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Safeguarding against Harm in a Climate-Smart Forest Economy: Definitions, Challenges, and Solutions

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Abstract: Sustainably managed forests and forest products have a well-documented potential to deliver significant climate change mitigation benefits via sequestration, storage, and substitution (the 3Ss) when they are sourced sustainably and substituted for traditional resource-intensive materials. Moving beyond product-specific considerations, a climate-smart forest economy (CSFE) aims to bolster the 3Ss and catalyze broader systemic change to address the climate crisis. In their most successful cases, forest value chain interventions that lead to CSFEs will link secondary and tertiary sectors for greater waste reduction, substitution, innovation, and overall cascading climate benefits. However, interventions that contribute to CSFEs, from small to large scale, will inevitably impact environments and communities, both directly and indirectly. While positive impacts can be thought of as co-benefits and should be encouraged, negative impacts are considered negative externalities, and these should be avoided or minimized wherever possible by safeguarding against harm. The failure to minimize negative externalities will have implications for equity, project longevity, and climate benefits. This paper provides preliminary results of mixed methods research with an aim of identifying and building consensus on the definitions, challenges, and solutions relevant to the assessment, planning, and implementation of CSFE safeguards. While broad and novel CSFE safeguards application faces diverse challenges, this paper explores practical solutions to advance and set a foundation for future dialogue, analysis, and application.

Keywords: safeguards; global forest sector; forest stock; indigenous; harvested wood products; livelihoods; climate change; mitigation; carbon; construction

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1. Introduction

Sustainably managed forests and forest products have a well-documented potential to deliver significant climate change mitigation benefits via sequestration, storage, and substitution (the 3Ss) when sourced sustainably and substituted for traditional resource-intensive materials [1–4]. Moving beyond product-specific considerations, a climate-smart forest economy (CSFE) aims to bolster the 3Ss and catalyze broader systemic change to address the climate crisis by leveraging forests and wood products. CSFE interventions may include any type of initiative, policy, or investment aiming to support a CSFE along various scales and configurations of forest management, development, planning, and construction, among other points of leverage. They aim to restore, not deplete, natural resources; reduce, not increase, emissions from value chains; and safeguard, not exploit, the interests of smallholder and forest-dwelling communities. In their most successful cases, forest value chain interventions that lead to CSFEs will link secondary and tertiary sectors for greater waste reduction, substitution, innovation, and overall cascading climate benefits.

Both forest protection and the need for forest products have been dominant themes in international climate negotiations. Most recently, an ambitious new commitment emerged at the 26th Conference of the Parties (COP26), namely the COP26 Glasgow Leaders' Declaration on Forests and Land Use. The agreement was signed by more than 125 countries

representing greater than 90% of global forested land and 85% of the world's tropical forests, pledging to end and reverse deforestation by 2030 [5]. Sustainably meeting global demand for development needs is tightly aligned with these international climate objectives [6]. Accordingly, at COP26, a group of 27 countries and the European Union committed to supporting the Forest, Agriculture and Commodity Trade (FACT) Roadmap, which aims to protect forests while simultaneously promoting development and trade [7]. For continued and equitable climate advancement, there is a need for climate ambitions to align with the development concerns and ambitions of the least developed countries (LDCs).

Sustainably managed forest products, particularly those used in construction, stand to play an important role in meeting global climate objectives without compromising development needs and international ambitions, such as the Sustainable Development Goals (SDGs) [8]. The building sector currently accounts for approximately 38% of global greenhouse gas (GHG) emissions [9], 26% of which (or around 10% of total GHG emissions) stem from building construction and material manufacturing. To meet rising population and development demands, estimates show global building stock is expected to increase substantially this century, doubling by 2050. For example, about 230 billion square meters of floor space is expected to be constructed worldwide within the next 40 years [10,11]. Maintaining "business as usual" construction practices (including current product mixes, architecture and design, and per capita square footage) will dangerously compromise global ambitions to limit global warming to 1.5 °C, as set out by the Paris Climate Accord. Meeting stated targets will necessitate a rapid transition towards lower carbon construction, including a greater reliance on renewable products [12].

