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Is the Implementation of Cocoa Companies' Forest Policies on Track to Effectively and Equitably Address Deforestation in West Africa?

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ABSTRACT

Tropical forests play a crucial role in achieving the sustainable development goals by contributing to climate stability, conserving biodiversity and sustaining livelihoods. However, forests are disappearing due to agricultural expansion. In West Africa, cocoa production is a major driver of deforestation. This study examines the design and implementation of forest-focused supply chain policies (FSPs) in cocoa supply chains in Côte d'Ivoire and Ghana, the world's two leading cocoa producers. FSPs are voluntary policies of companies to combat deforestation, restore forests, and improve farmers' livelihoods. Drawing on 91 stakeholder interviews, we developed a conceptual framework to examine FSPs' theory of change, implementation and potential effectiveness and equity. Our findings reveal shortcomings in FSPs' design and implementation. FSPs are mostly narrowly focused on preventing illegal deforestation and only target farmers in companies' 'direct' supply chains, neglecting important landscape-scale approaches and processes. Companies also fail to include smallholder farmers sufficiently in policy design and implementation. Lastly, FSPs prioritise productivity enhancement but overlook the importance of addressing farmers' social norms and values. We provide recommendations on how to address the shortcomings to achieve sustainable cocoa production.

1 | Introduction

Tropical forests play a critical role in global environmental sustainability by contributing to climate stability, biodiversity conservation and the livelihoods of millions, particularly rural residents in low-income countries (Rowland et al. 2017). However, these forests face severe threats, with agricultural expansion being one of the primary drivers of tropical forest loss, especially in tropical regions (Pendrill et al. 2022).

While there has been significant research on agriculture, deforestation, and environmental policy in the Amazon forest

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basin and forests of Borneo and Sumatra, the Upper Guinean Forests of West Africa (GFWA) have received less attention. The expansion of cocoa and food crops into forested lands, including protected areas, has been identified as a major driver of deforestation in the region (CFI 2022; Goldman et al. 2020; Higonnet et al. 2017; Kalischek et al. 2023). Côte d'Ivoire and Ghana, located within the Upper Guinean Forests, together produce about 60% of the world's cocoa (FAO 2022) and face a paradoxical challenge. From 2000 to 2019, cocoa cultivation replaced 2.4 million hectares of forest in Côte d'Ivoire and 848,000 ha in Ghana, accounting for 45% and 57% of total deforestation and degradation, respectively (Renier et al. 2023). Moreover, over 30% of cocoa producers in these countries live below the extreme poverty line, with approximately 78% earning less than a living income (van Vliet et al. 2021). These interconnected environmental and socio-economic challenges align with several Sustainable Development Goals, including poverty reduction (SDG 1), conservation of terrestrial ecosystems (SDG 15), and sustainable food production and consumption (SDG 12) (Schaafsma et al. 2023; UN 2015).

Forest-focused Supply Chain Policies (FSPs) are voluntary environmental governance tools adopted within company or country supply chains aimed at combating deforestation, restoring forests and improving farmers' livelihoods (Brandi 2017; Garrett et al. 2021; Lambin and Thorlakson 2018). FSPs have emerged as key tools alongside existing territorial interventions (e.g., Protected Areas) in addressing deforestation and promoting sustainable agricultural practices across commodity sectors including palm oil, cattle, soy, coffee and cocoa (Bager and Lambin 2022; Garrett et al. 2019; Lambin et al. 2018).

In recent years, multinational companies in the cocoa and chocolate industry have increasingly adopted FSPs in response to the challenges, with substantial investments in their implementation (Carodenuto and Buluran 2021; CFI 2022). The 2017 Cocoa & Forests Initiative (CFI) stands as a landmark multi-stakeholder commitment, in which 35 cocoa and chocolate companies partnered with the governments of Côte d'Ivoire and Ghana to address deforestation in the cocoa sector (CFI 2017). This initiative led to the development of frameworks for action and the implementation of traceability and monitoring systems, including farm mapping and productivity-enhancing support providing a rich and relevant context for examining FSP design and implementation.

Despite these advancements, significant gaps remain in our understanding of the effectiveness and equity of FSPs in the cocoa sector, particularly regarding traceability within the cocoa supply chain, the activation of social norms among smallholder farmers (the primary cocoa producers), and the involvement of smallholders in the design and implementation of these policies. The activation of norms prioritising environmental sustainability over productivity remains underexplored, and there is limited evidence that smallholder farmers have been involved in FSPs' design and implementation.

In contrast, other commodity sectors, such as palm oil (e.g; Chandra et al. 2024; Grabs and Garrett 2023; Jopke and Schoneveld 2018; Lyons-White and Knight 2018), soy (e.g; Gollnow et al. 2022; Heilmayr et al. 2020) and cattle (e.g; Alix-Garcia and Gibbs 2017; Cammelli et al. 2022; Levy et al. 2023), have seen considerable research on the adoption, implementation, and effectiveness of FSPs.

While some recent studies have explored sustainable cocoa production, such as the distributional impacts of third-party certification schemes (Amuzu et al. 2022; Iddrisu et al. 2020; Ingram et al. 2018; Thompson et al. 2022), ex-post empirical assessments of FSPs at a regional scale are absent. Moreover, transparency about sourcing relationships in the cocoa sector remains limited (Renier et al. 2023), and existing assessments of zero-deforestation commitments have primarily relied on companies' self-reports (Grabs et al. 2021).

This study addresses these gaps by analysing the design and implementation of FSPs in the cocoa supply chains of Côte d'Ivoire and Ghana, the world's largest cocoa-producing countries. Despite significant forest loss in these countries, FSPs are relevant because they have the potential to enhance current and future cocoa productivity, thereby reducing pressure on neighbouring, highly forested countries and contributing to climate change adaptation (Schroth et al. 2016). Using stakeholder interviews, field observations, and sustainability reports, we build on previous evaluations of FSPs (e.g; Garrett et al. 2019; Grabs et al. 2021), by integrating the Pathways of Influence Framework (Bernstein and Cashore 2012) with the framework for assessing the effectiveness and equity of zero deforestation commitments, while also considering agroforestry aspects of FSPs. This combined framework allows us to analyse the theory of change, implementation strategies and potential effectiveness and equity of FSPs. Our research contributes to the literature by evaluating how current FSPs address key issues like traceability, social norm activation, landscape-scale collaboration, smallholder inclusion in policy design and implementation and benefit sharing, all of which are crucial for achieving sustainable cocoa production. We conclude by providing recommendations for strengthening FSPs in the cocoa sector to achieve more sustainable and equitable outcomes.

2 | Conceptual Framework

To assess the design, implementation and impact of Forest-focused Supply Chain Policies (FSPs) on smallholder farmers, we combine two complementary frameworks: the effectiveness and equity framework for evaluating zero deforestation commitments (ZDCs) (Grabs et al. 2021) and the pathways of influence framework (Bernstein and Cashore 2012). This integration allows us to examine both the principles underlying FSPs' design and implementation, and the theory of change through which multinational companies try to influence smallholder compliance.

2.1 | Effectiveness and Equity Principles of Zero Deforestation Supply Chain Policies

In smallholder-led commodity production systems such as cocoa, coffee and oil palm, balancing environmental

outcomes (effectiveness) with social equity is critical. Strict environmental policies, while necessary for forest conservation, may increase vulnerability among smallholders, particularly if compliance requires the application of resources they lack. This creates tension between effectiveness and equity (Brandi 2017; Grabs et al. 2021). These concerns have intensified with the passage of the European Union's deforestation-free regulation (EUDR), which aims to ensure that forest-risk commodities like cocoa imported into the EU are not produced from recently deforested land (European Commission, 2023). Given our study's aim of assessing the effectiveness and equity of current FSP designs in the cocoa sector, Grabs et al. (2021) framework is particularly suitable. It explicitly addresses these tensions by outlining seven principles for designing effective and equitable zero-deforestation policies.

These principles assert that FSPs should: (i) be stringent in terms of behaviours and cut-off dates, covering all producers, regions, and substitutable products; (ii) Actively disseminate rules through training; (iii) Remove barriers to compliance; (iv) Provide benefit-sharing schemes for compliance through price or non-price mechanisms; (v) Co-produce rules and implementation procedures with supply chain members and surrounding communities; (vi) Coordinate with other actors (private and public); and (vii) Employ inclusive oversight and equitable monitoring with differentiated enforcement.

