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The role of intermediaries in the implementation of sustainability standards. A case study of buyer-driven Rainforest Alliance certification in the Indonesian cocoa sector

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ABSTRACT

Voluntary Sustainability Standards (VSS) are private governance instruments that promote sustainable development in global production systems. In smallholder-dominated agricultural sectors such as cocoa, VSS often operate through group certification driven by buyers (companies or cooperatives). These buyers act as intermediaries that implement VSS through enforcement, incentives provision, and capacity-building pathways to ensure producers' compliance with VSS rules related to sustainable production practices. Despite growing recognition of their importance, the role of these intermediaries has largely remained underexplored. This paper investigates how buyers driving certification implement VSS, how they differ in doing so, and how these differences matter for implementation performance, i.e. the extent to which producers are exposed to implementation pathways. Applying the regulatory intermediation (RIT) framework, we conduct a comparative case study of the implementation of the Rainforest Alliance by three distinct buyer companies driving group certificates in the Indonesian cocoa sector, based on 43 interviews, three focus group discussions, field observations, and survey data from 228 certified farmers. We find that buyers driving certification are crucial intermediaries in VSS implementation and engage an array of sub-intermediaries to perform different implementation functions. The resulting structures of intermediation and the capacities of (sub-)intermediaries vary and matter for implementation performance: in particular, structures with fewer intermediaries that hold operational capacities, independence, expertise, and legitimacy enhance performance. This might bring us closer to understanding why some producers might alter their behavior more than others towards compliance with VSS rules. By unpacking the "black box" of buyers driving group certification in VSS implementation, our research informs both scholarship and policy efforts aimed at enhancing the effectiveness of VSS in achieving sustainability goals, and contributes to a better understanding of the role of buyers in global sustainability governance.

1. Introduction

Voluntary Sustainability Standards (VSS) are private, market-based governance instruments aiming to foster sustainable development in global production systems (Auld et al., 2008; Cashore et al., 2004). VSS develop rules related to sustainable production practices and operate on a certification logic whereby producers can gain a certificate and associated market access and price benefits for their products upon compliance with these requirements, assessed (usually) by an accredited third-party certification body (Marx et al., 2022; Oya et al., 2018). VSS have become prominent sustainability governance instruments in the past three decades, most importantly in (tropical) agricultural sectors, and especially in sectors characterized by smallholder production (Kemper et al., 2024; Marx et al., 2024). The cocoa sector, which accounts for the livelihoods of 5 to 6 million producers globally, 90 % of whom are smallholder farmers cultivating an area of 5 ha or less (Bermudez et al., 2022), is the sector in which certification is most prevalent, with an estimated 31.4 % of global production area (representing about 3.65 million hectares) being certified in 2022 (Kemper et al., 2024). One VSS in particular, the Rainforest Alliance, certifies 28 % of global cocoa production area alone (Kemper et al., 2024).

In smallholder-dominated agricultural sectors such as cocoa, VSS typically operate through group certification (Kemper et al., 2023). This type of certification enables to certify a group of producers (such as

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smallholder farmers) collectively rather than individually. This model reduces certification costs by distributing them across the group, thereby improving smallholders' access to certification and its associated benefits (Pinto et al., 2014; Steidle & Herrmann, 2019). Group certification is often buyer-driven, whereby an actor higher up the value chain – such as a cooperative, a trading company, or a processing firm – takes up the VSS certificate (usually becoming the "certificate holder") and organizes the implementation of certification to ensure that producers in the group comply with the VSS requirements related to sustainable production practices (Steidle & Herrmann, 2019). These actors hence act as intermediaries between VSS and producers: they convey VSS rules related to sustainable production practices to producers in the field, and ensure and enable these latter's compliance with these rules by performing key implementation functions such as monitoring and compliance assessment, premium distribution, and training provision, prescribed by VSS.

Recent research has emphasized how producers' exposure to different implementation pathways – including enforcement (e.g., compliance assessment), incentives (e.g., premium), and capacity-building (e.g., trainings) – matters to ensure their compliance with VSS requirements related to sustainable production practices (Auld et al., 2015; Batistic et al., 2024; Depoorter & Marx, 2023; Dietz et al., 2019; Grabs, 2020) and avoid "policy-practice decoupling", i.e. a gap between rules on paper and actual practices (Meyer & Rowan, 1977; Wijen, 2014). Variation in exposure to these pathways might in turn contribute to elucidating part of the heterogeneity in the sustainability impacts of VSS by influencing the degree to which producers comply with VSS requirements (Garrett & Pfaff, 2019; Oya et al., 2018).

Yet, existing studies have examined implementation pathways largely in isolation from the actors who deliver them. In particular, the role of buyers driving group certification as central actors in the implementation of VSS remains a "black box" (Chiputwa et al., 2015; Grabs, 2020, p. 195; Sellare et al., 2020). While their importance in VSS implementation and in sustainability governance in global value chains more broadly has been increasingly acknowledged (Grabs et al., 2024), little is known about how they implement certification and deliver implementation pathways to producers. As such, examining the intermediary role of buyers is essential to uncover intra-standard variation in compliance and, possibly, in sustainability impacts further along the causal chain.

To fill these gaps, this paper explores how buyers driving certification implement VSS and assesses their performance therein, defined as the extent to which producers are effectively exposed to implementation pathways. To do so, we apply insights from theories on the role of intermediaries in transnational regulatory governance (Abbott et al., 2017b; Brès et al., 2019; Marx & Wouters, 2017). The intermediation literature provides a useful framework to analyze the actors involved in the implementation of regulatory processes such as VSS and understand their functions and interactions. We combine this actor-centric framework with insights from the VSS literature delineating implementation pathways (enforcement, incentives, and capacity-building) to answer the following questions: how do buyers driving certification, as intermediaries, implement VSS? How do they differ in doing so? And how does this matter for performance in VSS implementation?

To answer these questions, we conduct an in-depth comparative case study of the implementation of the Rainforest Alliance Sustainable Agriculture Standard (henceforth "RA") by three distinct buyers driving their respective group certificates in the cocoa sector in South Sulawesi, Indonesia, along the three implementation pathways. Based on 43 interviews, three focus group discussions, field observations, and household survey data including 228 certified farmers collected in 2022, we analyze and compare how these three buyers implement RA.

This paper finds that buyers driving certification are crucial intermediaries in VSS implementation. In particular, by applying the regulatory intermediation framework, it highlights that these actors engage an array of sub-intermediaries that perform different implementation functions aiming to foster compliance with VSS standards through the three implementation pathways. The resulting structures of intermediation and the capacities of intermediaries vary across group certificates and matter for implementation performance. In particular, structures with fewer intermediaries that hold operational capacities, independence, expertise and legitimacy enhance performance and ensure that producers are effectively exposed to enforcement, incentives and capacity-building pathways.

We advance the understanding of VSS implementation by opening the "black box" of buyers driving group certification. Conceptually, we contribute to the literature on VSS implementation by conceptualizing these actors as key intermediaries in VSS implementation. Empirically, we make a contribution to the growing research agenda on the role of buyers as crucial supply chain sustainability governance actors.

This paper is structured as follows. Section 2 first outlines the literature on regulatory intermediation as an actor-centric analytic framework to understand VSS implementation, with a focus on the capacities of intermediaries and structures of intermediation. It then discusses the literature on VSS implementation and delineates three distinct implementation pathways and related functions that intermediaries can perform to ensure producers' compliance. Section 3 introduces our case study on the Rainforest Alliance in the Indonesian cocoa sector. Section 4 describes the data and methods. Section 5 presents the results, detailing the intermediation structures in VSS implementation (Section 5.1) and their comparative performance (Section 5.2) across three buyer-driven certified groups. Section 6 discusses the results by focusing on capacities of intermediaries and structures of intermediation in relation to implementation performance. Section 7 concludes by suggesting avenues for future research and policy implications.

2. Analytic framework: Intermediation in VSS implementation

In this section, we introduce our analytic framework starting from the theory of regulatory intermediation, which highlights the crucial role of intermediaries in rule implementation. Then, drawing on the VSS literature, we operationalize rule implementation in the context of VSS by identifying three distinct implementation pathways or approaches through which compliance with VSS rules can be ensured. Each pathway comprises distinct implementation functions, which can be performed by different intermediaries. We posit that this matters for implementation performance, defined as the extent to which producers are effectively exposed to these implementation functions.

2.1. Regulatory intermediation

The emerging literature on regulatory intermediation provides a useful framework of analysis to open the "black box" of VSS implementation by buyers driving group certification. Its starting point lies in the distinction, in the institutional literature, between the macro-institutional level where rules are developed by *regulators*, and the micro-institutional level where rules need to be complied with by rule *targets* (North, 1990; Ostrom, 2005). The gap between these two levels is fulfilled by *intermediaries* that play a key role in translating and implementing the rules, thereby bridging the regulators and the targets (Abbott et al., 2017b; Ménard et al., 2022). This three-party conceptualization of the regulatory process is represented in Abbott et al.'s (2017b) "Regulator-Intermediary-Target" or RIT model (Fig. 1). Accordingly, an intermediary is "any actor that acts directly or indirectly in conjunction with a regulator to affect the behavior of a target" (Abbott et al., 2017b, p. 19). Regulatory intermediation is hence "a process through which regulation is brought to the target through a

$$\mathbf{R} \rightarrow \mathbf{I} \rightarrow \mathbf{T}.$$

Fig. 1. Basic RIT model (Abbott et al., 2017b).

series of mediating activities" (Brès et al., 2019, p. 129) or *functions* such as, but not limited to, accreditation, compliance assessment and monitoring, data collection, distribution of incentives, training, and information provision (Abbott et al., 2017a; Ménard et al., 2022; Pegram, 2017). Importantly, intermediation and heterogeneity therein can help explain why targets subject to the same rules might display different compliance levels (Marx & Wouters, 2017; Ménard et al., 2022).

