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For the many not the few: introducing just transition for supply chain management

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Abstract

Purpose – Just transition is a fundamental concept for supply chain management but neither discipline pays attention to the other and little is known about how supply chains can be orchestrated as socioecological systems to manage these transitions. Building from a wide range of just transition examples, this paper explores just transition to understand how to move beyond instrumental supply chain practices to supply chains functioning in harmony with the planet and its people.

Design/methodology/approach – Building from a systematic review of 72 papers, the paper identifies just transition examples while interpreting them through the theoretical lens of supply chain management, providing valuable insights to help research and practice understand how to achieve low-carbon economies through supply chain management in environmentally and socially just ways.

Findings – The paper defines, elaborates, and extends the just transition construct by developing a transition taxonomy with two key dimensions. The purpose dimension (profit or shared outcomes) and the governance dimension (government-/industry-led versus civil society-involved), generating four transition archetypes. Most transitions projects are framed around the Euro- and US-centric, capitalist standards of development, leading to coloniality as well as economic and cultural depletion of communities. Framing just transition in accordance with context-specific plural values, the paper provides an alternative perspective to the extractive transition concept. This can guide supply chain management to decarbonise economies and societies by considering the rights of nature, communities and individuals.

Originality/value – Introducing just transition into the supply chain management domain, this paper unifies the various conceptualisations of just transition into a holistic understanding, providing a new foundation for supply chain management research.

Keywords Just transition, Decarbonisation, Community development, Decolonisation, Social dialogue, Supply chain management

Paper type Research paper

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1. Introduction

We are seeing the climate crisis happen before our eyes, with off-the-chart records across planetary boundary indicators. 20 of the 35 indicators were broken by huge margins, with 2023 the hottest year on record (Carrington, 2023).

The global energy sector will be instrumental in tackling this problem as it generates three-quarters of greenhouse gas (GHG) emissions globally (IEA, 2021b). It is crucial to replace fossil fuels, such coal, gas and oil with energy from renewable sources, such as wind, hydro and solar; to reduce carbon emissions. UN Secretary-General António Guterres stated "*without renewables, there can be no future*" (United Nations, 2023) and climate scientists insist that decarbonisation by phasing-out of fossil fuels must happen rapidly (Carrington, 2024).

Supply chain management is crucial to decarbonisation. Supply chains are at the heart of the worsening climate crisis (Silva *et al.*, 2023b); as supply chain carbon emissions (Scope 3) constitute, on average, 86% of all company emissions (Hoepner and Schneider, 2022), with only eight of the world's supply chains responsible for 50% of total global emissions (Lesser, 2021).

To tackle this, supply chain management must become socio-ecological systems ensuring harmonic integration with natural resources (Gualandris *et al.*, 2023). Supply chain management is, therefore, expected to reshape its processes and practices to be culturally and context specific (Samson and Swink, 2023). Yet, despite efforts, instrumental and traditional supply chain assumptions lack a shared vision for socio-ecological systems (Gualandris *et al.*, 2023). Decarbonisation requires restorative solutions for a variety of supply chain-related issues and the supply chain management discipline finds itself in need of a new foundation rooted in environmental and social justice.

Currently, decarbonisation and sustainability transitions are often framed, and endorsed by both practice and research, as technology and innovation-focused, prioritising the role of governments and markets for innovative and, often, niche solutions (Hale *et al.*, 2021). While, the growing environmental justice discourse is concerned with "*the unequal distribution of environmental risks on already disadvantaged individuals, communities, and non-humans*" (Williams and Doyon, 2020, p. 291). Fossil fuels must be phased-out and renewables must be phased-in, but this transition should not be framed solely on emissions reduction, because this completely ignores social and economic issues faced by communities and workers at multiple levels (Johnstone and Hielscher, 2017).

Therefore, a social justice narrative must be adopted to understand "*how (climate change) adaptation might exacerbate existing inequities and create new ones, and how voices from grassroots communities can be incorporated into just, democratic and workable transitions*" (Routledge *et al.*, 2018, p. 78). Given that human agency, politics, governance and power imbalances are often overlooked in sustainability transitions (Hale *et al.*, 2021), commentators underline the need for a *just transition* to a sustainable future (Carrington, 2023).

Just transitions are different from sustainability transitions. Engaging with social justice, a just transition ensures not only environmental impact reduction but also decent work, social inclusion and poverty elimination (Casano, 2019; Gilbert *et al.*, 2018). The concept of *just transition* originated in the 1960 and 1970s in the USA when coal mining operations changed from small, local, independent producers to large-scale operations following a series of mergers and acquisitions. Several small unprofitable mines closed, and trade unions demanded rights for workers and communities to avert mass unemployment and decline. This had varying degrees of success, due to the lack of union influence over industrial planning and policymaking (Abraham, 2017).

Two decades later the International Trade Union Confederation (ITUC) included the term "just transition" in a statement at the 1997 Kyoto Conference and in 2010 during the ITUC World Congress the resolution on "*combating climate change through sustainable development and just transition*" was adopted by unions (ITUC, 2010). The phrase gained universal recognition by international bodies, governments, trade unions, non-governmental organisations (NGOs) and activists in 2015, following its mention in the Paris Agreement

noting "*the imperatives of a just transition*". The concept continues to grow in scope and there are efforts at local, national, and international levels to create transformative and alternative models to tackle climate crisis in just ways for the future.

Despite its growing popularity, importance, and what appears to be an abundance of just transition projects and related policies, there is no commonly agreed definition of just transition or consistent focus (Kenfack, 2019). Little is known about how communities can be integrated into these transitions (Lennon, 2020). There is no consensus on how local communities and groups can work together to envisage a better future (Cock, 2019) or the real impact of just transitions on individuals and communities (Bainton *et al.*, 2021).

Lack of construct clarity has resulted in a lack of consistency in theory building since the meaning of just transition varies across studies. Consequently, theory building, theory testing, replication, and generalisation of findings have been difficult. Most theoretical contributions are descriptive and lack theoretical foundation. The just transition concept is broader than specific environmental issues such as energy security or low-carbon technologies, therefore it is imperative that we build multidisciplinary theory to understand what just transitions are, how they work and if, and how, societies, communities, and marginalised groups, such as women, indigenous people, and ethnic minorities, can influence just transitions.

In the shift to decarbonisation, the idea of just transition is fundamental for the transition and development of supply chains. The integration of just transition into the supply chain management discipline is essential to achieve a fair and equitable low-carbon economy, but has been, almost totally, ignored (Karaosman and Marshall, 2023). Both research and practical application of just transition in supply chain management are underdeveloped (*e.g.* Bainton *et al.*, 2021). As supply chain discourse has ignored just transition, the transition discourse also fails to include supply chains (Eaton, 2021).

However, it is clear that extractive activities and investments are cascaded onto lower-tier supply chains (Iskander and Lowe, 2020) and eco-industrial policies are needed to compliment strategies and practices that challenge exploitative supply chains (White, 2019). Transitions can significantly harm individuals, communities, and various stakeholders across supply chains and it is vital to address how just transitions affect lower-tier suppliers, such as marginalised small-scale farmers (Härri *et al.*, 2020) and miners. Restorative solutions are essential for a variety of supply chain-related transition issues that go beyond job losses in declining industries (Bainton *et al.*, 2021). Knowing that decarbonisation will impact sourcing, production and the distribution of materials, products and services, the concepts of justice and just transition must be embedded in supply chain management.

2. Supply chain management and just transition

Even though many supply chain management researchers use the concept of sustainability, most supply chain discourse still uses a limited conceptualisation of sustainability, taking an incremental and static approach and focusing on operational performance, profitability and risk management without acknowledging the link between supply chains and planetary as well as social boundaries (Wieland, 2021). Supply chain research could provide important answers to transitioning from high-carbon to low-carbon systems. But to do this, supply chains, supply chain management and supply chain research need to be reimagined. The current supply chain discourse that views sustainability as an accounting tool (Elkington, 2018) and that uses organisational theories that fail to explain networks with overlapping structures needs to change (Gualandris *et al.*, 2021).

Decarbonisation requires radical action by transforming how energy is sourced, produced and managed. Phasing-out fossil fuels and phasing-in renewable energy is the most effective and practical solution (Carrington, 2022). However, decarbonisation practices are pushed further down supply chains (Iskander and Lowe, 2020), often onto suppliers with fewer resources and more vulnerable communities (Karaosman and Marshall, 2023).

Additionally, decarbonisation does not preclude negative environmental and social impacts across energy supply chains. Even though onshore-wind-electricity production in 2020 was twice that generated in 2019 (IEA, 2021a), individual wind turbine capacity has more than doubled in a decade, and solar energy is more cost effective than fossil fuels in many countries (Robertson-Fall, 2022), renewable energy development still has environmental and societal challenges (Robertson-Fall, 2022). Renewable energy infrastructure relies on finite materials and the renewable energy industry operates in a linear "take-make-waste" system contributing to environmental problems, such as waste and biodiversity loss. For example, 48 million tonnes of wind turbine blades are anticipated to become waste by 2050 (Robertson-Fall, 2022); while solar panel waste is predicted to reach 78 million tonnes by 2050 (IRENA and IEA-PVPS, 2016). Furthermore, mineral production, including graphite, lithium and cobalt, is expected to increase by approximately 500% by 2050 to meet demand for renewable energy technologies (Hund *et al.*, 2020) with governments exploiting these natural resources for their own strategic advantage (Brende, 2022), ignoring severe health and safety impacts on workers and local communities (Dominish *et al.*, 2019). While, most renewable energy projects focus on cost reduction and ignore the means of production leading to modern slavery, community deprivation, biodiversity loss and human rights abuses (DeBoom, 2020), causing significant harm and damage not only for direct workers but also for supply chains.

Even though there are direct links between decarbonisation and supply chain management (*e.g.* Dahlmann *et al.*, 2023), decarbonising supply chains is a complex task (Xu *et al.*, 2023). Pagell and Wu (2009) categorise supply chain management practices as: sourcing management, operations and investments in people and talent. Therefore, achieving decarbonisation means transitioning each of these practices. Knowing that transitions involve intensifying actions around sourcing and operations, as well as distribution, just transitions must include a wide range of stakeholders (Härri *et al.*, 2020). Meixell and Luoma (2015) provide a framework of *supply chain stakeholders*, including primary stakeholders (suppliers, employees, managers, shareholders) and secondary stakeholders (communities, NGOs, trade associations), which need to be included in just transitions.

Recently, supply chain researchers have included transitions in their studies, for example, electric vehicle transitions (Chizaryfard *et al.*, 2022), energy transitions (Lennon, 2021), and transitioning to low-carbon fashion supply chains (Karaosman and Marshall, 2023). Yet, despite these efforts, supply chain research almost completely neglects the individuals in supply chains whose rights are adversely impacted by these transitions (Meehan and Pinnington, 2021) and fails to deliver strong theoretical and practical implications (Karaosman and Marshall, 2023).

Decarbonisation and supply chain management are interconnected (Xu *et al.*, 2023) and research at this intersection is needed. Supply chain management research is important for the just transition discourse to understand how to include the lived experiences of lower-tier suppliers, such as miners, into transitions (Hale *et al.*, 2021). And more important for our field, just transition is vital for supply chain management to understand how to create dynamic, socio-ecological systems so future disruptions, which will require new capabilities, skills and knowledge, can be managed better (Samson and Swink, 2023).

Building from the just transition literature we explore how just transition can be conceptualised and executed to create implications for supply chain management theory, practice and policy. Our research questions are:

RQ1. How can just transitions be understood and categorised?

RQ2. How can the supply chain management field embed just transition thinking?