The principles not only help assess whether policies are likely to address deforestation effectively, but also emphasise removing compliance barriers, ensuring benefit-sharing and promoting inclusivity, which are important in supply chains dominated by smallholder farmers. Given the specific challenges in cocoa production, we expanded this framework by adding principles on traceability and norm activation, which are essential for smallholders. Traceability ensures cocoa can be traced back to the specific plot where it was produced, helping farmers and companies meet sustainability requirements such as the EUDR (Fripp et al. 2023; Parra-Paitan et al. 2023; Renier et al. 2023; European Commission, 2023 180:). Norm activation encourages smallholders to adopt pro-conservation practices, helping companies achieve legitimacy by respecting local values (Dawson et al. 2018).

2.2 | Pathways of Influence Framework

The pathways of influence framework explores how international and transnational actors shape domestic policy, firm-level decisions and individual behaviour (Bernstein and Cashore 2012; Sotirov et al. 2020). This framework identifies four key pathways—rules, markets, norms and direct access—through which international actors drive behavioural change. In the context of FSPs, it provides a means to develop a holistic understanding of the theory of change that multinational companies can influence smallholder farmers' compliance with international commitments, which are often devised outside the producer countries but require local implementation.

The 'rules' pathway involves compliance with laws or standards to avoid penalties, reflecting a 'command-and-control' approach that uses coercion or sanctions(Börzel and Risse 2012; Furumo and Lambin 2020). However, because FSPs are largely voluntary (e.g., farmers can choose to sell through alternative buyers or exit cocoa supply chains), we exclude this pathway from our analysis.

The 'market' pathway uses both positive and negative economic incentives to influence behaviour, assuming that individuals and firms act as profit maximisers. For FSPs, positive incentives include financial rewards (e.g., sustainability premiums, payments for environmental services) or in-kind support (e.g., farm inputs), while negative incentives involve the threat of exclusion or suspension from a company's supply chain. Monitoring and traceability are critical for enforcing both positive and negative incentives. For instance, these mechanisms ensure that farmers who comply with sustainability criteria receive cash premiums and other benefits, while they are also used to exclude those who contribute to deforestation. However, while monitoring and traceability support both types of incentives, their primary rationale within FSPs tends to be linked to negative incentives, such as ensuring deforestation-free supply chains through exclusion or suspension (Maguire-Rajpaul et al. 2022). Consequently, monitoring and traceability are often classified as part of negative incentive systems. Their main function is to identify non-compliance and mitigate reputational risks for companies by eliminating unsustainable practices, even though positive rewards are sometimes tied to the same monitoring processes.

The 'norms' pathway influences behaviour by encouraging the internalisation of socially accepted expectations and dominant ideologies. For FSPs, activities promoting the internalisation of ethical norms related to forest conservation fall under this category. We expand this pathway to include broader policy dissemination activities that aim to activate pro-social and pro-conservation norms, renaming it the 'norms and information' pathway.

The 'direct access' pathway facilitates behaviour change by providing financial, technical and capacity-building support to local actors, empowering them to adopt new practices, which has been the dominant pathway in commodity exporting countries in Africa (Carodenuto and Cashore 2019). For FSPs, this includes agricultural training, legal and technological support, and the creation of local governance structures such as farmer organisations. Based on insights from field interviews, we renamed this pathway the 'enabling conditions' pathway to better reflect its focus on creating the necessary conditions for behaviour change.

2.3 | Integrating the Pathways of Influence Framework With Effectiveness-Equity Principles for FSPs

While the pathways of influence framework could help explain how companies aim to induce behaviour changes through FSPs, it does not sufficiently address farmer-level impacts. Therefore, we combine it with the Effectiveness and Equity framework, mapping FSP implementation strategies across the four pathways (negative incentives, positive incentives, enabling conditions, norms and information). This integrated framework allows us to examine how different approaches to

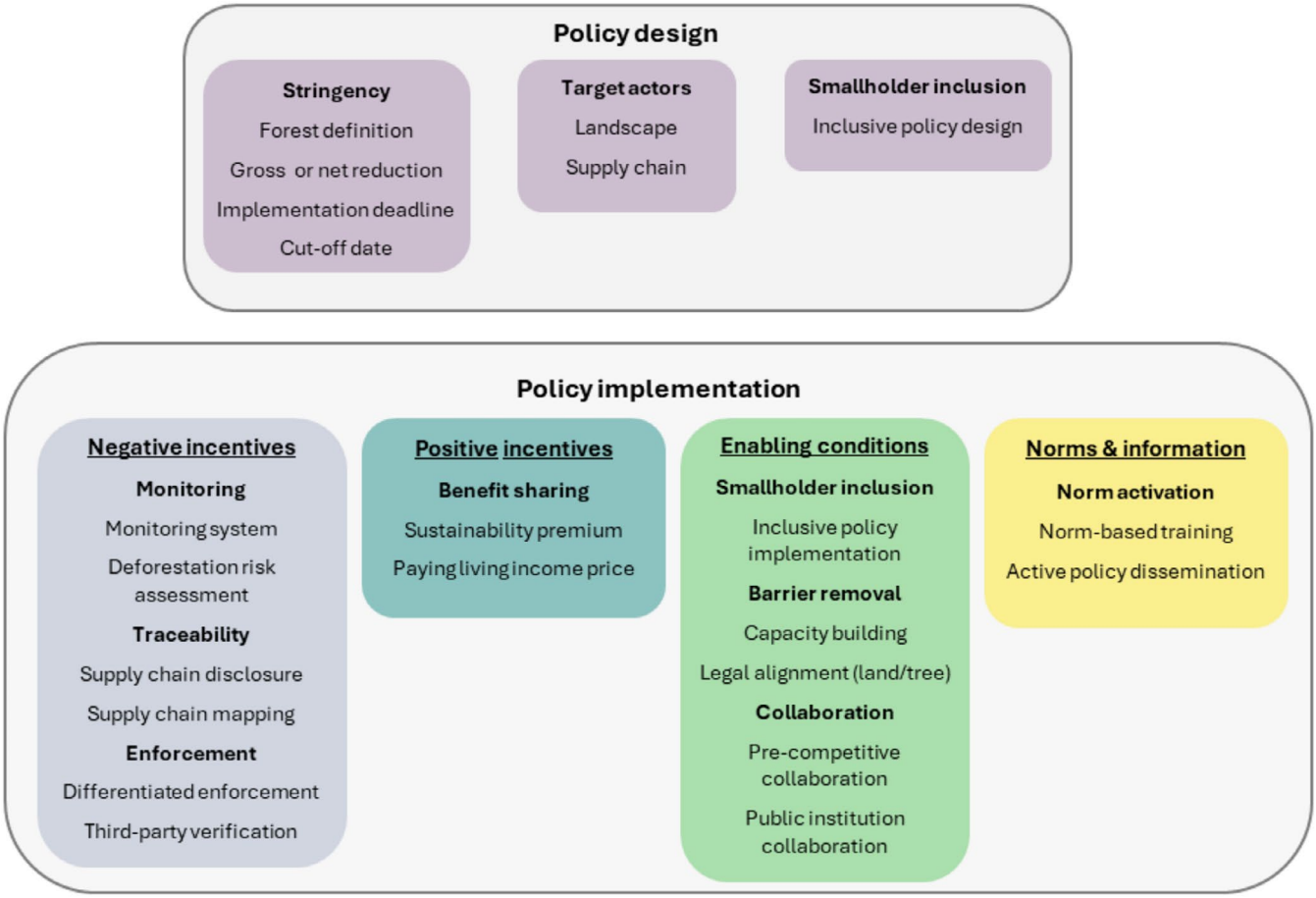

FIGURE 1 | Conceptual framework for assessing effectiveness and equity principles grouped under the pathways of influence. Adapted from Grabs et al. (2021) and Bernstein and Cashore (2012).

FSP design and implementation balance effectiveness and equity, accommodating the diverse motivations and capacities of smallholder producers. Figure 1 illustrates this combined approach.