Several recent theoretical and empirical contributions have advanced the RIT literature. Of particular relevance to understand VSS implementation by buyers driving group certification and their performance therein are the *capacities* of intermediaries and the *structures* of intermediation.

First, four key *capacities* of intermediaries are typically delineated and explain why intermediaries emerge in the regulatory process (Abbott et al., 2017b). These capacities include: operational capacities (resources, staff, access to targets), expertise (specialized knowledge about rules and how to implement them in a specific context), independence (autonomy and absence of conflicts of interests), and legitimacy (perception of appropriateness by relevant audiences) – although the definition and exact delimitations of these capacities are subject to nuances (see for example Abbott et al., 2017a; Auld & Renckens, 2025; Mena & Palazzo, 2012; Suchman, 1995). Intermediaries emerge in the regulatory process because they provide these additional capacities which regulators may lack, thereby enhancing the effectiveness of the regulatory process (Abbott et al., 2017a).

A second important contribution to the regulatory intermediation literature lies in demonstrating that different *structures* of intermediation can emerge, where the link between the regulator and the target is operated not by a single intermediary but by several intermediaries (Abbott et al., 2017a). Intermediaries can operate different functions in parallel to one another, but can also delegate specific functions to "sub-intermediaries", thereby generating "chains of intermediaries" (De Silva, 2017; Havinga & Verbruggen, 2017; Marx & Wouters, 2017). Sub-intermediaries can be independent entities separate from the initial intermediary, or dependent actors embedded within the initial intermediary organization (Auld & Renckens, 2025; Galland, 2017; Lytton, 2017; for further distinctions on types of intermediaries, see Brès et al., 2019). Intermediaries and sub-intermediaries operating different implementation functions can hence together generate complex structures of intermediation in a given regulatory process (Abbott et al., 2017a).

Several contributions have applied the RIT model to the VSS context. These studies typically conceptualize VSS as *regulators* (developing rules related to sustainable production systems) and certified entities as *targets* (complying with VSS rules), and tend to focus on specific *intermediaries*, typically accreditation bodies and certification bodies, studying their functions (accreditation and compliance assessment), capacities, and interactions (Auld & Renckens, 2017; Brès et al., 2019; Fransen & LeBaron, 2019; Galland, 2017; Loconto, 2017; Lund-Thomsen et al., 2021; Lytton, 2017). Yet, in group certification typical in smallholder-dominated agricultural sectors, while buyers driving certification are themselves partly *targets* as they need to comply with some VSS rules related to management and value chains obligations, they are also essential *intermediaries* conveying VSS rules related to sustainable agricultural production practices to producers in the field (indeed, Abbott et al., 2017a, note that "the boundaries among R, I, and T are not always clear-cut; the roles overlap and interact" (p. 283); for further studies on the dual role of actors as both intermediaries and targets, see Erikson & Larsson, 2022; Koenig-Archibugi & Macdonald, 2017; Michel, 2025). Hence, from the perspective of VSS rules related to sustainable agricultural production practices, producers can be conceptualized as the *targets*, and buyers driving certification as the *intermediaries*. Understanding how these intermediaries implement VSS, and how they might differ in doing so, is crucial to advance knowledge on why producers might display different compliance levels even in the same VSS-commodity-region context.

2.2. VSS implementation: Pathways and functions

To more systematically analyze rule implementation by intermediaries in the context of VSS, we draw on the VSS literature which has increasingly delineated three main implementation pathways through which compliance with VSS requirements can be ensured: enforcement, incentives and capacity-building (Auld et al., 2015; Batistic et al., 2024; Boonaert et al., 2024; Depoorter & Marx, 2023; Dietz et al., 2019; Grabs, 2020; Oya et al., 2018; Tampe, 2018; Wijen, 2014). These pathways represent different yet complementary approaches through which VSS can be implemented to ensure compliance. Each pathway relies on different assumptions on potential root causes of non-compliance and can be operationalized into specific implementation functions (Depoorter & Marx, 2023; Oya et al., 2018), which can be performed by different intermediaries.

First, the enforcement pathway draws from the negative enforcement school in the compliance literature. It relies on rational choice theory, assuming that utility-maximizing actors only comply if the cost of sanctions, determined by their probability and size, outweighs the benefits of non-compliance (Becker, 1968; Downs, 1997). Through a "command and control" approach, it consists, in essence, in verifying compliance with rules and punishing non-compliance, and typically relies on functions such as compliance assessment and monitoring (Gunningham, 2010; Kaufmann, 1989). Most VSS organizations require certificate holders to hire a third-party certification body – which might itself be required to be accredited by an accreditation body – to conduct external compliance assessments through audits (Auld et al., 2015; LeBaron et al., 2017; Loconto, 2017). In group certification particularly, VSS also typically ask certificate holders to conduct regular internal monitoring and assessment of producers' compliance. In addition, data collection and traceability systems can be put in place to keep track of certified producers and their respective sales (Depoorter & Marx, 2023; Mol & Oosterveer, 2015).

Second, the incentives pathway finds roots in the positive enforcement school and its utility-maximizing assumption, but also in behavioral economics and psychology, and posits that benefits need to be generated to compensate for the costs of compliance with rules, as well as to encourage continued compliance over time (Garrett & Pfaff, 2019; May 2005; van Rooij & Sokol, 2021). VSS implementation through the incentives pathway hence refers to functions related to the distribution of rewards to producers to incentivize and compensate them for the cost of adjusting their production practices towards more sustainable ones (Dietz et al., 2019; Estrella et al., 2022; Galati et al., 2017; Grabs, 2020; Minten et al., 2018). Most commonly, such rewards may take the form of a price premium which producers receive on top of the market price for their certified products. While many VSS leave the price premium to be determined by the market or to be negotiated between buyers and producers, some VSS, such as the Rainforest Alliance or Fairtrade International, impose a specified amount for this premium to be paid by buyers to producers (Depoorter & Marx, 2023). Other incentives can also include enhanced market access, in-kind rewards such as production inputs (e.g., seedlings, fertilizers, equipment), or community investments more broadly (Boonaert et al., 2024; Oya et al., 2018; Rubio-Jovel et al., 2024).

Lastly, the capacity-building pathway emerges from a developmental and managerial approach to VSS implementation. It posits that non-compliance may be unintentional, resulting from a lack of technical, material, or financial capacity, a lack of knowledge and expertise, a lack of awareness or understanding of the rules, or a lack of fit between the rules and local conditions (Chayes & Chayes, 1998; Young, 1992). The capacity-building pathway hence involves functions related to ensuring producers' knowledge of VSS requirements and enhancing their ability to comply (Auld et al., 2015; Nava & Tampe, 2022; van Rooij, 2021), typically through the provision of trainings and information or awareness-raising activities.

The institutional design literature on VSS has explored the extent to

which VSS develop rules related to these implementation pathways. For example, several studies have analyzed VSS rules on third-party compliance assessment and audit procedures (Auld & Gulbrandsen, 2010; Auld & Renckens, 2021; Castka et al., 2020; Dietz et al., 2018; LeBaron et al., 2017; Marx, 2014), on cost-sharing arrangements and on training (Fiorini et al., 2019; Fransen et al., 2019; Schleifer et al., 2019). Overall, they show that VSS differ in their stringency, i.e. extent to which they develop rules related to these implementation pathways (Depoorter & Marx, 2023), which could partly explain variation in the extent to which producers effectively receive enforcement, incentives and capacity-building (i.e. their exposure to these implementation pathways) across different VSS.

However, importantly, even when VSS do develop rules related to these implementation pathways, many of the related obligations fall on certificate holders (or buyers driving certification in group certificates) which have remained largely overlooked. A significant body of literature has focused on the role of accreditation bodies and certification bodies performing accreditation and compliance assessments functions. These studies have repeatedly highlighted major shortcomings in these enforcement systems and how this jeopardizes producers' compliance (Auld & Renckens, 2021; LeBaron et al., 2017). Yet, certificate holders are often responsible for many VSS rules related to the different implementation pathways. How these actors implement VSS along these pathways is usually detailed in an "internal management system", which however often remains a confidential document between VSS and certificate holders (Steidle & Herrmann, 2019). Although some studies have started to acknowledge the role of certificate holders such as cooperatives in distributing premiums (Minten et al., 2018; Naegele, 2020; Ponte, 2019; Vicol et al., 2018) or in providing trainings to producers (Boonaert et al., 2024; Chiputwa et al., 2015; Minten et al., 2018; Sellare et al., 2020), the implementation of VSS by buyers driving group certification largely remains a "black box" (Grabs, 2020). This is however crucial to understand why, even when certified under a single, stringently designed VSS, producers might have different exposure to implementation pathways and functions, which can in turn influence their compliance with VSS requirements on sustainable production practices (Batistic et al., 2024; Dietz et al., 2019).

We apply insights from the RIT literature to open the "black box" of VSS implementation by buyers driving certification. Fig. 2 illustrates our analytic framework of the RIT model applied to group certification. It identifies the *regulator* (VSS) and the *targets* (producers), as well as the *intermediaries* in-between: the accreditation and certification bodies traditionally studied in both the RIT and the VSS literatures, and the "black box" of buyers driving certification (certificate holders) which we set out to unpack. The figure also specifies the relationships between these actors and their functions. We focus on how the three implementation pathways and their related functions are operated by intermediaries.

