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Fostering compliance with voluntary sustainability standards through institutional design: An analytic framework and empirical application

Charline Depoorter

Leuven Centre for Global Governance Studies, University of Leuven, Leuven, Belgium

Division of Bioeconomics, Department of Earth and Environmental Sciences, University of Leuven, Leuven, Belgium

Axel Marx

Leuven Centre for Global Governance Studies, University of Leuven, Leuven, Belgium

Abstract

The institutional design of voluntary sustainability standards (VSS) has been recognized as an important determinant of compliance with VSS rules, which partly explains heterogeneity in VSS sustainability impacts. However, the current understanding of how VSS institutional design generates compliance is scattered and lacks systematic operationalization. This paper brings together different strands of literature and identifies three main mechanisms through which VSS institutional design can generate compliance: enforcement, market incentives, and capacity-building. We propose an integrated analytic framework that operationalizes these mechanisms into specific, identifiable design attributes. We apply it in an empirical analysis of 13 agrifood and forestry VSS to assess the extent to which these mechanisms are used in VSS institutional design. While enforcement appears necessary for VSS to operate, we find heterogeneity in how these mechanisms are used and combine, which is partly explained by contextual factors. This provides avenues for analyzing their respective effectiveness in generating compliance.

Keywords: certification, compliance, institutional design, private governance, voluntary sustainability standards.

1. Introduction

Voluntary sustainability standards (VSS) have emerged as transnational, private, market-based regulatory instruments in which a group of actors develops and enforces standards related to production practices in order to tackle pervasive sustainability issues in global value chains (GVCs), such as deforestation, labor rights violations, and poverty (UNFSS, 2013). They have proliferated from the 1990s onward, with more than 300 VSS currently in existence that certify an increasing share of global production, especially in the agricultural and forestry sectors (ITC, 2022).

Despite the prominence these instruments have gained, VSS have overall failed to generate significant sustainability transitions. This can partly be explained by shortcomings in compliance with their standards. Various factors can hinder compliance with VSS rules, including producers-specific characteristics, the economic, socio-political, and institutional environment in which VSS operate, as well as the institutional design of VSS (Garrett & Pfaff, 2019; Marx et al., 2022; Oya et al., 2018).

While institutional design has been recognized as an important determinant of compliance with VSS, it is unclear how VSS can optimize it to generate compliance through different mechanisms. Overall, studies have highlighted the high diversity in design across VSS (Fiorini et al., 2019; Marx, 2014). Some mechanisms to generate compliance have been prescribed or theoretically described, but they lack systematic operationalization into specific design attributes (Auld et al., 2015; Macdonald, 2020; Nava & Tampe, 2022; Wijen & Flowers, 2022). In parallel, institutional design analyses have been conducted which operationalize institutional design into

Correspondence: Charline Depoorter, Leuven Centre for Global Governance Studies, University of Leuven, Charles Deberiotstraat 34, 3000 Leuven, Belgium. Email: charline.depoorter@kuleuven.be

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identifiable attributes, but not from a compliance perspective (Marx, 2014; Schleifer, Fiorini, & Fransen, 2019). A couple of empirical studies test the effect of only some specific design attributes on compliance (Dietz et al., 2019; Grabs, 2020) and do not reflect broader mechanisms available to foster compliance.

This paper aims to close the gap between institutional design analyses and compliance mechanisms by expanding the existing literature both conceptually and empirically. Conceptually, the paper proposes an analytic framework to understand how different compliance mechanisms relate to differences in institutional design. By bringing together different strands of literature on compliance, institutional design effectiveness, VSS institutional design, VSS impacts, pathways, and theories of change, we identify three mechanisms for compliance: enforcement, market incentives, and capacity-building. We show that each mechanism can be operationalized into several VSS institutional design attributes that can be measured by specific indicators. Empirically, the paper finds that VSS do differ in institutional design for compliance by applying the analytic framework to 13 VSS. In doing so, we also highlight that previous studies focusing on VSS institutional design only partially revealed the different ways in which VSS differ and that institutional design is more complex in how it can foster compliance. While enforcement appears necessary for VSS to operate, we find heterogeneity in how the three mechanisms are used and combine.