While sustainably managed forests and forest products may deliver climate change mitigation benefits, the potential social, economic, and climatic implications of a transformational bioeconomy that replaces fossil fuels and emissions-intensive materials merit careful attention. CSFE interventions, which may include private initiatives, development or conservation projects, national or regional level systems change, and a variety of intervention types in between, will inevitably impact environments and communities both directly and indirectly. Key concerns associated with interventions that increase demand for forest products are that they may exacerbate the loss of global forest ecosystems, as well have negative economic and social impacts on the communities that rely on them.

In this paper, we (1) define and explore the importance of social and environmental safeguards for the development of a CSFE, (2) lay out dominant challenges to widespread safeguards implementation, and (3) present potential solutions for more effective and equitable CSFE safeguards application. Though the identified challenges and proposed solutions are not exhaustive, they are intended to inform strategy, shape dialogue, and provide initial steps for tackling these fundamental obstacles.

2. Materials and Methods

This paper provides preliminary results from a qualitative analysis of the challenges and potential for efficient and equitable safeguards assessment and implementation in a CSFE. In order to identify shared definitions, barriers, and solutions related to the implementation of social and environmental safeguards for a CSFE, we rely on data from expert scoping interviews, a survey targeting relevant multi-sector professionals, two workshops among Climate-Smart Forest Economy Program (CSFEP) members, review of existing scholarly and gray literature (e.g., reports from industry, governmental, and non-governmental entities), and qualitative coding of the existing safeguards guidance. Survey data were gathered remotely through the survey platform Qualtrics and interviews and workshops arranged through Zoom, all in the summer and fall of 2021.

Interviews (n = 10) and workshops included all six organizations contributing to the CSFEP initiative (with the entire population of contributing organizations represented), as well as select additional external experts active in this disciplinary space (including experts in forestry certification, safeguards, and corporate social and environmental risk assessments). The survey was distributed online to CSFEP organizations, as well as to a broader

network of professionals in sustainable forestry, certification, sustainable development, and climate change mitigation who participated anonymously and voluntarily, sharing information on organization type (n = 44). Overall, participants were largely from North America and Europe, with some participation from South Africa.

To define key pillars and issue areas of CSFE safeguards, as well as to identify current implementation and assessment challenges, we engaged in stocktaking and the qualitative coding of existing safeguard metrics and systems relevant to a CSFE. This involved assessment of a broad sample of guidance documents related to safeguards and responsible program implementation for various actors and scales, including development, forest management, forest product use, and private sector guidance (see Table 1 for a complete list). These documents were organized and qualitatively coded using the analysis software Dedoose.

Table 1. Social and Environmental Safeguards Guidance Included in the Qualitative Analysis.

Program	Coded Document
Accountability Framework Initiative (AFi)	Core Principles
BioCarbon Fund Initiative (ISFL)	ISFL Emission Reductions Program Requirements
Climate, Community, and Biodiversity Alliance	Climate, Community, and Biodiversity Standards
EU Public Procurement	Buying Green! A Handbook on Green Public Procurement
FAO Environmental and Social Management	Environmental and Social Management Guidelines
FSC Free, Prior, and Informed Consent	FSC Guidelines, Implementation of the Right to FPIC
FSC International Standard	FSC Principles and Criteria for Forest Stewardship
Gold Standard for the Global Goals	Safeguarding Principles and Requirements
IDB Environment and Safeguards Compliance Policy	Environment and Safeguards Compliance Policy
IFC Environmental and Social Management System	E. and S. Management System Handbook
IFC Environmental and Social Sustainability	Performance Standards on E. and S. Sustainability
International Tropical Timber Organization	E. and S. Management Guidelines
MSCI ESGs	MSCI ESG Ratings Methodology
UNDP Social and Environmental Standards	UNDP Social and Environmental Standards
UNREDD+	REDD+ S&E Standards
Verra Sustainable Development	Sustainable Development Verified Impact Standard
WWF Environmental and Social Safeguards	WWF Environmental and Social Safeguards Framework

3. Results

This section presents preliminary results of the diverse research workstreams. We first define social and environmental safeguards and discuss their importance for a CSFE. We then identify dominant challenges in assessment and implementation.