3 | Methods and Materials

3.1 | Study Design

We employed a stratified purposeful sampling approach to select respondents for semi-structured interviews (Onwuegbuzie and Collins 2007). This method fostered the inclusion of key stakeholder groups within the cocoa sector. The data collection process started with a review of grey literature and company communications (sustainability policies and reports, and websites) to develop a broader understanding of companies' FSP design and implementation, and the supply chain structure in the cocoa sector. This led to the selection of the Pathways of Influence and Effectiveness-Equity Frameworks to guide the design of the interview guides (Supporting Information, S2), selection of actors for the interviews (Table 2), and analysis of the data. The interview guides were further informed by earlier studies in the palm (Grabs and Garrett 2023) and cattle (Cammelli et al. 2022) sectors examining the effectiveness and equity of FSPs. Questions covered companies' sourcing volumes and regions, implementation mechanisms in relation to zero deforestation and agroforestry, community involvement and selection, enforcement and remediation, systematic challenges, views on the CFI and how the cocoa sector can be transformed into a sustainable sector.

3.2 | Interviews

We conducted 91 interviews in both countries covering the following groups: cocoa traders, chocolate manufacturers, local licensed buying companies (LBCs)[1], non-governmental and non-profit organisations (NGOs), state institutions operating within the cocoa and forests sectors, research institutions, industry experts in the cocoa sector, third-party certification bodies and farmer cooperatives. Table 2 provides details of the interviews conducted, arranged by groups of actors across the two countries.

We invited all major signatories to the CFI[2] who have a recognisable presence in Ghana and Côte d'Ivoire through personal connections and online platforms (namely LinkedIn and email). The CFI has 35 signatories, including various types of companies such as traders/exporters, manufacturers/brands, retailers and farmer cooperatives (CFI 2017). Our focus was specifically on manufacturers and traders/exporters due to

their presence and influence on producers. We conducted interviews with 12 company sustainability managers in Ghana and 10 in Côte d'Ivoire, working for a total of 14 companies (7 for each category of manufacturers and traders). We conducted face-to-face interviews during field visits to the two countries unless participants were unavailable, in which case virtual interviews were conducted. The interviews were audio recorded and detailed notes were taken. Field interviews took place between November 2021 and January 2022 in Ghana and March to April 2022 in Côte d'Ivoire. In addition to the interviews, we also analysed companies' sustainability reports, deforestation commitments/policies and their CFI annual progress reports covering the same period. This combination of fieldwork, interviews and document analysis builds on previous studies that only rely on companies' reports or commitments (Carodenuto 2019; Carodenuto and Buluran 2021; Grabs et al. 2021).

During the interview process, several challenges were encountered. First, gaining access to high-level stakeholders within international companies proved difficult, as some were reluctant to discuss the details of their supply chain policies and activities. This challenge was partly mitigated through snowball sampling, whereby initial interviewees recommended others within their networks. Participants were given a consent form to sign which outlined the research project, risk and benefits of participation as well as the confidentiality and anonymity of the data to encourage openness. Another challenge was the reluctance of some smallholder farmers to participate, particularly those living in or farming within protected areas who feared victimisation or eviction. To address this, efforts were made to build trust with respondents by conducting interviews in informal settings and assuring them confidentiality of the data.

3.3 | Data Processing and Analysis

We coded the transcribed interviews of the trading and manufacturing companies in NVivo 14 (Lumivero 2023). To maintain anonymity and confidentiality, no comments made by participants have been explicitly linked to their companies. The other interviews provided background that helped refine the initial coding framework and were crucial for contextualization of the results (Bastos Lima and Schilling-Vacaflor 2024).

Interview transcripts and notes were coded deductively and inductively. We inductively analysed the interview data and company documents following the five phases of thematic analysis proposed by Braun and Clarke (2006). First, we coded the activities reported by companies to implement their FSPs. Then, we grouped these activities into initial themes based on semantic and latent (underlying ideas and assumptions) levels of theme identification (Braun and Clarke 2006). For example, participants mentioned activities such as establishment of demonstration farms, farmer schools and rural service centres aimed at supporting farmers in adopting good agricultural practices. Initially, all these activities were grouped under the 'Good Agricultural Practices' theme at the semantic level. However, we further categorised them under the 'Productivity Enhancement' theme along with other codes such as supply of agro-chemicals and financial credit for farm inputs, because the underlying explanation behind these activities is to increase productivity.

Next, we analysed companies' implementation activities to evaluate their alignment with the four pathways of influence and interpret the underlying theory of change. These activities and themes are interconnected and not mutually exclusive, with some activities spanning multiple pathways.

To systematically apply our integrated framework, we created a scoring rubric which was used deductively to assess the design and implementation of companies' FSPs based on the 10 principles in Table 1. Each principle includes a set of criteria and scoring indicators, with scores ranging from 0 to 3 (0—Very Insufficient; 1—Insufficient; 2—Partially Sufficient; 3—Sufficient) (see codebook in Supporting Information). Scoring for each company was conducted in Microsoft Excel.

4 | Results

4.1 | Policy Design

We found that the design of current FSPs is partially sufficient on stringency (mean = 1.42 on a scale of 3) and insufficient on inclusiveness (mean = 0.45) to achieve effectiveness and equity. Furthermore, the targets of company policies were found to be insufficient, as companies are primarily focusing on farmers within their own supply chains (mean = 0.98).

Many companies commit to zero gross deforestation, but in practice only rely on the legal definitions of forests by the governments of Ghana and Côte d'Ivoire. This limits their efforts to prevent cocoa-driven deforestation occurring only in protected areas. One manufacturing company exemplified this phenomenon when explaining their focus on illegal deforestation: 'We map all the farms of our partners' farmers. We know exactly where the farms are. We do the deforestation risk assessment to understand the farms proximity to any sensitive environment as well. But within, as an organisation, we map all our farms and do risk assessment to ensure that none of our farmers are within a protected forest' (*MAN-G05*). Another company representative also mentioned: 'Our no deforestation policy is more about how we make sure that all the cocoa plantations, where we source from and [where] our farmers are planting their cocoa are not in restricted areas or forest reserves' (*MAN-G02*).

There is also insufficient consideration or adoption of landscape-level approaches in the design of companies' FSPs. Instead, FSPs predominantly focus on farm-level activities directed at farmers in the companies' sustainability programmes. This narrow focus of FSPs within the cocoa sector affects their ability to address deforestation effectively and equitably. Similarly, our findings indicate that smallholders are insufficiently involved in the co-design of FSPs (mean = 0.45). In most cases, we found no evidence of companies involving farmers in the design of FSPs, with their involvement largely restricted to community development interventions and livelihood support programs. Where companies did describe consulting farmers, this generally concerned

TABLE 1 | Principles and criteria used to evaluate the effectiveness and equity of companies' forest-focused supply chain policies/programmes (adapted from Grabs et al. 2021 and Garrett et al. 2019, Accountability Framework initiative 2022).

