Socially Just Triple-Wins? A Framework for Evaluating the Social Justice Implications of Climate Compatible Development

Benjamin T. Wood *, Lindsay C. Stringer, Andrew J. Dougill [ID] and Claire H. Quinn [ID]

Sustainability Research Institute, University of Leeds, Leeds LS2 9JT, UK; l.stringer@leeds.ac.uk (L.C.S.); a.j.dougill@leeds.ac.uk (A.J.D.); c.h.quinn@leeds.ac.uk (C.H.Q.)
* Correspondence: bw@xynteo.com

Abstract: Climate compatible development (CCD) aims to help people improve their lives in the face of climate threats without exacerbating these threats for current and future generations. It is proving an attractive concept to both academics and practitioners. However, the social justice implications of CCD have not yet been comprehensively explored and an absence of adequate evaluation frameworks has led to multiple, legitimate cross-scalar social justice claims being marginalised. This article develops a framework to guide holistic social justice evaluation of CCD initiatives across levels and scales. Underpinning this framework is a social justice approach that embraces particularism, pluralism and procedural justice. Drawing on existing research, the framework is used to explore the implications of the Clean Development Mechanism for recognition, participation and distribution in the Least Developed Countries. Findings show that achieving social justice through CCD is not a given; rather, the social justice implications of CCD differ within and between levels and scales. We conclude by suggesting ways in which our framework can be applied to augment knowledge on CCD. Understanding the processes through which social justices and injustices are created is integral to considerations of whether and how CCD should be used to underpin a new development landscape.

Keywords: social justice; climate change; mitigation; adaptation; equity; triple-wins; trade-offs; clean development mechanism

1. Introduction

Climate change mitigation, adaptation and development can have significant consequences for one another [1]. With efforts to implement the Sustainable Development Goals intensifying since their agreement in 2015 and the operationalisation of the 2015 Paris Agreement, consensus is emerging that development, mitigation and adaptation are usefully addressed using a joined-up approach [2,3]. Such integration can increase harmonisation, reduce conflicts and help harness co-benefits for each component [4]. In this context, climate compatible development (CCD) has been proposed as the basis of a development landscape able to manage the threats and opportunities that climate change presents for social and economic progress [5]. Seeking "triple-wins" across development, mitigation and adaptation, CCD is defined as "development that minimises the harm caused by climate impacts, while maximising the many human development opportunities presented by a low emissions, more resilient future" [5].

Tackling climate change and development problems together is attractive yet challenging for policymakers and practitioners. CCD appears, at face value, to be ethical, and by seeking to ensure that development, mitigation and adaptation point in the same direction, also seems efficient. The concept

has momentum and is fast becoming mainstreamed within the climate change and development lexicon [6].

CCD is being operationalised through policies, programmes and projects that, individually or in combination with one another, aim to further development, mitigation and adaptation across the developing world [7,8]. Governments and donors are currently investing in CCD to reduce vulnerabilities [6]. The United Kingdom's Department for International Development (DfID) considers that CCD is integral to helping the Least Developed Countries respond to climate and development shocks [9]. Ecosystem-based approaches, which protect, generate and utilise natural capital, have been shown to have particular promise for achieving CCD triple-wins, notably sustainable land management practices that span the water-energy-food nexus [10].

Thus far, CCD's operationalisation has outpaced academic inquiry into the concept. Research is nevertheless beginning to critique the origins, design and implementation of CCD (e.g., [11–13]). However, this research represents a small proportion of the overall CCD literature base, which tends to focus on appraising the feasibility of achieving CCD goals in different settings (e.g., [4,14]) and proposing strategies for advancing CCD (e.g., [6,15]). More critical research is required because, like other policy narratives, the concept represents a subjective way of viewing the world. Its use of discursive storylines can alter perceptions and, in-so-doing, shape what is included (and excluded) in policymaking and practice. Consequently, CCD justifies certain types of action but could side-line alternative responses and conceptual framings [12].

One pressing research gap relates to the social justice implications of pursuing CCD goals in different settings. Social justice is concerned with how opportunities, privileges, burdens and disadvantages are allocated within society [16]. It comprises two interdependent pillars: procedural and distributive justice. Procedural justice is achieved when individuals and groups have opportunities to meaningfully participate and have their values, cultures and identities recognised through, in this case, CCD decision-making processes [17]. Achieving distributive justice through CCD requires that procedurally fair decision-making processes are used to determine allocations of the material benefits and any negative side-effects that result from initiatives [18].

CCD operates in a multi-level context where several forms of uncertainty mean myriad values and interests coexist and conflict with one another [19,20]. Decisions about CCD are taken and its outcomes experienced across diverse governance levels and temporal and spatial scales [21]. Development, mitigation and adaptation are also each valued differently by individuals and collectives operating across these dimensions. Consequently, stakeholder priorities for, and perspectives about CCD, may not align [22]. Social justice approaches that consider issues of procedure and distribution can help adjudicate between competing viewpoints [16].

It has been acknowledged that social justice approaches are required to guide and analyse climate and development actions [7]. Distribution issues are central to CCD planning [5] and are being addressed through nascent research (e.g., [11,23,24]). However, albeit with notable exceptions (e.g., [25]), procedural considerations have received less attention in the literature. Neither the distributive nor procedural justice implications of initiatives pursuing CCD triple-wins have been well-explored, while analyses that consider linkages between procedural and distributive justice are scarce (exceptions include [26,27]).

A shortage of frameworks for guiding cross-level, multi-scalar justice analyses of CCD betrays the importance of social justice research. The climate justice literature has not yet produced frameworks for guiding and evaluating policy and practice in an integrated, systematic and rigorous manner. This is because:

(1)　Universalist propositions have dominated the literature and marginalised multiple, legitimate social justice claims;

(2)　Pluralism—the diversity of priorities and perspectives held by individuals and groups—has been overlooked within distributive justice thinking; and

(3)　Procedural justice has received inadequate attention.