3.1. Defining Safeguards

To ensure against undue social and environmental harm by a CSFE, thorough assessment, planning, implementation, and monitoring of environmental and social "safeguards" will be crucial. Here, using insight from literature, interviews, and workshop discussion, we define safeguards as measures taken to continually *assess*, *monitor,* and, where possible, *improve* the social and environmental impacts of interventions relative to the baseline, or counterfactual, scenario. Note that this definition seeks to merge divergent expert perspectives in that it does not specify a need to achieve "net benefit" versus "no undo harm"; rather, "improve" relative the counterfactual scenario includes both mitigating harm and increasing positive impact, where possible. While positive impacts can be thought of as co-benefits and should be encouraged, unfavorable impacts are considered negative externalities and should be avoided or minimized wherever possible.

Social and environmental safeguards language and guidelines, which started to gain traction in the early 1990s, are increasingly commonplace among a myriad of actor types and scales, including intergovernmental organizations focused on conservation and development (e.g., the World Bank Group and International Finance Corporation (IFC), UNREDD, the Food and Agriculture Organization of the United Nations (FAO), and the

International Tropical Timber Organization (ITTO)), timber certification and sustainability standards used by those in timber production and procurement (e.g., FSC and SFI), carbon project standards (e.g., Verra's Climate, Community, and Biodiversity (CCB) Standards and the Gold Standard), and voluntary corporate standards (e.g., the Accountability Framework initiative (AFi), MSCI). An increasingly eco-minded consumer base, as well as government policies supporting increased sustainable production and imports (e.g., the EU's Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan, China's Forest Law, and France's pledge to stop all deforestation imports by 2030) have spurred an uptick in standards and certification adoption. As an example, the global area under FSC forest certification has grown from 12 M hectares in 2000 to over 230 M ha in 2021; the FSC chain of custody certificates increased from 140 to nearly 50,000 over the same timeframe [13].

While development and conservation interventions differ (e.g., in scope, sector, and objective), there is high overlap in underlying social and environmental *issue areas* that underpin necessary safeguards (i.e., dimensions on which projects aim to cause no undue harm or encourage positive impact). Those issue areas can be binned into three general pillars: Ecosystem Health and Function, Society and Economy, and Climate (see Table 2).

Table 2. Social and Environmental Safeguards Pillars.

Pillars	Description
Ecosystem Health and Function	Conserving biodiversity, maintaining and restoring ecosystems, and sustainably managing natural resources are foundations of sustainable development. While nature has inherent value that cannot be fully measured or understood, protecting key attributes of ecosystems can ensure their ability to function and provide ecosystem services for society, as well as myriad other species that depend on them.
Society and Economy	*Social*. This includes a range of societal indicators of individual and communal effects in and around the intervention. Topics range from labor rights and working conditions, gender equality, participation, security and avoiding accidents, indigenous peoples, and cultural heritage.
	Economic. This includes general resource access and related well-being, poverty reduction, work opportunities, and economic assessment to consider potential risks to the local economy, with a particular focus on vulnerable and marginalized social groups in targeted communities.
Climate	Indicators reflect the project's net impact on climate, including greenhouse emissions and sequestration, as well as adaptation/resiliency benefits, and potential for the reversal or leakage of emissions to areas outside of the focus intervention.

While climate-related issue areas and associated indicators are not yet commonly spelled out in existing safeguards guidelines, it is along this pillar that forest and forest product interventions stand to have the greatest impact, necessitating its inclusion in any CSFE safeguards framework. Indeed, interview and survey results reveal a primary concern over the forest and forest product interventions' potentially negative impact on global emissions and forest loss. There was consensus among survey respondents that for interventions to be deemed "climate smart", they must be measurably climate-beneficial (e.g., they must show current or projected GHG emissions reductions relative to the baseline).

3.2. Importance of Safeguards for a CSFE

The building sector offers several CSFE-based opportunities to curb emissions (e.g., substituting sustainable wood materials for carbon-intensive materials such as concrete and steel) and store carbon [9,10]; the effects on forests, carbon, rural economies, and human well-being, however, could be negatively impacted unless safeguards are properly and continuously assessed and implemented. Importantly, the failure to adequately safeguard against harm and to achieve community buy-in will likely compromise the CSFE interventions' long-term objectives, both climate and otherwise.