This paper is structured as follows. Section 2 provides an overview of the literature on compliance with VSS and VSS institutional design, and how both relate. Section 3 presents three mechanisms for compliance and how they manifest in the VSS context from an institutional design perspective. Section 4 sets out the methodology and data used and proposes an analytic framework that systematically operationalizes the three mechanisms into VSS design attributes and indicators. We apply the analytic framework in an empirical analysis of 13 selected VSS in Section 5. Section 6 provides a broader discussion of the analytic framework and empirical results. In the conclusion, we suggest ways forward for research on VSS institutional design for compliance.

2. Compliance and VSS institutional design

VSS have gained increased prominence as transnational sustainability governance instruments, yet the evidence on their effectiveness in generating sustainability in GVCs remains mixed. While meta-studies conclude that overall, VSS have either positive but small or no significant impact on a range of social, economic, and environmental indicators and that there is evidence of only few negative impacts, they also underscore the high heterogeneity of results stemming from differences in methodology and focus (in terms of outcome indicators, region, sector, type of certified entities, etc.) across impact studies (DeFries et al., 2017; Meemken, 2020; Oya et al., 2018; Traldi, 2021). Substantively, these studies also highlight various factors that undermine VSS effectiveness, including shortcomings in compliance (LeBaron & Lister, 2022).

Compliance is paramount to the effectiveness of VSS as regulatory instruments since they rely on the prescription of standards to achieve sustainability outcomes. Although compliance can be operationalized in different ways, here we draw from organizational studies and define this concept as the coupling between policies (rules) and practices, as theorized by Meyer and Rowan (1977) in contrast with decoupling as a policies-practices mismatch. From this definition ensues a continuous (rather than dichotomous) notion of compliance ranging from basic compliance with minimum standards to achieve certification (adoption), to implementation of a broader set of standards (partial compliance), to full compliance, and finally, to beyond-compliance understood as deep-rooted, transformative changes in practices toward sustainability (Gunningham, 2010).

The VSS literature finds that shortcomings in compliance partly explain the lack of VSS effectiveness (Garrett & Pfaff, 2019) and have different sources. First, producers-specific characteristics can undermine their compliance, such as a lack of material, financial, or technical capacities to implement sustainable practices and bear the costs of certification, a lack of knowledge or understanding of the rules, or a lack of incentives to comply (Carter & Siddiki, 2021; DeFries et al., 2017; Nava & Tampe, 2022). Second, the broader economic, socio-political, and institutional environment can also hinder compliance with VSS, such as the market for certified products, the structure of certified value chains and value distribution (Grabs et al., 2021; Ponte, 2019), resistance toward VSS (Macdonald, 2020), or a governance gap between the regulatory context and VSS requirements (Gulbrandsen, 2014; Marx & Cuypers, 2010). Lastly, scholars argue that VSS effectiveness and compliance with their standards cannot be analyzed in isolation of VSS institutional design (Marx et al., 2022; Oya et al., 2018).

This paper explicitly focuses on this latter argument and provides insights into the existing literature on VSS institutional design, on how it relates to compliance, and what gaps remain.

With the proliferation of VSS, studies have emerged to understand VSS institutional design and how they differ from one another. Although the understanding of what "institutional design" encompasses varies across studies, it can be defined as the structured arrangement of rules, procedures, and other organizational elements that govern the development and enforcement of standards. This includes elements such as standard-setting processes, verification mechanisms, stakeholder engagement, transparency and accountability, incentives and benefits, support systems, and conflict resolution. Research has analyzed factors that influence VSS design, such as interactions with national actors, consumer demand and civil society pressures, standard-setters' preferences and power relations within VSS, and the broader economic order and how VSS design subsequently evolves over time (Auld, 2014; Fransen, 2011; Schleifer, 2019; Sneyd, 2014; Sun, 2022). More specifically, institutional design analyses have also been conducted, which operationalize VSS design into specific attributes. Two types of institutional design analyses can be distinguished.

First, comparative perspectives have studied the presence and combination of various institutional design attributes across sets of VSS (ranging from a dozen to over 400). Attributes investigated include, for example, cost-sharing arrangements and support (Fransen et al., 2019; Schleifer, Fiorini, & Fransen, 2019), inclusiveness in decision-making bodies (Bennett, 2017), decision-making rules, third-party verification, complaint systems and transparency (Auld & Gulbrandsen, 2010; Marx, 2014), and audit procedures (Auld & Renckens, 2021; Castka et al., 2020). Overall, these studies show a high diversity in institutional design across VSS.