This article aims to develop a framework that targets this gap. In so doing, we contribute to the emergence of a more critical CCD research agenda. This is urgently required to uncover the real consequences that CCD has for target populations. Four objectives aid fulfilment of our aim. These are to:

(1) Set out the parameters of uncertainty and value plurality in the CCD operating context;
(2) Detail the three aforementioned limitations of the climate justice literature;
(3) Present a framework that addresses these limitations; and
(4) Apply this framework to explore the social justice opportunities afforded to the Least Developed Countries (LDCs) under the Clean Development Mechanism (CDM)—a policy instrument designed to finance CCD in developing countries.

2. CCD: Navigating Uncertainty and Value Plurality

Knowledge of climate change is incomplete due to constrained understanding of the complex Earth system and limitations inherent in climate models [20]. This makes precise predictions about changes (especially in regions and localities) impossible and the outcomes of mitigation and adaptation activities uncertain. There may also be unknown, undiscovered forms of uncertainty [28]. Meanwhile, development also suffers from chronic data shortages and commonly relies upon outdated methods. Low capacity means data collection is often infrequent, irregular and incomplete [29].

The problem of uncertainty surrounding CCD initiatives is complicated in a world marked by vast, socially-constructed inequality in terms of climate change and development issues. As Barrett [30] argues, climate change constitutes the source of a double inequality with "an inverse distribution of risk and responsibility". Uneven development patterns are also human creations that condition populations' capacities to respond to change [31].

Combatting this inequality through CCD approaches requires multi-stakeholder working across global, national and local scales [32]. The term "stakeholders" refers to actors or organisations with an interest in, or who are impacted by, CCD [33]. They include donor agencies, non-governmental organisations (NGOs), private organisations, national and local governments, technical experts and local people [34]. Stakeholders' cultures and value positions will condition how they approach uncertain climate and development problems [35]. Moreover, belief systems motivating some stakeholders' priorities and actions may not be fully comprehensible to others [19].

Debate about what is to be developed, and how development should take place, is commonplace, irrespective of climate change concerns [36]. In the context of uncertainty and disparate value positions, stakeholder priorities for CCD will likely conflict with one another. How to progress mitigation and adaptation and balance them against one another within policy remains contentious, with divergence between nation-states around these issues having created difficulties for global climate negotiations, complicating the achievement of the 2015 Paris Agreement [37].

What constitutes mitigation and adaptation is also contentious. Mitigation and adaptation policy (e.g., under the United Nations Framework Convention on Climate Change (UNFCCC)) is commonly directed by knowledge produced by the Intergovernmental Panel on Climate Change (IPCC) [38,39]. However, centuries-old strategies adopted by developing world populations for dealing with climate stresses have gone unrecognised within adaptation projects that are funded and executed by external actors. Likewise, the mitigation potential of indigenous livelihood strategies has not been well acknowledged [40]. Efforts to promote the IPCC as the "epistemic authority on matters of climate policy" [41] may therefore serve to legitimise certain mitigation and adaptation actions (and actors) while delegitimising others, particularly those implemented by indigenous populations [42].

By recognising the importance of development, mitigation and adaptation simultaneously, CCD could encourage common ground between different constituencies [14]. However, the literature on policy mechanisms (e.g., the CDM, REDD+, voluntary carbon market standards) seeking multiple-wins across development, mitigation and adaptation suggests that this will not be a given. There are concerns that interventions tend to pursue mitigation benefits at the expense of development and adaptation [34,43–45]. For example, Mustalahti et al. [12] show that local development priorities

(e.g., water access, food security) are poorly reconciled with global mitigation goals through REDD+ design in Tanzania. Stakeholders involved in CCD initiatives may concurrently seek to pursue other agendas whilst furthering development, mitigation and/or adaptation, which could exacerbate disagreement.

CCD outcomes could also create conflict. Initiatives that pursue development, mitigation and adaptation are sometimes perceived to deliver negative side-effects. Suckall et al. [46] draw on local testimonies to contend that autonomous local adaptations in Zanzibar have undermined mitigation and development. This is because farmers spend longer on farms when climate impacts reduce agricultural productivity. This reduces the time that farmers have to spend investing in alternative livelihood activities, some of which can also create mitigation benefits (e.g., forestry activities). Tompkins et al. [11] analyse policies related to agriculture, aquaculture, fisheries, forestry and tourism with the potential to create CCD triple-wins in Belize, Kenya, Vietnam and Ghana. They argue that, although some of these policies can create triple-wins, others fail and often create unanticipated negative impacts for development, mitigation and adaptation.

"Do no harm" principles are often mainstreamed within policy mechanisms [47,48], meaning negative side-effects ought to be unintended and unanticipated ex ante. However, theoretically, they could also be anticipated and/or intentional. The popularised depiction of CCD focusses on "wins" and "winners" but pays little attention to negative side-effects that might be created through its pursuit [11]. This is unsurprising as discussing "winners" and "losers" in the context of climate change is highly contentious and often avoided [31].

Points of contention will likely differ across spatial and temporal scales because development, mitigation and adaptation outcomes are experienced differently by actors operating across these dimensions. Strategies that benefit certain individuals and groups can disadvantage others [27]. Likewise, those deemed successful in the present may or may not be configured to deal with future conditions [49].

Conflict could also emerge over issues only indirectly related to climate and development outcomes. This is because CCD has consequences for stakeholders who are not target beneficiaries. For example, framing interventions in line with multiple-win approaches is politically expedient for donors [50] and might help development organisations access finance that is increasingly channelled into CCD-related initiatives [15]. Conversely, stakeholders could face auxiliary side-effects. CCD may, for instance, force project developers to spread scarce resources thinly in pursuit of simultaneous triple-wins. Auxiliary outcomes may also differ across spatial and temporal dimensions.

In sum, CCD represents a complicated policy problem that is characterised by uncertainty and disparate value positions. How CCD initiatives are framed depends on which subjective beliefs are "winning-out" in this context. By encouraging simultaneous consideration of development, mitigation and adaptation, CCD thinking could help reconcile diverse stakeholder priorities. However, doing so is likely to be contentious and complex. Multi-level, cross-scalar CCD outcomes can also create new points of contention.

