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Building resilience knowledge for sustainable development

Insights from development studies

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Abstract: This paper explores how the concept of resilience has been used in development studies. Set amidst the rise of resilience in sustainable development, it offers insights for scholars and policy-makers, alike. Sampling 419 resilience-oriented journal articles from 2017–22, it uses Kuhnian paradigms to analyse development knowledge production. This produces three key findings. First is the absence of a coherent resilience paradigm (with shared definitions, problems, and methods) in development studies. Second is its use, instead, by pre-existing paradigms as a theoretical add-on to better address complexity and/or as a new buzzword to repackage prior arguments. Third are latent possibilities for resilience as both a rallying call and siren song in sustainable development. Here, resilience discourses open vital space for development cooperation and climate action. However, its outcomes will depend on whether we can first understand precisely what we talk about when we talk about resilience.

Key words: resilience, sustainable development, development policy, development studies, Kuhnian paradigms, politics of knowledge

JEL classification: I15, I18, O20, Q01, Q56, R11, R58

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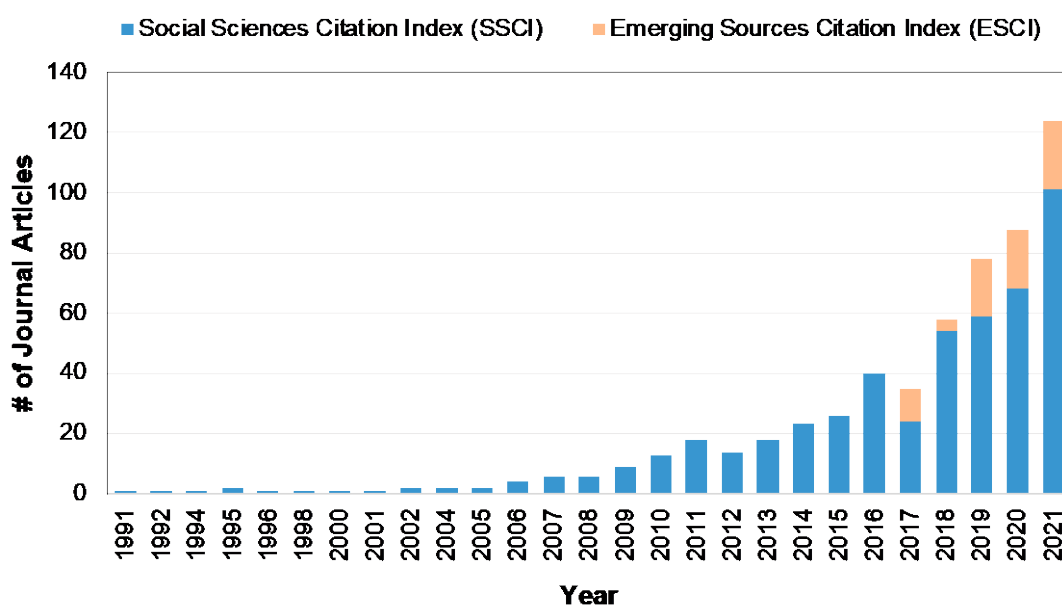
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1 Introduction

At the opening plenary of the 2022 Development Studies Association (DSA) annual conference, Aromar Revi pointed to a new buzzword on the horizon: ‘resilience’. For those fluent in the language of climate action and sustainability, ‘resilience’ may be as obvious as adaptation or mitigation. For others, however, the concept may be ambiguous or unclear. This is by no means an indictment against resilience. After all, ‘development’ is no different; as potentially perplexing to those outside (e.g., do you mean child development?) as it is obvious to those within. However, this raises a basic need for clarity amidst the rise of resilience. And as charted in Figure 1, use of ‘resilience’ in development studies is indeed rising.

Figure 1: The growing presence of resilience policy in development studies journals



Source: author's illustration using data compiled from Web of Science.

Consequently, this study on resilience in development studies serves scholars and policy-makers, alike. For newcomers, it offers a sort of guide for the perplexed (to cite Schumacher 1977). Its aim here is simple. *How has the concept of resilience been used in development studies?* The ensuing analysis lays out a basic understanding of resilience in development. How is resilience defined across diverse development contexts? What opportunities and challenges can be identified?

These questions will be relevant for those already engaging with resilience. Amidst its rising popularity, *how can resilience be used more effectively for sustainable development?* Is the concept used consistently enough for constructive or meaningful exchange? This rise of resilience has not come without concerns on its present uses (Hodgson et al. 2015; Leach 2008; Volante and Klinger 2022; Wares 2022). Critically examining the use of resilience in development studies thus contributes to its theoretical and practical efficacy. As noted by Ekbladh (2016), a well-executed review can steer a field towards more fruitful—or at least less wasteful—directions.

Indeed, it is worth noting prior meta-reviews responding to the rise of resilience. These remain concentrated on specific sectors within development. For example, Fook (2017) scrutinises community-based approaches to climate resilience. This community focus also manifests in rural

development, where Roberts et al. (2017) examine UK and EU resilience policy agendas on technology for rural resilience. Simultaneously, Béné et al. (2018) map the emergence of ‘urban resilience’. This rise of resilience in development also goes beyond urban/rural spaces. Flagging growing works on health resilience, Khosla (2017) unpacks its social, psychological, and clinical dimensions. Wang et al. (2021) further add elements from ecological resilience in reviewing works on forest fire mitigation for adaptation to climate change.

These recent works illustrate the spread of resilience across development research and policy. However, while each covers a specific part, no one addresses development studies as a whole. This paper accordingly contributes a holistic view of ‘resilience’ in development studies. Applying Thomas Kuhn’s seminal view of knowledge production, to what extent does ‘resilience’ constitute its own paradigm within development studies? Tracing the career of resilience in development knowledge production, it adds a new chapter to the political and intellectual history of development studies (e.g., Amin et al. 1978; Gendzier 1985; Hettne 1995; Larrain 1989; Mkandawire 2011; Packenham 1973; Park 2017).