This paper investigates multiple just transition case studies in the literature, as a foundation for supply chain management research and practice to interrogate how to transition to low-

carbon supply chains in environmentally and socially just ways, while also providing advice for policymakers. The paper defines, elaborates, and extends the just transition construct by developing a taxonomy with two key dimensions. The purpose dimension (profit or shared outcomes) and the governance dimension (government-/industry-led versus civil society-involved), which, in combination, generate four just transition archetypes. Building on the taxonomy, we uncover just transition's theoretical grounding for supply chain management.

3. Research methodology

This study used a systematic literature review (SLR) methodology. The SLR protocol, developed by Tranfield *et al.* (2003), was followed to identify the appropriate keywords, inclusion and exclusion criteria, filter and read the papers, analyse and synthetise knowledge, and develop the final taxonomy. This helped to eliminate bias and subjective reflections throughout the process.

Identifying the keywords for this study was a complex process. Sustainability transitions, in general, are framed in technical and innovation terms, focused on emissions reduction with no consideration of social issues (Johnstone and Hielscher, 2017). *Just transitions* are a very different concept from sustainability transitions, as they focus on the issues of social justice, human agency, politics, governance and power imbalances (Casano, 2019). Therefore, to capture the complexities and important issues faced by communities and workers before, during and after sustainability transitions, the key words "*just transition*" were used to ensure the focus on this specific idea and discourse, ultimately including not excluding the people affected by the sustainability transition. "*Just transition*" was identified within the abstract, key word, or title field to ensure the relevance of the publication.

Scopus and Web of Science were used as the databases for the literature search due to their wide range of disciplines and the quality, range and depth of their contributions. The review included only peer-reviewed journal articles, as examples from other resources such as newspapers, conferences, textbooks were likely to be featured in the academic papers (Karaosman *et al.*, 2016). Consequently, Scopus generated 227 results. A reliability analysis was undertaken, and Web of Science results were compared to Scopus results and missing articles were inserted to the sample.

After duplicated articles were eliminated, the results were combined into a single list comprising a total of 252 papers. Titles and abstracts of these papers were carefully reviewed. For exclusion criteria, due to the people focus of the just transition concept, papers that did not focus on communities, workers, actors, and other stakeholders, for example those articles focusing on general policy development, accounting, or mathematical modelling regarding emission reductions where communities, workers, actors, and other stakeholders were not involved, were excluded.

This step generated 118 papers. These papers, focusing on social issues within and across just transition projects, were fully reviewed. 31 papers were then excluded due to their lack of explicit focus on people, 15 papers were excluded as they were not available, and attempts made to contact the authors failed. A final 72 papers, directly related to the phenomenon of just transition (projects, processes, mechanisms) and people (for communities, workers, other stakeholders), were included in the study. These papers, given in Appendix 1, cement the foundation for the theoretical discussion and propositions.

72 papers were thoroughly analysed by the author team. A spreadsheet was created to categorise the papers based on their descriptive details including Article code, Authors, Subject area, Method, Unit of analysis, Context and Research Questions. Then, each paper was analysed to obtain key findings pertaining to Objectives, Mechanisms, Community Effects, Key Success Factors, Key Failure Factors and Future Research Directions. The

author team discussed their individual contributions and synthesised the findings, leading to the creation of the just transition taxonomy.

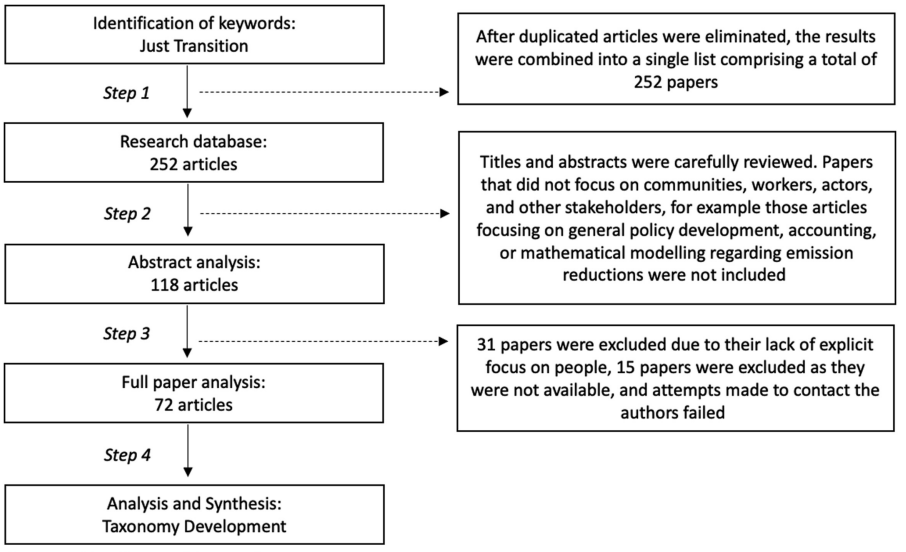
Moving beyond simple descriptions of the papers, the purpose of this review is to help scholars generate theory at the nexus of just transition and supply chain management. This review article combines integrative and generative approaches, as suggested by Post *et al.* (2020). The review exposes an emerging perspective by identifying a theoretical perspective on just transition. The just transition taxonomy illustrates the theoretical dimensions along which this new perspective is discussed. The taxonomy is then elaborated through the lens of supply chain management, providing an informed research agenda that offers suggestions on what to focus on, explore and report. Figure 1 shows the SLR methodology.

4. Findings

4.1 Descriptive findings

Key dimensions of the just transition literature included the discipline, theory and method. The full list of the articles reviewed can be found in Appendix where each article is given a code, for example Article 1 (A1), and associated with descriptive details in terms of its focus, theory and method.

25 (35%) articles were published in geographical and environmental science journals, (A3, A4, A5, A8, A17, A18, A20, A25, A29, A30, A32, A33, A34, A36, A37, A38, A39, A41, A45, A50, A53, A56, A58, A60, A70). 13 (18%) articles were published in energy-related journals, A7, A9, A15, A19, A22, A24, A27, A31, A35, A47, A52, A67, A71. About 8 (11%) articles were in sociology journals (A12, A43, A46, A49, A51, A54, A61, A69) and 2 (3%) articles were in industrial relations journals (A23, A65). The remaining 26 (36%) articles came from agroecology (A16), food systems (A26), political science (A1, A40, A66, A68), social and political philosophy (A6, A21) climate policy (A28, A55), environmental politics (A10, A13, A28, A64), alternatives journals (A11), development studies (A14, A59, A62), transformation (A48) and extractive industries (A42), globalisation (A57, A63), urban planning (A44), A2 common market studies (A2) and community development (A23, A72).



Source(s): Created by authors

Figure 1.
The SLR methodology

Forty-seven, or over 60% of the papers, did not include a theoretical lens. Feminist theories covering ecofeminism and gender were used in four papers (A2, A3, A7, A51); counter hegemony (A16, A26) and neo-Gramscian theory (A71) were used in 3 papers; radical design theory was used in one paper (A69); Colonialism (A25, A46) and Authoritarianism (A38) were used in three papers, and justice theories including social justice (A8) and climate justice (A60) were used in two papers. The remaining papers covered space and place (A15), agroecology (A39), necropolitics (A17), green political theory and civic republicanism (A6), transformative resistance (A14), transitional labour market theory (A12), transitions management theory (A27), treadmill of production (A65) and triple embeddedness (A9).

The most common methods were descriptive analysis (A2, A7, A46, A48), essays (A18, A19, A30, A41, A42, A47, A51, A53, A54, A57, A58, A59, A66, A69, A72), and reviews (A4, A10, A11, A20, A61, A64 (35%) followed by case studies (A14, A26, A27, A29, A38, A39, A43, A55, A56, A60, A62, A68, A70), interviews (A49), and mixed methods (A3, A17, A67) (24%). Other methods used were literature reviews (A12, A28, A32), comparative analysis (A1, A31, A52), critical analysis (A6, A33, A37), and action research (A63).

4.2 Just transition: definition

The climate emergency means that many governments across the planet are accelerating efforts to transition to low-carbon economies, mainly through technical and market-based efforts such as carbon-offset projects or renewable energy generation. These actions, however, have been shown to create injustice problems at both national and international levels with effects lasting for generations (Lamb *et al.*, 2020 (A45); Newell and Mulvaney, 2013 (A53)). Previous transition projects have exploited marginalised communities, similar to the exploitation practices of the fossil fuel industries (Dale, 2019 (A16); DeBoom, 2020 (A17); Lennon, 2020 (A46); Masterman-Smith, 2010 (A49)), therefore, *just transition* has emerged in opposition to techno-focused sustainability transitions that have failed to include issues of justice (Mayer, 2018 (A50); Williams and Doyon, 2020 (A70)).

Since its introduction, just transition has increased in popularity and has been adopted across a number of international, multinational, national, and sub-national policy frameworks (Bainton *et al.*, 2021 (A4)). A typical just transition definition is the Silesia Declaration at COP24 in Poland (2018): "*a just transition of the workforce and the creation of decent work and quality jobs are crucial to ensure an effective and inclusive transition to low greenhouse gas emission and climate resilient development, and to enhance the public support for achieving the long-term goals of the Paris Agreement*" (UNCCC, 2018).

Just transition, however, does not have a globally agreed or accepted definition. Framing just transition in economic terms, some authors state that the costs associated with sustainability transitions must not be borne by the workers, targeted industries, and/or local communities (Abraham, 2017 (A1); Casano, 2019 (A12)). Others focus on labour, and use just transition as an overarching construct to promote green jobs (Bainton *et al.*, 2021 (A4)). For example, the International Labour Organization (ILO) states '*a just transition means ensuring the climate actions we take protect the planet, people and the economy. This initiative is designed to encourage policy coherence around measures that boost decent green job opportunities, skills development, and enterprise innovation, along with social protection measures for the vulnerable'* ILO Director-General Guy Ryder, UN Climate Action Summit 2019.

Some authors accentuate the ongoing jobs versus climate debate (Healy and Barry, 2017 (A35)) and provide a delineation between what labour unions and climate activists advocate with varying interpretations of just transition and strategic differences (Kenfack, 2019 (A43)). Although both trade unions and climate activists support just transition, labour unions defend "*affirmative just transition*". This approach advocates for a transition within the existing socio-political system. This can be perceived as an ecological transition within the

current political economy (Kenfack, 2019 (A43)). Climate justice activists, on the other hand, define "*transformative just transition*". This approach advocates for a radical change of the current political economy and climate justice activists emphasise self-determination through grassroots movements and reject market-based efforts (Velicu and Barca, 2020 (A66)).

Just transition is advocated as an alternative vision to destructive capitalism and imperialism (Bainton *et al.*, 2021 (A4)). Researchers and policymakers are acknowledging the intertwined social and political issues of transitions (Johnstone and Hielscher, 2017 (A42)), seeing just transition as a feminist issue (Bell *et al.*, 2020 (A7)) and envisioning a post-capitalist transition beyond a low-carbon version of today's system (Healy and Barry, 2017 (A35); Kenfack, 2019 (A43)). The rhetoric of just transition is shifting to a discussion of systemic transformation that rejects technology-focused and market-based solutions and that emphasises inclusion by placing marginalised communities at the centre of the transition (Satgar, 2015 (A61)).

It is vital to understand that just transition encompasses broader issues of democracy, engagement and socioeconomic tensions (Barry, 2019 (A6); García-García *et al.*, 2020 (A24)) and that a transition cannot be just if it does not also involve bottom-up approaches based on inclusion, respect, and equity (Banerjee *et al.*, 2017 (A5); Elliott and Setyowati, 2020 (A21); Haggett *et al.*, 2020 (A29); Mookerjea, 2019 (A51)). However, inconsistencies, ideological clashes and perception gaps between how just transition can be understood and how it can be conceptualised must be identified to understand how to achieve low-carbon economies in environmentally and socially just ways.