Second, explanatory perspectives have sought to understand how VSS institutional design relates to other variables. For example, in a study of 123 VSS, van der Ven (2019) finds that transnational VSS are more likely to adhere to "best practices" such as inclusiveness of decision-making and transparency. Fiorini et al. (2019), analyzing 180 VSS, show that VSS that are members of the ISEAL Alliance (a membership organization for credible sustainability systems), headquartered in OECD countries, that include buyers in their board, and producers in their decision-making bodies, are more likely to apply producer-friendly practices. Based on 180 VSS, Schleifer, Fiorini, and Auld (2019) find that the involvement of public actors in VSS structures and VSS membership with ISEAL Alliance are linked to increased transparency. Castka & Corbett (2016) analyze the effect of different design attributes such as third-party on-site audits, certifiers' accreditation, chain of custody certification, open-consensus-based standard-setting, and government control on experts' perceptions of VSS legitimacy and on media coverage for 41 VSS. They highlight that the mere presence of some design attributes is insufficient for VSS to be perceived as legitimate due to the high variation in their operationalization. In an important contribution, Dietz et al. (2018) test the relationship between VSS stringency, including both substantial requirements and enforcement attributes, and their adoption. They develop a "Voluntary Coffee Standard Index" (VOCSI) applied to 14 VSS in the coffee sector and show that the most widely adopted VSS are the least stringent. This strand of the literature puts forward the relevance of various design attributes for variables such as producer-friendly practices, transparency, legitimacy, and adoption, and tends to be driven by normative considerations aiming to understand whether VSS should be trusted as credible tools for sustainability.

But how does VSS institutional design relate to compliance? Bridging these two concepts, some scholars have analyzed their relationship from conceptual or theoretical perspectives. Nava and Tampe (2022) and Macdonald (2020), for example, argue that compliance can be improved (i.e., "re-coupling") through knowledge transfer and learning, support, capacity-building, progressive compliance, and local standards as it ensures acceptance and implementation of standards. Other authors identify "control" (or "rigidity") and "empowerment" (or "flexibility") as two distinct mechanisms used in VSS design to improve implementation of standards through addressing different types of compliance problems (Auld et al., 2015; Riisgaard et al., 2020; Wijen & Flowers, 2022). Oya et al. (2018) identify different "pathways" or mechanisms through which VSS can generate compliance and, ultimately, positive sustainability impacts: standards prescription, market interventions and premium payments, and capacity-building. In a study on the impact of UTZ certification on export performance of cocoa-producing countries, Grassnick and Brümmer (2021) hypothesize that compliance with standards improves through trainings, frequent audits, information transfer, traceability systems, and labels. While these studies point to important VSS design mechanisms to generate compliance, they lack an integrated and systematic operationalization of these mechanisms into specific design attributes.

From an empirical perspective, a seminal study by Dietz et al. (2019) finds that price premium and awareness and clarity of standards have significant effect on compliance, while the effect of trainings is mixed. The study also finds limited evidence on the effects of auditing and auditor oversight on compliance. In another important empirical contribution, Grabs (2020) highlights tensions between enforcement and capacity-building as distinct and often opposite mechanisms to foster implementation of standards. She tests different variables of VSS institutional design against compliance with 32 environmental and socio-economic indicators for seven VSS in the coffee sector and finds that clear and critical requirements as well as a price premium have the most positive impacts. These scarce studies test how selected VSS design attributes foster compliance, but do not explore how different attributes can combine in distinct compliance mechanisms.

This paper contributes to bridging the gap between institutional design analyses and compliance by proposing an integrated and systematic framework to analyze VSS institutional design for compliance. In the next section, we draw from the regulatory compliance literature to identify mechanisms for compliance and explore how they manifest in the VSS context, with an explicit focus on institutional design. We then develop a systematic analytic framework to assess VSS institutional design mechanisms for compliance based on identifiable design attributes.