We conduct a case study of the implementation of Rainforest Alliance by intermediaries in three distinct buyer-driven group certificates in the Indonesian cocoa sector. We compare the performance of intermediation structures by measuring the extent to which producers in the respective groups are effectively exposed to the different implementation pathways and functions. We discuss performance in relation to capacities and structures of intermediation.

3. Case study: Cocoa certification in South Sulawesi, Indonesia

3.1. Indonesian cocoa sector

Indonesia is the third largest producer of cocoa (*Theobroma cacao*) after Ghana and Côte d'Ivoire, supplying over 667 thousand tons of raw beans in 2022 (FAO, 2023). Cocoa is the most certified commodity globally, with 31.4 % of global production area being certified (Kemper et al., 2024). While considerable research has been conducted on certified cocoa in Côte d'Ivoire and Ghana (e.g., Ingram et al., 2018; Lemeilleur et al., 2015; Renier et al., 2023; Sellare et al., 2020), as well as on certified palm oil and coffee in Indonesia (e.g., Bahruddin et al., 2024; Lee et al., 2020; Neilson, 2008; Vicol et al., 2018; Watts et al., 2021), certification in the Indonesian cocoa sector has received relatively scant attention (but see Wijaya et al., 2018).

The Indonesian cocoa sector is characterized by buyer-driven (Gereffi et al., 2005; Gibbon, 2001), export-oriented, short supply chains. Production is dominated by smallholders (cultivating less than 2 ha of cocoa), accounting for 99.81 % of national production (BPS, 2023). It is concentrated on the island of Sulawesi (> 60 % of national production volume), particularly in the province of South Sulawesi (BPS, 2023) in the "cocoa belt" along the Gulf of Boni. Our research area comprises the districts of Luwu, North Luwu and East Luwu (hereafter "Luwu districts", see Fig. 3) in South Sulawesi.

Cocoa grown in Indonesia is characterized by a high fat content (in contrast with cocoa grown in Ghana and Côte d'Ivoire which has a stronger aromatic profile), attracting multinational trading and processing companies which use it as a filler in chocolate products (Moriarty et al., 2014). These companies have a direct presence in the field and source from local (micro-)collectors. Most of the national production is destined for export, with 385 thousand tons of cocoa products exported in 2022 (BPS, 2023). An export tax on raw beans, in force since 2010, encourages local processing and has eventually stimulated imports of raw beans (146 thousand tons in 2022) to fill up surplus capacities of local processing plants (BPS, 2023).

After a major expansion in the late 1980s and 1990s (Ruf et al., 1996), cocoa production has been decreasing more recently (−10 % of production volume between 2012 and 2022) (FAO, 2023). Yields have been diminishing significantly since the early 2000s due to ageing trees, pest diseases, and declining soil fertility (Clough et al., 2009). In addition, the production area has decreased since the 2010 s (–22 % between 2012 and 2022) (FAO, 2023) due to conversion to other commodities, typically oil palm, rice and maize (Supriana et al., 2020), as well as to labor shifts away from cocoa production (and from agriculture more broadly), as a result of low and volatile market prices, low accessibility of agricultural inputs, and a lack of government support for the sector.

3.2. Cocoa certification in Indonesia

These challenges, combined with increasing demand and pressures for sustainable sourcing (O'Rourke, 2012), have stimulated the introduction of VSS and other private and multistakeholder sustainability programs in the early 2000s in the Indonesian cocoa sector (Wijaya et al., 2018). In particular, two VSS have gained considerable grounds over the past two decades: Rainforest Alliance and UTZ.[1] The Rainforest Alliance (RA) was founded in 1987 as a non-governmental organization that promotes environmental preservation and improved livelihoods through responsible business. It provides certification in a variety of agricultural sectors, including cocoa, coffee, tea, bananas, nuts, and herbs and spices (Rainforest Alliance, 2024a). UTZ, founded in 2002, was a non-profit organization offering certification for sustainable farming in the cocoa, coffee, hazelnut and tea sectors, promoting good agricultural practices, improved labor and living conditions, responsible farm management and environmental preservation (Rainforest Alliance, 2024b). In 2018, the Rainforest Alliance and UTZ announced their merger and are now operating a single standard together, the 2020 Rainforest Alliance Sustainable Agriculture Standard, fully effective since June 2022 (Rainforest Alliance, 2024a).

In Indonesia, 45,833 tons of cocoa were certified by RA in 2022, representing about 7 % of national cocoa production and covering 40,600 ha across 26,342 farms (Rainforest Alliance, 2023). Based on publicly available certification data (Rainforest Alliance, n.d.) and field

[1] Organic cocoa certification can also be found in Indonesia but marginally, covering 120 tons in 2021 (Kemper et al., 2023).

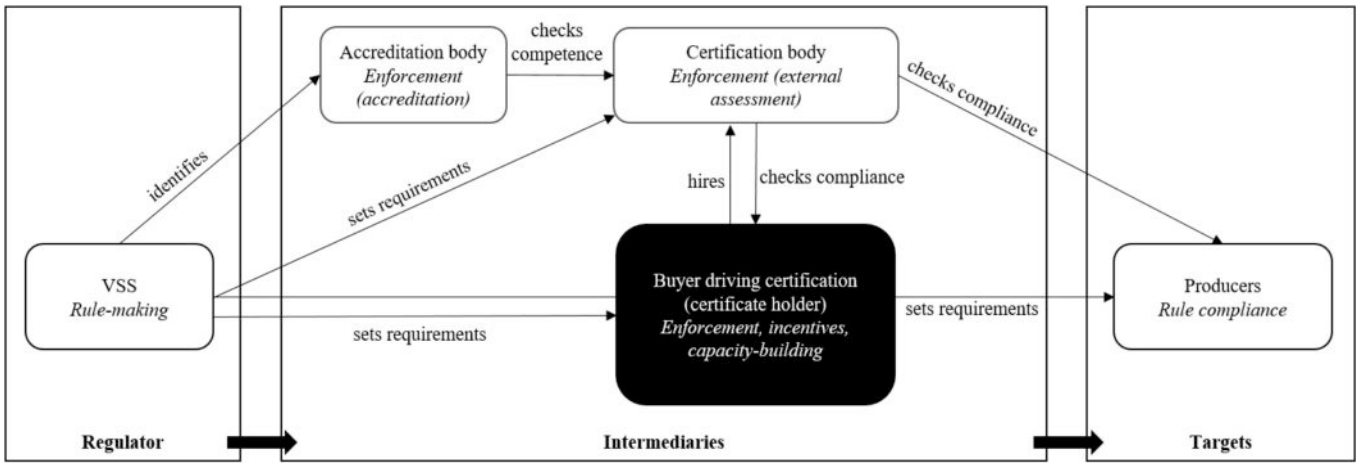

Fig. 2. Analytic framework: RIT model of group certification and the black box of buyer-driven implementation (based on Abbott et al., 2017b; Loconto, 2017; Marx et al., 2024).

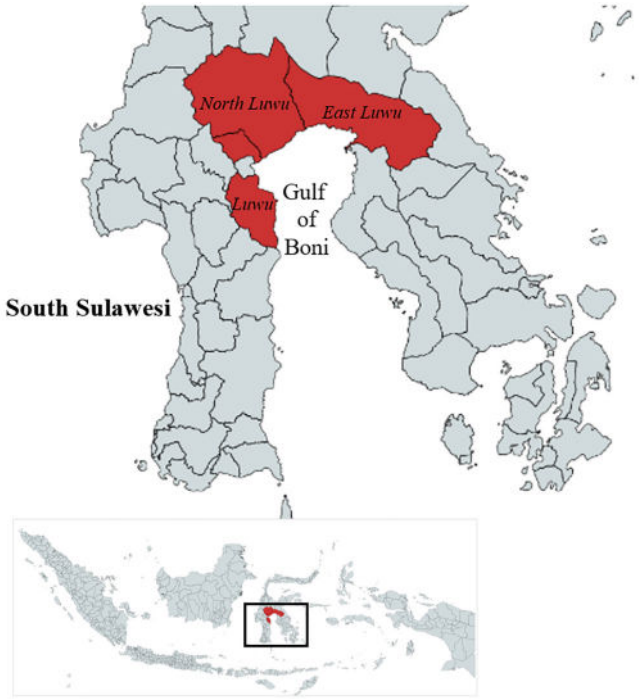

Fig. 3. Districts of Luwu, North Luwu and East Luwu, South Sulawesi province, Indonesia.

research (see Section 4), three distinct buyer-driven RA group certificates can be identified in our research area (Luwu districts). These certified groups are led by three multinational trading and/or processing companies who organize their respective producers in their RA certificates, namely: Mars, Cargill, and Olam (now Olam Food Ingredients, OFI). Hereafter, we refer to these distinct buyer-driven certified groups as RA-Mars, RA-Cargill, and RA-Olam. While RA-Mars includes producers across the three Luwu districts, RA-Cargill's producers are mostly concentrated in East Luwu and RA-Olam's producers in North Luwu.

4. Data and methods

To unpack the "black box" of VSS implementation by buyers driving certification as intermediaries, we conduct an in-depth qualitative comparative case study of the implementation of Rainforest Alliance certification by the three buyers driving group certificates in the cocoa sector in South Sulawesi, Indonesia (RA-Mars, RA-Cargill, RA-Olam). The VSS-commodity-region-specific focus allows to concentrate the analysis on differences in RA implementation across the certified groups that could explain differences in producers' exposure to implementation pathways and functions.