4.3 Just transition: a multidimensional taxonomy

Building from the SLR, the research developed a just transition taxonomy. The taxonomy has two overarching dimensions. The first dimension is *Purpose*, which captures the primary objective of the transition over time. The purpose of the transition is framed and executed around self-interest by pursuing strategies for profit maximisation; while also identifying transitions that aim for multiple, shared outcomes beyond profit, such as restoring environmental or social justice, for the greater good. Transitions also involve phasing-out fossil fuels, *e.g.* shutting down coal mines; and phasing-in renewables, *e.g.* developing offshore wind projects.

The second dimension captures the *Governance* mode of just transition, for example, those led primarily by government or private industry, versus those involving civil society. The taxonomy proposes four key just transition archetypes with illustrative examples.

4.3.1 Neoliberal transitions: profit-focused and government-/industry-led governance. Even though the just transition literature is focused on justice, the articles identified in the SLR featured transition projects characterised by self-interest, short-term financial targets and top-down governance. We call these *Neoliberal Transitions* as these are characterised by self-interest for profit maximisation and technical and market-based solutions. In *Neoliberal Transitions*, communities, workers and unions are completely ignored (Goddard and Farrelly, 2018 (A27)) and industrial lobbies, pursuing similar neoliberal objectives, influence the procedures and processes of the transitions (Herberg *et al.*, 2020 (A36); Evans and Phelan, 2016 (A22)). With neoliberal interests fuelled by authoritarian approaches, political instability and fossil fuel lobbies, energy transitions become strategic manoeuvres based on self-interest (Dodd *et al.*, 2020 (A19)), and the just transition idea ends up being an empty concept (Bainton *et al.*, 2021 (A4)), as social issues and problems faced by communities are ignored (Johnstone and Hielscher, 2017 (A42)).

4.3.1.1 Illustrative neoliberal transition examples. Facing economic pressure, UK coal experienced significant decline in the last decades, leading to rapid closure of several coal fields. Then, the UK decided to phase-out coal by 2025. The UK generated more electricity

from renewables than from coal, marking its first coal-free day in 2016. Yet, the UK coal phase-out plan, characterised by top-down policymaking without community inclusion resulted in high levels of unemployment (coal-economy-related jobs dropped from 221,000 in 1985 to 7,000 in 2005), lack of benefits and lack of job opportunities for communities (Johnstone and Hielscher, 2017 (A42)). Similarly, in the US, 30,000 jobs were lost in coal mining between 2011 and 2017 and the Appalachian region's coal output is now expected to decline by 58% by 2035, with no plan for the workers (Abraham, 2017 (A1)).

In contexts where there is political instability, neoliberal transitions tend to dominate. For example, in early 2011, the Federal government in Australia, the Gillard Labour Party in coalition with the Green Party and independents, created a national energy policy, the Clean Energy Future (CEF). Among their goals was a "just transition" of the Latrobe Valley, where the primary inexpensive electricity producer was located. The producer generated over 85–90% of the State's electricity from three massive coal mines and four brown-coal-fired power stations (Snell, 2018 (A63)). However, the State government (Victorian Labour) lost the election in November 2011 and was replaced by the incoming Conservative Liberal-National coalition that was less interested in equality issues. Just transition efforts stalled and the State and Federal governments established a new policy action area under which the Valley's transition was reframed at a regional scale. By enlarging the policy zone, they made any available re-distributional funding to communities from the federal CEF programme eligible for distribution over the wider, conservative-voting area (Weller, 2019 (A68)). The wider territory silenced the community voice of those directly affected and distracted attention from disadvantaged and marginalised communities.

Furthermore, when governments try to phase-out coal due to falling profitability but fail to create multistakeholder, collaborative social dialogues with local communities in regions where coal is perceived as culturally celebrated, coal's cultural significance eclipses its detrimental health and environmental impacts and instead finds communal support to cherish coal as part of community identity (Mayer, 2018 (A50)). This tends to lead to civil disobedience and resistance against just transitions (Wagemans *et al.*, 2019 (A67)). Examples include the coal industry-funded "Friends of Coal" campaign in West Virginia (Mayer, 2018 (A50)); the Appalachian community blaming the federal government for environmental regulations; and the community of Emery County, Utah, with coal mining stretching back to the 1800s, seeing renewables as a threat to the local economy and incompatible with their local identity; are all examples where energy transitions are seen as mechanisms to punish coal workers, communities and supply chain stakeholders.

Fossil fuel lobbies also fabricate negative publicity for renewables and advocate for clean coal or gas as viable alternatives. For example, just transition efforts in the province of Alberta, Canada (responsible for 65% of Canada's total coal capacity with strong community support) failed and the Alberta government lobbied to frame the transition from coal to gas as more environmentally friendly (Harrahill and Douglas, 2019 (A31)).

In many cases, industrial lobby groups and corporations influence transitions. For example, in the US, fossil fuel firms influenced policymakers and energy strategies (Healy and Barry, 2017 (A35)). In Poland, the largest hard coal producer in the EU, the government teamed up with fossil fuel lobbies and coalitions, private industry, and parts of civil society to orchestrate a resistance campaign, lobbying for legislation for phasing-in coal, lobbying for phasing-out renewables and building narratives around the importance of coal for energy security and clean coal technologies (Brauers and Oei, 2020 (A9)).

4.3.2 Corporatist transitions: shared outcome focused and government-/industry-led governance. Corporatist Transitions focus on decarbonisation, by phasing-in renewables, to enable multiple, shared outcomes such as ensuring communities having cleaner and cheaper energy. These transitions are led by governments and industry bodies. Although these transitions focus on shared outcomes and development, these outcomes are usually framed in

economic terms, rather than social justice (Elliott and Setyowati, 2020), with most projects failing to pay attention to multifaceted aspects of supply chain management (e.g. sourcing). Additionally, powerful stakeholders rely on issue framing and agenda-setting where policymakers determine how problems are defined and positioned relative to others (Weller, 2019 (A68)).

Corporatist transitions fail to understand that renewable energy projects are nature-based with societal consequences. For example, the impact of producing electric batteries on the workers' and miners' health and well-being is ignored, while being promoted as vital for the storage of energy from solar panels or wind sources. Renewable energy projects are endorsed but questions of how the disposal of construction materials will affect farmers, agricultural and grazing lands are not considered. Despite good intentions, corporatist transitions fail to protect, not only nature, but also communities and their rights.

4.3.2.1 Illustrative corporatist transition examples. In corporatist transitions, community engagement and social dialogues are neglected. Governments, in collaboration with industrial partners, pursue development of technological solutions, such as solar panels, ignoring holistic action, such as behavioural and system changes (e.g. Satgar, 2015 (A61)). For example, by only focusing on technological solutions, California's massive unregulated solar market benefited from unskilled labour exploitation (Healy and Barry, 2017 (A35)).

Additionally, the raw materials used for renewable energy solutions, e.g. lithium ion batteries to store energy from solar panels, are produced by exploiting workers and miners in various countries (Lennon, 2020 (A46)). Many of the biggest sources of raw materials, fundamental for phasing-in renewables, are based in Africa where modern slavery issues are rife. The Democratic Republic of the Congo, for example, produces 60% of global cobalt, a key component in electric vehicle batteries (DeBoom, 2020 (A17)). Other essential battery components, such as graphite, coltan, and lithium are found in the Democratic Republic of the Congo, the Ivory Coast, Mali, Mozambique, Namibia, and Niger. Malawi is also expected to become a massive producer of neodymium and praseodymium, which are rare earth elements to be used in electric vehicles and wind turbines (DeBoom, 2020 (A17)).

Phasing-in renewables requires the exploitation and extraction of important natural resources. However, local communities depend on these resources, including communal forests and rivers for their homes and livelihoods. The change of ownership and legal status of natural resources previously held by local communities results in social problems including income and gender inequality, conflicts and violence, and even when compensation packages are offered to these communities, promises made often fall short of reality (Lamb *et al.*, 2020 (A45)).

Many phasing-in renewables projects abuse the ecological and social rights of developing or underdeveloped countries in order to reduce the Global North's carbon emissions but also to ensure a continuous supply of cheap but green energy beyond their borders, otherwise known as carbon colonialism (DeBoom, 2020 (A17)). When a limited number of people in power manage key resources through top-down approaches, cultural and democratic practices are damaged (Routledge *et al.*, 2018 (A60)). A transition that narrowly focuses on market-based technological solutions, which policymakers often favour (Johnstone and Hielscher, 2017 (A42)), ignores systemic issues of undemocratic and colonised sourcing and production processes in these supply chains (White, 2019 (A69)).

4.3.3 Polycentric transitions: profit-focused and civil society-involved governance. *Polycentric Transitions* mostly focus on phasing-out coal. They are initially driven by decreases in profitability, but these transitions are created, led by or involve civil society actors. Although these transitions focus on involving multiple stakeholders, the outcomes are usually framed in economic terms.

4.3.3.1 Illustrative polycentric transition examples. Polycentric transition cases show that unions with strong ties to fossil fuels have mounted resistance when phasing-out coal and

phasing-in renewables. Unions are fundamental to just transitions but can be counterproductive if unions do not ensure accountability and do not provide their members with transparent information about their agendas, priorities, negotiations and decisions. For example, the United Mine Workers of America (UMWA) pursued a dictatorial agenda and created action plans that were not democratic for Appalachia's coalminers. Union's leaders agreed to furlough thousands of miners in return for higher wages and larger benefits for the remaining unionised miners in untransparent negotiations between union leaders, the government and coal companies (Abraham, 2017 (A1)).

Even when governments partner with civil society organisations, their agendas can by driven by profit rather than shared outcomes. For example, in Port Augusta, South Australia, the worker- and union-led just transition plan to transform coal-fired power to solar-thermal power failed due to lack of government support in terms of financial support and equity loans (Herdic, 2019 (A37)). And, in Hamburg, the constant opposition of the Social Democrats, as well as the local energy unions, hindered attempts to create a more integrated renewable energy policy resulting in the public company created to run the grid by Social Democrats not integrated with local state-run Hamburg Energie (Routledge *et al.*, 2018 (A60)).

When the focus of decarbonisation concentrates on cost reduction rather than on supply chain issues, for example raw material sourcing and energy production, the transition can result in counterproductive consequences. For example, one transition initiative in the Northeast US saw environmental and climate justice organisations launch a solar energy campaign in low-income communities of colour: Solarize. They grouped houses into larger procurement pools to ensure lower energy prices, with the community selecting the supplier. However, the project focused on cost reduction for renewable energy use and failed to look at the means of production in its supply chain. The supplier selected used solar panels manufactured under some of the worst working conditions for those producing them, so the project, while aiming for racially just and cheap renewable energy, perpetuated extractive social practices (Lennon, 2020 (A46)).

Government support, leadership and stakeholder engagement are antecedent to success, leading to numerous environmental and societal benefits. But polycentric transitions lack a more democratic and plural nature, so human and community well-being is not always enhanced through community-led, collaborative, and participatory actions. Furthermore, there is tension between short-term climate change mitigation strategies and long-term social issues. The research found that polycentric transitions fail to ensure socially and environmentally just pathways to transitions. Finally, ignoring supply chain workers and communities, embedded in sourcing and production stages of renewable energy, results in environmental and social issues, on a larger scale, being exacerbated rather than solved, showing that supply chain thinking must be embedded to ensure just transitions.

