollet, S., L. Colombo, P. De Meo, et al. 2021. "Towards Territorially Embedded, Equitable and Resilient Food Systems? Insights From Grassroots Responses to COVID-19 in Italy and the City Region of Rome." *Sustainability* 13, no. 5: 2425. https://doi.org/10.3390/su13052425.

Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** geo270040-sup-0001-DataS1.docx. **Data S2:** geo270040-sup-0002-DataS2.docx. **Data S3:** geo270040-sup-0003-DataS3.docx. **Data S4:** geo270040-sup-0004-DataS4.xlsx. **Data S5:** geo270040-sup-0005-DataS5.docx.

20544049, 2025, 2, Downloaded from https://rgs-ibg.onlinelibrary.wiley.com/doi/10.1002/geo2.70040 by Imperial College London, Wiley Online Library on [20/02/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License