Our analysis proceeds in two steps. First, we apply the RIT framework as an actor-centric analytic lens to understand RA implementation through intermediaries along the three main implementation pathways: enforcement, incentives, and capacity-building. Each pathway is operationalized into specific functions as identified in the literature (Section 2.2.) and based on RA implementation rules and guidelines, as detailed in Table 1 (see List A.1 in Appendix for an overview of relevant RA documents). For each buyer-driven RA group certificate, we identify intermediaries (and sub-intermediaries) involved in implementing RA and the implementation functions they operate.

To do so, we use qualitative data collected during two field work periods, in May-June 2022 and October-December 2022, in South Sulawesi, including in-depth semi-structured stakeholder interviews, focus group discussions (FGDs), and field observations. Table 2 provides an overview of the qualitative data collected and the associated codes used for in-text reference. In total, 43 semi-structured interviews, some of which assisted by a translator and some including several participants, were conducted with different relevant stakeholders. Additionally, three FGDs, assisted by a translator, were conducted (one per buyer-driven certified group) gathering between 8 and 10 certified farmers from different villages in order to enhance our understanding of RA implementation by intermediaries in the different groups (Kapiszewski et al., 2015). We complemented this with field observations and secondary data from publicly available documents from companies, RA, and other stakeholders.

Second, we compare producers' exposure to implementation functions as a proxy to assess intermediation performance across the three buyer-driven certified groups. To do so, we further operationalize each implementation function into indicators measurable at farmer level through survey data, detailed in Table 1.

We use original farm-household survey data collected in the Luwu districts between October and December 2022. A purposive two-stage stratified sampling design was applied. In the first stage, we created one stratum of villages for each of the certified groups, containing all known villages where certified farmers were located. For RA-Cargill and RA-Olam groups, which are district-constrained (to East Luwu and North Luwu respectively), we randomly selected seven villages within the associated stratum, and for RA-Mars (present across the three districts), we randomly selected three villages in each district within its stratum. In the second stage, ten certified cocoa-producing households

Table 1
Operationalization of VSS implementation pathways into functions and farmer level indicators.

Implementation pathway	Implementation functions	Definition	Related RA rules	Farmer level indicators (all binary)
Enforcement	Accreditation	Accreditation of certification body to perform external compliance assessment	RA Rules for the Authorization of Certification Bodies v1	*NA*
	External compliance assessment	Assessment of compliance with RA requirements conducted by an external certification body	RA 2020 Certification and auditing rules v1.3	• Ever received an audit[1] on compliance with RA requirements • Received an audit[1] in the last 12 months on compliance with RA requirements
	Internal compliance assessment and monitoring	Assessment and monitoring of compliance with RA requirements conducted internally	RA 2020 Sustainable Agriculture Standard v1.3, criteria 1.4.1.	• Ever received an unannounced audit[1] on compliance with RA requirements
	Data collection and traceability	Collection of individual farmers' identification data and certified sales records in traceability system	RA 2020 Sustainable Agriculture Standard v1.3, criteria 2.1.5.	• Sells certified beans to buyer associated with company driving certification allowing for traceability (as opposed to independent buyer or buyer associated with another company)
Incentives	Price premium distribution	Distribution of a price premium for sales of certified products	RA 2020 Sustainable Agriculture Standard v1.3, criteria 3.2.1.[2]	• Cash premium[3] received in the last 12 months • In-kind premium[4] received in the last 12 months
Capacity-building	Trainings	Formal or informal organized trainings on RA requirements and good agricultural practices	RA 2020 Sustainable Agriculture Standard v1.3, criteria 1.3.3.	• Ever participated in training on RA requirements • Participates annually in training on RA requirements • Participates more than once a year in training on RA requirements • High perceived learning benefits of training
	Information provision	Written guidance on RA system and requirements and good agricultural practices	RA 2020 Sustainable Agriculture Standard v1.3, criteria 1.2.7. and 1.3.3.	• Received information in the form of written guidance or documentation on RA requirements (e.g. booklets, posters at collection points, other documentation)

Notes: [1] We do not distinguish between external (conducted by an independent third-party certification body) and internal (conducted by the buyer driving certification) compliance assessments as it proved difficult for farmers in the survey to differentiate between the two. [2] The new "Sustainability Differential / Sustainability Investment" ("SD/SI") system of RA, introduced with the new version of the standard in 2020, requires both an in-cash price premium of minimum 70 USD/ton for cocoa ("SD") as well as an in-kind investment ("SI"). We do not operationalize the SI since information about it is kept confidential by certificate holders and is difficult to identify on the ground, as it can take various forms and might not yet have been tangibly measurable at the time of our study. [3] For a measure of the value of the cash premium received (USD/ton), see Table A.2 in Appendix. [4] Although RA requires a cash premium of 70 USD/ton, we also measure in-kind premium received because Mars negotiated an exception with RA to distribute the equivalent of the cash premium in kind. We were not able to reliably derive the cash value of in-kind premium received by farmers.

Table 2
Overview of qualitative data collected.

Code	Type of actors interviewed	Number of interviews	Code	Focus group discussion	Number of farmers
MAR	Mars management & field staff	2	FGD-M	RA-Mars certified farmers	10
CAR	Cargill management & field staff	3	FGD-C	RA-Cargill certified farmers	8
OLA	Olam management & field staff	2	FGD-O	RA-Olam certified farmers	9
RA	Rainforest Alliance staff	7			
SER	Service provider company	1			
CB	Certification bodies	3			
CSA	Cocoa sustainability association	3			
GOV	Representatives of local governments	4			
COOP	Representatives of cooperatives	3			
NGO	NGO partners	3			
COL	Collectors	7			
CH	Independent certificate holder	1			
FAR	Certified farmers (excl. FGDs)	4			
	Total	43			

were randomly sampled in each village to participate in the survey. Two households (one in RA-Cargill and one in RA-Olam) were excluded as they did not harvest or sell cocoa in the 12 months prior to the survey. We arrive at a final sample of 228 RA-certified farmers (90 under RA-Mars, 69 under RA-Cargill, and 69 under RA-Olam). A group of trained enumerators administered a structured questionnaire using tablets and the software SurveyCTO. The questionnaire covered questions on demographic and socio-economic data, cocoa production and practices, as well as certification-related questions. We compare producers' exposure to implementation functions as a proxy for intermediation performance across the three groups by performing Student's t-tests on the selected variables (see Table 1).

This study entails several limitations. First, we only compare the implementation of a single VSS by three buyer companies in the Indonesian cocoa sector. This only captures part of the potential heterogeneity in VSS implementation through intermediaries and the performance thereof. A second limitation pertains to the measurement of farmers' exposure to implementation functions. In particular, issues of identification persist regarding farmers' ability to accurately recognize and differentiate what constitutes an audit, a premium, or a training session. Additionally, our survey data does not account for the quality of audits, does not allow to reliably derive the cash value of in-kind premium received, and does not fully capture the quality of trainings received.

5. Results

5.1. Intermediaries in RA implementation

This section presents our results on how different buyers driving three distinct group certificates implement RA in the Indonesian cocoa sector. We describe their respective intermediation (RIT) models in

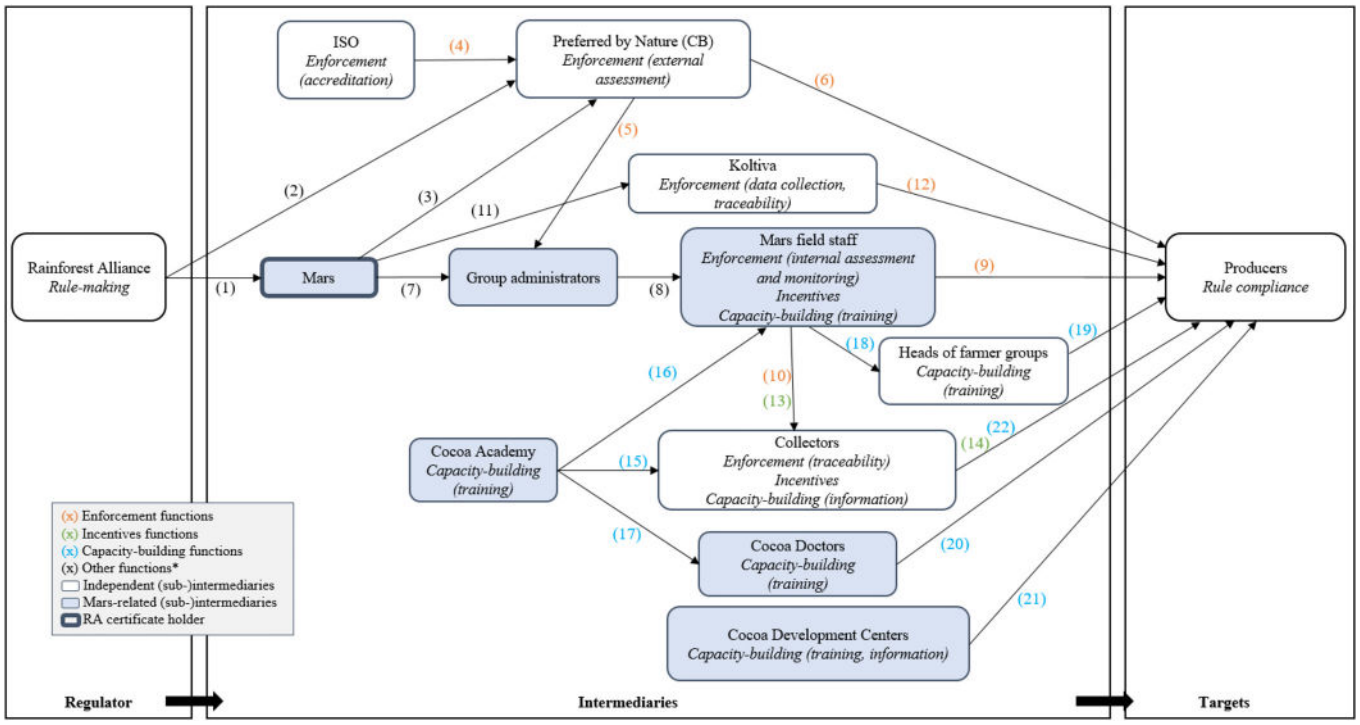

Fig. 4. RA-Mars RIT model * "Other functions" = functions not related to a specific implementation pathway but referring to other described relationships setting the RIT model in motion.