4.3.4 Pluralist transitions: shared outcome focused and civil society-involved governance. The cases from the literature demonstrated that some decarbonisation initiatives are driven by shared outcomes and are led by or involve civil society organisations. *Pluralist Transitions* are characterised by multi-level processes that enable inclusivity; where communities, networks and stakeholders take action to decarbonise by phasing-out coal or by phasing-in renewables to restore environmental, economic and social resources. *Pluralist transitions*, characterised by multi-level government and policy support and community consultation and inclusion, help to achieve increased economic activity, job creation, supply chain worker development programmes, socially owned renewable energy infrastructure, and land protection in affected regions. The cases demonstrated that when government-led initiatives are managed inclusively with active community participation, private industry-funded fossil fuel campaigns and risks of civil disobedience are more likely mitigated.

4.3.4.1 Illustrative pluralist transition examples. Pluralist transitions occur when various stakeholders, including women, workers, local communities and underrepresented groups,

are integrated into phasing-in renewables projects. In these transitions, it is evident that decision-making power is decentralised, and social dialogues are important for success. For example, Enel, an Italian energy company, built long-lasting industrial relations across its supply chains (Tomassetti, 2020 (A65)) after initiating strong social dialogues with unions, local representatives, and supply chain communities, in Enel's shift to carbon neutrality (Galgóczi, 2020 (A23)). Enel's social dialogues led to successful worker reallocation programmes with reskilling, redeployment, and early retirement for elderly workers, with wage levels sustained (Tomassetti, 2020 (A65)).

In Germany, the state-approved co-determination law ensures companies have to make decisions with workers (Oei *et al.*, 2020 (A55)). This meant that social dialogue between local government, federal government, workers and affected communities led to the phasing-out of coal in the North Rhine-Westphalia region. Similarly, in Australia, when a private company, Paris-based Engie and its investment partners, announced the closure of the jointly owned Latrobe Valley's Hazelwood power station within less than five months, the State government (Victorian Labour) collaborated with the unions and local communities to create a worker transition programme (Snell, 2018 (A63)). The pluralist transition succeeded while the corporatist transition, in the same geography, failed.

Some pluralist transitions also happen when neoliberal actions fail to deliver just transitions and lead to union action. Unions assert their structural and political power through direct talks with politicians and strike action (Brauers and Oei, 2020 (A9)). For example, in South Africa, when the government initially launched a neoliberal transition and energy plan which was dominated by fossil fuels; NUMSA, a workers' union, took various actions, including forming research and development groups, bringing together workers and supply chain stakeholders from different sectors, and launching an action plan to bring themselves into the decision-making process. The union consulted with workers and communities and changed the energy plan into one that worked for workers and communities as well as the energy companies (Satgar, 2015 (A61)).

Civil society organisations also use grassroot campaigning to ensure environmental and social justice and representation for workers, affected communities and broader stakeholders (e.g. supplier workers), and force neoliberal transitions to become pluralist. For example, in Kenya, a coalition of local social and environmental activists mobilised workers and communities, concerned about negative ecological and societal consequences of coal power production, to develop a campaign and file a lawsuit to stop the development of Kenya's first coal-fired power plant, with the primary aim of disrupting colonial, extractive and growth-oriented coal development (Brown and Spiegel, 2019 (A10)). While, in Germany, green and left-wing group activists formed a radical grassroots movement to confront state actors supporting privatised models of energy delivery in favour of public- and community-owned models of renewable energy delivery. They embraced more democratised and decentralised principles in decision-making where they brought together civil society and communities (Routledge *et al.*, 2018 (A60)).

Pluralist transitions that are also characterised by union transparency and accountability, deliver positive outcomes. In the Hazelwood example above, the worker transition programme delivered training and support with more than 300 workers engaged in the programme as the Federal government agreed to provide training support to all Hazelwood workers including their spouses. The State government also created Victoria's first special economic zone, providing financial incentives for new businesses, such as fee exemptions for property purchases and tax reductions for those generating jobs for ex-Hazelwood workers (Snell, 2018). In the South African example, the NUMSA union convinced the government to use local procurement and pioneered socially owned renewable energy (Satgar, 2015 (A61)).

However, even within pluralist transition, it is evident that supply chain workers are negatively and disproportionally affected by phasing-out coal projects. In Germany, when

early retirement was possible or miners were transferred to other industries, supply chain workers were excluded (Oei *et al.*, 2020 (A55)). In Latrobe Valley, when miners were engaged in just transition programmes, supply chains workers were excluded (Snell, 2018 (A63)). Long-term social dialogues are pivotal mechanisms in managing these multi-tier supply chains. Pluralist actions must, therefore, ensure the representation and inclusion of the supply chain workers throughout just transitions.

4.4 Just transition taxonomy

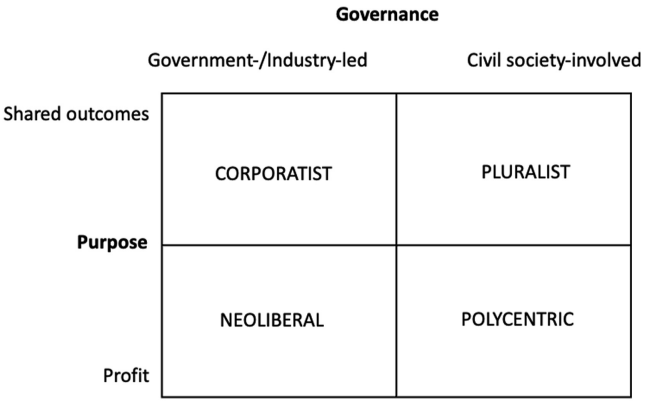
From the SLR, the research identified four archetypes of the just transition taxonomy (*Neoliberal*, *Corporatist, Polycentric and Pluralist*), based on the purpose of the transition, whether it is focused on profit or if there are multiple, shared outcomes for the phasing-out or phasing-in of renewables, and the governance, whether transitions are government and industry led or involve civil society actors. The taxonomy is shown in Figure 2.

5. Theoretical discussion: supply chain management needs just transition

The worsening environmental and socio-political crises force supply chains to move beyond *a minimal harm vision* toward *a* vision of *harmony with living systems* (Gualandris *et al.*, 2023). However, supply chains are rarely viewed as socio-ecological systems (Gualandris *et al.*, 2023) and technological solutions are presented as the remedy for challenges facing supply chains, devaluing labour and exacerbating power imbalances (McCarthy *et al.*, 2022).

Supply chains are dynamic systems, not static entities (Silva *et al.*, 2023b), but most supply chain management research fails to capture the knowledge of lower-tier suppliers (Santos *et al.*, 2023), ignoring lower tiers, their stories and experiences (Glover, 2020). Transitions comprise various types of agency, such as sense-making, learning, power and forming partnerships (Köhler *et al.*, 2019), which makes it vital to explore the specific skills, knowledge and techniques that can be used (Allwood, 2020).

Knowledge is embodied in the context, and sustainability knowledge, behaviours and values are shaped through experience (Santos *et al.*, 2023). Suppliers and lower-tier suppliers have tacit knowledge, challenging the notion that buying firms are the only source of knowledge (Silva *et al.*, 2023a). Hence, more research is needed to understand how lower tier suppliers' knowledge can influence the learning of buying firms (Silva *et al.*, 2023a).



Source(s): Created by authors

Figure 2.
Transition taxonomy

Creating equitable and resilient supply chains requires companies to take responsibility for their supply chain practices. Yet, to do this, governments and organisations need to be aware of the intertwined problems that happen in these supply chains, and then co-design policies and solutions with supply chain stakeholders (Pullman *et al.*, 2024). This requires supply chain management research to extend its focus from the organisational workforce to supply chain stakeholders, particularly during times of transition (Samson and Swink, 2023). Furthermore, supply chain researchers need to explore the theories, methods and constructs used by other scientists who explore socio-ecological systems (Gualandris *et al.*, 2023) and must take into account how processes and practices are shaped by different cultures and contexts (Samson and Swink, 2023).

The just transition concept provides an important opportunity for supply chain management discourse. This section explores the implications of decarbonisation and just energy transitions for supply chain management, creating research pathways for the supply chain community to enable leading-edge research with substantial practical and policy implications.

5.1 Phasing-out fossil fuels: implications for supply chain management research

Closing coal mines is key to phasing-out fossil fuels. But many phasing-out fossil fuel transitions fail to consider social or cultural issues and do not represent coal miners or affected communities. If transitions take an instrumental approach, individuals and communities will be ignored within supply chains. Therefore, it is important to understand how supply chains during just transitions can be managed.

Sourcing Management: Supply chain researchers are concerned that many products and industries, *e.g.* plastics, toys, textiles, etc., are contingent on oil- and gas-derived raw materials. Researchers have to explore the scalable, equitable and healthy alternatives for these products and how alternative supply chains are created, managed and sustained. Although this discourse has started to evolve in supply chain management (Marshall *et al.*, 2022, 2023), there is huge research potential in this area.

Building from the examples illustrated in Poland, the US and Canada, influential industry coalitions can affect decisions and frame decarbonisation in financial terms. When driven by profit, as evidenced by neoliberal and polycentric transitions, these projects harm marginalised communities (DeBoom, 2020 (A17)). With increasing public scrutiny and legislative pressure for supply chain due diligence, supply chain management needs to better understand how standards and verification mechanisms of, for example, offsetting schemes, renewable energy credits and certifications that see natural resources as market commodities, can be converted into schemes that recognise cultural values and rights that are not aligned with powerholders' financial interests.

Additional research paths include exploring how supply chains within transition projects are planned as socio-ecological systems. For example, many REED + projects to tackle deforestation have resulted in the appropriation of indigenous' communities and their lands without consent (Ciplet and Harrison, 2020 (A13)). Supply chain research can investigate how to transform neoliberal transitions into pluralist transitions based on shared outcomes.

As evidenced by various examples such as Enel in Italy, Numsa in South Africa and activist coalitions in Kenya, the just transition discourse also shows supply chain management scholars how anti-extractivist organisations do supply chain planning differently. Supply chain scholars can explore how these transition projects are managed in more inclusive ways and create the radical strategies and holistic action plans needed.

Operations: Many suppliers need to invest in infrastructure to decarbonise their operations, and consequently their supply chains. However, costs disproportionately affect small and micro organisations across supply chains. Therefore, supply chain scholars must

understand how operations and supply chain finance can be arranged so suppliers can invest in the tools, processes and technologies necessary for decarbonisation across their supply chains. Additionally, increasing carbon taxes will impact small and medium-sized enterprises across various industries. Supply chain management needs to explore how increased carbon taxes will affect suppliers and how compensation and/or incentives can help minimise the use of fossil fuels across supply chains.

The lack of decarbonised suppliers in most industries is another key issue. For example, fashion brands source from developing countries where accessibility and availability of renewable energy is scarce. It is imperative to understand, how that transition will happen in low- and middle-income countries and the location decisions during that transition and how to build capabilities for decarbonising while managing conflicts that will arise. For example, how grassroots movements have converted oil- and gas-dependent to renewable energy operations (Ciplet and Harrison, 2020 (A13)), and how multiple supply chain stakeholders can be brought together, regardless of differences to develop these competences and capabilities.

Just transition can help supply chain management to explore questions such as how collective power can be enacted, how community identities can be understood to develop collective competences through partnership, and how divergent views impeding progress can be understood to develop longer-term structural changes across supply chains.

Investment in People: Around 13 million energy-related jobs will be lost globally as a consequence of phasing-out fossil fuels in the energy sector (Zahidi *et al.*, 2024). Most of these job losses will occur in supply chains where alternative employment opportunities are scarce. Research is needed to understand reskilling, upgrading and employment opportunities for supply chain workers in new alternative settings. Understanding how workers, displaced across fossil fuel supply chains, can be reskilled and equipped so that communities, supply chains and economies dependent on fossil fuels can be diversified in just ways.