Tracing resilience across 419 journal articles from 2017–22, this study finds little in the way of a coherent resilience paradigm in development studies. Resilience is instead used by incumbent development paradigms in piecemeal fashion to extend and/or repackage their claims. At the same time, the widespread use of resilience opens shared grounds for sustainable development and collective action across international and interdisciplinary divides. However, an unawareness of its non-uniform use can produce more harm than help.

This paper thus closes by calling for concerted monitoring and evaluation of resilience policy and resilience knowledge production, itself. If the language of resilience is to advance our collective prospects for development cooperation and climate action, then we will need to know precisely what we each are talking about.

2 Methods

2.1 Analytical framework

This study applies methods from the philosophy of science to development studies to analyse knowledge production on ‘resilience’. Specifically, this paper uses Thomas Kuhn’s (1996 [1962]) seminal model of academic knowledge production to ask whether resilience constitutes its own paradigm in development studies. In doing so, it follows on prior interdisciplinary collaboration between development studies and the philosophy of science, from Preston (1982) with Kuhn to Somjee (1991) with Popper and Kvanraven (2021) with Lakatos.

Here, Kuhn’s paradigms entail research communities operating on a shared set of premises, problems, and methods. This enables constructive knowledge production until internal theoretical tensions and external social conditions trigger a type of gestalt shift known as a ‘paradigm shift’ in research agendas/orientations. A trademark example is the paradigm shift from geocentric to heliocentric worldviews during the Copernican revolution (see Kuhn 1957).

To be clear, Kuhn’s paradigms should not be conflated as necessarily being desirable nor sound. Intended to describe the social structure of scientific knowledge production, Victorian British anthropology, German *Volkekunde* (ethnography), and US international relations all offer paradigmatic traits (*vis-à-vis* shared premises, problems, and methods). Each also justified and spread racism at global scale (Acharya 2022; Anievas et al. 2014; Gordon 1988). Thus, the analytical

merits of using of Kuhnian paradigms to interpret knowledge production should not be misunderstood or conflated as implying the superiority of any one paradigm—‘scientific’ or otherwise.

Rather, Kuhnian paradigms offer a framework to deconstruct the (i) premises, (ii) problems, and (iii) methods underwriting resilience knowledge production in development studies. These elements allow us to disentangle and make sense of the many meanings or uses of resilience. In particular, it sheds light on the extent to which resilience knowledge production entails a constructive, collective endeavour. An optimistic hypothesis here might posit that resilience is used in a uniform sense as a coherent resilience paradigm (e.g., Imperiale and Vanclay 2021; Roberts and Sass 2022). A negative hypothesis might similarly posit a new paradigm, but with perverse ends in reproducing social inequality and hindering sustainable development. Alternatively, a null hypothesis might posit the lack of a shared paradigm at all. Instead, the use of resilience may give way to altogether different premises, problems, and methods.

When resituated in surrounding politics, this focus on knowledge production bears real-world implications sustainable development. Academic knowledge plays an instrumental role in shaping reality(s). MacKenzie (2006) hence finds economic models acting like ‘an engine, not a camera’ in financial markets. As warned by Berlin (1969: 119), ‘Over a hundred years ago, the German poet Heine warned the French not to underestimate the power of ideas: philosophical concepts nurtured in the stillness of a professor’s study could destroy a civilisation.’

Echoing recent (re)discoveries of persisting neocolonial dependencies and acute environmental limits to growth, knowledge is also shaped *by* particular realities. Academic knowledge production is a social practice; a highly formalised language game (Wittgenstein 2001 [1953]). However, it is not an inclusive game. As noted by Diane Coyle regarding the gender gap in economics, ‘It’s not possible to do good social science if you are so unrepresentative of society’ (Hartford 2021: 1). Yet, entire continents and identities have been cast through academic ideas (Mudimbe 1988; Said 1978; Sud and Sánchez-Ancochea 2022).

As reminded in epistemology, knowledge is value-laden in shaping (and being shaped by) partial realities (Anscombe 1958; Feyerabend 1975; Kuhn 1957; Putnam 2004). Disciplinary histories have notably traced the politics underwriting international, area, and development studies (e.g., Acharya and Buzan 2010; Bamba 2016; Engerman 2007; Gilman 2003; Park 2020; Tickner and Wæver 2009; Thakur and Vale 2020; Zeleza 1997). However, said politics does not remain secluded to the past. Calls to decolonise the curriculum (from the University of Capetown and beyond) remind of the persisting colonial legacies in academic knowledge production and the university (Nyamnjoh 2017, 2022; Platzky Miller 2020).

The question of whose resilience knowledge matters thus bears a question of whose reality counts (Chambers 1997). Academic knowledge production offers a channel for social control; whether via class reproduction (Bourdieu 1990), manufactured consent (Herman and Chomsky 1988), or colonised minds (Amin 1975; Nyerere 1975). It is in these social and political contexts that the structure of resilience knowledge production bears implications for development research, policy, and practice.

2.2 Empirical data

To populate this Kuhnian framework on resilience knowledge production, this study used bibliometric methods to compile a database on resilience-oriented development scholarship. Relying on tools from Web of Science, this entailed large-scale search, compilation, and coding of

journal articles. Limited to journals categorised by Web of Science under ‘development studies’, it sampled publications from the past 5.5 years (1 January 2017–30 June 2022).