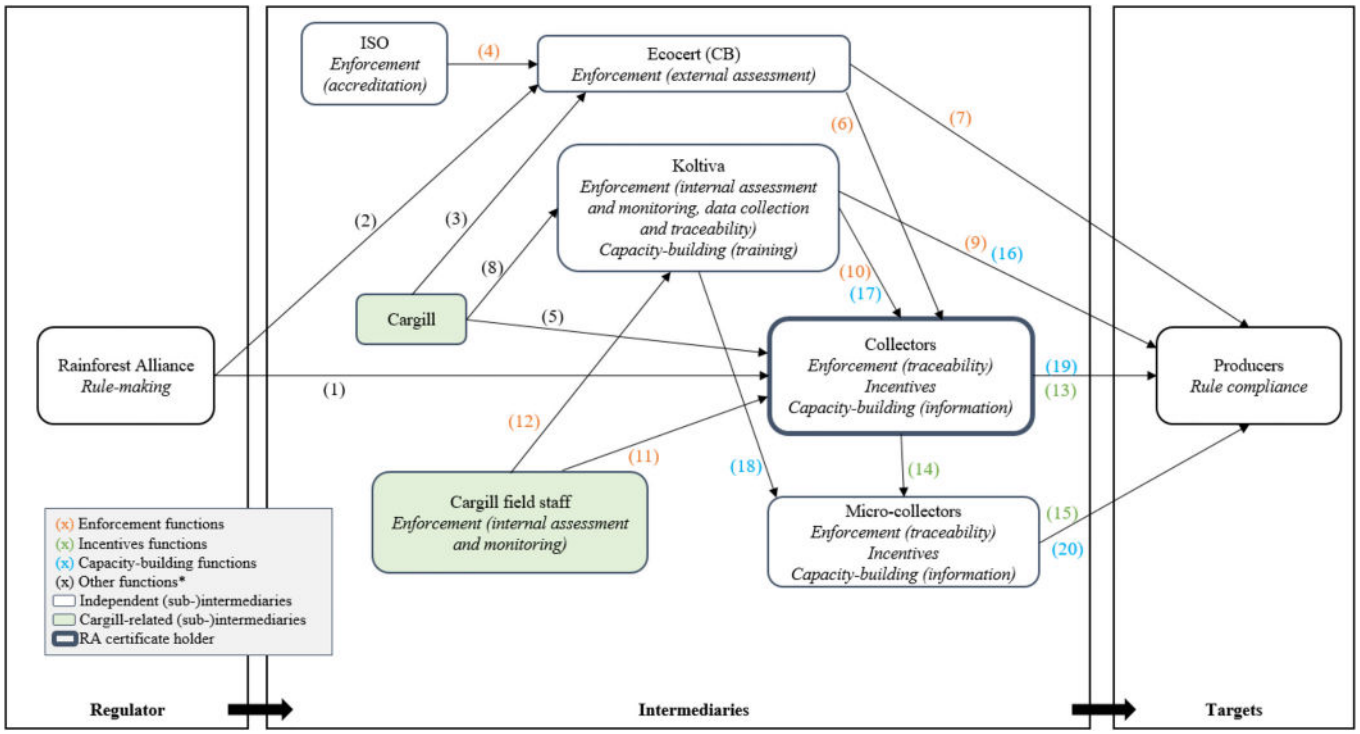

Fig. 5. RA-Cargill RIT model * "Other functions" = functions not related to a specific implementation pathway but referring to other described relationships setting the RIT model in motion.

implementing RA. Each model (visualized in Figs. 4, 5 and 6) identifies the regulator (RA), the rule targets (producers), and unpacks the respective (sub-)intermediaries involved in RA implementation in each buyer-driven certified group. For each (sub-)intermediary, we define the functions they perform in relation to the three implementation pathways (enforcement, incentives and capacity-building) and in relation to other actors. In Figs. 4, 5 and 6, these relationships are represented by numbered arrows and further described in text with corresponding numbers between brackets. The color of the numbers represent the pathways used. We also distinguish between (sub-)intermediaries which

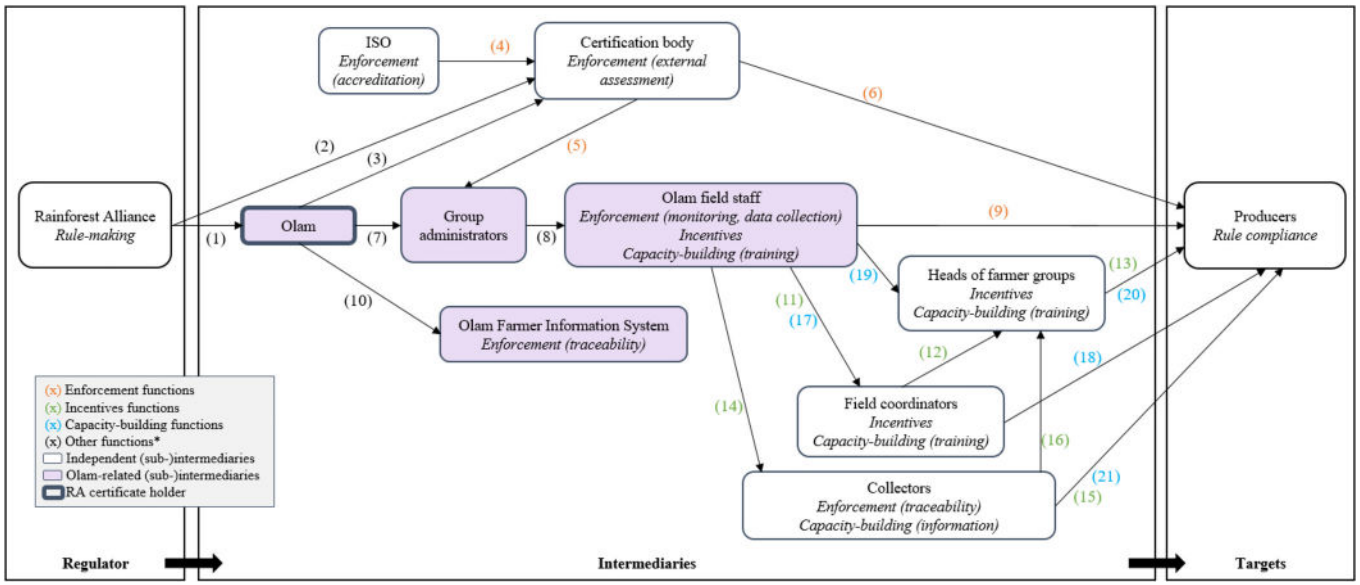

Fig. 6. RA-Olam RIT model * "Other functions" = functions not related to a specific implementation pathway but referring to other described relationships setting the RIT model in motion.

are part of the buyer company driving certification and independent (sub-)intermediaries.

5.1.1. *Rainforest Alliance – Mars*

Mars is a multinational agri-food trading, processing, and manufacturing company with a long-standing and strong presence in the cocoa sector in Indonesia through its local subsidiary. Since the early 2000s, Mars has invested substantially in sustainability as well as in research and development programs in Indonesia in order to tackle productivity issues in cocoa and ensure supply (MAR-1). Part of its sustainability strategy is to engage in certification, which also enhances its access to higher-value export markets, particularly in the European Union and the United States. In South Sulawesi, and in the three Luwu districts more specifically, Mars has been engaged in RA certification since 2009, starting with 1,000 producers and growing to about 10,000 producers currently in the certificate, managed by several group administrators (MAR-1, RA-4, RA-6). Mars sources mostly certified wet beans from its RA-certified producers through (micro-)collectors, but also buys non-certified as well as dry beans, either directly from producers through (micro-)collectors or indirectly from trading partners (including Cargill and Olam) (CAR-2, CSA-2, MAR-1, NGO-3). Beans are further processed in Mars' local processing plants before being exported (MAR-1, MAR-2).

As illustrated in Fig. 4, the implementation of RA by Mars features several (sub-)intermediaries performing different functions related to the three implementation pathways.

First, for functions related to the enforcement pathway, as required by RA (1)(2), external compliance assessments are conducted through audits by a certification body (Preferred by Nature) hired by Mars (3) (the certificate holder) and accredited by an accreditation body (4) against ISO 17065 / 17021 norms to perform audits (CB-3, MAR-1). These independent audits are conducted once a year on group administrators (5) and on a sample of farmers (6) (MAR-2). Group administrators are appointed by Mars (7) to manage groups of certified farmers (MAR-1). Group administrators delegate to Mars field staff (8) the functions of performing internal compliance assessments of certified farmers (9) and collectors (10) on an annual basis and of monitoring them on a continuous basis (COL-5, COL-6, MAR-1), although this does not always materialize in practice (COL-4, FGD-M). In terms of data collection and traceability, Mars hires Koltiva (11), an independent private company providing agri-food supply chain traceability services with established presence in the field, to collect farmer-level data (12) which inform internal and external compliance assessments (MAR-2). Koltiva also operates a traceability app for Mars which allows collectors to record sales of (certified) cocoa for each farmer (12) (COL-2, COL-6, SER-1).