3. Conceptualizing compliance mechanisms in VSS institutional design

To understand more systematically how VSS institutional design can generate compliance, we draw from the literature on regulatory compliance. In particular, several distinct mechanisms through which regulatory institutions foster compliance with their rules can be identified, stemming from different schools of thought. Here we focus on three main ones: the enforcement mechanism, the market incentives mechanism, and the capacity-building mechanism (Étienne, 2010; van Rooij & Sokol, 2021; Vedung et al., 1998). A fourth mechanism for compliance has also received extensive scholarly attention: a legitimacy-based mechanism. While important, we exclude it from our framework for two reasons: (1) the definition of legitimacy is contingent upon normative conceptions, and (2) its operationalization significantly overlaps with the operationalization of the other mechanisms rather than being distinct. The latter makes it impossible to analytically and empirically distinguish the legitimacy-based mechanism from the other mechanisms. In this section, we introduce each of the first three mechanisms from the compliance literature and their underlying assumptions regarding the sources of noncompliance, and describe how they can manifest in the context of VSS as private voluntary regulatory instruments. While distinct, these three mechanisms are not mutually exclusive in their use. However, they are not necessarily additive in their effects on actual compliance either (Abbott & Snidal, 2009; Ayres & Braithwaite, 1992; Gunningham, 2010; Nava & Tampe, 2022; Tallberg, 2002)—a point to which we turn in the discussion.

3.1. Enforcement mechanism: Monitoring compliance

The enforcement mechanism, also referred to as "command and control" or the "stick approach" (Vedung et al., 1998), consists, in essence, of monitoring the implementation of rules and punishing noncompliance. This mechanism finds its groundings in the negative enforcement school in the compliance literature, which relies on rational choice theory and assumes that actors are utility-maximizing and comply if the cost of sanctions, determined by their probability and size, outweighs the benefits of noncompliance (Becker, 1968; Downs, 1997; Gunningham et al., 2004; Kaufmann, 1989). Central to the enforcement mechanism are the presence of strong monitoring and verification systems to detect noncompliance and the presence of sanctions to deter it (Gunningham, 2010; Locke, 2013).

From this enforcement perspective, VSS are conceptualized primarily as regulatory institutions that develop rules and put systems in place to control their implementation. While enforcement has a coercive and legally binding connotation, VSS constitute soft enforcement instruments (due to their voluntary nature) and hence rely more on monitoring than on sanctions, which are limited to suspending or withdrawing certification, possibly leading to reputational damage and market access restriction, rather than legally enforceable ones (Abbott & Snidal, 2009; Auld et al., 2008). With the emergence of VSS, concerns have been raised early on about whether their verification systems and sanctions are effective in enforcing standards or whether they are mere "greenwashing" tools that legitimize business-as-usual, and a significant body of literature has hence discussed different

attributes of verification systems needed to make regulatory institutions more effective in ensuring compliance (see LeBaron et al., 2017; Power, 1997; Short et al., 2016; Strathern, 2000; Transparentem, 2021).

Applicable to the VSS context, several attributes of verification systems relevant for compliance can be distinguished. First, significant attention has been paid to how VSS control adopters' compliance through a top-down audit system. Most VSS continue to rely on audits, consisting of a verification or assessment of adopters' performance against a set of defined standards or criteria (Bennett, 2022; Marx, 2014). It has been put forward that more frequent audits organized on-site (in contrast with remote audits or mere document checks) and that assess a representative and large enough sample of operations are desirable to ensure compliance (Jenkins, 2001; May & Wood, 2003; O'Rourke, 2003). Additionally, unannounced audits prevent cosmetic compliance, that is, adopters operating ad hoc changes and hiding noncompliances to pass the audit, and consulting workers and other external stakeholders that may be affected by the certified entity's operations during the audit or the certification process can also reveal shortcomings in compliance (Marx, 2014; Transparentem, 2021).

Second, attention has more recently been paid to bottom-up verification systems, mostly in the form of complaint and dispute settlement systems. These systems allow to continuously monitor compliance by providing a platform for affected stakeholders to raise concerns about a certified entity's operations. The presence but also the accessibility and effectiveness of complaint systems determine their potential to detect noncompliance and administer sanctions (Marx, 2014). More recently, "workers voice technology" or smartphone whistleblowing or allegation channels have also gained potential for workers and grassroots stakeholders to report human rights and other sustainability issues (Taylor & Shih, 2019).