Principle	Criterion	Explanation
Policy design phase		
Policy target	Landscape target (spatial)	The FSP of the company goes beyond the property level by incorporating a landscape/jurisdictional approach that focuses on sustainable land use (e.g., Landscape and Jurisdictional Approach)
	Supply chain	The policy goal of achieving zero deforestation covers all suppliers (both direct and indirect) and non-suppliers within a company's sourcing area
Policy stringency	Deforestation reduction target	There is a clear definition of deforestation as well as a deforestation reduction target which is aimed at achieving zero deforestation in a company's supply chain (e.g., zero gross, zero net, zero legal)
	Operationalisation of forest definition	There is an inclusive definition of forest that goes beyond the legal definition of forest in the sourcing region. The definition should include forest outside protected areas and high conservation value and high carbon stock
	Cut-off date	The policy specifies a cut-off date beyond which deforestation or conversion would not be accepted
	Implementation deadline/target date	There is a clear stated date in the policy indicating when the company aims to achieve or implement their commitments of sourcing deforestation free cocoa
Policy implementation phase		
Monitoring approach	Deforestation risk assessment	Deforestation risk assessment is undertaken to assess incidence of risk of deforestation and forest conversion for both direct and indirect suppliers
	Monitoring system/tool	The monitoring system being used is inclusive and participatory
Traceability	Supply chain mapping	Polygon mapping or geolocation of all suppliers (direct and indirect) within the supply chain are undertaken to the individual farm or plot level
	Disclosure of suppliers	There is adequate disclosure of where a company sources or buys their cocoa in a manner to enable independent verification or identification. This can be done in a spatial manner and goes to the farm or plot level
Enforcement approach	Third-party verification	An independent organisation conducts audits with auditors separate from the company
	Differentiated enforcement	The company applies a differentiated approach to enforcement considering local context and capacity to avoid unfair exclusion instead of a strict or blanket enforcement, thereby promoting access equity
Smallholder inclusion	Policy co-design	Smallholder producers and communities have a strong influence on the formulation/design/rulemaking of the policies adopted by companies they sell their cocoa to. This will ensure procedural equity in the FSP design
	Policy co-implementation	Communities and producers are involved in the implementation of the company's FSPs, thereby ensuring procedural equity.
Barrier removal	Capacity building of producers	Support (e.g., technological, and financial) are offered to smallholder producers to help them enter and/or remain in responsible supply chains and/or achieve compliance with the FSPs, thereby promoting contextual equity
	Legal alignment (land/tree tenure)	Adequate support is offered to farmers to meet any legal requirements or overcome any legal barriers to sustainable production or compliance with companies' FSPs, thereby promoting contextual equity

(Continues)

TABLE 1 | (Continued)

Principle	Criterion	Explanation
Benefit sharing	Conditional benefit sharing (sustainability premium)	Farmers receive cash premiums or sustainability premiums for the sale of certified and/or sustainable cocoa, thereby promoting distributional equity. The amount paid to the farmers is also disclosed by companies in their sustainability reports
	Unconditional benefit sharing (Living Income reference price)	There is a commitment and sufficient evidence that farmers are paid a living income reference price for the cocoa they sell to a company. The living income price is an additional price, along with providing evidence of payment, beyond sustainability premiums in accordance with the living income (at the farm-gate) for the cocoa beans they produce. This will ensure distributional equity for the farmers
Collaboration	Evidence of collaboration with state institutions	There is evidence of involvement or collaboration with state institutions in the implementation or development of policies/intervention/projects to advance sustainability in the cocoa sector
	Pre-competitive landscape collaboration	There is commitment and evidence of pre-competitive collaboration with other companies to implement a landscape level intervention for sustainable cocoa production
Norm activation	Active policy dissemination	Company communicates to producers their commitments and requirements and what they must do to achieve sustainable cocoa production
	Norm-based intervention/training	Company undertakes interventions that aimed at activating or strengthening the pro-conservation cultural norms/practices of farmers, thereby promoting recognitional equity

specific matters such as the type of tree seedlings they prefer to plant on their farms, rather than inputs to broader policy design.

4.2 | Policy Implementation

4.2.1 | Pathways of Influence

We observed that companies implement a wide range of activities, but these activities and associated theories of change are skewed towards creating enabling conditions and providing positive incentives (Figure 2). Productivity enhancements and agroforestry-related activities constitute most of the positive incentive and enabling condition pathways. This aligns with companies' theories of change that increasing farmers' income through enhanced productivity will discourage further expansion into forest areas. For instance, one sustainability manager explained: 'We provide knowledge to our farmers to help them increase their yields and avoid expanding farm sizes into protected areas, including HCS-HCV [High Carbon Stock, High Conservation Value] areas. These trainings also promote good environmental, social, agricultural, and business practices' (*MAN-G01*). When asked how they are helping farmers to comply with their FSPs another sustainability manager mentioned: 'And we do this by building the capacity of farmers, training them. Organising farmers field schools, you know, to help them so that they will be able to work on the farms to improve their yield and productivity' (*MAN-G04*). In most cases, agroforestry activities, such as supplying shade trees to farmers, are considered and framed as productivity enhancements, even though these may or may not increase productivity (Abdulai et al. 2018; Nasser et al. 2020).

The negative incentive pathway is less common, but present for addressing deforestation compliance. This pathway relies on monitoring, traceability, and enforcement tools (example, satellite monitoring, farm mapping, deforestation risk assessment, farm certification audits) to influence the behaviour of farmers away from encroaching into forest areas for cocoa production. Farmers whose farms are detected by these tools to be in forest areas are excluded or suspended from companies' direct sourcing and sustainability programmes. One sustainability manager in Ghana exemplified this and told us: 'We have forest policy such that you cannot buy cocoa from the forest reserves. We put in place systems and strategies to ensure that every cocoa [bean] we buy does not come from the forest reserves and we maintain farms outside the forest reserve. That does not mean that in our operation we do not identify farmers who do have farms in the forest reserves. But once you are identified you are within a forest reserve you are dismissed from the group and if you are in a buffer zone you are given a warning letter and remediation plan to ensure that you do not encroach into forest reserves' (*TRA-G05*).

The norms and information pathway, which encompasses activities to activate farmers' pro-conservation values and behaviour, was represented in the fewest activities. While we identified some activities that were implicitly targeting norms and values, we observed that most community engagement activities undertaken by companies do not explicitly seek to activate or strengthen farmers' values, norms and pro-environmental behaviours. Instead, they focus on advocating for farmers to desist from expanding into protected forests to avoid exclusion from supply chains or the loss of certification premiums.

4.2.2 | Effectiveness and Equity Potential Across Each Pathway

While there is a mix of implementation activities across pathways, we found the individual activities in this mix to be insufficient or partially insufficient to achieve effectiveness and equity of companies' FSPs (see Figure 3 and Appendix 3). The exception is the set of enforcement and monitoring activities in the negative incentive pathway. Within the negative incentive pathway, all but two of the companies we interviewed use a form of independent third-party verification such as Rainforest Alliance or Fairtrade. Additionally, all assessed companies engaged in polygon farm mapping and deforestation risk assessments to monitor and address deforestation, although their focus remained primarily on their direct suppliers. As a result, this pathway holds high potential for effectiveness but suffers from low equity due to the limited involvement of farmers in the monitoring and enforcement processes.

TABLE 2 | Summary of interviews conducted in Ghana and Côte d'Ivoire.

		# Interviews	
Stakeholder group	**Code**	**Ghana**	**Côte d'Ivoire**
Cocoa trading companies	TRA	6	7
Chocolate manufacturers	MAN	6	6
Licensed buying companies (local)	LBC	2	1
Farmer cooperatives/ community-base organisations	FCB	6	6
Non-governmental and civil society organisations	NGO	12	11
Third-party certification bodies	TPB	1	1
Government officials	GO	9	4
Research Institutions/ consultants/expert informants	RIE	2	7
Cocoa purchasing clerks	PC	2	2
Total		46	45

With respect to positive incentives, we found that all the companies we assessed provide a form of sustainability premium, contingent on farmers' participation in their sustainability programmes. Yet only 40% of Ivorian cocoa is directly sourced, indicating that most farmers are engaged in indirect selling and are thus not part of such programmes (Guye 2024; Renier et al. 2023), lack access to these benefits, as well as non-compliant farmers. This is exemplified by statements from the company representatives we interviewed such as: 'Farmers who are part of [sustainability] programme know that at the end of the year they will be paid [certification] premiums. If farmers are not part of the programme [indirect suppliers], they cannot get paid' *MAN-G03*. 'If farmers do not comply, we buy as conventional, meaning they will not get [cash] premium, which pushes them to comply' (*TRA-G03*). Payment of living income for cocoa farmers is widely advocated as a means of alleviating poverty. While companies have made public statements in support of farmers earning living income, our findings reveal inadequacies in companies' FSPs in meeting this benefit-sharing criterion (mean = 0.41). This highlights the need for industry-wide improvements in benefit-sharing practices. The overall low numbers of farmers engaged and exclusion of many actors (indirect suppliers) results in moderate effectiveness and equity.