As just transition and sustainability transitions are happening across multiple sectors, the examples from the just transition discourse can show supply chain researchers the dynamics of these transitions and their positive and negative impacts on all aspects of supply chains and supply chain management.

5.2 Phasing-in renewables: implications for supply chain management research

Phasing-in renewables projects can be just as problematic as the introduction of fossil fuels. Supply chain stakeholders need to be acknowledged, listened to and protected. Supply chain management must explore the nuanced consequences of decarbonisation efforts focused on supply chain practices, processes and stakeholders.

Sourcing Management: Renewable energy production is growing, along with the demand for metals and minerals. Access to these critical materials will directly affect multiple supply chains. Supply chain scholars must explore sourcing management at the nexus of the environment and labour movements, local and national government and community organisations.

Bottom-up or pluralist transitions can guide supply chain research. Instead of focusing on industry leaders and/or governments for decarbonisation, supply chain researchers need engage with just transition communities to see how radical actions are undertaken to create alternative sourcing based on community strengths and supply chains as dynamic ecosystems.

Given that low-carbon processes and practices will disrupt employment, alternatives, such as regenerative agriculture, need to be developed. But this must be done in fair and just ways. For example, regenerative supply chain practices, including water cycle improvement and/or biodiversity protection, can create up to 5 million jobs by 2040 in Africa (Zahidi *et al.*, 2024) but it is not clear how these supply chains should be created, managed and sustained or how to include supply chain stakeholders in framing these policies and strategies.

Operations: Renewable energy is becoming the cheapest energy source, but there are barriers associated with infrastructure and maintenance for power generation, operations and distribution. Researchers should explore how to manage these operations and how to equitably distribute costs across supply chain actors so they are not abdicated to vulnerable and dependent suppliers. Capital costs for low-carbon materials, processes and solutions are high, therefore, research is needed to understand what incentives are needed for clean energy production, for example tax credits, and how these incentives can be shared and promoted across supply chains. Supply chain research can answer how purchasing policies and operations strategies can be designed to maximise the potential of low-carbon technologies to make them equitable, accessible and available for supply chains, especially within developing countries.

Low-carbon processes, material alternatives and innovative technologies, are costly and accelerating decarbonisation efforts is contingent upon access to finance. Supply chain finance needs to facilitate just transition for a fair decarbonisation, distributing benefits and opportunities to suppliers across multiple tiers, including farmers and homeworkers. Supply chain finance and operations management research can explain how to ensure equitable access to technology to accelerate innovation across supply chains, such as food, construction and fashion.

Investment in People: Pluralist just transitions symbolise the principles of community engagement, solidarity and rejecting the extractive decarbonisation concept that has negative natural and societal consequences. How primary workers are considered in the planning and management of these transitions, and how this can be extended to the broader supply chain workforce that will be disproportionally affected by decarbonisation, needs to be understood. If the supply chain workers are not provided with the same benefits, such as early retirement or transfers to other industries that coal miners, and other primary workers, receive, it is vital to explore how social dialogues can be used during transitions, ensuring representation and inclusion of the supply chain workforce in decision-making and benefit-distribution schemes.

Renewable energy projects need specialist know-how, but skills are relatively rare. It is estimated that almost 40% of the world's workforce will need new skills and competences in renewable energy (Zahidi *et al.*, 2024). Unfortunately, this change means that gender inequality will be exacerbated because new jobs will be available in industries with higher male employment, such as construction and manufacturing (García-García *et al.*, 2020 (A24)). Some suppliers, especially in low- and middle-income countries, have already developed context-specific, localised solutions and tacit knowledge that need to be shared with broader supply chain communities. Researchers building strong alliances with social movements across supply chains including workers, feminists and environmentalists, are key to success.

It is imperative for supply chain scholars to learn from the taxonomy in terms of how stakeholders can be integrated, how unskilled workers can be upskilled, how they can be involved in low-carbon transitions, and how new employment can be created for and with them. It is important to understand what upskilling a workforce means and what consequences, intentional or unintentional, may emerge. For example, would scaling up new innovative processes and models mean geographical relocation of production and sourcing, and what are the challenges and opportunities of such geographic changes?

6. Conclusion

This paper contributes to both just transition and supply chain management disciplines by examining the current literature on just transitions to understand what happened in the past, what worked, what did not work, and what factors led to success or failure. Building on the

just transition literature through the lens of supply chain management, the review shows that just transitions need harmony between nature and people through decentralised decision-making, engaged communities, and orchestrated community-led projects. Hence, giving agency back to people at various supply chain levels is vital while, simultaneously, improving the well-being of the planet and society.

The taxonomy conceptualises supply chains as dynamic systems in which the role of people and tacit knowledge, embedded in their context, are vital for transformations. Suppliers and lower-tier suppliers are needed to create equitable and resilient supply chains. By extending the supply chain research focus from organisational workforce to supply chain stakeholders, supply chain researchers are provided with research pathways to further explore just transition across supply chain practice and processes, including sourcing, operations and investment in people.

6.1 Practical implications

Conversations at the intersection of union and environmental politics are happening, but these conversations are usually limited to health and safety issues (Satgar, 2015 (A61)). This needs to be extended to broader socioeconomic and political issues. Transitions cannot be just if local actions are not framed in a global context (Iskander and Lowe, 2020 (A40)).

Decarbonisation practices should be framed around the means of production (Lennon, 2021 (A47)), rather than promoting innovation as techno-centric solutions without discussions around their socially destructive consequences (Johnstone and Hielscher, 2017 (A42)). Supply of minerals, metals and materials are some of the most problematic areas for the communities (Bainton *et al.*, 2021 (A4)), which require holistic action plans. Therefore, companies and organisations need to prevent the inhumane exploitation of Congolese miners in supply chains in which lithium ion batteries are produced (Lennon, 2020 (A46)) and forest management policies and systems, such as REDD + initiatives, need to tackle issues such as the forced displacement of indigenous peoples (Elliott and Setyowati, 2020 (A21)).

Severe socioeconomic impacts on communities, including forced migration, labour exploitation, the destruction of local economies, and jobs, with increasing poverty and social inequality result in perceptions of the unsustainable nature of sustainability transitions (Anigstein and Wyczykier, 2019 (A3)). Practices must, therefore, put supply chain stakeholders at the centre, recognising their experiences, rights, identities and values. For example, women's agency and specific skills around agricultural techniques and low-carbon cooking practices, are of paramount importance in climate change adaptation (Allwood, 2020 (A2)). These skills need to be explored and cherished. Supply chain workers need to be trained for new and different jobs and acquire education for new skills, while at the same time social protection and retirement benefits have to be ensured to prevent intergenerational injustice problems (Stevis and Felli, 2015 (A64)).

6.2 Policy implications

Policymaking on energy transitions does not sufficiently integrate supply chain logic or cultural values and, consequently, fails to provide alternatives to the dominant instrumental view. Top-down decision-making, supported by policies favouring business over societal protection, benefits elite powerholders and neglects communities across supply chains. When these communities are not integrated into decision-making, politically charged, investor-friendly projects fail communities with effects lasting for generations (Schapper, 2021 (A62)).

When policy instruments and strategies do not develop reflexive or participatory decision-making processes workers cannot act. Phasing-in renewables can be seen as the most logical

thing to do toward decarbonisation. But, as the corporatist transitions suggest, if these actions are led by governments and industries, short-term economic development becomes the primary goal, hijacking concerns over long-term environmental and social justice issues and resulting in failure.

Transitions characterised by multi-level processes and community engagement, however, reject extractive decarbonisation and consider workers in the planning and management phases of transition projects. Unfortunately, most community-involved transitions do not include supply chain workers. Supply chain workers are often ignored and are not provided the same benefits that directly affected communities, such as coal miners, receive. Even though we applaud community inclusion and social dialogue dynamics in these transitions, the lack of supply chain worker representation and inclusion are serious concerns.

Policies are needed to integrate broader communities into decentralised decision-making processes, including civil society, women, workers, local communities and underrepresented groups. Just transition requires strong and decisive policies that ensure multi-level decision-making with plural, local and societal values represented.

6.3 Limitations and ways forward

This is an SLR paper, which can be considered a limitation; therefore, we invite researchers to conduct empirical studies to bring evidence of the dynamic nature of energy transitions across supply chains. There is much to learn about the connection between just transitions and supply chains; therefore, alternative methods, such as action research and ethnographies, should be used.

In addition, the full life cycle of transitions is overlooked in the literature (Healy and Barry, 2017). Therefore, our focus must shift to the impact of upstream operations (e.g. extraction of fossil fuels) on health, so we can judge how traditional supply chain management practices should change. Countries and supply chain communities in the Global South are disproportionally affected by climate change; however, various indigenous communities show remarkable resilience. Their traditional knowledge and cultures provide valuable lessons for supply chain management to combat climate change. Supply chain management research can provide a deeper understanding of the knowledge embedded in attitudes, values, beliefs, experiences and behavioural responses to climate change.

Researchers should immerse themselves with supply chain stakeholders to understand how supply chains phasing-out of coal or phasing-in of renewables can be truly inclusive and successful. Future research needs to understand how to embed social values, such as diversity, gender equality and intersectionality into a strong, political paradigm shift; therefore, we call for research to interrogate development and supply chain strategies that forge the path from authoritarian transitions to people-centred partnerships.

Further, gender issues and inequality problems must be central to future research. We need to understand how to move beyond symbolic endeavours or tick-box exercises toward radical policy transformation for just transition with gender-focused and community-based inclusion at all supplies chain levels. Policy, research and practice must recognise the problem of ingrained structural inequality for women, people of colour, lower classes, and indigenous communities within these supply chains. It is not about top-down assumptions of what just transition should be, it is about realising that just transition structures and mechanisms must include the experienced realities of all supply chain stakeholders to craft just, fair and equitable socio-ecological systems. This can be the only way to protect people's rights. These questions form an important research agenda for future supply chain management research for just transition and beyond.

References

Abraham, J. (2017), "Just transitions for the miners: labor environmentalism in the Ruhr and Appalachian coalfields", *New Political Science*, Vol. 39 No. 2, pp. 218-240.

Allwood, G. (2020), "Mainstreaming gender and climate change to achieve a just transition to a climate-neutral Europe", *Journal of Common Market Studies*, Vol. 58 S1, pp. 173-186, doi: 10.1111/jcms.13082.

Anigstein, C. and Wyczykier, G. (2019), "Union actors and socio-environmental problems: the trade union confederation of the Americas", *Latin American Perspectives*, Vol. 46 No. 6, pp. 109-124, doi: 10.1177/0094582x19868179.

Bainton, N., Kemp, D., Lèbre, E., Owen, J.R. and Marston, G. (2021), "The energy-extractives nexus and the just transition", *Sustainable Development*, Vol. 29 No. 4, pp. 1-11, December 2020, doi: 10.1002/sd.2163.

Banerjee, A., Halvorsen, K.E., Eastmond-Spencer, A. and Sweitz, S.R. (2017), "Sustainable development for whom and how? Exploring the gaps between popular discourses and ground reality using the Mexican jatropha biodiesel case", *Environmental Management*, Vol. 59 No. 6, pp. 912-923, doi: 10.1007/s00267-017-0848-x.

Barry, J. (2019), "Green republicanism and a 'Just Transition' from the tyranny of economic growth", *Critical Review of International Social and Political Philosophy*, Vol. 24 No. 5, pp. 725-742, doi: 10.1080/13698230.2019.1698134.