In addition, the outcome transparency of both top-down and bottom-up verification systems influences compliance as well. MSI Integrity (2020) notes that for VSS "that are not transparent about member noncompliance, the probability of compliance by companies and their business partners decreases" (p. 127). Audit and complaint reports that are made public can increase pressure on adopters to comply in order to avoid reputational damage and boycotts (Gunningham et al., 2004; Hale, 2008; Locke, 2013; Schleifer, Fiorini, & Auld, 2019).

When regulating adopters, the consequences of noncompliance are also important. MSI Integrity (2020) highlights that VSS "also need to have mechanisms or processes in place that adequately respond to evidence of noncompliance. Without such mechanisms, which can perhaps be thought of as performing the 'regulatory' or 'oversight' functions of [VSS], there is little assurance that the standards that [VSS] set will lead to improved compliance" (p. 127). These processes can take several forms, such as requiring corrective actions and verifying the resolution of noncompliance. In the case of repeated or severe noncompliance, sanctions can be applied, as aforementioned, in the form of suspension or withdrawal of certification.

In addition to regulating adopters, and in response to repeated criticisms, the audit regime has been increasingly refined to prescribe measures to regulate controllers as well to minimize the risk of corruption and underreporting of noncompliance (LeBaron et al., 2017). In particular, the literature highlights the importance of ensuring both independence and competence in audits (Abbott & Snidal, 2009, p. 65; Esbenshade, 2004). While auditors are usually paid by certified entities, some measures can help ensure the independence of third-party auditors, such as requirements on absence of conflict of interest, an auditor rotation system, or an audit allocation system (Esbenshade, 2004; O'Rourke, 2003). Also, the competence of the auditing organization and its auditors can be ensured through accreditation, experience and training requirements, and oversight mechanisms (Bartley et al., 2015; Short et al., 2016; Terwindt & Armstrong, 2019).

3.2. Market incentives mechanism: Rewarding compliance

The market incentives[1] mechanism, or "carrot approach" (Vedung et al., 1998), also finds roots in the enforcement school in the compliance literature, yet relies on offering rewards for compliance (positive enforcement) rather than threatening sanctions in case of noncompliance (negative enforcement). This mechanism draws on rational choice theory and its utility-maximizing assumption, but also on behavioral economics and psychology, and posits that regulatory institutions need to generate benefits that are large enough for adopters to voluntarily join certification, to compensate for the costs of compliance with rules, as well as to maintain compliance over time (Galati et al., 2017; Garrett & Pfaff, 2019; May, 2005; van Rooij & Sokol, 2021).

Market incentives, such as economic benefits, market access, and reputational gains, are especially important to ensure adoption and compliance in the VSS context as they remain voluntary regulatory schemes (Carter & Siddiki, 2021; Galati et al., 2017; Mason, 2012; May, 2005; Reinders Folmer, 2021). These market incentives can be guaranteed through different attributes of VSS design. First, measures ensuring economic benefits from the sale of certified products can encourage continued compliance. For example, guaranteeing a minimum price that buyers pay to suppliers for certified products shields suppliers from market price volatility and, if superior to the market price, provides additional income (Sneyd, 2014). Guaranteeing a price premium for certified product sales can also incentivize adopters to comply (Dietz et al., 2019; Grabs, 2020).

Second, attributes related to increasing market access further encourage compliance. In this respect, the presence of a traceability system is considered as a market incentive as it reduces transaction costs by facilitating the connection between suppliers and buyers and sparing further verification costs (Grassnick & Brümmer, 2021). Moreover, some types of traceability systems may be more incentivizing than others. Traceability systems set rules on the use and movements of certified products when ownership of the products is transferred from one custodian to another, and form the basis for claims that can be made about the certified products. Two main types of chain of custody models can be distinguished (ISEAL Alliance, 2016): an "Identity Preservation/Segregation" model and a "Mass Balance" model. The former does not allow mixing certified products with noncertified ones, while the latter does. It is expected that allowing for "Mass Balance" encourages adoption and compliance, as adopters reap the reputational and market benefits of holding a VSS certificate while submitting only a fraction of their production or operations to certification (van der Ven et al., 2018), whereas "Identity Preservation/Segregation" systems involve higher costs and logistical challenges that may discourage adopters. "Mass Balance" can also serve as a stepping stone toward upscaled compliance by allowing for a gradual transition and generating positive spill-over effects on conventional production practices (van der Ven et al., 2018). More recently, "Credit Trading" traceability systems have emerged that decouple claims from certified products and are intended to reward responsible production where the physical value chains make sourcing of the actual product difficult, which can provide an incentive to comply.