Under the enabling condition pathway, companies are investing in capacity building of farmers in the form of training in

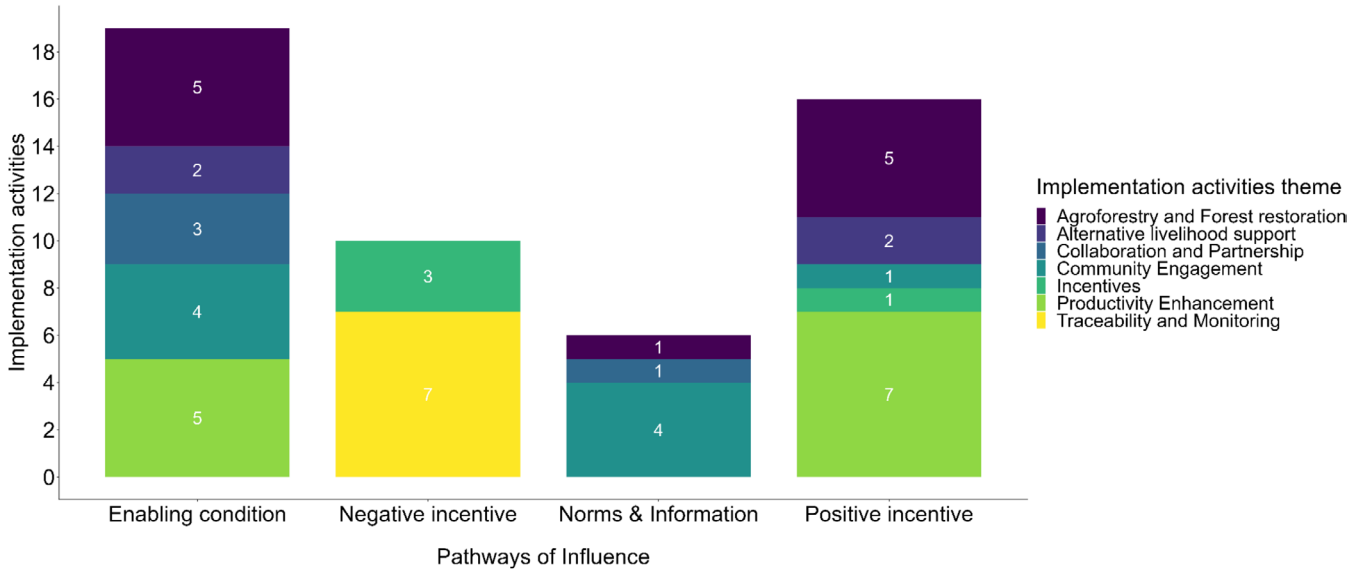

FIGURE 2 | Implementation activities grouped by pathways of influence. This figure shows the number of activities identified through interviews and company reports across all companies. It is important to note that this count reflects only the presence of activities, not the quality of their implementation. Additionally, some activities may span multiple pathways.

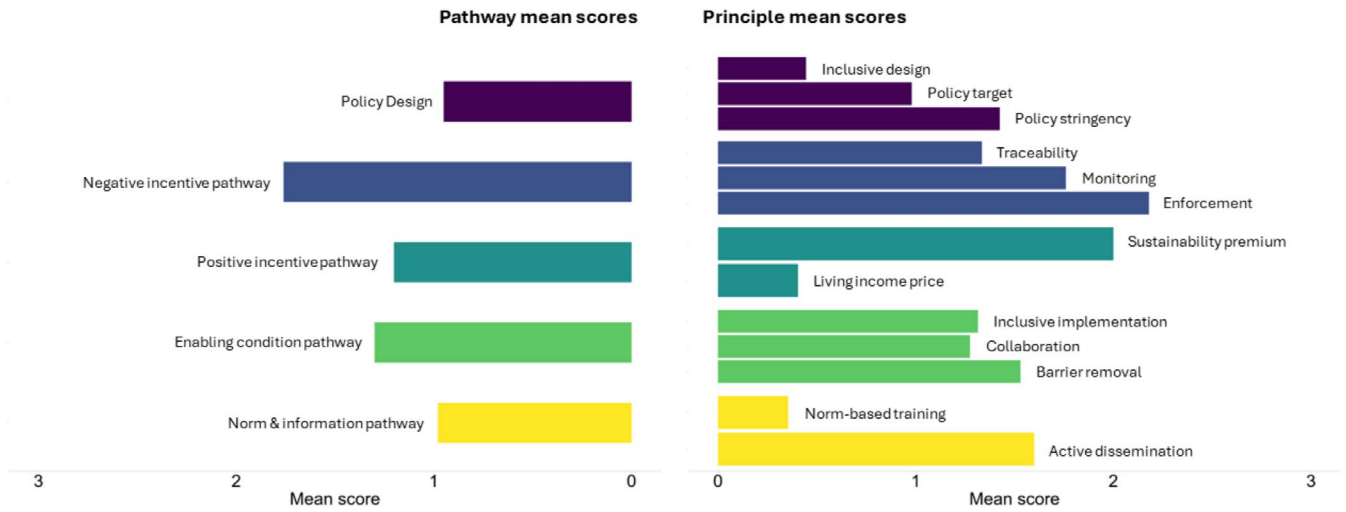

FIGURE 3 | Mean scores of companies on effectiveness and equity principles within pathways of influence. The "Principle Mean Scores" panel presents the mean scores of effectiveness and equity principles based on their respective criteria (see Table 1 and Appendix 3 for details on the criteria and their corresponding mean scores, grouped under each principle). The "Pathway Mean Scores" panel shows the mean scores for all companies across the pathways of influence and policy stages, including policy design and implementation. These pathways comprise negative incentives, positive incentives, enabling conditions, and norms and information pathways.

good agricultural practices. However, our findings reveal that most of the capacity building is geared towards increasing productivity of cocoa farms such as good farm management (e.g., pruning, weeding, pest control). For example, a representative of one trading company in Côte d'Ivoire explained: 'We have what we call FDP—farm development plan. The aim of the tool is to increase productivity by 20% each year. The lead farmers have to do the diagnostics of the farm; the soils, the household and so forth and then he has to produce a plan that the farmer has to follow; he has to do the coaching that the farmer has to follow to do [get] the good yields' (*TRA-C04*). Few companies also provide training on agroforestry and forest conservation for farmers identified to be in high-risk areas such as proximity to protected areas.

Support to farmers to attain legal/tenure rights over their lands and trees, which are important for farmers to invest in sustainable farming practices (Schulte et al. 2020), was found to be insufficient to achieve effectiveness and equity (Supporting Information), although companies acknowledged it is important. The few companies who reported implementing land and tree tenure interventions are doing so on a pilot basis because of the cost and complexities that require state collaboration and interventions (Tropenbos International et al. 2023). We found some level of involvement of smallholder farmers in the implementation of FSPs (mean = 1.32) particularly in Côte d'Ivoire through farmer cooperatives instead of community-level institutions and independent community organisations.

Companies also showed partial sufficiency in relation to collaboration and partnerships with government institutions and competitors (mean = 1.23). Although all the companies we assessed are signatories to the CFI, which aims to bring companies together to work towards achieving sustainable cocoa production, our findings indicate they rarely engage in pre-competitive landscape-level collaboration in the implementation of their FSPs (Supporting Information). Most companies also tend to rely on third-party organisations for the implementation of their FSPs, with less collaboration with state institutions working in the cocoa and forest sectors. As a result, the overall enabling conditions pathway has moderate potential equity, but low overall potential effectiveness.

Lastly, the norms and information pathway of FSP implementation across companies was found to be the most insufficient (mean = 0.98) to achieve effectiveness and equity. Companies' activities are partially sufficient (mean = 1.60) to disseminate their policies through awareness and sensitisation activities. These activities are typically integrated into companies' broader capacity building initiatives, with a strong emphasis on enhancing productivity as explained by one sustainability manager, 'As part of our training, we have the good environmental training and climate smart agriculture training, to provide to our farmers to ensure that they adopt good practices with regard to forest protection, but also with regard to not extending their farms in HCS or HCV' (*MAN-G01*). On the other hand, the use of norm-based interventions and training to activate or strengthen farmers' or communities' pro-conservation values and norms by linking conservation to community-level wellbeing benefits was almost absent in the implementation of FSPs (mean = 0.36). Although companies do inform farmers about the importance of having trees and not clearing forest, information-sharing usually takes the form of threat of exclusion, which falls under the negative incentive pathway, or material benefit of improving cocoa productivity, a positive incentive pathway activity.