Bell, S.E., Daggett, C. and Labuski, C. (2020), "Toward feminist energy systems: why adding women and solar panels is not enough☆", *Energy Research and Social Science*, Vol. 68 October 2019, 101557, doi: 10.1016/j.erss.2020.101557.

Brauers, H. and Oei, P.Y. (2020), "The political economy of coal in Poland: drivers and barriers for a shift away from fossil fuels", *Energy Policy*, Vol. 144, 111621, doi: 10.1016/j.enpol.2020.111621.

Brende, B. (2022), "Opinion: WEF president: how the world can rebuild cooperation", *CNN Business*, available at: https://edition.cnn.com/2022/05/21/perspectives/davos-wef-president-cooperation/index.html

Brown, B. and Spiegel, S.-J. (2019), "Studying global environmental meetings", *Global Environmental Politics*, Vol. 19 No. 2, pp. 149-168, doi: 10.1162/glep_a_00501.

Carrington, D. (2022), "Critical climate indicators broke records in 2021, says UN", *The Guardian*, available at: https://www.theguardian.com/environment/2022/may/18/critical-climate-indicators-broke-records-in-2021-says-un?CMP=Share_iOSApp_Other

Carrington, D. (2023), "Earth's 'vital signs' worse than at any time in human history, scientists warn", *The Guardian*, available at: https://www.theguardian.com/environment/2023/oct/24/earth-vital-signs-human-history-scientists-sustainable-future#:~:text=Their%20report%20found%20that%2020,human%20and%20livestock%20population%20numbers

Carrington, D. (2024), "'Astounding' ocean temperatures in 2023 intensified extreme weather, data shows", *The Guardian*, available at: https://www.theguardian.com/environment/2024/jan/11/ocean-warming-temperatures-2023-extreme-weather-data

Casano, L. (2019), "Skills and professions for a 'Just Transition'. Some reflections for legal research", *E-Journal of International and Comparative Labour Studies*, Vol. 8 No. 3, pp. 31-47.

Chizaryfard, A., Nuur, C. and Trucco, P. (2022), "Managing structural tensions in the transition to the circular economy: the case of Eeectric vehicle batteries", *Circular Economy and Sustainability*, Vol. 2 No. 3, pp. 1157-1185, doi: 10.1007/s43615-022-00152-2.

Ciplet, D. and Harrison, J.L. (2020), "Transition tensions: mapping conflicts in movements for a just and sustainable transition", *Environmental Politics*, Vol. 29 No. 3, pp. 435-456, doi: 10.1080/09644016.2019.1595883.

Cock, J. (2019), "Resistance to coal inequalities and the possibilities of a just transition in South Africa*", *Development Southern Africa*, Vol. 36 No. 6, pp. 860-873, doi: 10.1080/0376835x.2019.1660859.

Dahlmann, F., Brammer, S. and Roehrich, J.K. (2023), "Navigating the 'performing-organizing' paradox: tensions between supply chain transparency, coordination, and scope 3 GHG emissions performance", *International Journal of Operations and Production Management*, Vol. 43 No. 11, pp. 1757-1780, doi: 10.1108/IJOPM-09-2022-0622.

Dale, B. (2019), "Alliances for agroecology: from climate change to food system change", *Agroecology and Sustainable Food Systems*, Vol. 44 No. 5, pp. 629-652, doi: 10.1002/9781118846810.ch21.

DeBoom, M.J. (2020), "Climate necropolitics: ecological civilization and the distributive geographies of extractive violence in the anthropocene", *Annals of the American Association of Geographers*, Vol. 111 No. 3, pp. 900-912, doi: 10.1080/24694452.2020.1843995.

Dodd, T., Rai, A. and Caught, K. (2020), "Electricity markets in flux: the importance of a just transition", *Electricity Journal*, Vol. 33 No. 9, 106835, doi: 10.1016/j.tej.2020.106835.

Dominish, E., Florin, N. and Teske, S. (2019), "Responsible minerals sourcing for renewable energy", Report prepared for Earthworks by the Institute for Sustainable Futures, University of Technology Sydney.

Eaton, E. (2021), "Approaches to energy transitions: carbon pricing, managed decline, and/or green new deal?", *Geography Compass*, Vol. 15 No. 2, pp. 1-11, doi: 10.1111/gec3.12554.

Elkington, J. (2018), "25 years ago I coined the phrase 'Triple bottom line.' Here's why it's time to rethink it", *Harvard Business Review*, available at: https://hbr.org/2018/06/25-years-ago-i-coined-the-phrase-triple-bottom-line-heres-why-im-giving-up-on-it

Elliott, L. and Setyowati, A.B. (2020), "Toward a socially just transition to low carbon development: the case of Indonesia", *Asian Affairs*, Vol. 51 No. 4, pp. 875-894, doi: 10.1080/03068374.2020.1835000.

Evans, G. and Phelan, L. (2016), "Transition to a post-carbon society: linking environmental justice and just transition discourses", *Energy Policy*, Vol. 99, November, pp. 329-339, doi: 10.1016/j.enpol.2016.05.003.

Galgóczi, B. (2020), "Just transition on the ground: challenges and opportunities for social dialogue", *European Journal of Industrial Relations*, Vol. 26 No. 4, pp. 367-382.

García-García, P., Carpintero, Ó. and Buendía, L. (2020), "Just energy transitions to low carbon economies: a review of the concept and its effects on labour and income", *Energy Research and Social Science*, Vol. 70 April, 101664, doi: 10.1016/j.erss.2020.101664.

Gilbert, J., Schindel, A. and Robert, S. (2018), "Just transitions in a public school food system: the case of Buffalo, New York", *Journal of Agriculture, Food Systems, and Community Development*, Vol. 8 October, pp. 95-113, doi: 10.5304/jafscd.2018.08b.011.

Glover, J. (2020), "The dark side of sustainable dairy supply chains", *International Journal of Operations and Production Management*, Vol. 40 No. 12, pp. 1801-1827, doi: 10.1108/ijopm-05-2019-0394.

Goddard, G. and Farrelly, M.A. (2018), "Just transition management: balancing just outcomes with just processes in Australian renewable energy transitions", *Applied Energy*, Vol. 225 December 2017, pp. 110-123, doi: 10.1016/j.apenergy.2018.05.025.

Gualandris, J., Longoni, A., Luzzini, D. and Pagell, M. (2021), "The association between supply chain structure and transparency: a large-scale empirical study", *Journal of Operations Management*, Vol. 67 No. 7, pp. 803-827, doi: 10.1002/joom.1150.

Gualandris, J., Branzei, O., Wilhelm, M., Lazzarini, S., Linnenluecke, M., Hamann, R., Dooley, K.J., Barnett, M.L. and Chen, C. (2023), "Unchaining supply chains: transformative leaps toward regenerating social–ecological systems", *Journal of Supply Chain Management*, Vol. 60 October 2023, pp. 53-67, doi: 10.1111/jscm.12314.

Haggett, C., Brink, T., Russell, A., Roach, M., Dalton, T. and Mccay, B.J. (2020), "Offshore wind projects", *Oceanography*, Vol. 33 No. 4, pp. 38-47, doi: 10.5670/oceanog.2020.404.

Hale, J., Schipanski, M. and Carolan, M. (2021), "Just wheat transitions?: Working toward constructive structural changes in wheat production", *Local Environment*, Vol. 26 No. 1, pp. 43-59.

Harrahill, K. and Douglas, O. (2019), "Framework development for 'just transition' in coal producing jurisdictions", *Energy Policy*, Vol. 134 September, 110990, doi: 10.1016/j.enpol.2019.110990.

Härri, A., Levänen, J. and Koistinen, K. (2020), "Marginalized small-scale farmers as actors in just circular-economy transitions: exploring opportunities to circulate crop residue as raw material in India", *Sustainability (Switzerland)*, Vol. 12 No. 24, pp. 1-18, doi: 10.3390/su122410355.

Healy, N. and Barry, J. (2017), "Politicizing energy justice and energy system transitions: fossil fuel divestment and a 'just transition", *Energy Policy*, Vol. 108, November 2016, pp. 451-459, doi: 10.1016/j.enpol.2017.06.014.

Herberg, J., Haas, T., Oppold, D. and von Schneidemesser, D. (2020), "A collaborative transformation beyond coal and cars? Co-creation and corporatism in the German energy and mobility transitions", *Sustainability (Switzerland)*, Vol. 12 No. 8, p. 3278, doi: 10.3390/SU12083278.

Herdic, C. (2019), "The proposed 100 by 50'Act: protecting collective bargaining of workers in a 'just transition' to a clean-energy future", *Environmental Claims Journal*, Vol. 31 No. 2, pp. 133-159, doi: 10.1080/10406026.2018.1547528.

Hoepner, A. and Schneider, F. (2022), "Disclosure without solution: first evidence from scope 3 reporting in the oil and gas sector", Michael J. Brennan Irish Finance Working Paper Series No. 22-13.

Hund, K., La Porta, D., Fabregas, T., Laing, T. and Drexhage, J. (2020), "Minerals for climate action: the mineral intensity of the clean energy transition, climate smart mining", International Bank for Reconstruction and Development, The World Bank.

IEA (2021a), *Wind Power, Wind Power*, International Energy Agency, available at: https://www.iea.org/reports/wind-power%0A

IEA (2021b), "Net zero by 2050", *Net Zero Emissions*, International Energy Agency, doi: 10.1787/c8328405-en, available at: https://www.iea.org/reports/net-zero-by-2050

IRENA and IEA-PVPS (2016), *End-of-Life Management: Solar Photovoltaic Panels*, International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems.

Iskander, N.N. and Lowe, N. (2020), "Climate change and work: politics and power", *Annual Review of Political Science*, Vol. 23 No. 1, pp. 111-131, doi: 10.1146/annurev-polisci-061418-095236.

ITUC (2010), *Resolution on Combating Climate Change through Sustainable Development and Just Transition*, International Trade Union Confederation, Vancouver.

Johnstone, P. and Hielscher, S. (2017), "Phasing out coal, sustaining coal communities? Living with technological decline in sustainability pathways", *Extractive Industries and Society*, Vol. 4 No. 3, pp. 457-461, doi: 10.1016/j.exis.2017.06.002.

Karaosman, H. and Marshall, D. (2023), "Impact pathways: just transition in fashion operations and supply chain management", *International Journal of Operations and Production Management*, Vol. 43 No. 13, pp. 226-237, doi: 10.1108/ijopm-05-2022-0348.

Karaosman, H., Morales-Alonso, G. and Brun, A. (2016), "From a systematic literature review to a classification framework: sustainability integration in fashion operations", *Sustainability*, Vol. 9 No. 1, p. 30, doi: 10.3390/su9010030.

Kenfack, C.E. (2019), "Just transition at the intersection of labour and climate justice movements: lessons from the Portuguese climate jobs campaign", *Global Labour Journal*, Vol. 10 No. 3, pp. 224-239, doi: 10.15173/glj.v10i3.3631.

Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M.S., Nykvist, B., Pel, B., Raven, R., Rohracher, H., Sandén, B., Schot, J., Sovacool, B., Turnheim, B., Welch, D. and Wells, P. (2019), "An agenda for sustainability transitions research: state of the art and future directions", *Environmental Innovation and Societal Transitions*, Vol. 31 January, pp. 1-32, doi: 10.1016/j.eist.2019.01.004.

Lamb, W.F., Antal, M., Bohnenberger, K., Brand-Correa, L.I., Müller-Hansen, F., Jakob, M., Minx, J.C., Raiser, K., Williams, L. and Sovacool, B.K. (2020), "What are the social outcomes of climate policies? A systematic map and review of the ex-post literature", *Environmental Research Letters*, Vol. 15 No. 11, 113006, doi: 10.1088/1748-9326/abc11f.