This choice of starting date enabled a more inclusive sample that covered two citation indices. The first is a ‘gold standard’ for scholarship: the Social Sciences Citation Index (SSCI). The second is the lesser-known Emerging Sources Citation Index (ESCI), established in 2017 to capture emerging markets in academic knowledge production. This structural hierarchy, echoing a global centre and periphery, is highly problematic in the political economy of knowledge production (Chou 2014; Chou and Chan 2017; Hanafi 2011). For the purpose of this study, however, these two citation indices proxy dominant global arenas in which to trace development studies scholarship on resilience.

The resulting database contained 419 resilience-oriented journal articles. Given the ambiguous and potentially coincidental uses of resilience, articles required both ‘resilience’ and ‘policy’ in their title and/or abstract. Filtered to include only journal articles (including review articles and first access) and editorial materials (e.g., special issue introductions), key search parameters are detailed in Table 1. The titles, abstracts, keywords, and full manuscripts were then used to identify the core research premises, problems, and methods—the basic ingredients of a Kuhnian paradigm.

As a final caveat, this sample excluded resilience knowledge production beyond SSCI and ESCI-listed development journals. This means that policy documents, reports, and other ‘grey literature’ were not covered here. It also means that resilience knowledge in languages other than English was largely excluded (Table 1). Examining resilience policy production and the translation of resilience knowledge across sociolinguistic space remains an important area for future work. For the time being, the academic space of development studies scholarship offers an important place to start in piecing together a bigger picture on development’s collective uses of resilience.

Table 1: The final sample of development journal articles from the Emerging Sources Citation Index (ESCI) and the Social Sciences Citation Index (SSCI) from Web of Science

	(total)	ESCI	SSCI
Sample size (n)	419	81	338
<i>% with funding</i>	<i>46%</i>	<i>31%</i>	<i>49%</i>
<i>% in english</i>	<i>98%</i>	<i>91%</i>	<i>100%</i>
Publication date	2017-01-01 to 2022-06-30		
Publication type	Articles, review articles, first access, editorial materials		
Search string	ti=(resilien* AND policy) OR ab=(resilien* AND policy) AND wc=development studies		

Note: retrieved 23 July 2022.

Source: author’s compilation using Web of Science data.

3 Results

To recall our opening question, how has the concept of resilience been used in development studies? At first glance, these 419 articles evidence an extensive use of resilience across development contexts. Indeed, no less than 140 semantic varieties of resilience were found across these works (e.g., migrant resilience, forest resilience, cyber resilience; see Table 2, Figure 2). Following our Kuhnian paradigms, the ensuing sections disaggregate their constituent premises, problems, and methods.

3.1 Resilience premises

To begin, a conceptual diversity emerged when examining resilience definitions. At its most basic, resilience was defined by the ability to bounce back from shocks (Klassen and Murphy 2020; Rizzo 2017; Vergara-Solana et al. 2022). As reminded by Béné et al. (2018), its etymology stems from *resilire* ('to jump back') in Latin. This brings a gestalt shift in reframing risk. Instead of risk elimination, resilience emphasises systemic adaptation as a more sustainable approach. A number of origins in the genealogy of resilience are traced to engineering, ecology, and psychology (Bellini et al. 2017; Béné et al. 2018; Clare et al. 2017; Huang et al. 2018; Tan 2021; Vitale et al. 2022).

Figure 2: Frequency-based word cloud of journal article keywords tied to resilience



Source: author's illustration using keyword meta-data extracted from this study's literature sample; see text.

In engineering, emphasis is placed on structural integrity against major shocks (Bellini et al. 2017; Vitale et al. 2022). Here, resilience prioritises *elasticity* over *hardness* when measuring a system's strength (e.g., the tensile strength of bamboo or wood over ceramic or brick). Béné et al. (2018: 118) offer one such example from naval engineering in 'the ability of materials to withstand severe conditions' alongside 'the capacity of a material to absorb energy when it is deformed elastically and then, upon unloading, to have this energy recovered'.

In ecology, resilience is framed as a 'system's ability to absorb the shock without changing its structure, identity and function' (Bellini et al. 2017: 141). If engineering responds to the risk of mechanical failure, then ecology adds the risk of extinction. As defined in a seminal work by Holling (1973: 17): 'Resilience determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes [...] and still persist. In this definition, resilience is the property of the system and persistence or probability of extinction is the result.'

In psychology, resilience responds to personal trauma instead of extinction or mechanical failure (Rushton et al. 2022). Applied to both individuals and groups, Khosla (2017: 233) offers one definition as 'the capacity and a dynamic process of successfully adapting/coping, overcoming stress/risk/challenges and adversity while maintaining normal psychological as well as physical functioning'. While 'normal' functions change across social contexts, emphasis remains on the mental ability to persist amidst adversity (e.g., human and/or natural disasters, social discrimination).

Table 2: A sample of 140 flavours of resilience from the development studies literature