Physical science approaches and economic methodologies that draw upon quantitative data and approach problems from particular epistemological positions (e.g., climate science models, rational-choice theory, and assumption-based planning approaches) are crucial support-tools for climate and development planning and response design [51]. However, these approaches are incapable of adjudicating between competing stakeholder priorities and perspectives, especially in the context of uncertainty related to complex systems [51]. This is because they perform best when facts are undisputed and knowledge is perfect [51]. Social justice approaches can help reconcile different viewpoints and are therefore required to advance CCD. In the next section, existing climate justice approaches that could aid the design, implementation and evaluation of CCD are discussed.

3. Debating Climate Justice: A Literature Review

Social justice has been at the forefront of climate change debates ever since it became a major political issue [52]. The same is true of sustainable development debates, where the extent to which the concept has reduced or exacerbated global inequalities is disputed [36]. While not initially addressed explicitly, social justice considerations formed a major part of early international-level climate policy decisions informing, for example, the UNFCCC's guiding principle: common but differentiated responsibilities and respective capabilities [53]. Recently, social justice has been dealt with more directly, and was identified as crucial for fostering progress towards the 2015 Paris Agreement [53]. Sub-national climate action also has social justice at its core: for example, the Scottish Government has established a Climate Justice Fund to finance project-level mitigation and adaptation activities in developing nations [54].

However, conceptions of social justice that permeate climate research and practice are currently inadequate. Multiple different theoretical perspectives exist that consider social justice in divergent ways and propose unique approaches to navigate the value plurality surrounding CCD. This section explores the debates and disagreements on climate justice. It is argued that dominant conceptions of climate justice are limited in three ways: universalist propositions dominate; distributive justice approaches overlook pluralism; and procedural justice is given inadequate attention. This makes them unsuitable for the evaluation of CCD.

3.1. Limitation 1: Universalism Dominates

The merits of different social justice approaches have been debated by philosophers and social scientists for centuries. While by no means homogenous groupings, four main "types" of social justice theory are pre-eminent: utilitarianism; egalitarianism; libertarianism; and contractarianism [55].

Utilitarianism seeks to balance societal costs and benefits to maximise aggregate social welfare (however defined) [55]. It is unconcerned with inequalities that this might create: "justice is what is beneficial to the most" [56]. Egalitarians see all people as inherently equal and demand the full removal of inequality [55]. For libertarians (e.g., [57,58]), social intervention that prevents individuals from making free choices is unjust. All societal consequences stemming from free decision-making are considered fair, even when extreme inequalities are created. By contrast, Rawls and other contractarians dictate that the least privileged should be made as well off as possible. They argue that if individuals were unaware of their abilities' and socio-economic positions, agreeing upon a set of rules with which to organise society would be conceivable [59].

Each theory type has gained some traction within climate research and has been epistemologically embedded within policy proposals and/or scientific models. Much climate science and economics literature recourses to utilitarian assumptions, considering that climate impacts "matter" only when they affect well-being and can be quantified monetarily [60]. Egalitarian thinking permeates proposals calling for equal entitlements to the atmosphere, equal burdens in dealing with climate change and equal rights to be protected from its impacts [61]. Proposals that demand the right to be protected from climate impacts caused by others (e.g., [62]) also display libertarian thinking. Hence, individual value positions can be motivated by dissimilar and incommensurable rationales [63]. Rawlsian thinking manifests itself in calls to protect the most vulnerable to climate impacts [18]. Notwithstanding criticisms for being deterministic, and disempowering those deemed "vulnerable" [64], the concept of vulnerability has been institutionalised within climate research and practice [65].

Dominant theories differ radically in most respects but are analogous in one crucial sense: they present universal laws for advancing social justice. Objectively deciding between them is fundamentally impossible [19]. Competing theories appear flawless to supporters but unsatisfactory to proponents of alternative perspectives [55]. Theories concentrate on identifying "optimally just" societal arrangements, meaning they also fail to provide suitable methodologies for comparing and improving existing societal arrangements [19]. This limits their real-world relevance. The failure to

agree on a common social justice approach [66] and operationalise key principles (e.g., what constitutes equal burden sharing in practice) has long hindered international climate talks.

Universalist theories regard social justice principles as consistent across time and space. Consequently, they overlook how different contexts and cultures shape social justice claims [67]. Drawing on empirical research in India, Fisher [7] demonstrates that multiple identities, development inequalities and diverse experiences with climate impacts and policy outcomes translates into myriad climate justice claims. When analysed across different levels and scales, varied interpretations of social justice and injustice emerge [68]. Social justice is "negotiated and generated in the context of conflicting views and interests" [18]. Hence, universalism should give way to particularism at and across a range of scales.

Excluding consideration of intergenerational trade-offs, climate justice is predominantly conceived as a static ideal to be operationalised within the UNFCCC. Agency is granted only to sovereign governments, meaning subnational considerations are underexplored [52]. However, what is valued by national governments is not necessarily valued by other stakeholders. Diverse priorities for REDD+ and the Clean Development Mechanism, for example, exist at national and local levels [22,26]. Values and experiences also differ within scales (e.g., [69]). There are increasing attempts to engage with sub-national climate justice (e.g., [70,71]). However, multi-level, cross-scalar analyses are scarce [72]. The social justice implications of decisions determining the scales at which climate responses are designed and implemented have also been overlooked [7].

Theorists' own experiences and consciousness mean attempts to develop universal justice laws may be fundamentally particular in nature and suffer from philosophical incoherence [73]. Moreover, attempts to determine some universal common ground in a multiverse of disparate realities can be so abstract as to be irrelevant for practical usage [67]. While some (e.g., [74]) argue that multiplicity makes social justice "meaningless", it is acknowledgement of this diversity that showcases the importance of social justice research and practice. The task for theorists and practitioners is not to determine universal theory but to understand and reconcile competing priorities about how social life ought to be arranged.

3.2. Limitation 2: Pluralism Is Overlooked within Distributive Justice Thinking

The pre-eminence of universalism is mirrored by a near-exclusive focus on questions of distribution within the literature [18]. Studies examining distribution within CCD and climate policy more widely have drawn on a range of inter-disciplinary techniques (e.g., [46,75,76]) Distributive justice theories diverge in terms of what ought to be distributed (e.g., income, wealth, employment, opportunities, utility, and costs) and how [77]. However, linked to the dominance of universalism, climate justice theories have dictated which societal goods are in need of distribution.