Safeguarding against loss to forest ecosystems is not easy to achieve or measure, as it entails maintaining and measuring forest ecosystem services, forest extent, and carbon pools. For CSFE forest product interventions, it also requires tracking timber to its original source. Complicating forest and carbon assessments ensuring against net forest loss, which may be more easily measured with remote sensing, does not always equate to intact forest ecosystems. For example, while plantation monoculture forests may maintain forest area, they generally hold and sequester significantly less carbon than old or natural growth forests [14]. An increase in demand for forest products could increase pressure to replace old or more diverse forests with plantations, presenting a concern associated with both carbon and biodiversity.

Beyond environmental concerns, many indigenous peoples and smallholder agriculturalists are highly dependent on forest biodiversity for their livelihoods and wellbeing. Areas managed by indigenous peoples (approximately 28% of global land surface) include some of the most ecologically intact forests and many biodiversity hotspots [15]. The relationships between indigenous and other forest communities and forests remain important and are in flux as linkages with national and global markets grow. Safeguarding against negative social and economic impacts on forest communities will be necessary to align with both global human rights and environmental agendas [8].

Failure to minimize negative externalities will have negative implications for equity as well as project longevity; myriad well-intentioned interventions are unsustainable in the long term when communities and resources are negatively impacted [16]. Across all circumstances, safeguarding against negative externalities will be essential for sustainable and impactful implementation to address climate change. Achieving positive impacts, or co-benefits, will further bolster a CSFE to serve as a catalyst for larger systems change.

3.3. Assessment and Implementation Challenges

The widespread adoption of social and environmental safeguards is necessary to achieve an equitable and sustainable CSFE; doing so in an efficient and timely fashion, without compromising integrity and reliability, will be crucial for maximizing positive climate impact. In response to the severity of the climate crisis, interviewees and workshop participants asserted a pressing need for immediate action toward the development of robust CSFEs, while also acknowledging the high risk of unintended negative outcomes. Applying safeguards early, broadly, and consistently can minimize negative consequences (see [17]).

Alongside an increasing interest in social and environmental safeguards and related certification initiatives, however, has arisen a flurry of criticisms about their effectiveness. Conservation NGOs have criticized FSC and other certification bodies for serving as vehicles for corporate greenwashing, citing a lack of consistency, traceability, and transparency, particularly in countries with weak governance [18,19]. The World Bank has been accused of faltering on accountability with regard to safeguards and on promoting a utilitarian approach to development under which broader economic development trumps environmental and social considerations [20].

Survey respondents also show mixed and often limited confidence in the perceived effectiveness of existing standards to safeguard against both environmental and social harm. As an example, 78% of respondents believe that FSC is either somewhat or very effective at safeguarding against environmental harm, as compared to 52% for safeguarding against

community economic and social harm. Regarding REDD+ Social and Environmental Standards (SES), only 9% of respondents report that it is either somewhat or very effective at safeguarding against environmental harm, while 37% believe it is somewhat or very effective at safeguarding against social and economic harm. Notably, both interviewees and survey respondents expressed greater skepticism about chain-of-custody certifications than forest certifications on both environmental and social dimensions due to concerns about product traceability and illegal logging. It is worth noting that some of the limited confidence in existing safeguards guidance and certification may stem from a divergence between what experts think safeguards *should* do and what they, for the most part, currently strive to do. For example, 75% of survey respondents believe that safeguards should ensure *positive* environmental and social impacts, edging into co-benefits, rather than merely safeguarding against harm.

All interviewees expressed a strong need for improved metrics and guidance for more reliable, efficient, and transparent safeguards assessments, while acknowledging the developments that have occurred over the past decades. A common theme in interviews was that, while safeguards guidance (and especially forest certifications) may be imperfect, they play an important role in "maintaining global standards and creating a safe space for interaction [interview, 2021]" among diverse stakeholders, ideally leading to continuous improvements.

The reality is that safeguarding a CSFE confidently and adequately presents several profound challenges. Key CSFE assessment and implementation challenges fall into the following major categories: (1) A lack of clarity about actor responsibilities, (2) Insufficient data availability and reliability, (3) Uncertainties about navigating existing safeguards guidance, (4) Inefficient implementation, (5) Challenges for achieving inclusive engagement, and (6) Varying actor motivations. The following sections explore each in greater detail.

3.3.1. Challenge 1: Lack of Clarity about Actor Responsibilities

While there is broad consensus for a series of core principles underpinning CSFE safeguards (interview results), actors across the supply chain will have differing: (1) points of influence and intervention, (2) access to information and data, (3) levels of awareness of linkages to CSFE and a need to safeguard against harm.