academic resilience	life cycle resilience	resilience science
adaptive resilience	livelihood resilience	resilience scorecard
arable farming resilience	local agrifood system resilience	resilience strategies
authoritarian resilience	local resilience	resilience theory
civic resilience	market resilience	resilience thinking
climate resilience	migrant resilience	resiliency choices
climate resilient agriculture	multi-dimensional resiliency	resiliency frontier
climate resilient development	national resilience	resiliency options
climate resilient infrastructure	natural hazard resilience	resilient adaptation
coastal community resilience	neighbourhood housing resilience	resilient agricultural sector
coastal resilience	neighbourhood resilience	resilient cities
community resilience	neoliberal resilience	resilient development
country resilience	network resilience	resilient entrepreneurial ecosystem
COVID-19 resilience	operational resilience	resilient futures
cyber resilience	organisational resilience	resilient global value chains
dairy farmers' resilience	pandemic resilience	resilient indigenous territories
disaster resilience	pastoral resilience	resilient industries
disaster resilient village	policy resilience	resilient landscapes
drought resilience	population-level resilience	resilient peripheral regions
ecological resilience	production resilience	resilient planning
economic resilience	psychological resilience	resilient rangelands
ecosystem resilience	public health resilience	resilient refugees
emotional resilience	public servant resilience	resilient regions
energy resilience	rare earth supply chain resilience	resilient scenarios
engineering resilience	regional economic resilience	resilient schools
environmental resilience	regional food resilience	resilient supply chain design
evolutionary resilience	regional resilience	retail resilience
farmers' resilience	resilience actors	rural resilience
faux resilience	resilience approaches	sectoral resilience
financial resilience	resilience assessment	seismic resilience
fishing community resilience	resilience behaviour	small-scale farmers' resilience
flood resilience	resilience capacity	SME resilience
food systems resilience	resilience challenges	social resilience
food-related disaster resilience	resilience discourse	social-ecological resilience
forest resilience	resilience factors	specific resilience
farming systems' resilience	resilience finance	student resilience
general resilience	resilience framework	sub-federal resilience
global financial system resilience	resilience goals	supermarket resilience
green team resilience	resilience indicators	supply chain resilience
health system resilience	resilience measurement	system resilience
household resilience	resilience mobility	urban flood resilience
housing value resilience	resilience outcomes	urban food system resilience
human resilience	resilience paradigm	urban resilience
inclusive resilience	resilience planning	urban water resilience
institutional resilience	resilience policies	value-based resilience
labour market resilience	resilience practitioners	youth resilience
legal resilience	resilience programming	

Source: author's compilation using various data sources.

To these, evolutionary resilience and social-ecological resilience added notable variations. Until now, definitions of resilience have focused on the ability to 'bounce back'. In evolutionary resilience, however, resilient subjects 'bounce forward' through structural transformation (Bellini et al. 2017). If prior definitions entail a minimal conservation of some past equilibrium, then evolutionary resilience entails maximal aims in moving above and beyond the status quo. Social-ecological resilience further expands this scope of resilience. Here, Ostrom's (1996, 2009) social-

ecological systems (SES) add seminal resilience works. Ostrom's SES framework is especially well-suited to sustainable development in recognising a complex intersectionality of individuals, institutions, and ecologies (e.g., Athayde and Silva-Lugo 2018; Henderson 2021; Szabooya 2022).

These definitions illustrate some of the conceptual diversity surrounding resilience, but there remains a small elephant in the room. Namely, a substantial portion (nearly 20 per cent) exhibited more ambiguous uses of resilience. In such cases, resilience was taken for granted with little explanation or elaboration. For example, Ryser et al. (2020) stress the importance of resilience for non-profit organisations and rural communities without specifying what said resilience means. Similarly, Taka and Northey (2020: 1740) specify 'organisational resilience' and the 'resilience, space and capacity of civil society' as their subject of study—but with no ensuing explanation or analytical use.

Further articles evidence this generic or colloquial use of resilience—notably in EU contexts. For example, Clifton et al. (2018) cite EU resilience against financial shocks in a general, non-technical sense. Servent and Tacea (2021) also use 'resilient institutions' to title their special issue on EU decision-making, but as a broad descriptor more than as a specific concept. The same applies to de Bièvre (2020) on resilient EU trade policies and to Lewis and Sagnayeva (2018) on resilient political settlements in Kyrgyzstan.

This might be cynically interpreted as paying lip service or jumping on the resilience bandwagon. While not necessarily objectionable on such grounds alone, these ambiguous uses are not conducive for effective resilience policy and knowledge production. At a basic level, these ambiguous uses of resilience point to hazards in taking the concept for granted. Its specific definitions (e.g., in engineering, ecology, psychology) remind that the concept of resilience is neither obvious nor homogenous.

In contrast to its diverse definitions, the normative orientation of resilience was more consistent. Namely, resilience was frequently adopted as an obvious or implicit good. For example, Dudu and Çakmak (2018) cite the economic impact of climate change as reason for building resilience in Turkey—again without explaining why or what resilience means. Similarly, Ahmed et al. (2018) cite the costs of antimicrobial resistance to call for greater economic resilience—again with no further explanation. The same applies to the call in Zereyesus et al. (2017) for resilience policies to solve food poverty in Ghana. In all these cases, the definition and normative orientation of resilience are taken for granted as obvious or self-evident development solutions.

The one exception noted to this normative orientation arose when resilience was applied to political institutions. Here, resilience was framed as normatively neutral (amoral) or even bad (immoral). For example, several studies attribute resilience to negative subjects like neoliberalism, authoritarianism, illicit drug trafficking, and rentier states (Berry 2020; Bril-Mascarenhas and Madariaga 2019; Cavatorta and Tahchi 2019; Gutierrez 2020; Lewis and Sagnayeva 2020). In rarer instances, studies highlight how resilience policies that meant to help caused harm instead (e.g., Wares 2022; Volante and Kliner 2022). However, these remain an exception to the norm of assuming resilience as an implicit good.

In sum, development studies' use of resilience reveals diverse definitions, contrasted by a normative homogeneity on the desirability of resilience—regardless of its definition (or lack thereof). When speaking of resilience in development studies, this suggests that not everyone is clear nor consistent on exactly what everyone is speaking about.

3.2 Resilience problems

If development studies offers a kaleidoscopic (and rather blurry) view of resilience definitions, then does the field at least converge on a common set of problems? Broadly speaking, a common thread can be highlighted in the problem of complexity.

This complexity is attributed to both subjects and risks. In complex risks, resilience responds to unstable or even unknowable risks; a response to unknown unknowns more than known unknowns. Research problems correspondingly shift from risk elimination to risk adaptation, given their inherent unpredictability.