4.3 | Differences Between Countries and Company Types

In comparing companies' FSP implementation activities between Ghana and Côte d'Ivoire, we observed minimal variation across the effectiveness and equity principles as well as the pathways, except for the collaboration principle (pre-competitive landscape collaboration and public sector collaboration)

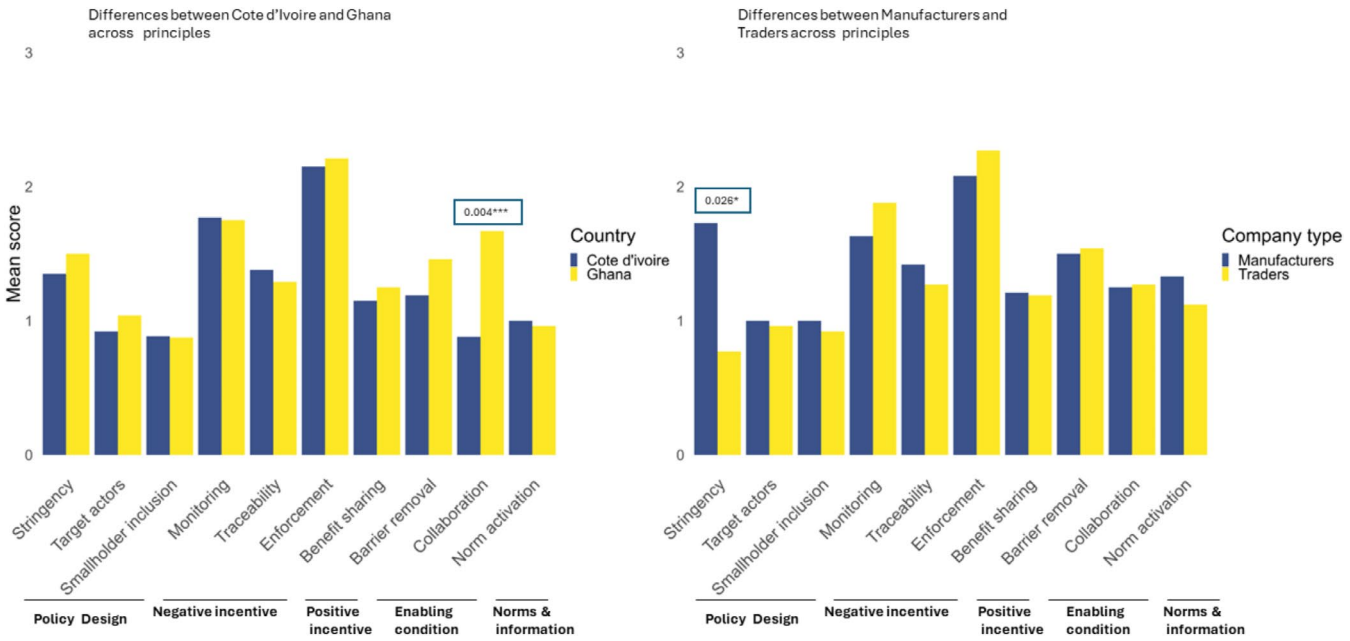

FIGURE 4 | Mean scores achieved by companies on each evaluation principle of effectiveness and equity, categorised by country (on the left) and company type (Manufacturers and Traders on the right). The collaboration principle showed a significant difference at $p = 0.004$*** between Ghana and Côte d'Ivoire, while the policy stringency principle showed a significant difference at $p = 0.026$** between the manufacturers and traders. Level of significance: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$

(Figure 4). A Wilcoxon sum-ranked test of difference in means (Table 3) revealed a significant difference between countries on collaboration principle, where companies operating in Ghana perform better in collaborating with other companies and state institutions compared to companies in Côte d'Ivoire. Eight of the 12 companies in Ghana were found to be involved in at least one pre-competitive landscape project, the Asunafo-Asutifi landscape project, which is being spearheaded by the World Cocoa Foundation in collaboration with two state institutions, the Forestry Commission and the Ghana Cocoa Board (COCOBOD) (TFA et al. 2022). Conversely, no such collaboration was observed in Côte d'Ivoire, where companies tended towards individual landscape projects such as the Cavally Forest landscape project led by Nestle.

Similarly, there was minimal variation between cocoa trading companies and chocolate manufacturing companies across the effectiveness and equity principles except in policy design, where we observed a significant difference on the stringency principle. Chocolate manufacturing companies appeared to have more stringent policies than cocoa trading companies, particularly on the deforestation reduction target. We found for instance that most manufacturers have committed to a zero gross deforestation target while most traders usually do not specify their targets.

5 | Discussion

5.1 | Narrow Targets, Scope and Inclusion

Our study found that companies' existing FSPs in the cocoa sector have very narrow deforestation reduction targets and forest definitions. While some companies, mostly chocolate manufacturers, have a 'zero gross' deforestation target in their FSPs, committing to avoid any form of deforestation (Brown and Zarin 2013; Garrett et al. 2019), the operationalisation of their FSPs in practice reveals that the primary focus is on avoiding cocoa-related deforestation in protected areas. The monitoring and enforcement efforts of companies, including farm mapping and satellite monitoring, mostly aim at preventing farmers from encroaching into protected areas for cocoa. In doing so, companies cite the land use laws of Ghana and Côte d'Ivoire, which only prohibit deforestation in protected areas. The reliance on legal definitions of forest, instead of scientific and comprehensive definitions including HCS and HCV, casts doubt on the effectiveness of current FSPs in the cocoa sector because the 'illegal deforestation' target is the least stringent of all deforestation reduction targets (Garrett et al. 2019). This means cocoa produced on cleared forest or land of high conservation value outside protected areas can be classified as compliant with companies' policies, leading to potential greenwashing.

FSPs that replicate the existing legal forest protections, for example, zero-deforestation in protected areas, can help enforce public policies, but will have significantly lower additionality than those moving beyond the bare minimum of complying with narrow legal frameworks (Garrett et al. 2016; Lambin et al. 2014). This situation, whereby company commitments are downgraded in ambition to align with local legal contexts, is not unique to cocoa. Similar issues have been observed in the palm oil sector in Indonesia, the Brazilian Cerrado soy sector, and the Brazilian Amazon cattle sector. In Indonesia, for example, deforestation-reduction efforts are targeted on concessions and forest estates, resulting in spillovers to off-concession and off-estate areas (Grabs and Garrett 2023; Heilmayr et al. 2020). In the soy sector, many companies have committed to global zero-deforestation policies on paper, but implementation has been

TABLE 3 | Wilcoxon sum-ranked test of difference in means of companies' scores between countries (Ghana and Côte d'Ivoire) and company type (manufactures and traders).

	Company type			Country		
Effectiveness equity principle	**Manufacturer ($N=12$)**	**Traders ($N=13$)**	***p* (0.05)**	**Côte d'Ivoire ($N=13$)**	**Ghana ($N=12$)**	***p* (0.05)**
Policy target	1.00	0.962	0.814	0.923	1.042	0.427
Policy stringency	1.729	1.135	0.026**	1.346	1.500	0.620
Monitoring	1.625	1.884	0.442	1.769	1.750	0.909
Traceability	1.417	1.269	0.409	1.385	1.292	0.582
Enforcement	2.083	2.269	0.345	2.154	2.208	0.883
Smallholder inclusion	1.000	0.769	0.367	1.051	1.056	1.00
Barrier removal	1.500	1.538	0.796	1.346	1.708	0.152
Benefit sharing	1.208	1.192	0.948	1.154	1.250	0.518
Collaboration	1.250	1.231	0.955	0.885	1.667	0.004***
Social norms	1.333	1.115	0.232	1.115	1.333	0.382

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

restricted to the Amazon biome (Gollnow et al. 2022), resulting in leakage to the Cerrado and other biomes nearby (Heilmayr, et al. , 2020; Villoria et al. 2022). In the Brazilian Amazon, many companies have signed Terms of Adjustment of Conduct with the state prosecutors' office, agreeing to tackle deforestation in their supply chains. However, these policies are limited to legal alignment only, not zero-gross deforestation (Cammelli et al. 2022; Levy et al. 2023).