Points of influence and intervention. A range of capacities and points of influence presents challenges for determining appropriate safeguards responsibilities at the intervention level (e.g., identifying stepwise improvements commensurate with actor type and capacity) by which to assess and compare CSFE interventions. For example, a major investor or procurement team may have the capability, and thus, assumed responsibility, to know a great deal of information about sourced materials and the social and environmental impacts of their production, transportation, and manufacture. Smaller actors and initiatives, on the other hand, may have fewer resources, and thus, a lower capacity to engage in comprehensive safeguards assessments; smaller interventions may also be less likely to cause large-scale social or environmental harm.

Access to differing information and data. Different actors have varying degrees of access to information (and the associated safeguards assurances) due to both variation in capacity and intervention types. For example, a local producer will be intimately knowledgeable about harvest practices and internal work conditions but will have no information on regional economic trends. A regional economic coalition will use socioeconomic and resource data to make recommendations but will need to rely on various assurances to know that wood is sustainable. Further, variations in data reliability and the appropriateness of application at differing levels of granularity cause additional challenges and uncertainties about use and interpretation.

Levels of awareness of linkages to CSFE and a need to safeguard against harm. An effective CSFE will engage a diversity of actors (e.g., forest managers, urban planners, regional development organizations, policymakers, builders, those in procurement, and end use consumers), many of whom are not likely aware of the interdisciplinary discussion and the

importance of their role in assuring safeguards within a supply chain. Scholarly critique has pointed to the difficulty that a large organization (e.g., the World Bank, which works with a wide range of government, consulting, and other implementing organizations) has in understanding responsibilities across a series of subsidiaries and partners, even when it has an established framework for social and environmental safeguards [20]. The multi-actor and multi-scale planning and tracking necessary for CSFE requires innovative thinking and communication.

3.3.2. Challenge 2: Data Availability and Reliability

In assessing an intervention's impact on the myriad environmental and social issue areas, project implementers should use the best available data aligned with actor capacity, responsibility, and resources. Data scarcity or unreliability, however, is a serious challenge undermining effective implementation of social and environmental safeguards. Further, some data may have very high levels of uncertainty, meaning that it is not possible to know the exact value because of deviations, noise, or incorrect or unavailable metrics. Without accurate data on sourcing, management, labor, etc., establishing baseline safeguards and assessing impact over time is all but impossible.

In some cases, data exist but are not readily available, e.g., in the case of proprietary information or when costs are prohibitive for lower-capacity actors. While local-level social and environmental impact assessments may be the most reliable indicators of an intervention's impact, they are also the most impacted by data scarcity and reliability. As opposed to assessments at the jurisdictional level, local community assessments will first require certainty about product sourcing; where that is uncertain, other localized safeguards considerations are not possible to measure.

Illegal timber markets further complicate the reliable safeguards assessment of global timber procurement [21]. As just one example, China is a large exporter of illegal timber, with the United States as a top destination country by volume; it may not be possible for those sourcing timber from China to know the origin countries of the timber, let alone the forest management practices, making reliable safeguards assessments very challenging at best [22,23]. To date, many producer countries face high, though largely uncertain, rates of illegal logging, compromising jurisdictional approaches to sustainable timber sourcing, as well as assessments of social and environmental impact. Even where sophisticated tracing systems exist (e.g., Brazil), there may be inconsistency in enforcement or ineffective auditing systems for monitoring discrepancies between revenues due and received, compromising both claims of sustainable harvest, as well as the ability to track country-level progress over time [24].

Data scarcity and uncertainty present a profound difficulty in terms of assessing impact and then navigating decision making, including prioritizing among issue areas and knowing when to walk away from an intervention. With any intervention, there will be tradeoffs between social, economic, ecological, and climate benefits. Those tradeoffs will present themselves differently and at different scales according to the intervention's location, scale, type, and priorities. Taking a systematic approach to identifying and addressing those tradeoffs is heavily compromised by a lack of reliable data.

While 67% of survey respondents say that interventions should be abandoned in the case of uncertain social or environmental impact, this conviction is not likely shared among all project implementers, many of whom may not be motivated by safeguards as a primary objective. To some degree, missing and imperfect data should be expected [25]; how one should best approach that reality and whether one can reliably make claims to safeguards implementation in the face of uncertainty is unclear.