These complex risks manifest in two forms: shocks and stressors. Shocks entail short-term, high magnitude events. Examples included financial crises, the COVID-19 pandemic, and natural disasters (e.g., Castañeda-Navarrete et al. 2021; Pfieler et al. 2017; Walch 2018). Conversely, stressors entail long-term, low magnitude events. Risks here included social discrimination, political oppression, economic hardship, and occupational stress (e.g., McNair et al. 2022; Pasha 2020; Quénel et al. 2022; Wilcox and Lawson 2018).

Shocks and stressors also appeared together for the worst of both worlds: long-term, high magnitude impacts. Climate change was emblematic of this compound risk, with climate pressure (e.g., global warming, depleting watersheds) compounding extreme weather events (e.g., heat waves, typhoons, forest fires) and human disasters (e.g., conflict, famine, pandemics).

Complex subjects further compound these complex risks. This development literature was notably (but perhaps unsurprisingly) anthropocentric in emphasising social more than ecological subjects. The latter ecologies, where found, were invariably tied to the welfare of human subjects in a social-ecological system. Thus, wetlands tied to rural livelihoods in Bangladesh (Reid and Alam 2017), just as forests tied to fire risks in the US, energy infrastructure in Europe, and gender inequality in Nepal (Bhattarai 2020; Sotirov and Storch 2018; Steen-Adams et al. 2017).

Complex subjects also split into a resilience as applied to individuals versus institutions. Resilience for individuals centred on vulnerable groups, tying closely to social and community development. Example social dimensions included age, ethnicity, gender, occupation, and race (e.g., Costa et al. 2019; Davidson and Carlin 2019; Hak et al. 2018; Hughes et al. 2022; Lawford et al. 2018).

Resilience for institutions centred on social structures (e.g., markets, laws), overlapping more with political and economic development. Example subjects included resilient financial markets, agri-industrial sectors, supply chains, small and medium enterprises, and housing markets (e.g., Cardoso et al. 2022; Jarratt and Davies 2020; Liu et al. 2018; Nan and Park 2022; Wang 2019). Extending into political economy, subjects also include legal institutions, policy regimes, and government bodies (e.g., Madariaga 2017; Philipson et al. 2021; Wong and van der Heijden 2022). On rarer occasions, institutional subjects pointed to a securitisation of resilience in its application to critical national infrastructure, cyber security, and broader national security (e.g., Keller et al. 2018; Noel et al. 2021; Oyewunmi 2021; Zhong et al. 2022).

Finally, problems centred on joint social-ecological subjects tied closely to rural and urban development. Spanning a diverse human geography, examples included coastal fisheries, semi-arid agriculture, and small island developing states (e.g., Delfiyan et al. 2021; Robinson 2019; Szaboova et al. 2022). Again grounded in human welfare, these nonetheless canvassed a range of ecologies from cities to rainforests, wetlands, plateaus, mountains, grasslands, and more (e.g., Baumber et al. 2020; Cao et al. 2018; Fastenrath et al. 2019; Gongbuzeren et al. 2018; Mercy 2020).

Altogether, these subjects and risks compound to produce a vast array of development problems. Echoing its many definitions, these problems reflect development studies' markedly multidisciplinary terrain. In trespassing across disciplinary borders, these problems frequently challenge the very relevance of present categorical divides (e.g., natural versus human disasters, economy versus environment, humanitarianism versus development). Resilience was thus used to foster interdisciplinary views of fundamentally interdisciplinary problems. Examples were thus able to address complex problems of deforestation tied to gender inequality, violent conflict tied to food security, and urban flood risks tied to racial discrimination (Bhattarai 2020; Brück and d'Errico 2019; Hughes et al. 2022).

However, this widespread use of resilience to address interdisciplinary problems rendered multiple versions of interdisciplinarity more than any one common or collective form. Beyond the underlying meta-narrative of complexity, little evidence was found of a common set of problems across these works. Even climate change did not offer a unifying strand, given studies focusing only on social resilience. This raises a curious possibility wherein the interdisciplinarity fostered by resilience remains divided along disciplinary lines. Much like nationalist forms of internationalism or scientific and/or religious forms of universalism, one might speak here of disciplinary forms of being interdisciplinary.

When added to resilience's diverse definitions, these manifold problems offer little evidence of some coherent 'resilience paradigm' in development studies. Resilience renders highly interdisciplinary views of complex subjects and risks, but from standpoints clustered around familiar disciplinary lines. These evoke a diverse use of resilience that yet gives way to prior development studies paradigms.

3.3 Resilience methods

If little evidence was found of a dedicated set of resilience problems and premises, then what of the methods employed by these works? As possibly hinted at by a shared concern with complexity, is there evidence of a shared methodology? It is here that development's multidisciplinary approaches to resilience become especially clear. To elaborate, resilience is used methodologically in two ways: (i) as an empirical subject and (ii) as a theoretical approach.

The use of resilience as an empirical subject arises in meta-reviews or meta-analyses of resilience research and policy. The latter evidences the extensive use of resilience in development policy (e.g., Dwyer 2022; Eraydin and Özatağan 2021; Kakderi et al. 2021; Roberts et al. 2017). Example policy institutions included the European Union, the Food and Agriculture Organization, the World Health Organization, the Intergovernmental Panel on Climate Change, the Organisation for Economic Co-operation and Development, the UK Department for International Development, and the World Bank (e.g., Arslan et al. 2018; Bottazzi et al. 2019; Rushton et al. 2022; Sundararaman et al. 2021; Volante and Klinger 2022; Wang et al. 2017).