Second, on the incentives pathway, Mars distributes an in-kind price premium to farmers through collectors (13)(14) (COL-5, MAR-1, MAR-2, COOP-2). While RA imposes a cash premium of at least 70 USD/ton to be paid by buyers to producers, Mars has been granted an exception by RA to distribute this premium in-kind instead, theoretically equivalent to 100 USD/ton (RA-3): farmers, based on their certified sales volumes, accumulate "credits" which they can convert into agricultural inputs of their choice (fertilizers, pesticides, seedlings, equipment, etc.) from a list provided by Mars (COL-3, FGD-M, MAR-1). It is however reported that collectors do not always distribute the appropriate premium (COL-4, FGD-M, RA-5) and that farmers cannot systematically choose the type of in-kind premium to be received (FAR-1, FAR-2, FGD-M).

On the capacity-building pathway, a chain of sub-intermediaries performs functions through a "train-the-trainer" approach. The Cocoa Academy is a province-level Mars facility providing trainings related (among others) to RA requirements and good agricultural practices to collectors (15), to Mars field staff (16), and to "Cocoa Doctors" (17) (MAR-1, MAR-2). Field staff in turn provides (group) training to heads of farmer groups (18), who then train farmers (19) on an annual basis (in group) (MAR-1, MAR-2). Cocoa Doctors are well-performing farmers (sometimes also heads of farmer groups) hired and trained by Mars to, in turn, provide individual coaching to other farmers (20) four times per year (FAR-1, FAR-2, MAR-2, NGO-3, RA-5). However, farmers express dissatisfaction with such a "train-the-trainer" approach: they do not perceive their peer farmers providing them with trainings as legitimate or expert enough to do so (FGD-M), when they receive training at all (FAR-4, FGD-M). In addition,

"When we receive training, it is only theory, not practical training on our plots. (…) We want more practical advice on how to apply the theory in the field" (FGD-M).

District-level Cocoa Development Centers also provide trainings, coaching and material support on a needs basis, including through demonstration plots and cocoa nurseries, and communicate information on RA requirements and good agricultural practices through posters (21) (MAR-1, MAR-2, RA-5). Such posters are also displayed at collectors' collection points (22) (MAR-2).

Overall, the RA-Mars RIT model involves many sub-intermediaries to whom Mars delegates implementation functions in relatively long intermediation chains. In addition, while Mars hires Koltiva as an independent sub-intermediary to perform data collection and traceability functions, several of the other sub-intermediaries are "dependent" entities, related to Mars.

5.1.2. Rainforest Alliance – Cargill

Cargill is a multinational agri-food trading and processing company that sources cocoa from several regions in Indonesia, including certified cocoa in the district of East Luwu. Cargill has its own sustainability sourcing program but adopted UTZ certification in 2017 in South Sulawesi, primarily to gain access to export markets (CAR-1). After the merger between UTZ and RA, Cargill continued certification under RA (RA-1). In total, Cargill sources from about 22,000 certified farmers in Indonesia (CAR-1). In contrast to Mars and Olam, Cargill is not the certificate holder (CH) of RA but drives certification and coordinates local collectors who are the official CHs (16 in Indonesia, one in East Luwu) (CAR-1, CAR-2).

Fig. 5 depicts the RIT model of RA implementation by Cargill, which also features several (sub-)intermediaries performing different functions along the three implementation pathways.

On the enforcement pathway, as required by RA (1)(2), an independent certification body (Ecocert) hired by Cargill (3) and ISO-accredited (4) conducts external compliance assessments through audits (CAR-1). Cargill hires independent collectors (5) as official CHs of the RA certificate, who also act as group administrators, for their knowledge of the local context and their long-standing relationships with farmers. As one interviewee expressed:

"Collectors are the main actors [in implementing RA], the middlemen, they are close to farmers and have a long-standing relationship with them. They have independence and knowledge of the field. So, them being certificate holders makes more sense. It increases their accountability and ownership of the certification program; it generates more engagement from their side" (CAR-3).

In addition, audits by the certification body are conducted annually on both collectors (CHs) (6) and on a sample of farmers (7) (CAR-1, CH-1, FGD-C). In terms of internal compliance assessment and monitoring, Cargill hires Koltiva (8) as an independent intermediary to perform annual assessments and continuous monitoring of farmers (9) and of collectors (10) (CAR-1, CH-1, SER-1). Koltiva has significant field staff (CAR-1) and expertise (CAR-2, CAR-3), well as close relationships with RA-Cargill farmers and collectors through almost daily interactions (CAR-1, CH-1, SER-1). Cargill field staff conducts oversight through additional internal assessments of CHs twice per year and continuous monitoring through a close relationship and daily interactions (11), and performs annual assessments of Koltiva (12) (CAR-3, CH-1, COL-1). In terms of data collection and traceability, Koltiva collects farmer-level data (9) to inform CHs and the certification body, and operates a traceability app which (micro-)collectors use to record certified sales (CAR-1, SER-1) and which farmers can access to follow market prices and their sales data (FGD-C).

On the incentives pathway, Cargill distributes the required RA cash premium of, in theory, 70 USD/ton to individual certified farmers. Farmers are usually aware of the premium they are entitled to by following their sales data through the traceability app (COL-1, FGD-C). The premium is distributed directly by bank transfer (CAR-1, CAR-3). Alternatively, for farmers who do not have a bank account, the premium is distributed in cash through collectors (CHs) (13) (CAR-1, COL-1). When distances are too important, this latter delegates price premium distribution to micro-collectors (14) who then distribute it to individual farmers (15). When the premium is distributed in cash by (micro-)collectors, a receipt needs to be signed and a picture taken as a proof of premium distribution (CAR-2, COL-1).

On the capacity-building pathway, Cargill relies on Koltiva to provide (group) training to farmers three times a year on RA requirements and good agricultural practices and individual coaching once a year (16) (CAR-1, CAR-3, SER-1). Farmers perceive Koltiva field staff as legitimate experts to train them, as they provide not only theoretical but also practical trainings which has resulted in tangible improvements in productivity and plantation management (FGD-C). Support is also provided through demonstration plots and cocoa nurseries. Koltiva also trains collectors (17) and micro-collectors (18) on the RA system and its requirements (SER-1). Additionally, information on RA requirements and good agricultural practices are communicated to farmers through user-friendly posters at collectors (19) and micro-collectors (20) (COL-1, FGD-C).

Overall, the RA-Cargill RIT model is characterized by several sub-intermediaries, but in relatively shorter intermediation chains than RA-Mars (for example through the direct distribution of premium, or training provision by Koltiva contrasting with the "train-the-trainer" approach in RA-Mars). Cargill also delegates more functions to independent intermediaries, including Koltiva which has significant field resources, expertise, and legitimacy in the field, and independent collectors (CHs) who have long-standing relationships with farmers. This delegation also generates accountability, with oversight functions from Cargill on these independent intermediaries.

5.1.3. Rainforest Alliance – Olam

Olam is a multinational agri-food trading and processing company that sources cocoa from 150,000 farmers across Indonesia. Since the early 2000s, Olam has developed a sustainability program which focuses on good agricultural practices, and more recently on living income, community development and empowerment, and forest protection (OLA-1). Olam became UTZ-certified in 2014, following increased demand for certified beans from its clients, and continued its certification with RA since the merger (OLA-1, RA-4). In South Sulawesi, Olam states to exclusively source certified dry beans. Farmers in Olam's RA certificate are organized in groups managed by group administrators (two groups in North Luwu, one group in East Luwu, each counting between 1,500 and 4,000 farmers) (OLA-1, RA-1, RA-4, RA-6).

Fig. 6 depicts the RIT model of RA implementation by Olam, also featuring several (sub-)intermediaries performing different functions along the three implementation pathways.

On the enforcement pathway, as required by RA (1)(2), external compliance assessment is conducted by a recognized independent certification body[2] hired by Olam (3) and accredited (4) by an accreditation body on ISO 17065 / 17021 norms to perform audits once a year on group administrators (5) and a sample of farmers (6) (OLA-1). Group administrators are appointed by Olam (7), the certificate holder, to manage groups of certified farmers (as in RA-Mars) (OLA-1). Group administrators in turn delegate to Olam field staff (8) to conduct monitoring of farmers, although their presence in the field is strongly constrained due to understaffing (CB-2, FGD-O, RA-5). In terms of data collection and traceability, in contrast with RA-Mars and RA-Cargill, Olam field staff collect farmer-level data (9) and Olam operates its own traceability app, the Olam Farmer Information System (10), through which collectors register certified farmers' sales records (COL-2, NGO-1, OLA-1).

On the incentives pathway, Olam distributes both in-kind and in-cash premium (OLA-2). Similar to Mars, Olam requested an exception from RA to distribute the premium in-kind. Olam still distributes the premium in-kind in many instances despite the fact that the exception was not granted by RA (RA-3, FGD-O). The in-kind premium distribution is characterized by a chain of sub-intermediaries: Olam field staff hand in the premium, mostly in the form of fertilizers, to "field coordinators" (11) who are well-performing farmers that are independent from Olam and often have a higher status in their community (and are sometimes

[2] None of our interviewees disclosed the name of the certification body; public document search also did not yield any result.

also heads of a farmer group), although the shortage of Olam field staff sometimes prevents the distribution of the premium (GOV-4). Field coordinators then distribute the in-kind premium to heads of farmers groups (12), who in turn give it to farmers (13) (COL-3). The premium is calculated at farmer group level based on the related farmers' registered sales of certified cocoa to a specific independent collector assigned for each farmer group (COL-2). The in-kind premium is then usually distributed equally among farmers of the group, regardless of their respective certified sales volume or cocoa plot size, which raises discontent among farmers (FGD-O). In some cases, the premium is distributed in cash from Olam to collectors (14) and then to individual farmers (15) at the time of sales, and sometimes with heads of farmer groups as an additional intermediary between collectors (16) and producers (13) (COL-2, FGD-O). For both types of premium, issues of capture are however reported, with different sub-intermediaries along the chain retaining (part of) the premium (GOV-4, FGD-O).