3.3.3. Challenge 3. Navigating Existing Guidance

Guidance on sustainable forest management [26], land use planning [27], ecosystem service metrics, third-party assurances [28], and sustainable development is, while ever-changing and critiqued, well documented. With all the relevant applied and academic work

in this space, the challenge—unless funding or governance dictates (e.g., development bank funding or NDCs, respectively)—is that it is not clear *which* guidance is relevant, efficient, transparent, or sufficient for diverse actor types and in various types of interventions. This spurs questions such as:

- What guidance is relevant for different scales? Different actors?
- How should CFSE interventions be categorized to point to existing guidance as a starting point?
- Which guidance documents point to relevant indicators and tools, as opposed to general principles?
- What *additional* safeguards issue areas are particular to CSFE interventions and, as such, are not included in existing guidance?

With ample data and information available from satellite maps [29,30], corruption trackers (e.g., the Corruption Perception Index), governance indictors [31,32], commitments to climate objectives, and deforestation data [33], stocktaking these resources and effectively leveraging them requires clear guidance and an establishment of best practices. While assurances like certification are in place, it is not clear whether these provide comprehensive safeguards assurances for a CSFE (with a distinct emphasis on climate) or which safeguard concerns they cover.

Finally, there are uncertainties and disagreements about the relative assurances provided across the diversity of existing required and voluntary guidance. While some safeguards guidelines specify measurement and assessment criteria alongside best practices for individual issue areas, others offer more general principals. Some promote no undue harm, while others strive to increase the likelihood of positive impact on local communities and environments (e.g., the World Wildlife Fund's Environmental and Social Safeguards Framework (ESSF) and the Community, Climate, and Biodiversity Standards). How to leverage existing guidance in diverse CSFE initiatives in a comparable and yet realistic manner is not yet well understood.

3.3.4. Challenge 4: Inefficient Implementation

Considering the full scope of topics included in safeguards assessments, tackling a complete checklist of safeguards may not be efficient or even feasible due to knowledge, cost, time, and data constraints. In a best-case scenario, CSFE actors would require the capacity for on-the-ground assessment, as well as resources for third-party verification. Platforms and opportunities to clearly communicate assessed safeguards are limited beyond certification labels, which themselves do not encompass all CSFE safeguard issue areas.

Without reliable proxies (and best practices for how to use them) to identify high-risk issue areas at the onset, effectively or efficiently considering safeguards will be unduly onerous for some actors and thus, less likely to be implemented at any level. Assuming capacity limitations and expertise gaps in nearly all contexts, these can be even more acute depending on the region or country. As an example, lower income countries are much less likely to have in-country third-party verification actors for forest carbon projects, jurisdictional approaches, or certification [34]. This can exacerbate power dynamics related to who is authorized to provide assurances and greatly increase costs for potential CSFE contributors who need to then pay for international expertise.

3.3.5. Challenge 5: Achieving Inclusive Engagement

Certain regions are seen as greater hot spots for deforestation, illegal logging, and corruption, among other concerns, making engagement in these areas inherently risky. Accordingly, many companies have moved toward sourcing exclusively from countries seen as posing lower timber legality risks [35]. While this may reduce the likelihood of risk, it also reduces any potentially positive impact that may result from CSFE initiatives in those regions, including enhanced transparency, a reduction in forest loss, and the promotion of good forest management, among other co-benefits. Studies have found that promoting sustainable management with engagement, training, and benefit-sharing can be effective.

For example, various studies on the role of certification have found social, economic, and environmental co-benefits, including in those relating to working conditions [36], land tenure [37], and along High Conservation Value (HCV) indices [38]. In such cases, working with "good"" actors in challenging areas can promote equity, as well as increase total global CFSE benefits.

However, there are many producers for whom certification and other programs are not available, e.g., due to tenure arrangements or cost constraints. Outside of certification, small producers who are directly responsible for forest decision making may not be able to communicate sustainable practices to a distant consumer.