Owing to the perceived urgency of promoting action to reduce the causes of climate change, climate justice debates centred upon the costs and benefits of mitigation until the mid-2000s [18]. Subsequently, there has been a growing realisation that: (1) climate change impacts are already threatening development progress; (2) climate vulnerabilities are linked to pre-existing global inequalities; and, therefore; and (3) adaptation must go beyond developing large-scale infrastructure to protect against future climate change [1]. In light of this, social justice dilemmas related to adaptation needs and the provision of resources for meeting these needs have been articulated. However, studies often focus on climate impacts and adaption needs rather than the consequences of adaptation interventions (e.g. [78]).

That mitigation and adaptation are mediated through development issues (e.g., health, water access) is similarly under-considered. Climate change and development are deeply intertwined and one cannot be discussed without reference to the other [1]. It follows that climate justice should be concerned about the climate but also uneven development processes. However, climate injustices are often conceived as separate from developmental injustices [7].

Belying their multi-dimensional nature, the distributional outcomes of mitigation, adaptation and climate impacts on development are also conceived narrowly. Largely, distributive justice is discussed in terms of emissions reductions, finance and technology [37]. Meanwhile, dimensions that are more difficult to quantify (e.g., loss-of-life and environmental degradation) are overlooked [53]. Social justice approaches also dictate mechanisms by which distribution should proceed, independent of context and the particular societal good in question (e.g., dominant Rawlsian social justice approaches consider that climate strategies should be configured to benefit the most vulnerable) [79].

However, if the nature of social justice is context-specific, then logically, the types of goods to be distributed and the mechanisms by which that distribution occurs must follow suit [67]. Multiple identities, global inequalities and diverse cross-scalar experiences with climate impacts and policy outcomes make it impossible to define a universal standard of distributive justice with regards to CCD. Rather, pluralism—the diversity of priorities and perspectives held by individuals and groups—is ubiquitous, manifesting itself in heterogeneous beliefs about what is to be distributed and how, which differ across governance levels and (spatial and temporal) scales [7].

Communities create their own societal goods, the relevance and importance of which is derived from meanings attached to them [67]. While certain societal goods may have analogues in alternative communities, they will unlikely carry precisely the same meaning [67]. Since they can have radically different properties, each specific societal good in a particular society will have its own distribution criterion. Thus, different "spheres" of distribution are created [80].

As different spheres of distribution are incommensurable, they must be kept strictly separate. The opposite scenario is where "dominance" reigns. Here, holders of certain societal goods use these to obtain other goods (and avoid bads) despite not fulfilling the requirements of the relevant distributive mechanisms [67]. Dominance is ubiquitous within the climate discourse. "Substitutability"—the idea that losses of particular goods can be compensated by increasing access to different types of goods—has been mainstreamed [61]. However, it is not clear that environmental degradation can be satisfactorily compensated by financial transfers. The natural environment is often valued for non-material reasons [60], making financial compensation alone insufficient. Facilitating distributive justice through CCD requires acknowledgement of the multiple, incommensurable spheres of distribution [67].

3.3. Limitation 3: Procedural Justice Is Ill-Considered

The supremacy of distributive justice is increasingly questioned. Distribution is a crucial social justice consideration, but cannot be separated from issues of procedure. For individuals and groups to self-determine what is to be distributed and how, they must be granted recognition—or equality of status [80]—and participatory opportunities [16].

Unlike distribution, which can be seen as the "economic dimension" of social justice, recognition resides in the socio-cultural realm [81]. Misrecognition—the absence of recognition—occurs when individuals and groups are subject to "devaluation, insults, disenfranchisement and oppression" [82] through formal governance processes or informal customs, norms and behaviours. This is intrinsically unjust since it can cause psychological harm and/or obstructs people's potential to flourish within society [82]. Real-world patterns of misrecognition are often the foundation for distributive injustices [16].

Distributional outcomes condition patterns of (mis)recognition by determining which individuals and groups can command respect and status [19]. However, this does not make recognition merely another type of "good" in need of adequate distribution. Recognition does not suffer from rival consumption [16] and its socio-cultural constitution means it cannot simply be dispersed by actors and institutions [83]. Patterns of recognition are embedded within social practices. While powerful actors and institutions can shape these practices (e.g., a government might alter the law to give rights to certain groups), they seldom control them [16]. Thus, distribution and recognition, although interconnected, are not reducible to one another.

Participation comprises the third pillar of social justice. The extent that individuals and groups can participate equitably within public life shapes "the course of . . . common activity" [84] and influences whether they are considered in subsequent distributional patterns [83]. Mechanisms that combine and analyse different opinions, preferences and interests are crucial. These may not always satisfy every divergent perspective but reasoned, democratic debate between perspectives presents the best chance of achieving widespread consensus, or at least mutual tolerance [19]. Climate justice, therefore, will only be achieved through "shades of grey" and "negotiated compromises" [85].