Lennon, M. (2020), "Postcarbon amnesia: toward a recognition of racial grief in renewable energy futures", *Science Technology and Human Values*, Vol. 45 No. 5, pp. 934-962, doi: 10.1177/0162243919900556.

Lennon, M. (2021), "Energy transitions in a time of intersecting precarities: from reductive environmentalism to antiracist praxis", *Energy Research and Social Science*, Vol. 73 February, 101930, doi: 10.1016/j.erss.2021.101930.

Lesser, R. (2021), "Supply chains can be a climate game-changer. Here's why", *World Economic Forum*, available at: https://www.weforum.org/agenda/2021/01/tackling-supply-chain-emissions-is-a-game-changer-for-climate-action/

Marshall, D., O'Dochartaigh, A., Prothero, A., Reynolds, O. and Secchi, E. (2022), "Why businesses need to embrace the bioeconomy", *MIT Sloan Management Review*.

Marshall, D., O'Dochartaigh, A., Prothero, A., Reynolds, O. and Secchi, E. (2023), "Are you ready for the sustainable bio-circular economy?", *Business Horizons*, Vol. 66 No. 6, pp. 805-816, doi: 10.1016/j.bushor.2023.05.002.

Masterman-Smith, H. (2010), "Labour force participation, social inclusion and the fair work act: current and carbon-constrained contexts", *Australian Journal of Social Issues*, Vol. 45 No. 2, pp. 227-241, doi: 10.1002/j.1839-4655.2010.tb00176.x.

Mayer, A. (2018), "A just transition for coal miners? Community identity and support from local policy actors", *Environmental Innovation and Societal Transitions*, Vol. 28 December 2017, pp. 1-13, doi: 10.1016/j.eist.2018.03.006.

McCarthy, L., Touboulic, A. and Glover, J. (2022), "Who's milking it? Scripted stories of food labour", *Work, Employment and Society*, Vol. 36 No. 6, pp. 1038-1059, doi: 10.1177/0950017021997357.

Meehan, J. and Pinnington, B.D. (2021), "Modern slavery in supply chains: insights through strategic ambiguity", *International Journal of Operations and Production Management*, Vol. 41 No. 2, pp. 77-101, doi: 10.1108/ijopm-05-2020-0292.

Meixell, M. and Luoma, P. (2015), "Stakeholder pressure in sustainable supply chain management: a systematic review", edited by Saenz, P.M.J. and Koufteros, D.X., *International Journal of Physical Distribution and Logistics Management*, Vol. 45 Nos 1/2, pp. 69-89, doi: 10.1108/ijpdlm-05-2013-0155.

Mookerjea, S. (2019), "Renewable energy transition under multiple colonialisms: passive revolution, fascism redux and utopian praxes", *Cultural Studies*, Vol. 33 No. 3, pp. 570-593, doi: 10.1080/09502386.2019.1585464.

Newell, P. and Mulvaney, D. (2013), "The political economy of the 'just transition", *Geographical Journal*, Vol. 179 No. 2, pp. 132-140, doi: 10.1111/geoj.12008.

Oei, P.Y., Brauers, H. and Herpich, P. (2020), "Lessons from Germany's hard coal mining phase-out: policies and transition from 1950 to 2018", *Climate Policy*, Vol. 20 No. 8, pp. 963-979, doi: 10.1080/14693062.2019.1688636.

Pagell, M. and Wu, Z.H. (2009), "Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars", *Journal of Supply Chain Management*, Vol. 45 No. 2, pp. 37-56, doi: 10.1111/j.1745-493x.2009.03162.x.

Post, C., Sarala, R., Gatrell, C. and Prescott, J.E. (2020), "Advancing theory with review articles", *Journal of Management Studies*, Vol. 57 No. 2, pp. 351-376, doi: 10.1111/joms.12549.

Pullman, M., McCarthy, L. and Mena, C. (2024), "Breaking bad: how can supply chain management better address illegal supply chains?", *International Journal of Operations and Production Management*, Vol. 44 No. 1, pp. 298-314, doi: 10.1108/ijopm-02-2023-0079.

Robertson-Fall, T. (2022), *Why Renewable Energy Infrastructure Needs to Be Built for a Circular Economy*, Ellen MacArthur Foundation, Isle of Wight.

Routledge, P., Cumbers, A. and Derickson, K.D. (2018), "States of just transition: realising climate justice through and against the state", *Geoforum*, Vol. 88, November 2017, pp. 78-86, doi: 10.1016/j.geoforum.2017.11.015.

Samson, D. and Swink, M. (2023), "People, performance and transition: a case study of psychological contract and stakeholder orientation in the Toyota Australia plant closure", *Journal of Operations Management*, Vol. 69 No. 1, pp. 67-101, doi: 10.1002/joom.1218.

Santos, K.A., Silva, M.E. and Pereira, S.C.F. (2023), "(Un)Learning sustainability practices in a multi-tiered supply chain: an interpretive study", *International Journal of Operations and Production Management*, Vol. 43 No. 8, pp. 1226-1249, doi: 10.1108/ijopm-08-2022-0504.

Satgar, V. (2015), "A trade union approach to climate justice: the campaign strategy of the national union of metalworkers of South Africa", *Global Labour Journal*, Vol. 6 No. 3, doi: 10.15173/glj.v6i3.2325.

Schapper, A. (2021), "Climate justice concerns and human rights trade-offs in Ethiopia's green economy transition: the case of gibe III", *European Journal of Development Research*, Vol. 33 No. 6, pp. 1952-1972, 0123456789, doi: 10.1057/s41287-020-00340-6.

Silva, M.E., Pereira, M.M.O. and Boffelli, A. (2023a), "Bridging sustainability knowledge management and supply chain learning: evidence through buyer selection", *International Journal of Operations and Production Management*, Vol. 43 No. 6, pp. 947-983, doi: 10.1108/ijopm-01-2022-0047.

Silva, M.E., Pereira, M.M.O. and Hendry, L.C. (2023b), "Embracing change in tandem: resilience and sustainability together transforming supply chains", *International Journal of Operations and Production Management*, Vol. 43 No. 1, pp. 166-196, doi: 10.1108/ijopm-09-2022-0625.

Snell, D. (2018), "'Just transition'? Conceptual challenges meet stark reality in a 'transitioning' coal region in Australia", *Globalizations*, Vol. 15 No. 4, pp. 550-564.

Stevis, D. and Felli, R. (2015), "Global labour unions and just transition to a green economy", *International Environmental Agreements: Politics, Law and Economics*, Vol. 15 No. 1, pp. 29-43.

Tomassetti, P. (2020), "From treadmill of production to just transition and beyond", *European Journal of Industrial Relations*, Vol. 26 No. 4, pp. 439-457.

Tranfield, D., Denyer, D. and Smart, P. (2003), "Towards a methodology for developing evidence-informed management knowledge by means of systematic review *", *British Journal of Management*, Vol. 14 No. 3, pp. 207-222, doi: 10.1111/1467-8551.00375.

UNCCC (2018), "Solidarity and just transition: silesia declaration", *COP24 Katowice*.

United Nations (2023), "For a livable climate: net-zero commitments must be backed by credible action", *United Nations Climate Action*.

Velicu, I. and Barca, S. (2020), "The Just Transition and its work of inequality", *Sustainability: Science, Practice, and Policy*, Vol. 16 No. 1, pp. 263-273, doi: 10.1080/15487733.2020.1814585.

Wagemans, D., Scholl, C. and Vasseur, V. (2019), "Facilitating the energy transition-the governance role of local renewable energy cooperatives", *Energies*, Vol. 12 No. 21, p. 4171, doi: 10.3390/en12214171.

Weller, S.A. (2019), "Just transition? Strategic framing and the challenges facing coal dependent communities", *EPC: Politics and Space*, Vol. 37 No. 2, pp. 298-316, doi: 10.1177/2399654418784304.

White, D.F. (2019), "Ecological democracy, just transitions and a political ecology of design", *Environmental Values*, Vol. 28 No. 1, pp. 31-53, doi: 10.3197/096327119x15445433913569.

Wieland, A. (2021), "Dancing the supply chain: toward transformative supply chain management", *Journal of Supply Chain Management*, Vol. 57 No. 1, pp. 58-73, doi: 10.1111/jscm.12248.

Williams, S. and Doyon, A. (2020), "The Energy Futures Lab: a case study of justice in energy transitions", *Environmental Innovation and Societal Transitions*, Vol. 37 December 2019, pp. 290-301, doi: 10.1016/j.eist.2020.10.001.

Xu, L., Jia, F., Lin, X. and Chen, L. (2023), "The role of technology in supply chain decarbonisation: towards an integrated conceptual framework", *Supply Chain Management: An International Journal*, Vol. 28 No. 4, pp. 803-824, doi: 10.1108/scm-09-2022-0352.

Zahidi, S., Lesser, R. and Steiner, A. (2024), "Accelerating an equitable transition A framework for economic equity", available at: https://www.weforum.org/publications/accelerating-an-equitable-transition-a-framework-for-economic-equity/

Appendix

Code	Authors	Year	Journal	Focus	Theory	Method
A1	Abraham	2017	New Political Science	Just transitions for the miners: Labor environmentalism in the Ruhr and Appalachian coalfields	Corporatism and just transition	Comparative analysis
A2	Allwood	2020	Journal Of Common Market Studies	Mainstreaming gender and climate change to achieve a just transition to a climate-neutral Europe	Gender theory	Descriptive review policy
A3	Anigstein and Wyczykier	2019	Latin American Perspectives	Union actors and socio-environmental problems: The Trade Union Confederation of the Americas	Feminist theory	Mixed methods
A4	Bainton *et al*	2021	Sustainable Development	The energy-extractives nexus and the just transition	None	Descriptive review
A5	Banerjee *et al*	2017	Environmental Management	Sustainable development for whom and how? Exploring the gaps between popular discourses and ground reality using the Mexican Jatropha biodiesel case	None	Semi-structured interviews
A6	Barry	2019	Critical Review Of International Social And Political Philosophy	Green republicanism and a 'Just Transition' from the tyranny of economic growth	Green political theory and Civic republicanism	Critical review
A7	Bell *et al*	2020	Energy Research and Social Science	Toward feminist energy systems: Why adding women and solar panels is not enough	Ecofemiminism	Descriptive analysis
A8	Bennett *et al*	2019	Sustainability	Just transformations to sustainability	Social justice theory	Conceptual and methodological paper

(*continued*)

Table A1. Articles reviewed

Code	Authors	Year	Journal	Focus	Theory	Method
A9	Brauers and Oei	2020	Energy Policy	The political economy of coal in Poland: Drivers and barriers for a shift away from fossil fuels	Triple embeddedness	Review
A10	Brown and Spiegel	2019	Global Environmental Politics	Coal, climate justice, and the cultural politics of energy transition	None	Descriptive review
A11	Burrows	2001	Alternatives Journal	Just transition	None	Descriptive review
A12	Casano	2019	E-Journal Of International And Comparative Labour Studies	Skills and professions for a "Just Transition". Some reflections for legal research	Transitional labour market theory	Literature review and theoretical framework
A13	Ciplet and Harrison	2020	Environmental Politics	Transition tensions: mapping conflicts in movements for a just and sustainable transition	None	Interviews with stakeholders
A14	Cock	2019	Development Southern Africa	Resistance to coal inequalities and the possibilities of a just transition in South Africa	Transformative resistence	Case study review
A15	Crowe and Li	2020	Energy Research And Social Science	Is the just transition socially accepted? Energy history, place, and support for coal and solar in Illinois, Texas, and Vermont	Space and place theory	Mail Survey
A16	Dale	2020	Agroecology And Sustainable Food Systems	Alliances for agroecology: From climate change to food system change	Counter hegemony theory	Interviews and Observation of approaches
A17	DeBoom	2020	Annals Of The American Association Of Geographers	Climate necropolitics: Ecological civilization and the distributive geographies of extractive violence in the Anthropocene	Necropolitics	Mixed methods