The empirical study of resilience research, itself, added evidence of the extensive use of resilience in development scholarship. As noted by Huang et al. (2018: 47), there has been 'an explosion in the popularity of resilience within both academic and policy discourses'. Here, a number of prior meta-reviews highlight the multidisciplinary and multisectoral scope of resilience research. Bodies of work surveyed here include resilience in climate change, agriculture, community participation, economic development, finance, and peacebuilding (e.g., Barrett 2017; Castells-Quintana et al. 2018; Ferreira 2020; Fook 2017; Jawo et al. 2022; Johnson et al. 2021). COVID-19 also emerged as a shared thread in meta-reviews on resilient value chains and public health systems (e.g., Anbumozhi and Kalirajan 2021; Caponnetto et al. 2021). These studies on resilience research, however, were notably outweighed by the empirical focus on resilience policies.

The methodological integration of resilience into theoretical or analytical approaches also brought development's multidisciplinary constituents to the fore. Here, resilience was combined with a host of methods from the social sciences and the humanities. These spanned both quantitative and qualitative methods for measuring or otherwise evaluating resilience. Quantitative approaches included a heavy emphasis on mathematical modelling to proxy or measure the resilience of social-ecological systems. Tied to scholarship from economics, urban studies, operations research, and management science, resilience was measured through a variety of spatial and spatial-temporal regression models. Notably, these methods frequently focused on modelling resilience at the national scale (e.g., Du et al. 2020; Wang et al. 2021; Zenka et al. 2021; Kim and Marcouiller 2020; Pascariu et al. 2021). In rarer occasions, models extended to transnational contexts, as seen in the examples of EU resilience and supply chain resilience (e.g., Annoni et al. 2019; Liu, et al. 2018).

Qualitative methods for measuring resilience also emerged from anthropology, geography, history, and politics. To recall the division of complex subjects into resilience of individuals versus resilience of institutions, measuring the resilience of individuals relied primarily on ethnographies and life histories. These enabled documentation of subjective perceptions and definitions of resilience across local communities (e.g., Athayde and Silva-Lugo 2018; Drennan 2018; Maitrot et al. 2021). Measuring the resilience of institutions (social and social-ecological) then relied on a variety of historical methods. These included historical approaches from political ecology, historical institutionalism, heritage studies, and discourse analysis (e.g., Beckwith 2022; Gupta and Gupta 2022; Mikulewicz and Taylor 2020; Steen-Adams 2017; Vanhercke and Verdun 2022).

Combined, these quantitative and qualitative approaches to measuring resilience shed light on a range of resilience indicators. For example, resilience could be proxied or measured through the temporal speed of a system's recovery, the breaking point of simulated financial markets, subjective scorecards to evaluate local and national conditions, and psychological coping mechanisms from vulnerable groups to adapt to systemic risks (e.g., Leal and Napoletano 2019; Pfeifer et al. 2017; Tan 2021). While appropriate to each study's contexts, these methods raise questions regarding their consistency and compatibility across social-ecological (and scholarly/disciplinary) contexts.

On one hand, this added diversity in resilience methods expands recognition of complex development contexts. On the other, it belies a marked divergence in associated methods. These raise further questions on the present existence (or lack thereof) of common, compatible, or otherwise commensurable resilience measures. Added to the diversity of resilience premises and problems, these methods provide little evidence of a binding element or collective orientation that would otherwise indicate a distinct resilience paradigm.

4 Discussion

4.1 The (non-)existence of a resilience paradigm

Having examined the premises, problems, and methods across these sampled works, has the rise of resilience in development studies brought a new paradigm? These 419 journal articles suggest the lack of a clear or coherent resilience paradigm in development studies—at least as of yet.

Instead, a case could be made for resilience as being in a pre-paradigm state. This is described by Kuhn (1996: 47-48) as being 'marked by frequent and deep debates over legitimate methods, problems, and standards of solution, though these serve rather to define schools than to produce agreement'. To recall our methodological caveats, however, there is no inherent reason for why resilience *should* constitute a paradigm. As warned prior, paradigmatic status should not be

conflated as implying some superior scientific status. Indeed, it is worth remembering that Kuhn’s paradigms fundamentally warn against an unquestioning faith in science.

Rather, what this lack of a resilience paradigm means is that development scholars (and to an extent, the policymakers that they examine) use the concept in substantially different ways (Table 3). The observed premises, problems, and methods offer little in the way of a coherent paradigm, logic scaffold, or Lakatosian programme (Kvangraven 2021; Park 2020).

Instead, resilience may be better framed as a *catalyst* in development research and policy. In its role as a catalyst, it has promoted recognition of complexity across a range of social-ecological systems and risks (e.g., climate change, pandemics, financial crises, social discrimination, geopolitical instability, national security). In its many dimensions, the resulting views showcase the multidisciplinary breadth of development studies.

Table 3: A Kuhnian paradigm-based deconstruction on the uses of resilience in development studies

Shared Premises	Language: resilience definitions	'Bounce back', 'bounce forward', or undefined/ambiguous
	Values: normative orientations	Resilience as good (or, in rare cases, as bad)
Shared Problems	Managing complex risks	Shocks, stressors, or both (e.g., climate change)
	Managing complex subjects	Social or social-ecological systems
Shared Methods	Uses as a theoretical approach	Resilience as part of quantitative, qualitative, or mixed methods
	Uses as an empirical subject	Resilience policies or resilience research as the empirical data

Source: author’s compilation using various data sources.

Table 4: Implications for drawn from the present uses of resilience in development studies

Opportunities	Resilience as a rallying call: a new consensus for global action	A platform for international cooperation
		A platform for interdisciplinary innovation
Challenges	Resilience as a siren song: a new mechanism for political control	A problem of language (ontological)
		A problem of measurement (epistemological)
		A problem of trade-offs (moral/ethical)
		A problem of control (political)

Source: author’s compilation using various data sources.