On the capacity-building pathway, RA-Olam features a chain of intermediaries similar to RA-Mars through a "train-the-trainer" approach. It is stated that Olam field staff offer (group) training on RA requirements and good agricultural practices to field coordinators (17) annually, who in turn provide (group) training to farmers, including through demonstration plots and cocoa nurseries (18) (OLA-1). Olam field staff also organize coaching sessions for heads of farmer groups (19) twice per year, who in turn coach farmers in their group (20) (OLA-1). However, Olam lacks field staff to effectively supply these trainings on a regular basis (COL-2, FGD-O, GOV-4, NGO-3, RA-5), and farmers have expressed dissatisfaction as regards the expertise and legitimacy of other farmers to provide them with trainings:

"*We expected someone qualified, maybe with a PhD, but when the trainer came, it was just one of our fellow farmers. And now it is always the same person giving the same training. (…) We want a professional trainer, and practical training in addition to the theory*" (FGD-O).

Lastly, posters on RA requirements and good agricultural practices are displayed at collectors' collection points (21).

Overall, RA-Olam is characterized by several sub-intermediaries to whom Olam delegates implementation functions in often long chains of intermediation (such as for premium distribution and trainings). Yet, it significantly relies on its own entities for many of these functions, despite reported understaffing. It does not hire an independent specialized intermediary like Koltiva as Mars and Cargill do.

Table 3 brings these insights together by providing an overview of the different implementation pathways and functions and how these are

Table 3
Implementation pathways, functions and intermediaries, per buyer-driven certified group.

Implementation pathway	Implementation function	Intermediaries		
		RA-Mars	RA-Cargill	RA-Olam
Enforcement	Accreditation	• Accreditation body (ISO) accrediting certification body (4)	• Accreditation body (ISO) accrediting certification body (4)	• Accreditation body (ISO) accrediting certification body (4)
	External compliance assessment	• Certification body (Preferred by Nature) conducting annual audits on group administrators (5) and a sample of farmers (6)	• Certification body (Ecocert) conducting annual audits on collectors (CHs) (6) and a sample of farmers (7)	• Certification body (?) conducting annual audits on group administrators (5) and sample of farmers (6)
	Internal compliance assessment and monitoring	• Mars field staff conducting annual internal compliance assessments and continuous monitoring of farmers (9) and collectors (10)	• Koltiva conducting annual internal assessments and continuous monitoring of farmers (9) and collectors (CHs) (10) • Cargill field staff conducting internal assessment twice per year and continuous monitoring of collectors (CHs) (11); and annual assessment of Koltiva (12)	• Olam field staff monitoring farmers (9)
	Data collection and traceability	• Koltiva collecting farm-level data (12) • Koltiva operating traceability app • Collectors filling in sales data	• Koltiva collecting farm-level data (9) • Koltiva operating traceability app • (Micro-)collectors filling in sales data	• Olam field staff collecting farmer-level data (9) • Olam Farmer Information System operating traceability app (10) • Collectors filling in sales data
Incentives	Price premium distribution	• Mars field staff distributing the in-kind premium to collectors (13), in turn distributing in-kind prorated premium to farmers (14)	• Cargill distributing the in-cash prorated premium to farmers' bank account • Collectors (CHs) distributing in-cash pro rata premium to farmers (13); or distributing the premium to micro-collectors (14) who in turn distribute it in cash to farmers (15)	• Olam field staff distributing the in-kind farmer group level premium to field coordinators (11); who in turn distribute it to heads of farmer groups (12); who in turn distribute it equally to farmers (13) • Olam field staff distributing the in-cash farmer group level premium to collectors (14); who in turn distribute it to farmers (15); or through collectors (16)
Capacity-building	Trainings	• Cocoa Academy training of collectors (15), Mars field staff (16) and Cocoa Doctors (17) • Mars field staff annual (group) training of heads of farmer groups (18) • Heads of farmer groups annual (group) training of farmers (19) • Cocoa Doctors coaching of farmers (20) four times per year • Cocoa Development Centers training and coaching of farmers (incl. through demoplots and nurseries) when needed (21)	• Koltiva training farmers (in group) three times per year and individual coaching once per year (incl. through demoplots and nurseries) (16) • Koltiva training of collectors (CHs) (17) and micro-collectors (18) on RA system and requirements	• Olam field staff training of field coordinators (17), who then train farmers annually (incl. through demoplots and nurseries) (18) • Olam field staff providing coaching of heads of farmers groups twice a year (19), who then coach farmers (20)
	Information provision	• Cocoa Development Centers displaying posters on RA requirements and GAP (21) • Collectors displaying posters on RA requirements and GAP (22)	• Collectors (CHs) displaying posters on RA requirements and GAP (19) • Micro-collectors displaying posters on RA requirements and GAP (20)	• Collectors displaying posters on RA requirements and GAP (21)

operated by different (sub-)intermediaries across the three buyer-driven certified groups.

5.2. Performance of intermediation in RA implementation

Fig. 7 illustrates our results on the exposure of farmers to implementation functions for the three buyer-driven certified groups respectively as a proxy for intermediation performance in RA implementation (see also in Appendix, Table A.1 for summary statistics on farmer household characteristics and Table A.2 for full descriptive statistics on famers' exposure to implementation functions). We describe the results along the three implementation pathways before turning to the discussion.

5.2.1. Enforcement

First, Fig. 7 shows that RA-Cargill farmers have significantly more exposure to the enforcement pathway across the different functions compared to RA-Mars and RA-Olam farmers. In particular, 96 % of RA-Cargill farmers have ever received an audit, and 83 % have in the 12 months prior to the survey. This is significantly higher than RA-Mars (63 %) and RA-Olam (49 %) farmers. In addition, 59 % of RA-Cargill farmers have received unannounced audits, compared to 30 % of RA-Mars farmers and 14 % of RA-Olam farmers. Lastly, RA-Olam farmers experience significantly lower traceability, with only 57 % of them selling their certified beans to Olam-associated buyers, compared to 87 % for RA-Mars and 94 % for RA-Cargill farmers.

5.2.2. Incentives

Second, Fig. 7 also highlights that RA-Olam farmers receive worryingly low incentives despite RA's mandatory cash premium requirement, likely due to aforementioned shortcomings in traceability as well as capture. RA-Cargill and RA-Mars farmers receive significantly more incentives, although in different forms. Most RA-Cargill farmers (96 %) report to have received a cash premium in the 12 months prior to the survey, amounting to an average of 53 USD/ton (see Table A.2 in Appendix), whereas RA-Mars and RA-Olam farmers generally have not received a cash premium (3 % and 7 % respectively). In parallel, as Mars distributes the mandatory RA premium in-kind, a majority of their certified farmers (73 %) report to have received such premium in the 12 months prior to the survey, compared to 6 % of RA-Cargill farmers (who receive cash premium) and 16 % of RA-Olam farmers.

5.2.3. Capacity-building

Third, Fig. 7 shows that RA-Cargill farmers have significantly higher exposure to the capacity-building pathway compared to both RA-Mars and RA-Olam across most functions. Most RA-Mars and RA-Cargill farmers have participated in at least one training in the past (87 % and 90 % respectively), with a significantly lower share (62 %) for RA-Olam farmers. Yet, RA-Cargill farmers also on average attend trainings more frequently than RA-Mars and RA-Olam farmers. Additionally, 74 % of them estimate that the learning benefits from these trainings are high, compared to 58 % for RA-Mars and 52 % for RA-Olam farmers. Lastly, RA-Cargill farmers receive on average significantly more written guidance (67 % of them) compared to RA-Mars (39 %) and RA-Olam (48 %) farmers.

6. Discussion

Our analysis shows that buyers driving certification play an important role in VSS implementation as intermediaries and by engaging sub-intermediaries that perform different implementation functions. This indicates more complexity in VSS implementation than previously researched in the literature. We also find that even within the same context, the same rules can be implemented in different ways through diversity in intermediation (Ménard et al., 2022). The capacities of intermediaries and structures of intermediation matter, with some appearing more performant than others for VSS implementation.