Table A1. (*continued*)

Code	Authors	Year	Journal	Focus	Theory	Method
A18	Delina and Sovacool	2018	Current Opinion In Environmental Sustainability	Of temporality and plurality: An epistemic and governance agenda for accelerating just transitions for energy access and sustainable development	None	Perspective description
A19	Dodd *et al*	2020	Electricity Journal	Electricity markets in flux: The importance of a just transition	None	Descriptive essay
A20	Eaton	2021	Geography Compass	Approaches to energy transitions: Carbon pricing, managed decline, and/or green new deal?	None	Descriptive review
A21	Elliott and Setyowati	2020	Asian Affairs	Toward a socially just transition to low-carbon development: The case of Indonesia	None	Development Report - Low carbon
A22	Evans and Phelan	2016	Energy Policy	Transition to a post-carbon society: Linking environmental justice and just transition discourses	None	Discussion paper
A23	Galgóczi	2020	European Journal Of Industrial Relations	Just transition on the ground: Challenges and opportunities for social dialogue	None	Critial analysis
A24	García-García *et al*	2020	Energy Research And Social Science	Just energy transitions to low-carbon economies: A review of the concept and its effects on labour and income	None	Systematic review
A25	Garciá-López	2018	Environmental Justice	The multiple layers of environmental injustice in contexts of (un)natural disasters: The case of Puerto Rico post-hurricane Maria	Colonialism	Criticial observations

(*continued*)

Table A1.

Code	Authors	Year	Journal	Focus	Theory	Method
A26	Gilbert *et al*	2018	Journal Of Agriculture, Food Systems, And Community Development	Just transitions in a public school food system: The case of Buffalo, New York	Counter hegemony theory	Case studies
A27	Goddard and Farrelly	2018	Applied Energy	Just transition management: Balancing just outcomes with just processes in Australian renewable energy transitions	Transitions management theory	Qualitative case study
A28	Green and Gambhir	2019	Climate Policy	Transitional assistance policies for just, equitable and smooth low-carbon transitions: who, what and how?	None	Literature review
A29	Haggett *et al*	2020	Oceanography	Offshore wind projects and fisheries	None	Case studies - UK and USA
A30	Hale *et al*	2021	Local Environment The International Journal Of Justice And Sustainability	Just wheat transitions?: Working toward constructive structural changes in wheat production	None	Descriptive essay
A31	Harrahill and Dougles	2019	Energy Policy	Framework development for 'just transition' in coal producing jurisdictions	None	Comparative analysis
A32	Härri *et al*	2020	Sustainability	Marginalized small-scale farmers as actors in just circular-economy transitions: Exploring opportunities to circulate crop residue as raw material in India	None	Literature review
A33	Hayward and Roy	2019	Annual Review Of Environment And Resources	Sustainable living: Bridging the North-South divide in lifestyles and consumption debates	None	Critical analysis

Table A1. (*continued*)

Code	Authors	Year	Journal	Focus	Theory	Method
A34	He *et al*	2020	One Earth	Enabling a rapid and just transition away from coal in China	None	Discussion paper
A35	Healy and Barry	2017	Energy Policy	Politicizing energy justice and energy system transitions: Fossil fuel divestment and a "just transition"	None	Discussion paper
A36	Herberg *et al*	2020	Sustainabilty	A collaborative transformation beyond coal and cars? Co-creation and corporatism in the German energy and mobility transitions	None	Discussion paper
A37	Herdic	2019	Environmental Claims Journal	The proposed 100 by 50 Act: Protecting collective bargaining of workers in a "Just Transition" to a clean energy future	None	Critical analysis
A38	Huang and Liu	2021	Journal Of Environmental Planning And Management	Toward just energy transitions in authoritarian regimes: indirect participation and adaptive governance	Authoritarianism and social injustice	Literature review and case studies
A39	Isgren and Ness	2017	Sustainability	Agroecology to promote just sustainability transitions: Analysis of a civil society network in the Rwenzori region, Western Uganda	Agroecology	Case study
A40	Iskander and Lowe	2020	Annual Review Of Political Science	Climate change and work: Politics and power	None	Discussion paper
A41	Jakob *et al*	2020	Nature Climate Change	The future of coal in a carbon-constrained climate	None	Descriptive essay

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Table A1.

Code	Authors	Year	Journal	Focus	Theory	Method
A42	Johnstone and Hielscher	2017	The Extractive Industries And Society	Phasing-out coal, sustaining coal communities? Living with technological decline in sustainability pathways	None	Descriptive essay
A43	Kenfack	2019	Global Labour Journal	Just transition at the intersection of labour and climate justice movements: Lessons from the Portuguese climate jobs campaign	None	Case studies and interviews
A44	Krzysztofik *et al*	2020	Land Use Policy	Paths of urban planning in a post-mining area. A case study of a former sandpit in southern Poland	None	Door-to-door survey
A45	Lamb *et al*	2020	Environmental Research Values	What are the social outcomes of climate policies? A systematic map and review of the ex-post literature	None	Systematic policy review
A46	Lennon	2020	Science, Technology and Human Values	Post-carbon amnesia: Toward a recognition of racial grief in renewable energy futures	Colonialism	Descriptive analysis
A47	Lennon	2021	Energy Research and Social Science	Energy transitions in a time of intersecting precarities: From reductive environmentalism to antiracist praxis	None	Descriptive essay
A48	Marcatelli	2020	Transformation	Medupi power station and the water-energynexus in South Africa	None	Descriptive analysis - political economy
A49	Masterman-Smith	2010	Australian Journal Of Social Issues	Labour force participation, social inclusion and the fair work act: Current and carbon-constrained contexts	None	Statistical (HILDA) survey, interviews and focus groups

Table A1. (*continued*)

Code	Authors	Year	Journal	Focus	Theory	Method
A50	Mayer	2018	Environmental Innovation And Societal Transitions	A just transition for coal miners? Community identity and support from local policy actors	Community identity and policy frames	Online survey
A51	Mookerjea	2019	Cultural Studies	Renewable energy transition under multiple colonialisms: passive revolution, fascism redux and utopian praxes	Socio-ecological reproduction feminist theory	Descriptive essay
A52	Müller *et al*	2020	Energy Research and Social Science	Is green a Pan-African colour? Mapping African renewable energy policies and transitions in 34 countries	None	Comparative analysis
A53	Newell and Mulvaney	2013	The Geographical Journal	The political economy of the 'just transition	None	Descriptive essay
A54	Novitz	2020	International Labour Review	ILO conventions, SDGs, decent work	None	Descriptive essay
A55	Oei *et al*	2020	Climate Policy	Lessons from Germany's hard coal mining phase-out:' policies and transition from 1950 to 2018	None	Case study
A56	Olson-Hazboun	2018	The Extractive Industries And Society	"Why are we being punished and they are being rewarded? " Views on renewable energy in fossil fuels-based communities of the U.S. west	None	Case study
A57	Räthzel *et al*	2018	Globalisations	Beyond the nature–labour divide: trade union responses to climate change in South Africa	None	Descriptive essay
A58	Robinson and Shine	2018	Nature Climate Change	Achieving a climate justice pathway to 1.5 °C	None	Descriptive essay
A59	Rosemberg	2017	Development	Sustainable industrial transformation: For whom and where to start?	None	Descriptive essay

(*continued*)

Table A1.

Code	Authors	Year	Journal	Focus	Theory	Method
A60	Routledge *et al*	2018	Geoforum	States of just transition: Realising climate justice through and against the state	Climate justice	Case studies
A61	Satgar	2015	Global Labour Journal	A trade union approach to climate justice: The campaign strategy of the national union of metalworkers of South Africa	None	Descriptive review
A62	Schapper	2020	The European Journal Of Development Research	Climate justice concerns and human rights trade-offs in Ethiopia's green economy transition: The case of Gibe III	None	Case study
A63	Snell	2018	Globalisations	'Just transition'? Conceptual challenges meet stark reality in a 'transitioning' coal region in Australia	none	Action research
A64	Stevis and Felli	2015	International Environmental Agreements: Politics, Law And Economics	Global labour unions and just transition to a green economy	none	Descriptive review
A65	Tomassetti	2020	European Journal Of Industrial Relations	From treadmill of production to just transition and beyond	Treadmill of production	Critical analysis
A66	Velicu and Barca	2020	Sustainability: Science, Practice And Policy	The just transition and its work of inequality	None	Descriptive essay
A67	Wagemans *et al*	2019	Energies	Local renewable energy cooperatives; Surveys with qualitative interviews with selected cooperatives; lrces and their governance role; the governance roles of lrecs in the province of Limburg, the Netherlands	None	Mixed methods

Table A1. (*continued*)

Code	Authors	Year	Journal	Focus	Theory	Method
A68	Weller	2019	Politics And Space	Just transition? Strategic framing and the challenges facing coal dependent communities	None	Case study
A69	White	2020	Capitalism, Nature, Socialism	Just transitions/ Design for transitions: Preliminary notes on a design politics for a Green New Deal	Radical Design theory	Descritpive essay
A70	Williams and Doyon	2020	Environmental Innovation And Societal Transitions	The Energy Futures Lab: A case study of justice in energy transitions	None	Case study through semi-structured interviews
A71	Winkler	2020	Energy Research and Social Science	Towards a theory of just transition: A neo-Gramscian understanding of how to shift development pathways to zero poverty and zero carbon	neo-Gramscian theory	Descriptive essay
A72	Woelfle-Erskine	2018	Community Development Journal	Beavers as commoners? Invitations to river restoration work in beavery mode	None	Descriptive essay

Source(s): Created by the authors

Table A1.

About the authors

Dr Hakan Karaosman is a globally recognised and award-winning expert in supply chain sustainability with a special research interest in fashion and textiles. He is Assistant Professor at Cardiff Business School at Cardiff University and Visiting Assistant Professor at University College Dublin. His research focuses on environmental sustainability and social justice in complex fashion supply chains. He has extensive outreach and service contributions. He has been featured by multiple media articles and events including *Forbes, The Guardian, Vogue Business, Vogue Italia, Financial Times, The Irish Times* and *La Repubblica*. In addition to his published academic work, he collaborates with the UN, NGOs, fashion companies and media platforms on sustainability, climate change and transparency issues.

Prof Donna Marshall is multi-award-winning, world-class sustainable supply chain scholar and is ranked among the top supply chain researchers in Europe. She has published in high-impact internationally reviewed journals, such as *Sloan Management Review, Journal of Business Ethics, Production and Operations Management, International Journal of Operations and Production Management, Journal of Supply Chain Management* and *Supply Chain Management International Journal* as well as has been contributing to media articles. She has won multi-million euros in funding and leads several international, interdisciplinary research teams. Prof Marshall has extensive teaching experience and has won multiple teaching awards as well as taking leadership roles in international high-ranking journals, professional organisations and conferences. She advises companies, NGOs, government and the media on responsible global value chains. Donna Marshall is the corresponding author and can be contacted at: donna.marshall@ucd.ie

Irene Ward is committed to advocating for evidence based solutions for environmental sustainability and has 18 years experience in management of funded research in Ireland and Scotland. She completed an MSc in Environmental Sustainability in 2024 and has spent the last three years working in sustainable energy research programme management. She also holds a BSc in Geography and a Masters in Management.