One might thus foresee potential conflicts between these multiple uses of resilience across development studies. However, this would require contact and mutual awareness in the first place. These findings rather found more evidence of fragmentation in the literature. For example, Dafermos et al. (2021: 248) explicitly adopt a vague definition of climate resilience, explaining that ‘Despite widespread use of the term, the meaning of ‘resilience’ is poorly defined’. Though partly

true, this sample produced many works that arose in response to this very problem across an array of development sub-sectors—yet to no avail. Indeed, such efforts did not seem to translate across the sample to mitigate the more vague or ambiguous uses of resilience to be found. In this regard, this study's present attempt at a more holistic view of resilience across development studies adds to potential defences against more cavalier or less constructive uses of the term.

Following this study's own methodological concerns with the politics of knowledge production, the significance of resilience's pre-paradigmatic status extends well beyond academia's ivory towers. In particular, the observed role of resilience as a catalyst for responding to complexity raises distinct challenges and opportunities for development research and policy. Outlined in Table 4, these entail superimposed possibilities for resilience as both a rallying call and a siren song in sustainable development.

4.2 Resilience as a rallying call

The widespread use of resilience evidenced here raises prospects for a *resilience consensus* in development research and policy. This consensus lacks the analytical depth or consistency of a paradigm. In a twist, however, this may enhance its role as a catalyst for sustainable development and climate action. Opening a more inclusive discourse due to its ambiguity, this resilience consensus bears opportunities for (i) international cooperation in development policy and (ii) interdisciplinary innovation in development research.

Resilience may ironically bear opportunities *thanks* to its ambiguous, non-uniform use. This is set amidst rising geopolitical tensions, which endanger prospects for sustainable development and climate action (Kim and Lee 2022; Park 2022). In such contexts, even a shallow normative consensus on the value or need for resilience opens vital space for global action. As noted by development economist and policymaker Paul Streeten (Jolly and Streeten 2001: 127):

Perhaps lack of clarity and sharpness is the price you have to pay for getting agreement on action. Practical [people] reach agreement by blurring distinctions, academics by sharpening them. If you spell out your meaning too clearly, there will be some interests that will object. [...] It is partly the lack of clarity, of sharpness, that the UN documents suffer from that has the virtue that they can lead to action.

However ambiguous or inconsistent its meaning(s) may be, the widespread use of resilience thus opens a vital discourse or platform for development cooperation and climate action. If ambiguity is the proverbial lifeblood of diplomacy, then one might argue that resilience has diplomacy running in its veins. Indeed, resilience's lack of paradigmatic status in development studies frees it from the exclusionary norms dictating Kuhn's scientific paradigms. A silver lining hence emerges in the inclusive participation enabled by a less-disciplined use of resilience, *à la* Feyerabend's (1975) call for epistemic anarchy.

To be clear, this implies neither an automatic nor straightforward process towards such inclusive outcomes. Indeed, the flip side of a less regimented or regulated use of resilience is a cacophony (e.g., tower of babel) and/or hegemony (e.g., re-branded neoliberal consensus) spread through resilience. Yet, every change brings opportunity, and the longer trials and travails of development suggest the need to seize every opportunity (including buzzwords or panaceas)—whether premised on polyvalence (Ziai 2016) or political-epistemic pragmatism (Park 2020).

Sustainable development research also stands to gain from resilience as a platform for interdisciplinary innovation. In its role as a catalyst, resilience offers a means to bridge disciplinary

perspectives on sustainable development. Indeed, the sampled works evidence a flourishing interdisciplinarity—albeit divided along disciplinary lines.

Much in the way that the concept of institutions has spread across social studies (e.g., history, politics, sociology, anthropology, economics), resilience opens a path for interdisciplinary cross-pollination. Once again, it is thanks to its lack of paradigmatic status that this resilience consensus can span multiple disciplines. This may not be just a bonus, but a necessity to respond to the social-ecological complexities of sustainable development.

4.2 Resilience as a siren song

Beyond its opportunities, this sample's fuzzy and fragmented use of resilience also bears challenges. Subverting its rallying call as a potential siren song, this can be traced across problems of (i) language, (ii) measurement, (iii) trade-offs, and (iv) control.

First is an ontological problem of language. In large part, the prior opportunities hinge on effective communication of what we mean by resilience in development studies. However, the sampled uses point to multiple, at-times ambiguous definitions. Moreover, its fragmentation suggests a lack of awareness across said differences.

The mention of language also raises another elephant in the room. As raised in the methodological caveats, a looming question remains regarding the extent to which 'resilience' meaningfully translates beyond English-language academic and policy discourses. This study offers a comparative baseline, in light of English's present role as an academic *lingua franca*. However, cross-linguistic scrutiny of resilience research and policy remains an important direction for future work.

The language of resilience matters for more than academic reasons. A general lack of awareness on the many ways in which we speak about resilience can impair collective action. In particular, it raises risks of miscommunication and semantic conflict, which deter effective knowledge production and development cooperation. Resilience may pose what linguists refer to as a false friend. A classic example is the word 'gift' in English versus '*Gift*' ('poison') in German. The same semantic vessel, ontological category, or speech act can contain very different substantive meanings. A lack of self-reflective oversight can further invite hegemony over resilience meanings, which shape the grounds for ensuing policies. Far from abstruse or abstract, the ontological contents of resilience-speak warrant close scrutiny.

Second is an epistemological problem of measurement. Once resilience has been defined, how does one measure it? When situated in global contexts for sustainable development, this problem of measurement is far from straightforward. As observed here, resilience bears diverse methods for measuring resilience (e.g., models, scorecards, life histories). These raise questions on which resilience measures apply where and when. A political element also enters in asking whose resilience measures matter for whom. When applied across global contexts, this renders practical dilemmas. For resilience to forge a sustainable consensus, it will need some common set of measures from which to derive action. Referred to by Kuhn as a problem of incommensurability, questions remain on the translatability or transferability of resilience definitions and measures.