We also found that all FSPs primarily focus on farmers in their direct supply chains and farm-level outcomes as the policy target. Although some companies reported leading landscape-level interventions such as [3]Hotspot Intervention Areas (HIAs) in Ghana, these are generally one-off projects led by an individual company from a given supply chain tier in a single sourcing area. Companies rarely engage in precompetitive, cooperative landscape-level interventions across their sourcing regions that would be needed to drive change at ecologically and socially relevant scales, despite civil society efforts to coordinate and encourage companies to work collaboratively at this scale (CFI 2017; TFA 2023). A lack of focus on cooperating at the landscape scale means companies' FSPs largely miss farmers engaged in indirect supply, which constitutes about 60% of the supply chain (Guye 2024; Renier et al. 2023). This challenge has been similarly observed in palm oil, cattle and soy supply chains (Cammelli et al. 2022; Chandra et al. 2024; zu Ermgassen et al. 2022), where the focus on direct suppliers has led to a significant portion of the forests lying outside companies' sourcing areas remaining unprotected by any private sector policies.

Another challenge with focusing on direct suppliers at the farm level is that it does not match the scale of the environmental challenges. Much of the remaining forests are not on individual farms, but rather in nearby community forests and protected areas. The narrow focus on individual suppliers exacerbates problems with leakage and displacement, in this case within the local implementation region. Farmers allocate all cleared land to cocoa cultivation to reach compliance with the zero-deforestation agreements, then displace food crop production to protected forest areas, to meet their food security requirements (Addoah et al. 2023; Ajagun et al. 2022; Renier et al. 2025).

The lack of landscape-level targeting also affects companies' monitoring, enforcement, and traceability efforts. This is because accurate and real-time monitoring and enforcement of the entire supply base of a company is not always feasible (Fripp et al. 2023). The cocoa supply chain is complex, consisting of several thousands of smallholder producers with small farms of 2–5 ha (Bymolt et al. 2018). Farmers may produce cocoa on multiple farms, and then mix the cocoa beans before selling them to various intermediaries (Dontenville et al. 2022). While some of these farms may be registered to a company's sustainability programme and therefore monitored and traced (direct suppliers), others may not. Additionally, at the cooperative or local trader level, the cocoa beans are also mixed, further challenging traceability (Nitidae 2021; Stoop et al. 2021). In Ghana, for example, the second largest LBC, a state-owned company, does not have any FSP and buys all forms of cocoa from farmers which are later sold to exporters with FSPs through the state-owned Cocoa Marketing Company (CMC). These complexities in the cocoa supply chain—which have also been reported in various other supply chains (zu Ermgassen et al. 2022) but especially in the palm oil sector (Lyons-White and Knight 2018), makes the narrow focus of companies' FSPs on their direct suppliers at the farm level ineffective in addressing the sustainability challenges in the cocoa sector.

5.2 | Insufficient Inclusion of Smallholders and Limited Benefits

Our study found that the current inclusion of smallholders in the policy-making process is insufficient to achieve effectiveness

and equity of companies' FSPs. While some companies reported consulting farmers at certain stages, farmers' involvement is often limited to stating their preferences for community development interventions such as construction of boreholes and alternative livelihood interventions or selecting tree species for agroforestry. Key aspects of the design of companies' FSPs such as deforestation monitoring, enforcement, and traceability are top-down in nature and less inclusive. For instance, farm mapping for traceability and monitoring rarely involves cocoa farmers. Instead, companies pay external agents to visit farms for mapping, rather than training farmers to map their own farms. Most farmers we engaged with in the field reported a lack of knowledge about the rationale for farm mapping and complained of fatigue from repeated visits by company agents.

When farmers are excluded from policy design, they have less understanding and ownership of the programs, reducing their motivation to comply. Previous studies on certification programs show that insufficient farmer participation can undermine sustainability efforts (Ansah et al. 2020; Bymolt et al. 2018). In their study of smallholder participation in sustainable cocoa certification programmes in Ghana, Ansah et al. (2020) found that cocoa farmers lack adequate information about certification processes, are disconnected from managing price premiums, and are excluded from compliance verification. A similar lack of inclusion in companies' FSPs have been reported in the palm oil (Chandra et al. 2024; Eggen et al. 2024; Lyons-White et al. 2025), and cattle sectors (Cammelli et al. 2022). In one study in Sumatra, Indonesia, Chandra et al. (2024) found that less than 10% of the smallholder farmers in the supply chains of firms with no peat, no deforestation, no exploitation FSPs even know that the policies exist. These failures to include farmers risk undermining FSPs' legitimacy, reduce opportunities to promote participation and compliance, and increase the potential to promote bifurcated markets for conventional and sustainable commodities (Cammelli et al. 2022; Lyons-White et al. 2025; Chandra et al. 2024).

Training and capacity building for cocoa farmers to map their own farms could also help legitimise companies' farm mapping and monitoring activities, making them more inclusive and minimising data errors. This would address challenges related to the unfair exclusion of farmers due to a lack of understanding of local nuances of land tenure (Meridia & Rabo Foundation, 2024). Some studies have underscored the importance of community monitoring in forest conservation, including in West Africa (Christensen et al. 2021). For instance, one study in the Peruvian Amazon found that combining community monitoring with remote-sensing technology may reduce tree cover loss (Slough et al. 2021).

Companies also fall short of paying farmers a living income wage. Only one manufacturer reported paying farmers the 'Fairtrade living income reference price'; the others rely solely on the sustainability or certification premiums provided in their sustainability programs. However, sustainability or certification premiums alone cannot bring substantial improvements in the living conditions of cocoa farmers (Boysen et al. 2023). Given that about 78% of cocoa farmers in Ghana and Côte d'Ivoire earn less than a living income (van Vliet et al. 2021), paying cocoa farmers a living income reference price—as advocated by some civil society organisations, will be needed to address the high level of poverty and deforestation in the cocoa sector, and help achieve the sustainable development goal of no poverty (SDG1) and life on earth (SDG 12) (UN 2015). Addressing poverty is not only essential to the equity dimension of FSPs but has been found to have positive impacts on forest conservation in some regions (Ferraro and Simorangkir 2020; Meyfroidt et al. 2022).

5.3 | Emphasis on Negative Incentives and Productivity Over Social Norms and Systemic Changes

Companies in the cocoa sector tend to prioritise negative incentive activities, such as monitoring, traceability and enforcement. They also engage in enabling condition activities, such as capacity building on good agricultural practices and offering material incentives. The focus on monitoring, traceability and enforcement helps companies manage reputational risks, while productivity enhancement activities and material incentives are sourcing strategies to ensure consistent cocoa production and supply.

With the European Union Deforestation Regulation (EUDR) now in place, companies are expected to increase their reliance on negative incentives such as monitoring and enforcement. There is little incentive to consider the risk of unjustly excluding smallholder farmers from supply chains when they have no ability to comply, or to compensate them for the additional burden. While trade-offs between effectiveness and equity may be unavoidable (Grabs and Garrett 2023), this inequity also risks undermining the long-term effectiveness of FSPs' due to the potential for challenges discussed earlier with legitimacy, participation and compliance and leakage (Cammelli et al. 2022; Lyons-White et al. 2025). This is further exacerbated by the lack of reliable national forest monitoring and traceability systems, as well as ambiguity surrounding the boundaries of some protected forests and admitted farms[4]. These relationships between the effectiveness and equity of FSPs require further investigation.

Cocoa FSPs often follow the logic that by assisting farmers in improving the productivity of their existing cocoa farms, yields will increase, leading to higher incomes for farmers. These higher incomes would discourage farmers from expanding their farms into forested areas (Amiel and Laurans 2019). Some researchers also argue that enhancing cocoa farm productivity is essential for farmers to achieve a living income (van Vliet et al. 2021). Yet, others argue that solely emphasising productivity through intensification has not effectively reduced deforestation or alleviated poverty among cocoa farmers (Fountain and Huetz-Adams 2022; Odijie 2018), particularly because many productivity improvement initiatives, such as good agricultural practices training, do not directly address deforestation (Grabs et al. 2021) and cocoa yield has remained consistently low over the years (Asante et al. 2021). This approach also has the potential to contribute more to deforestation through a rebound effect where more forests are cleared to cultivate cocoa (García et al. 2020; Pelletier et al. 2020).