Participation and distribution share a two-way relationship. Allocations of societal goods and bads determine which stakeholders have the necessary capacity (e.g., finances and expertise) to make best use of participatory opportunities [19]. Likewise, participation and recognition share a reciprocal relationship. Those who go unrecognised are not usually afforded participatory opportunities [81]. Conversely, people's abilities to command recognition depends on the depth and breadth of their participatory opportunities [16]. Participatory processes tie together considerations of distribution and recognition, but are distinct from both.
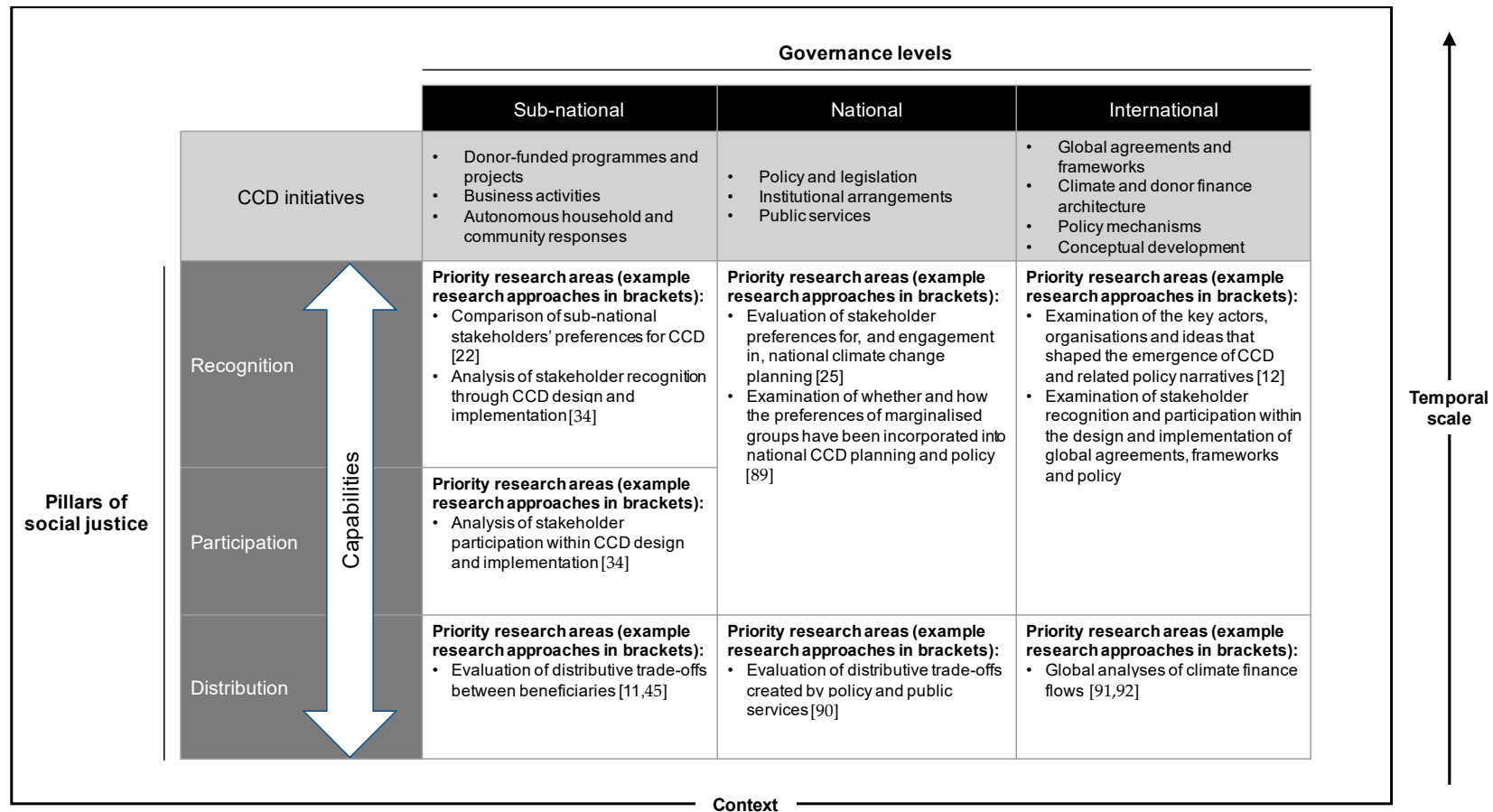
Empirical research has found that procedural justice is integral to real-life climate justice framings, with civil society groups [86] and climate change responses [52] emphasising participation and recognition. Research has begun to reflect these empirical realities (e.g., [18,87]). However, barriers to procedural justice currently ostracise legitimate social justice claims at international, national [88] and local levels [30].

To summarise, dominant conceptions of climate justice are unsuitable for the evaluation of CCD as considerations of context, pluralism and procedural justice are overlooked. This means multiple, diverse cross-scalar social justice claims are ignored, especially those advocated from sub-national levels. While these limitations have been discussed elsewhere (e.g., [7,18]), they have not been engaged with holistically. Frameworks that build on these lessons are absent, which creates a barrier to exploring social justice within the CCD discourse. The following section seeks to rectify this.

4. A Framework for Evaluating the Social Justice Implications of CCD

A conceptual framework for guiding evaluations of CCD theory and practice is presented (Figure 1) that overcomes the three limitations highlighted in the previous section. It emphasises: (1) initiatives through which CCD is being operationalised across governance levels; (2) priority research areas for exploring the social justice implications of these initiatives; and (3) examples of research approaches for doing so. As such, it provides pathways for bridging the gap between social justice theory and practical research.

	Governance levels		
	Sub-national	**National**	**International**
CCD initiatives	• Donor-funded programmes and projects • Business activities • Autonomous household and community responses	• Policy and legislation • Institutional arrangements • Public services	• Global agreements and frameworks • Climate and donor finance architecture • Policy mechanisms • Conceptual development
Recognition	**Priority research areas (example research approaches in brackets):** • Comparison of sub-national stakeholders' preferences for CCD [22] • Analysis of stakeholder recognition through CCD design and implementation [34]	**Priority research areas (example research approaches in brackets):** • Evaluation of stakeholder preferences for, and engagement in, national climate change planning [25] • Examination of whether and how the preferences of marginalised groups have been incorporated into national CCD planning and policy [89]	**Priority research areas (example research approaches in brackets):** • Examination of the key actors, organisations and ideas that shaped the emergence of CCD and related policy narratives [12] • Examination of stakeholder recognition and participation within the design and implementation of global agreements, frameworks and policy
Participation	**Priority research areas (example research approaches in brackets):** • Analysis of stakeholder participation within CCD design and implementation [34]		
Distribution	**Priority research areas (example research approaches in brackets):** • Evaluation of distributive trade-offs between beneficiaries [11,45]	**Priority research areas (example research approaches in brackets):** • Evaluation of distributive trade-offs created by policy and public services [90]	**Priority research areas (example research approaches in brackets):** • Global analyses of climate finance flows [91,92]

Pillars of social justice · Capabilities · Context · Temporal scale

Figure 1. A framework to guide evaluation of the multi-level, cross-scalar social justice implications of climate compatible development (CCD). The table in the centre of the figure categorises CCD initiatives by governance level; indicates priority areas for exploring the implications of these initiatives for recognition, participation and distribution; and provides examples of research approaches for doing so. The box around the table and the black arrow to the right of the figure showcase the importance of considering context and temporal scales within social justice analyses. Source: [11,12,22,25,34,45,89–92].