There is a need to consider actors along a gradient of sustainability performance rather than either "in" or "out" of certification. For instance, Cerutti et al. [39] (p. 51) found that, for actors not yet able to meet all requirements of certification, "positive changes may be induced by the pursuit of certification even before it is achieved" by companies that publicly declare an intention to become certified. Ultimately, a CSFE would benefit from proactively and responsibly bringing additional actors into the fold. As one interviewee noted, "Certification moved from 9/10 to 10/10, what about moving an actor that's 2/10 to 6/10?"

3.3.6. Challenge 6: Varying Actor Motivations

A wide range of organization types and scales may contribute to a CSFE, each with differing motivations for safeguards assessment and implementation. Some organizations (e.g., development institutions or carbon registries) have internal mechanisms that require safeguards assessment and implementation following an approved framework. Other organizations (e.g., multinational corporations) have shareholders to report to and may face increasing economic and CSR incentives to safeguard against social and environmental harm. Still others are government actors looking to uphold legal minimum safeguards considerations while operating with limited budgets.

This range of motivations presents challenges for determining realistic safeguard expectations against which to compare one's own efforts and abilities, a hurdle in achieving more widespread safeguards buy-in. Mechanisms for transparency and assurances that others are following environmental commitments (e.g., as may be achieved via external audits) can encourage more widespread commitment to and motivation for safeguards adoption; actors are less likely to shirk obligations when they trust that others are cooperating as well [40]. As Potoski and Prakash (2005) find, voluntary environmental programs and commitments, particularly those with third-party verification can "spur a virtuous cycle" whereby trust begets more trust [40] (p. 246). While such an aim is desirable, the ability to achieve it is compromised by the variation in actor types, capacities, and motivations across a CSFE.

4. Discussion

With consideration of the assortment of challenges associated with safeguards assessment and implementation, this section discusses a non-exhaustive overview of potential solutions intended to inform strategy, shape dialogue, and provide initial steps to advance.

Address Variations in Data Reliability and Availability. Data challenges can be addressed by identifying, communicating, and applying best practices (e.g., best available data, acceptable levels of uncertainty) in CSFE safeguard assessment and monitoring, which can be aligned with actor capacity, responsibility, and resources. Identifying data best practices can support greater transparency, shared confidence in data and information, and an increased understanding of actor responsibility.

Building CSFE Communities. Successful CSFEs will involve a wide range of decision-makers and professionals, many of whom can be considered newer actors in forest-based thinking and planning, and who have not traditionally participated in such dialogues (e.g., designers, architects). For these actors, there are opportunities to raise awareness of their role in CSFEs, as well as their responsibilities and leverage points in terms of assuring

that safeguards are being met. This will be essential to encourage ambition, CSFE-aligned critical decision making, and increase understanding of the need to safeguard against unintended consequences. This can be achieved by clarifying and facilitating the use of existing standards and criteria, the development of case studies, and peer learning and training opportunities.

Expanding Oversight Capacity. After data limitations and general awareness, the biggest challenges for safeguards assessment and monitoring are human capacity (e.g., time and finances) and expertise gaps. Third-party monitoring and verification can also be a form of power imbalance (e.g., cost prohibitive and proprietary knowledge) that further entrenches uneven power dynamics between wealthy countries/external actors leading oversight. This can, in part, be addressed by (1) building capacity among actors to assess safeguards within their organizations and establish transparent tracking systems and (2) boosting third-party verification and review capacity in rural and high-risk countries and regions to monitor safeguards at governance, investor, and land manager levels. Developing in-country verification capacity can reduce overall costs for verification visits due to high travel expenses and further distributes the financial benefits of a safeguard-aligned CSFE.

Limit geographic distances to link benefits to producers and minimize risk. Considering known challenges in assessing and tracking global timber trade flows, determining local impacts and whether local needs are met is generally difficult. A report from the 2021 workshop "Scoping Dialogue on Climate Positive Forest Products" notes that relying on local wood sources in regional timber markets can help ensure that benefits flow back to communities and rural actors. Workshop participants emphasized that wood products (including applications such as mass timber) should be designed and manufactured to meet local needs and preferences, particularly in developing countries where wealth and resources are limited. The workshop's report further highlighted the need to consider global mass timber supply and demand dynamics in terms of carbon [12].