5.4 | Policy Recommendations

5.4.1 | Expand Forests and Actors Covered

To improve impact on forest conservation companies must adopt more comprehensive definitions of forests and include off-reserve areas in their FSPs (Garrett et al. 2019). Companies must also extend implementation to indirect suppliers (zu Ermgassen et al. 2022).

5.4.2 | Move to a Landscape Approach

Companies should adopt a landscape approach whereby companies sourcing from the same landscape or jurisdiction engage in a pre-competitive collaboration as well as with state institutions to extend zero-deforestation, agroforestry monitoring and capacity building to broader scales. This approach will not only help address challenges with off-reserve areas and indirect suppliers, but it can also mitigate the issue of displacement of food crops into protected areas (Addoah et al. 2023; Renier et al. 2025). A landscape approach can also address equity concerns associated with the EUDR including the potential abandonment of smallholder producers deemed to be 'at-risk' of non-compliance in favour of compliant farmers or areas (Angel and Kurniawati 2023).

Additionally, a pre-competitive landscape approach has been argued to be cost efficient and can lead to economies of scale for activities such as deforestation monitoring and traceability, if companies come together to share expertise and resources while working with government and non-government institutions (Meyer and Miller 2015; TFA 2023). Furthermore, considering the vertical integration of the cocoa sector where a few companies control a significant portion of the market, these companies have the ability to influence certain standards of practice including landscape level interventions (Bakhtary et al. 2020).

5.4.3 | Change and Activate Social Norms

To achieve sustainable cocoa production, companies must include non-material incentives in their FSP implementation. These incentives should highlight the cultural, social and ecological importance of forest conservation, alongside the material incentives typically offered. This balanced approach is important because solely emphasising material benefits, such as enhanced yield and premiums, can undermine the inherent motivations for conservation among farmers or land users who, for various reasons, choose not to engage in deforestation (Garrett et al. 2022; Maguire-Rajpaul et al. 2022).

We recommend leveraging social norms to promote sustainable farming practices among smallholder cocoa farmers. Companies should implement interventions that emphasise the intrinsic value of forests and link conservation to community well-being and pro-social values. Social norms theory posits that individuals adopt environmentally responsible behaviours when they feel such actions are expected and valued within their community (Cialdini et al. 1991).

In West African cocoa production, social norms around land use and deforestation are intertwined with cultural and economic practices. Smallholder farmers often prioritise short-term gains due to livelihood pressures, but activating sustainable land management norms—combined with education, incentives, and community-driven enforcement, can be effective (Pretty 2003). By engaging with cultural values around land stewardship, companies can encourage social norms that discourage deforestation.

To activate these norms, companies should collaborate with and empower community-based organisations, trusted advocacy groups and other non-state actors through enabling conditions and the norms and information pathways. These 'norm entrepreneurs' (Börzel and Risse 2012; Dawson et al. 2018) can amplify local values and foster engagement. Initiatives may include supporting local organisations like farmer cooperatives and community-based natural resource management groups, celebrating local conservation efforts, and highlighting the long-term benefits of sustainable practices for future generations.

5.4.4 | Invest More in Smallholder Inclusion

To address the issue of deforestation effectively and equitably in the cocoa sector, it is imperative that company policies and regulations consider the inclusion of smallholder farmers who are their intended recipients. The active representation and participation of farmers in the decision-making process of setting the rules and regulations is important. The inclusion should not only be focused on companies' direct suppliers, farmer groups, or a few community leaders, but rather should account for the diversity of farmers with different levels of access, ownership, and rights such as natives, migrants, women and sharecroppers. This will ensure legitimacy of the policies and companies' sustainability interventions. Involving farmers in the policy design helps to also identify the interests of farmers and support they may need to comply with FSP requirements (Fountain and Huetz-Adams 2022).

During the policy implementation phase, for example, training farmers in farm mapping technology and actively involving them in mapping, deforestation monitoring, and enforcement activities could lead to more effective and inclusive participation of local communities in companies' FSPs, thereby addressing the issue of procedural equity. Moreover, rather than relying solely on satellite-based monitoring of deforestation and enforcement efforts, which may inadvertently exclude certain communities due to local complexities such as unclear land tenure, companies should consider supplementing this approach with community engagement through peer check systems and community-based reporting (Gaveau et al. 2017). This will make monitoring less intrusive and more accurate, as well as identifying the drivers and motivations of farmers encroaching into forests, informing the design of solutions that are locally feasible (Beaudoin et al. 2016; Maguire-Rajpaul et al. 2022; Wong et al. 2022).

5.4.5 | Promote Sustainable Livelihoods Over Cocoa Yields

Companies must look beyond increasing cocoa productivity as the main solution to address deforestation and poverty. Helping farmers increase income through higher cocoa prices, value added activities and product diversification is essential.

Agroforestry has the potential to assist in diversification, but only if the species disseminated go beyond timber species.

6 | Conclusion, Limitations and Future Research

Our analysis of companies' FSPs in the cocoa sector of Ghana and Côte d'Ivoire reveals significant shortcomings in the current design and implementation of these policies to equitably and effectively address deforestation. We found that, on average, existing design and implementation of FSPs in the cocoa sector are unlikely to be effective and equitable due to: (i) narrow target and inclusion of smallholder farmers of the policy design, (ii) inadequate benefit sharing for farmers, (iii) overreliance on productivity enhancement as the theory of change of achieving deforestation-free cocoa and (iv) lack of emphasis on norms in the current implementation of companies' FSPs. To foster more sustainable cocoa production, the design and implementation of FSPs must show a greater mix of approaches that directly and indirectly tackle deforestation, while also protecting the livelihoods of those involved. To meet the requirements of deforestation regulations like the EUDR and contribute meaningfully to the sustainable development agenda, companies should ensure that their FSPs are co-designed and co-implemented with smallholder farmers. Adequate benefit sharing, such as payment of the living income reference price to farmers, should be a priority. Furthermore, specific interventions should aim to strengthen pro-conservation values within farming communities, ensuring that norms and social dynamics play a key role in policy success. Importantly, policies must go further than a focus on cocoa yields, agroforestry, and deforestation towards a focus on landscape approaches and economic diversification if they want to tackle the root causes of poverty and environmental degradation in the GFWA.

Some limitations in our study offer a direction for future research. First, our understanding of how companies' FSPs are implemented, and their potential impacts could be improved by conducting a causal impact evaluation of company FSPs. However, carrying out such evaluations would require companies to be willing to share data and information about their interventions. Second, our study focused on signatories of the CFI, which includes many of the largest companies in the cocoa sector. While this focus was strategic, it may have overlooked the efforts of smaller companies that also contribute to sustainable cocoa production. Future research could examine the role of these smaller actors and assess how their sustainability efforts compare with those of CFI signatories.

Additionally, given the cross-sectional nature of this study, longitudinal research would be beneficial to track the long-term effects of FSPs over time and assess how these policies evolve alongside changes in the cocoa sector. Lastly, future research could explore how engaging farmers in the FSP design and implementation process could activate social norms and improve the effectiveness of interventions at the farm level.

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Endnotes

[1] LBCs are companies (local and international) that have been issued a licence by the Ghana Cocoa Board (COCOBOD) to purchase cocoa beans directly from cocoa farmers on behalf of COCOBOD.

[2] Companies were interviewed on the basis of confidentiality and agreed not to disclose their identity. The companies' sustainability reports, policies and commitments are all public information that are available on the companies website.

[3] Hotspot Intervention Area (HIA) are target landscape for the implementation of Ghana's Cocoa and Forest REDD+ Programme (GCFRP) including climate-smart cocoa production. They are created based on deforestation trends, cocoa production, drivers of deforestation, potential scale of impacts and presence of stakeholders (Mason et al. 2016)

[4] Admitted farms are lands within a particular forest reserve that were recognized as existing farmlands during the creation of the reserve and given legal status as farmland (Kumeh et al. 2022).

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.