At the core of the framework are the three pillars of social justice: recognition, participation and distribution (see far left column of the table in Figure 1). Issues of recognition and participation are crucial for understanding how CCD reconciles the competing agendas of multiple stakeholders operating across scales. The appropriate quality of, and balance between, development, mitigation and adaptation in initiatives should depend on the values and preferences of the specific stakeholders involved. Local people targeted by interventions must be afforded status and opportunities to share their perspectives alongside other stakeholders (e.g., donors, NGOs, governments, and private organisations). Evaluating recognition and participation will uncover whose belief-systems have won out at particular time intervals.

The extent to which CCD outcomes exacerbate or alleviate social conflict can be determined through distributive justice evaluations. Exploring which development, adaptation and mitigation outcomes are being distributed, and how, is vital. CCD activities and distribution mechanisms ought to emerge from specific implementation contexts, shaped by stakeholder value systems and perceived needs. To ensure the integrity of dissimilar distribution spheres, different goods should also be allocated by unique mechanisms. It might not, for example, be contextually-appropriate to allocate dissimilar development benefits (e.g., enhanced income-generating opportunities and improved energy access) using similar principles. Contextually-appropriate distribution mechanisms for adaptation must consider how and by whom climate impacts are felt. Similarly, decisions regarding who undertakes mitigation action will likely have their own logic, informed by ethical considerations.

A priori distribution patterns also matter. Often populations who benefit from climate and development initiatives are those able to command societal resources, whereas disadvantaged groups are marginalised [30]. CCD initiatives are taking place in underprivileged rural areas of developing countries [8]. Target populations live in financial poverty, lack education and healthcare and suffer from various other ailments [93]. Whether and to what extent populations are being afforded recognition and participatory opportunities under these initiatives is unclear.

Considering CCD's procedural and distributive justice implications across spatial scales and governance levels is crucial. CCD actions are being designed and implemented in different places and at dissimilar governance levels (see top row of the table in Figure 1) [1]. They impact unevenly on stakeholders operating across diverse spatial and governance dimensions [26]. Likewise, timescales matter (see black arrow to the right of Figure 1). It has been suggested that community-driven ecosystem restoration could facilitate adaptation, store carbon and help reduce poverty in rural sub-Saharan Africa [1]. However, ecosystem restoration benefits can take years to develop, creating barriers to participation for disadvantaged groups who must focus their labour on activities that yield immediate benefits in order to survive [71].

Sen's [19] "capabilities approach" serves as a final arbiter of social justice within the framework (see white, double-headed arrow in the far left column of the table in Figure 1). It provides an overarching rationale for considering recognition, participation and distribution as equally important components. It states that societal arrangements are best judged on how they contribute towards humans' multi-faceted, subjective quality of life. Material goods are essential for this but are not the only, or necessarily most important, dynamics at play [19]. Individuals and groups also depend on having the necessary political and civil freedoms to optimise resource use, and may even prioritise these freedoms over possession of material goods [19].

The capabilities approach equates societal arrangements' "justness" with individuals' and groups' abilities to pursue ends that they value [94]. Pursuing a capabilities approach places development at the heart of climate justice. As previously discussed, climate and development justice are poorly integrated. The safeguarding and enhancement of capabilities is widely considered the appropriate end for development justice [93,95]. Integrating climate and development justice is crucial for examining the "development first" CCD discourse.

CCD implementation contexts condition the extent to which capabilities are enhanced (see black box around the table in Figure 1). CCD is part of wider political-economic processes underpinned by

co-operation, competition and conflict between multiple actors, institutions and societal norms [96]. In turn, processes are affected by issues of power, discourse and resource access [97]. Stakeholders' respective agendas will naturally be influenced by these processes. It has been shown that political-economic factors have profound impacts for the achievement of development, mitigation and adaptation [13]. Likewise, CCD goals are routinely influenced and shaped by socio-ecological environments [98]. The diversity of actors and sources of finance involved in climate governance makes CCD's contextual surround particularly complex [97].

5. Exploring the Social Justice Implications of the CDM

The framework developed in section four is now used to explore the cross-scalar, multi-level social justice implications of the CDM for LDC populations. Countries are classified as LDCs by the United Nations based on their low gross national income, weak human assets (e.g., education, health, and nutrition) and economic instability [99]. Limited resource capacities and the sensitivity of their economies to climate impacts means these countries are acutely vulnerable to climate change [100].

The CDM is proposed as a policy instrument for financing CCD in developing countries, including the LDCs [101]. It constitutes a market-based approach to mitigation that enables emissions reduction projects in developing countries to generate Certified Emissions Reductions (CERs). These CERs can then be traded on the carbon market and bought by developed countries to meet their emissions reductions obligations under the UNFCCC [102]. It is intended that this will allow developed countries to achieve cost-effective emissions reductions. CDM projects constitute, for example, renewable energy, energy efficiency, afforestation and reforestation initiatives. It is considered that projects can encourage low-carbon development in developing countries [102]. They also have the potential to progress adaptation; for instance, by enhancing people's capabilities to deal with climate risks (e.g., through livelihood diversity, improved incomes) and safeguarding natural resources that provide safety nets against climate impacts [93].

Drawing on the CDM literature, social justice opportunities afforded to LDC populations are now discussed. Issues of participation, recognition and distribution at international and sub-national levels and scales are presented in turn.

5.1. International Implications

5.1.1. Participation and Recognition

A commitment to establish the CDM was agreed by the Conference of the Parties to the UNFCCC and was included in the Kyoto Protocol, which also bound developed countries to emissions reductions targets [38]. The CDM was first proposed by the US government during the Kyoto negotiations in the face of considerable opposition from developing countries, including the LDCs. Concern was expressed that the CDM: (1) might not create emissions reductions which were additional to business-as-usual scenarios; and (2) could enable developed countries to impose projects on developing countries which ran counter to their interests [103].