Identify and Strengthen Enabling Conditions. Enabling conditions are conditions that facilitate and serve as signals for CSFE safeguards assurances. They include established and effective forest governance and grievance mechanisms, recognized land tenure, monitoring systems, and mechanisms to identify and sanction illegal logging, among others. The presence of certain enabling conditions may serve as a signal or proxy that safeguard issue areas may be at low risk, facilitating more efficient safeguards assessment. Conversely, the absence of certain enabling conditions may suggest room for concern or a need to seek more project-relevant information.

Use Continuous Improvement and Risk Analyses to Inform decisions. Addressing broad CSFE safeguards can be overwhelming for newly engaged actors and those in high-risk areas due to capacity and resource gaps. One solution is to encourage a stepwise approach to safeguards, which can be both a tool for inclusivity and a realistic approach to broadening the CSFE community. This approach can meet actors at their starting point in terms of data, management, and ambitions. For actors at all levels, a performance baseline can be established, and a spectrum of improvements implemented, eventually enabling the achievement of clear benchmarks (e.g., certification). Most issue areas lend themselves to a spectrum of outcomes, ranging from avoiding harm to supporting co-benefits (Figure 1). To prioritize actions, a risk-based approach first assesses the level of concern and the potential gravity of negative outcomes for specific interventions. The most concerning, high potential impact areas can then be prioritized for information gathering and safeguarding. Even actors that have substantial safeguards information, for example, due to existing certification, will be able to identify opportunities for improvement.

Boost Transparency. Confidence in a CSFE and the broad adoption of CSFE safeguards require trust and transparency. While there are many opportunities to boost transparency, a few specific tactics include: (1) Increasing private sector and research linkages to make data created by the private sector available for broader use (e.g., informing proxy values for safeguards assessments), (2) Leveraging web-based platforms to share assessments, data,

and information about decision making in tradeoffs, and (3) Making publicly available private sector safeguard reports and monitoring, even when not required. Overall, increased CSFE safeguards transparency will inform reliability, which will increase marketability and boost actor confidence, which are foundations for CSFE motivation and ambition.

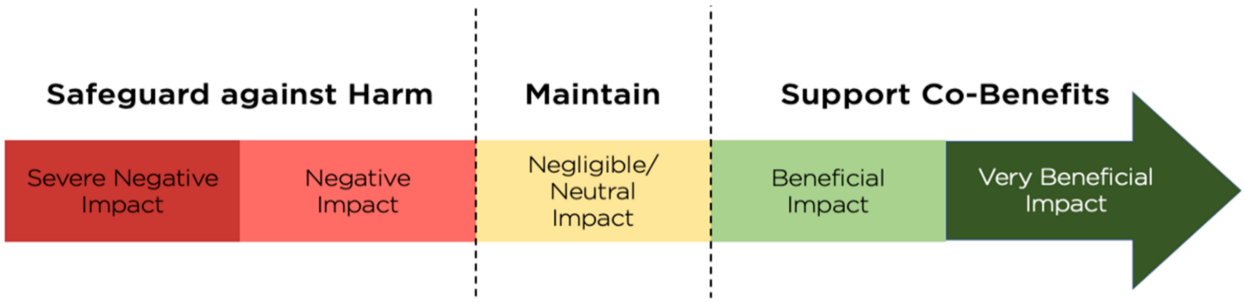

Figure 1. CSFE safeguard spectrum from harm to co-benefits.

5. Conclusions

This paper defined social and environmental safeguards as they pertain to a CSFE and then identified obstacles, as well as potential solutions, for their efficient, fair, and reliable assessment and implementation. A climate-smart forest economy (CSFE) has high ambitions of bolstering the 3Ss and catalyzing broader systemic change to address the climate crisis, all while aligning with sustainable development goals and related agendas. However, failure to minimize negative externalities will have implications for equity, project longevity, and climate benefits.

Participating multi-sectoral professionals believe that the need for climate benefits is incontrovertible for a climate-smart forest economy; social and environmental safeguards must be understood as a key tool to ensure climate benefits and long-term project viability. As this research presents results largely from North American and European perspectives, additional research is needed to further explore the perspectives and concerns from developing regions, especially those that are currently, or are expected to become, important timber producers (e.g., South America, Central Africa, and Southeast Asia). Safeguards solutions will require dialogue, engagement, knowledge transfer, and ambition from a wide range of stakeholders. If safeguards are not adequately implemented, interventions risk failure in terms of society and environment, as well as climate.

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