Lastly, measures ensuring reputational gains can also encourage compliance as they increase potential for profits and market access (Carter & Siddiki, 2021; Galati et al., 2017). Granting the use of a consumer-facing label (in contrast with business-to-business certificates) allows for differentiation of products on the market, can be used as a signaling mechanism to consumers and can justify a price premium. It can also increase traded volumes on markets where there is demand for sustainable products through improved reputation. Hence, as Ponte (2019) argues, economic actors engaged in business-to-consumer transactions are more likely to operate sustainability upgrading than when they are not (see also Abbott & Snidal, 2009, p. 73). Relatedly, the issuance of "add-on" certificates and labels encourage the implementation of further sustainability practices in addition to their baseline standards through further reputation improvement. These measures can hence encourage adoption, compliance, as well as beyond-compliance with VSS standards.

3.3. Capacity-building mechanism: Enabling compliance

The capacity-building mechanism, or the "sermons approach" (Vedung et al., 1998), finds its roots in the managerial and development literature and posits that noncompliance is not necessarily intentional but can result from an inability to comply, in terms of 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 the context in which they are to be implemented (Chayes & Chayes, 1998). From this perspective, what ensures compliance is not the threat of sanctions but measures that contribute to closing the compliance gap, that is, the difference between adopters' ability to comply and the capacity necessary to meet the rules (Downs, 1997; Young, 1992). Accordingly, information, cooperation, and support, rather than coercion and incentives, are more conducive to compliance, not only in the strict and short-term sense but also in generating norm internalization and integrated rule implementation in the longer term.

From this capacity-building perspective, VSS are conceived as knowledge-transfer and support instruments that enhance adopters' capacity to implement sustainable production practices (Boström, 2006; Brandi, 2020). In particular, we distinguish two types of capacity-building measures that can close the compliance gap: measures

aimed at enhancing the capacities of adopters and their understanding of the rules, and measures aimed at improving the fit between the rules and adopters' capacities.

First, several measures can be used by VSS to increase adopters' capacities and understanding of the rules. Providing guidance documents in complement to the list of requirements increases adopters' knowledge and understanding of the rules and hence prevents noncompliance resulting from ignorance (Fiorini et al., 2019). Trainings and technical support help adopters acquire further knowledge of the rules and provide them with know-how and expertise on how to implement them (Elder et al., 2013; Macdonald, 2020). Additionally, material and financial assistance provided to adopters, in the form of inputs or pre-financing arrangements, for example, decreases costs and improves their capacity to implement rules (Dietz & Grabs, 2022; Schleifer, Fiorini, & Fransen, 2019). Moreover, requiring an internal management plan from adopters can help them understand and internalize rules through a learning mechanism, since it requires reflexivity on how compliance can be achieved and maintained, and on how noncompliance can be prevented and/or mitigated (Huising & Silbey, 2021; Riisgaard et al., 2020). Lastly, a "continuous improvement" policy—requiring adopters to comply first with a core set of standards, which is then expanded over the years—allows for gradual implementation of the rules and increases adopters' capacity to comply through learning (Garrett & Pfaff, 2019; Grabs, 2020; Macdonald, 2020).

Second, VSS can adopt measures to improve the fit between the rules and adopters' capabilities (Nava & Tampe, 2022; Tampe, 2021). By developing locally adapted standards—derived from generic standards yet tailored to contextual specificities through consultation with local experts and stakeholders—compliance is enhanced by ensuring a more realistic implementation of the standards (Bennett, 2017; Macdonald, 2020; Reid & Rout, 2018). Additionally, adjusting standards to adopters' capacities increases compliance. Smallholder standards, for example, prescribe a reduced or adjusted set of requirements to align with the lower implementation capacity of smallholders. Fitted standards—to local contexts and capacities—also enhance the acceptance and internalization of the rules, which can increase compliance (Nava & Tampe, 2022).