Despite their initial opposition, developing countries agreed to incorporate the CDM within the Kyoto Protocol. This gave them leverage to reject developed country proposals to include discussion of voluntary developing country emissions reductions in the Kyoto text [104]. Small-island LDCs withdrew opposition to the CDM in exchange for the provision of an adaptation fund to be financed through a levy on CDM projects [104]. African LDCs began to welcome the CDM as a way to increase development finance [105]. However, Article 12 of the Kyoto Protocol (dubbed the "Kyoto surprise"), which defines the CDM, was inserted into the negotiating text only days before the Protocol was agreed. There have been suggestions that this contributed to a "veil of uncertainty" around the CDM and allowed insufficient time for detailed scrutiny of policy proposals by national delegations [104].

LDCs' acute vulnerability to climate change meant that they had a particularly strong interest in securing a global climate agreement at Kyoto [1]. They were reluctant to take negotiating positions

that might have jeopardised this [105]. Hence, their bargaining position with respect to the CDM may have been weaker than less vulnerable countries—a barrier to meaningful LDC participation in international CDM negotiations.

There are also suggestions that LDCs' were unable to command status and recognition. For example, Kasa et al. [106] margue that LDC's weak bargaining power and low institutional capacity led to their interests being manipulated by developed countries and more resource-wealthy developing countries within the UNFCCC. LDC delegations have expressed frustration that their perspectives have been inadequately considered within international climate negotiation processes [107].

LDC bargaining power and recognition was similarly restricted during the post-Kyoto negotiations that determined specific CDM rules and guidelines. These negotiations culminated in the 2001 Marrakesh Accords [108]. The Kyoto Protocol required ratification by UNFCCC member states responsible for 55 per cent of global emissions in 1990 to pass into force [109]. Consequently, member states accounting for large proportions of 1990 emissions (e.g., Japan and Russia) were able to dominate negotiations [110].

5.1.2. Distribution

The international distribution of CDM projects is unfavourable to the LDCs. Most CDM projects are located in middle-income countries (e.g., Brazil, China, India, and Mexico) [94]. Just 1.5% of all CDM projects have been located in LDCs and 17 (out of 47) LDCs have yet to host a project [94]. Common constraints related to LDC implementation contexts restrict project development, including limited institutional capacity and corruption; underdeveloped private sectors [111,112]; poor access to financial products [113]; restricted awareness of the CDM [114]; low carbon prices; and insufficient mitigation potential [93]. These constraints run counter to conditions that are valued by CDM investors [115]. Market-based proposals to reform the CDM to encourage LDC involvement are unlikely to succeed while constraints persist, yet many appear intractable [93]. Project distributions are misaligned with LDC's initial expectations for the CDM, especially African countries who considered that it would increase development finance [105].

5.2. Sub-National Implications

5.2.1. Participation and Recognition

The technical nature of CDM projects exposes skills shortages in LDCs, which are another common constraint to project development. They also prevent host country stakeholders (e.g., national NGOs, private organisations, sub-national governments, and local communities) from participating in the CDM by developing projects or mean they are highly reliant on external assistance to do so [116]. Indigenous mitigation approaches are not well recognised by CDM modalities, which favour Westernised, technocratic approaches [117]. This creates barriers to the establishment of "bottom-up" projects.

LDC governments' lack of power to bargain with external project developers also restricts their ability to meaningfully participate in project development. Under CDM regulations, host country governments have autonomy to dictate sustainable development criteria that projects must adhere to. Constraints to project development make LDCs unattractive CDM investment locations and force host governments to compete for CDM finance on investors' terms [118]. Hence, project developers have fewer incentives to recognise national development and adaptation priorities in LDCs relative to other developing countries.

Linked to the scarcity of functional projects, little attention has been paid to local people's opportunities to achieve procedural justice through CDM projects in LDCs [119]. Those studies that do exist show mixed findings [120,121]. Local participation in project design and implementation is written into the CDM guidelines, but is considered only to have been sporadically achieved [122]. Prouty [123] criticises the tokenistic "notice and comment" model of local people's participation in

projects. Poor access to modern communications infrastructure in marginalised areas of developing countries mean: (1) invitations to input may not be received by local people; and (2) these people may lack the means to respond to received invitations. Carrere [121] highlights how a CDM commercial forestry project in Uganda failed to recognise the concerns of local people who were evicted so that tree plantations could be established. However, Brown et al. [120] show how a community-based forestry project in Ethiopia facilitated procedural justice opportunities for local people by legally recognising community ownership of the project and establishing co-operatives for project management purposes. An absence of specific rules to ensure local participation in CDM projects may explain these differences [122].

5.2.2. Distribution

Local-level preferences for distribution have not been explored in the CDM literature, which obstructs analysis of sub-national distributive justice. Some sub-national evaluations of CDM project distribution patterns in LDCs have been conducted, however, showing mixed results. Brown et al. [120] indicate how the aforementioned Ethiopian forestry project has generated CCD benefits for local people by enhancing livelihoods and protecting agricultural lands from flooding. Likewise, Ayers and Huq [14] discuss a waste-to-compost project in Bangladesh that has improved soil condition in drought-prone areas and reduced poverty. Both projects have also yielded meaningful emissions reductions and therefore stand to make global-scale mitigation contributions.

CDM projects may also contribute towards negative-side effects for local people. Prouty [123] and Carrere [121] highlight that CDM forestry projects in Uganda have led to some local people being displaced and have interfered with the long-standing tenure arrangements and livelihood activities of others. Under LDC carbon market projects following very similar implementation regulations to the CDM, the most marginalised populations (e.g., elderly, disabled, extremely resource poor, women) have often received fewest benefits. In these projects, powerful local actors have used their superior resource access to monopolise project benefits for themselves, their friends and families [26]. Hence, separate distribution spheres have not been kept incommensurable. When projects fail to distribute benefits in accordance with local expectations, host governments can become wary of approving additional projects: a further constraint to project development in LDCs [93].