Third is a moral or ethical dilemma of trade-offs. Perfect compatibility in both language and measurement can still render practical dilemmas. As reminded by Isaiah Berlin, conflicts arise between even our most cardinal virtues. Freedom can conflict with security, just as the demands of justice can conflict with mercy (Berlin and Lukes 1998; Park 2020). Normative consensus on the 'goodness' of resilience does not guarantee against internal conflicts.

Resilience does not guarantee perfect compatibility or compromise across competing development aims (e.g., economic growth, environmental sustainability, social equality, intergenerational justice). These hidden trade-offs or moral dilemmas are especially notable across spatial-temporal scales (Wahby et al. 2022). For example, resilience still bears trade-offs between optimising between global, national, and local resilience. Similarly, short-term resilience (e.g., in crises or disaster recovery) does not automatically dissolve structural barriers to long-term resilience (e.g., neocolonial dependency, neoliberal inequality, neopatrimonial rent seeking). Conversely, short-term suffering might be required for long-term gains. Building resilience hence involves contested choices or rank-orderings between diverse actors and goods.

Fourth is a political problem of control. As hinted at prior, amidst development's many conceptions of resilience, who gets to define resilience for whom? These plural resilience definitions, problems, and measures point to a latent potential for tragedy. These conflicts over who controls resilience for whom tie to deep-rooted challenges for sustainable development and climate action. Resilience ideas and policies cannot be assumed to be constructive, compatible, or even communicable across global contexts. Its inconsistencies may instead raise barriers for collective action in global environmental politics. When imbued with power, resilience discourses also raise spectres of hegemonic control (e.g., a resilience consensus as a new Washington consensus). From disputed responsibilities for climate change to outright climate change denial, building resilience involves cooperation across not just plural actors and aims, but across plural perceived realities.

At best, this siren song thus raises hazards of fragmented or ineffective policy and knowledge production (e.g., semantic conflicts, old wine in new bottles). At worst, it invites risks for political capture; a case where might defines right in terms of how to build resilience. As cautioned by Wares (2022), resilience may be used to shame and blame less powerful actors into punitive action. Furthermore, its more conservative focus on 'bouncing back' may reinforce or reproduce social inequality and geopolitical hierarchy (e.g., neoliberalism, neocolonialism).

Consequently, these problems of language, measurement, trade-offs, and control reveal risks underlying resilience's rallying call. Tied to challenges for collective action on sustainable development and climate change, the widespread use of resilience warrants both optimism and caution. Neither side is palatable (nor particularly productive) on its own. Recognising its dual face as a rallying call and siren song may ward against a resilience that yields yet another panacea with rapid growth but no progress; another form of Wittgenstein's proverbial 'engine running idle'.

5 Conclusion

This paper investigated how the concept of resilience is used in development studies, sampling 419 journal articles from 2017–22. Framed in terms of Kuhnian paradigms to analyse resilience knowledge production, it found little evidence of a distinct resilience paradigm in development studies. Instead, resilience was used in fragmented and at-times ambiguous ways across pre-existing development paradigms. An indication of this non-uniform use was seen in the many definitions of resilience premising these studies. These were compounded by resilience problems across a wide array of complex subjects and risks. Evidencing multiple forms of interdisciplinarity, these studies reflect a corresponding diversity of methods used to measure resilience across diverse development contexts.

Combined, these premises, problems, and methods evidence the use of resilience to extend old paradigms more than the rise of a new resilience paradigm for sustainable development. Here,

resilience was used more like a catalyst towards a new consensus in development research and policy. Lacking the analytical clarity or consistency of a new paradigm, this resilience consensus yet bears its own opportunities and challenges. The former is captured in resilience as a potential rallying call. Its widespread adoption opens vital space for international cooperation and interdisciplinary innovation towards sustainable development.

However, resilience's rallying call also bears a potential siren song. Its problems of language, measurement, trade-offs, and control point to ontological, epistemological, moral, and political challenges. A lack of awareness of the many ways in which we speak of resilience raises barriers to sustaining collective action. Bearing implications for effective policy and knowledge production, resilience policies cannot be assumed to be constructive, compatible, or even communicable across development contexts. The global environmental politics surrounding sustainable development and climate action thus tie to deeper contestations over resilience policy and knowledge production, itself. Leading to potentially tragic outcomes, they remind of deeper challenges in realising collective action across plural perceived realities.

Consequently, a number of future directions can be highlighted for future work. First is an aforementioned shift in examining resilience policy and knowledge production across linguistic contexts. To what extent does resilience effectively translate across international contexts? Second is a shift to comparative analyses of resilience in development policy to complement present findings from development studies. Third is a historical question of how resilience came to spread across international development and international policy, more broadly. What is the genealogy of resilience in contemporary development contexts?

This study thus closes with a brief call for greater oversight of resilience to match its rise in development. This entails monitoring and evaluation that extends from resilience policy to resilience knowledge production, itself. The rationale here is simple. Resilience will collapse into a lesser buzzword or missed opportunity if we do not reckon with its diversity in development research and policy. No amount of blaming or shaming for climate action will help if we cannot understand each other. In a timing of rising temperatures and geopolitical tempers, this call for monitoring and evaluation is especially important for realising resilience's potential for sustainable development.

In short, clarity is important. When talking of resilience, it is helpful to know precisely what we are talking about. Otherwise, a lack of critical oversight may mean the loss of a vital opportunity for collective action and the relegation of this growing space to potential abuse from 'those who for the time being enjoy the monopoly of definition' (Hettne 1990: 281).

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