While the focus of this paper is explicitly on VSS institutional design, other key actors perform enforcement, market incentives, and capacity-building functions that can foster compliance with VSS. For example, watchdog civil society organizations or NGOs monitoring VSS adopters, drawing media attention to noncompliances and conducting naming-and-shaming campaigns against noncompliers constitute a form of enforcement (Bartley, 2003; Gereffi et al., 2001; O'Rourke, 2003). Demand-side actors, including buyers, consumers, the public sector, or NGOs, are also key in determining the potential of VSS sanctions (suspending or withdrawing certification) to be effective in deterring noncompliance, as well as in delivering market incentives for compliance, as they shape the market for certified products both in terms of demand and price. In terms of capacity-building, the public sector, NGOs, donor organizations, and other development actors, in partnership or not with VSS, also play a crucial role in delivering trainings and providing technical, material, or financial support that can improve adopters' capacity to comply with VSS (Humphrey, 2009; Marx, 2019).

4. Assessing compliance mechanisms in institutional design: Analytic framework

How are these mechanisms reflected in the institutional design of VSS? This section proposes an analytic framework to assess how VSS institutional design fosters compliance through different mechanisms. For this, we use a model for measurement validity following Adcock and Collier (2001). The model takes a broad concept—here, institutional design mechanisms for compliance—and breaks it down into more specific sub-concepts called "systematized concepts"—here, institutional design attributes, mostly identified in the previous section—which are then measured by indicators that allow for scoring of cases. The model relies on an iterative, back-and-forth process to revisit indicators and concepts and make amendments based on scores from observations.

Accordingly, we use different sources to develop the analytic framework and systematically operationalize the three mechanisms into attributes and measurable indicators. We start from existing VSS institutional design analyses (see Section 2) as well as databases, codes of practices, and evaluation tools, including the ITC Standards Map, the ISEAL Alliance Codes of Good Practice, the MSI Evaluation Tool, and the GIZ Sustainability Standards Comparison Tool (SSCT). The ITC Standards Map[2] is a comprehensive online database listing more than 300 VSS in existence. For each VSS, the database provides data on its requirements, its compliance assessment system, its governance, and the resources it provides to interpret and implement the standard. The ISEAL

Alliance Codes of Good Practices (ISEAL Alliance, 2023) define sets of institutional design requirements related to standard-setting, assurance system, and impact assessment for effective and credible VSS. The MSI Evaluation Tool (MSI Integrity, 2017) provides a framework to comprehensively and objectively assess the institutional design, structure, and operational procedures of VSS from an effectiveness perspective. It includes a detailed set of indicators related to seven systematized concepts of VSS design. The GIZ Sustainability Standards Comparison Tool (SSCT)[3] is intended as a guide for consumers to understand VSS labels and claims. It provides a framework to assess VSS on socio-economic and environmental requirements but also on a set of 89 "credibility" indicators pertaining to VSS institutional design. The empirical analysis in Section 5 also serves to identify indicators and attributes of VSS design for compliance, including more innovative ones that have not (yet) been included in existing frameworks (e.g., audit allocation system as an indicator of auditors independence).

Across these data sources, we selected only indicators and attributes relevant to either of the three mechanisms for compliance, then re-combined and refined them in an iterative back-and-forth process to develop a parsimonious yet comprehensive framework. The resulting analytic framework of VSS institutional design for compliance as shown in Table 1 comprises of 27 attributes and 46 indicators across the three mechanisms.

This analytic framework shows how different compliance mechanisms can be systematically operationalized into specific institutional design attributes. It builds upon previous institutional design analyses and frameworks (see Section 2) but applies a compliance lens. It also expands on mechanisms for compliance that have so far been described conceptually or theoretically across various papers (see Section 2) by integrating and systematically operationalizing them into a comprehensive set of measurable attributes and indicators, hence providing a systematic tool to assess VSS institutional design for compliance.

5. Empirical application

5.1. Data and case selection

We apply our analytic framework to 13 selected VSS, starting from the 300 VSS catalogued in the Standards Map and applying several selection criteria (some of which the Standards Map allows to filter on directly). First, we select VSS active in the agrifood and forestry sectors, as primary sectors of VSS emergence and certification dynamics (both in terms of number of VSS active and of certified share of global production). Second, we choose VSS operating at the production level (i.e., not solely at the manufacturing, distribution, or consumption levels) and performing standard-setting and certification activities (i.e., not solely benchmarking, sustainability ratings, best practices guidelines, or accreditation). Third, we exclude companies' in-house sustainability programs as their voluntary and compliance-oriented nature is questionable. Fourth, we focus on sustainability-oriented VSS (i.e., excluding geographic origin and food safety certifications) and on VSS that have a global presence (i.e., excluding those originating from and destined to a single country or geographic region).