In summary, international-level opportunities for LDCs to participate and command recognition in CDM design were curtailed by limited government bargaining power and negotiating resources. Consequently, international project distribution patterns are unfavourable to LDCs and misaligned with LDC government expectations because the CDM is incompatible with LDC implementation contexts. Misrecognition of indigenous knowledge and LDC government's lack of bargaining power restricts domestic stakeholders' participation in the few projects that are executed in these countries. At local-levels, CDM projects that create global-scale mitigation benefits show mixed results in terms of their propensities to enhance people's capabilities through participation, recognition and distributions of development and adaptation outcomes. Developmental problems that see countries classified as LDCs in the first instance restrict their opportunities to achieve social justice through the CDM.

6. Discussion

CCD professes to be a "development first" approach that aims to help people improve their lives in the face of climate threats without exacerbating these threats for current and future generations. However, its potential to live up to the grandiose claims of triple-wins is unclear. This article has sought to contribute to the nascent critical CCD research agenda by developing and presenting a framework to guide holistic social justice evaluations of CCD. The framework can help decision-makers adjudicate between the diverse perspectives of CCD stakeholders and, therefore, complements the use of physical science approaches and economic methodologies for designing, implementing and evaluating initiatives. The social justice approach that the framework is predicated on embraces particularism, pluralism and procedural justice. It provides a way to understand whether and how CCD enhances

social justice and remedies injustices, rather than seeking "to offer resolutions of questions about the nature of perfect justice" [19].

Our evaluation of the cross-scalar, multi-level justice implications of the CDM for LDC populations suggest that achievement of social justice through CCD will not be a given. The CDM case study showcases interconnections between recognition, participation and distribution, highlighting the need for frameworks that guide holistic evaluation of all three pillars of social justice. For instance, at the international level, a priori distribution patterns in the form of LDCs' acute climate vulnerability and their governments' poor resource access translate into limited bargaining power that creates barriers to meaningful participation. Accordingly, socio-economic conditions that are unique to LDCs are not adequately recognised through CDM design, which in turn curtails LDCs' abilities to attract project investment. Limited government bargaining power at sub-national levels might also contribute to the likelihood that projects advance patterns of injustice. Resultant unfavourable perceptions of the CDM within LDCs make the possibility of redressing international distribution patterns more unlikely.

The findings indicate that social justice implications across levels and scales can interact with another. However, this is obscured in the literature because studies have tended to evaluate social justice at particular times, spaces and governance dimensions. Developmental problems that see countries classified as LDCs in the first instance restrict their social justice opportunities under the CDM. This shows that CCD implementation contexts condition and shape the achievement of social justice, reinforcing the integral role of context in the framework developed herein.

Understanding the circumstances under which CCD structures and initiatives corroborate or divert from these findings will be vital in determining whether the concept is well-founded and robust. The framework developed in this article highlights: (1) priority research areas for exploring social justice through CCD; and (2) indicative analysis approaches for conducting such analyses, providing pathways for bridging the gap between social justice theory and practical research (see Figure 1). Future academic inquiry should examine the key actors, organisations and ideas that shaped the emergence of the concept, placing their relative power at the centre of analyses. Understanding who is being recognised and can participate would reveal possible political considerations involved in the conceptualisation of policy and practice that aims to achieve triple-wins across development, mitigation and adaptation. The distribution of benefits and any negative side-effects resulting from this conceptualisation also matters. Evaluation of these aspects would indicate whether CCD is being used instrumentally, and at whose expense.

Analysis of CCD's social justice implications at the theoretical-level should go hand-in-hand with research that seeks to unpack and systematically critique specific initiatives. As Tompkins et al. [11] point out, the absence of attempts to comprehensively map possible trade-offs that result from practical CCD initiatives should be rectified with great urgency. This would involve understanding how benefits and negative side-effects (of different sizes) are distributed within and between individuals and groups. There is a particular need to evaluate whether and how CCD distributions match local value systems and perceived needs.

Despite that issues of recognition and participation will shape the composition of distributive trade-offs, they have not so far been raised as a priority for future CCD research. Exploring recognition, participation and distribution holistically will be crucial to understanding whether, in what circumstances and for whom: (1) CCD can achieve triple-wins; (2) supplementary benefits result from the pursuit of triple-wins that would not be achieved by pursuing single- or double-wins; and (3) CCD creates negative side-effects that betray its framing as a mechanism for achieving benefits without incurring losses.

As showcased by the framework developed herein, CCD can be operationalised at and across different governance levels. However, it is not yet clear how the choice of governance level(s) at which CCD is pursued might impact upon recognition, participation and distribution. Evaluating the social justice implications of initiatives originating from different levels and in diverse geographical contexts could help inform choices. Whether and how results differ across different regions and sectors will be

important. Likewise, evaluating the social justice implications of CCD over time may alter perceptions of different initiatives by revealing over which horizons development, mitigation and adaptation wins can be sustained and negative side-effects averted.

Considering social justice may even make the achievement of triple-wins more likely. Diverse stakeholders will likely have dissimilar development, mitigation and adaptation and auxiliary agendas. Concerted attempts to reconcile these agendas could facilitate holistic understanding of inter-relationships between them. This could encourage compromise, lessen trade-offs and allow for their synergistic integration. Granting often-marginalised stakeholders recognition and participatory opportunities at local levels could encourage innovation [40]. Conversely, failure to achieve reconciliation could isolate stakeholders with different priorities from one another and fuel conflict which could destabilise relationships that are integral for achieving CCD goals.

7. Conclusions

The CCD cart is currently being put before the horse. As the case of the CDM shows, triple-win strategies and interventions are increasingly operationalised with little understanding of their implications for different individuals and groups. These initiatives risk adopting predefined ideas of socially just solutions, yet their actual social justice implications may be highly questionable. It is not yet clear for whom and at which governance levels the pursuit of triple-wins is creating procedural justice opportunities and valued benefits, nor whether these benefits can be generated and sustained without incurring negative-side effects. In this article, a framework has been developed that can be used to guide holistic social justice analyses of CCD and help provide much needed clarity.

As the CCD discourse matures and gains traction, a future research agenda that systematically critiques the origins and operationalisation of the pursuit of triple-wins is needed to facilitate improved understandings of whether and how it should be used to underpin a new development landscape. CCD policymakers and practitioners should adopt a learning-by-doing approach and proceed with caution until these processes and implications are better understood.

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