In terms of capacities of intermediaries, *operational capacity* appears crucial in VSS implementation. The RA-Olam case, for example, shows that the shortage of field staff resources leads to failures in the performance of several functions across the implementation pathways, including internal assessment and monitoring, premium distribution as well as training provision. In contrast, in the RA-Cargill case, Koltiva has extensive resources, field staff, and access to targets through regular and frequent interactions with farmers and collectors. These regular and frequent interactions create embedded relations which enhance VSS

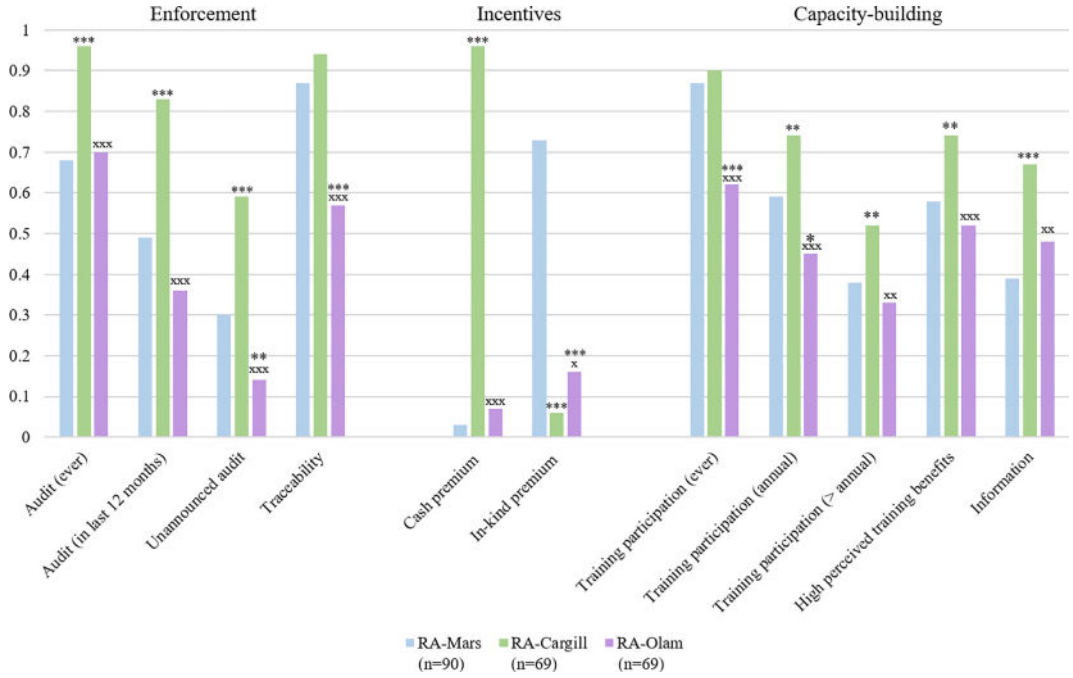

Fig. 7. Farmers' exposure to implementation functions, per implementation pathway and per certified group Notes: *'s indicate a significant difference in average compared to the sample of RA-Mars certified producers, x's compared to the sample of RA-Cargill certified producers. * $p \leq 0.10$; ** $p \leq 0.05$ and *** $p \leq 0.01$.

implementation. Previous work has demonstrated the importance of embedded relationships through frequent interactions (Uzzi, 1996) as this generates trust (Uzzi, 2018). Trust in turn facilitates cooperation and enhances learning dynamics in production processes (Helper, 1991; Helper et al., 2000; Hirschman, 1970; Sabel, 1994) which is particularly crucial in voluntary regulatory processes such as VSS, since producers need to be willing to and learn how to align their production practices with sustainability principles (Auld et al., 2015; Waddington et al., 2014).

In addition, our results show the importance of *expertise* in VSS implementation by intermediaries. In the RA-Cargill case, Koltiva and collectors (CHs) are engaged specifically for their extensive knowledge of the local context and of how to implement VSS according to local specificities. This is particularly crucial in delivering capacity-building to producers, since these latter tend to be more receptive to learning if it is provided by intermediaries which are to a degree specialized and have specific knowledge and skills (Waddington et al., 2014).

Independence is also key for intermediaries to implement VSS. Independence fosters a sense of ownership in VSS implementation, reduces potential conflicts of interest, and enhances accountability, including through oversight. In RA-Mars and RA-Cargill, Koltiva is hired as an independent sub-intermediary to collect farm-level data and operate the traceability app, which appears more performant in doing so than in the case of RA-Olam in which these functions are operated by Olam internally. Independence also appears to matter to fulfil compliance assessment and monitoring functions (enforcement) and delivering trainings (capacity-building), as the case of RA-Cargill shows through delegating these functions to Koltiva and exercising oversight.

Lastly, *legitimacy* is closely tied with independence and expertise (see also Abbott et al., 2017a; Auld & Renckens, 2025) and appears particularly important in performing capacity-building functions. In the cases of RA-Mars and RA-Olam, training providers appear less legitimate as they are fellow farmers who might lack expertise. In contrast, in RA-Cargill, farmers appear more satisfied with and receptive to trainings provided by Koltiva, due to its expertise and independence.

In terms of intermediation structures, our study suggests that shorter intermediation chains are more performant than chains involving an array of sub-intermediaries (provided that this comes with key capacities). Especially in terms of incentives distribution, longer chains create more opportunities for capture (see also Minten et al., 2018; Neilson, 2008; Vicol et al., 2018), as the cases of RA-Olam and, to a lesser extent, RA-Mars, show. In addition, longer chains in capacity-building functions seem to dilute expertise and legitimacy, as expressed in the RA-Mars and RA-Olam cases (see also Waddington et al., 2014; Wijaya et al., 2018). Hence, while engaging additional (sub-)intermediaries can bring key capacities to the regulatory process, a careful balancing act must be performed to avoid adverse effects of having such a thing as "too many intermediaries".

These results have significant implications for our understanding of how VSS contribute (or not) to sustainability. Several studies have measured the impacts of VSS on various sustainability outcomes. Overall, these studies show mixed results: some find positive effects of certification on some sustainability outcomes, whereas others find no effects, and a few even document negative effects on some sustainability outcomes (DeFries et al., 2017; Meemken, 2020; Oya et al., 2018; Traldi, 2021). One factor put forward to explain the lack of sustainability impacts of VSS relates to the fact that producers do not significantly alter their behavior towards complying with sustainable production practices prescribed by VSS (Garrett & Pfaff, 2019; Oya et al., 2018). Several studies have highlighted different potential root causes of non-compliance of producers, such as the lack of willingness, resources, or capacity to comply, and the lack of awareness of the rules (Batistic et al., 2024; Chayes & Chayes, 1998; Nava & Tampe, 2022; van Rooij & Sokol, 2021). Different implementation pathways, as set out in this study, aim to address these different root causes of non-compliance (Auld et al., 2015; Depoorter & Marx, 2023). Producers' exposure to these implementation pathways can help explain why some producers change their behavior more than others towards compliance (Batistic et al., 2024; Dietz et al., 2019; Grabs, 2020), which might in turn generate more significant sustainability impacts. For example, in a case study of coffee certification in Colombia, Batistic et al. (2024) find a positive effect of producers' exposure to enforcement and incentives on compliance with several sustainable production practices, although no significant effect is found for capacity-building. Dietz et al. (2019) find similar results in a study of certification in the Honduran coffee sector.

This paper shows that the exposure of producers to the different implementation pathways in the first place depends on intermediaries and how they implement VSS. These actors, hence, play a crucial role to potentially generate behavioral change towards sustainable production practices. Opening up the "black box" of intermediaries deepens our understanding of the different processes in the causal chain between setting sustainability standards on the one hand and sustainability impacts on the other hand (Garrett & Pfaff, 2019) through the actors involved in the implementation process.

7. Conclusion

This paper is the first of its kind to open the "black box" of VSS implementation by buyers driving group certification. It shows that these actors are crucial intermediaries in VSS implementation. In particular, by applying the regulatory intermediation (RIT) framework (Abbott et al., 2017b), it highlights that these actors engage an array of sub-intermediaries that perform different implementation functions. The resulting structures of intermediation and the capacities of intermediaries vary across group certificates and matter for implementation performance. In particular, structures with fewer intermediaries that hold operational capacity, expertise, independence, and legitimacy enhance implementation performance and ensure that producers are effectively exposed to enforcement, incentives and capacity-building. This in turn might affect their levels of compliance with VSS rules (Batistic et al., 2024; Dietz et al., 2019; Grabs, 2020).

Areas for future research include replicating this analysis to other case studies, including across different VSS, across different types of actors driving certification (such as cooperatives or local companies which have different capacities than multinational buyer companies studied here), as well as across different sectors and countries to understand how local institutional and cultural contexts shape intermediation structures, capacities, and performance.

Another promising area for future research lies in historical and longitudinal studies of how VSS implementation by intermediaries emerges and evolves. Here, historical institutionalist perspectives could shed light on why certain intermediaries and structures of intermediation emerge and persist through path dependency (Auld, 2014). Furthermore, exploring how intermediation in VSS implementation evolves over time and whether there are observable trends towards the internalization of implementation functions – including a potential shift away from certification altogether in favor of in-house sustainability programs – especially in the context of large buyers as crucial actors in sustainability governance, constitutes an increasingly relevant and important area for research (Grabs et al., 2024; Grabs & Carodenuto, 2021; Wright et al., 2025).

Lastly, more research is needed to analyze the impact of intermediation and exposure to implementation pathways on compliance (Batistic et al., 2024; Dietz et al., 2019), as well as on key sustainability outcome parameters. Doing so might bring us closer to understanding the heterogeneity of sustainability impacts generated by VSS.

Several policy recommendations can be formulated. First, although VSS face trade-offs between stringency and adoption (Dietz & Grabs, 2022; Haack & Rasche, 2021) as well as adaptability to local contexts (Nava & Tampe, 2022), they could consider making their rules for certificate holders' implementation more specific and stringent. Second and related, enhancing transparency on the implementation of buyer-driven

group certification is essential. VSS should require certificate holders to make their internal management system documents publicly available. This increased transparency would facilitate replication of our study in other settings, which in turn would improve the understanding of intermediation and performance thereof in VSS implementation. Transparency might also incentivize enhanced sustainability governance by buyers through to increased scrutiny on their practices (Gardner et al., 2019).

CRediT authorship contribution statement

Charline Depoorter: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. **Janne Bemelmans:** Data curation, Formal analysis, Investigation, Writing – review & editing. **Axel Marx:** Conceptualization, Funding acquisition, Methodology, Project administration, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.worlddev.2025.107128.

Data availability

The data that has been used is confidential.

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