This yields 13 VSS: 4C, Bonsucro, Fairtrade International, GLOBALG.A.P., IFOAM—organics,[4] ProTerra, Rainforest Alliance (2017 version, pre-merger with UTZ), Rainforest Alliance (2020 version, post-merger), the Roundtable on Responsible Soy (RTRS), the Roundtable on Sustainable Palm Oil (RSPO) and UTZ (pre-merger with Rainforest Alliance) for the agrifood sector, and the Forest Stewardship Council (FSC), and the Program for the Endorsement of Forest Certification (PEFC)[5] for the forestry sector. We include both Rainforest Alliance 2017 and UTZ (pre-merger) and Rainforest Alliance 2020 (post-merger) as our data collection period coincided with the merger's transition period, during which the three schemes were active. While our dataset is mostly cross-sectional, this provides us with an instance of longitudinal data.

We construct a cross-sectional dataset of institutional design for compliance for the 13 selected VSS by collecting empirical data from their respective publicly available procedural documents and websites. The range of documents screened varies across VSS as they structure information differently but typically includes "Code of Conduct," "System Regulations," "Certification Protocol," "Complaint Procedure," "Oversight Procedure," "Terms of Use," and "Theory of Change" documents and the like (see Supplementary Material 1), in their most recent versions (as of 2022). Attributes search was conducted by thoroughly reading and interpreting all relevant procedural documents instead of conducting keyword searches to ensure no attributes were overlooked due to differences in terminology across VSS. A list of keywords was then developed for each attribute. When attribute data were not found in procedural documents, we conducted keyword searches on VSS websites and screened the

Table 1 Analytic framework: Institutional design for compliance

Mechanism	Attribute name	Attribute definition	Indicators
Enforcement	Regular on-site audit	Audits are performed on site according to a predefined audit cycle, including re-certification audits and surveillance audits, after the initial certification audit	Frequency of on-site audits required after the initial certification audit, calculated as the number of on-site surveillance audits required within the certificate validity period and re-certification audits
	Sample size and selection	The sample of audited members/farms/producers is sufficiently large and representative of different types of activities and risk	Presence of procedure requiring that sample size is at least the square root of the number of members/farms/producers Presence of procedure requiring that sample selection is representative of risk and/or type of activities
	Stakeholders input	The input of affected stakeholders (internal and external) are taken into account in the certification process	Presence of procedure requiring to interview workers during the audit Presence of procedure requiring that external stakeholders are consulted during the certification process Presence of procedure guaranteeing the protection of interviewed/consulted stakeholders (e.g., anonymity/confidentiality, workers interviews conducted without the management)
	Unannounced audits	Certification bodies conduct unannounced (or "surprise," "short-notice") audits to avoid cosmetic compliance	Presence of procedure allowing certification bodies to conduct unannounced audits (e.g., in case of complaint, risk assessment, etc.) Presence of procedure requiring certification bodies to conduct a certain number of unannounced audits
	Certification/compliance status outcome transparency	Information on the certification status and compliance level of certified entities is publicly available	The VSS organization makes the list of certified entities and their certification status (e.g., valid, suspended, withdrawn) publicly available The VSS organization makes audit reports of individual certified entities publicly available
	Complaint and dispute settlement system	Complaint and dispute settlement system allows for any stakeholder to raise issues on certified entities' compliance or implementation of the standards	Presence of procedure for stakeholders to raise complaints to the VSS organization about certified entities' compliance Presence of procedures to facilitate the filing of complaints (e.g., translation services, confidentiality guarantee, funding support, "workers voice" technology or smartphone allegation channels)
	Complaint and dispute settlement system outcome transparency	Information about individual complaints and their outcomes is publicly available	The VSS organization publishes aggregated information about complaints that were received The VSS organization publishes information about and outcomes of individual complaints

(*Continues*)

Table 1 Continued

Mechanism	Attribute name	Attribute definition	Indicators
	Corrective actions	In case of noncompliance, the certified entity is required to undertake actions to mitigate noncompliance which are verified	Presence of procedure requiring certified entities to address noncompliances through corrective actions Presence of procedure requiring the verification of the implementation of corrective actions by certified entities to address noncompliances
	Sanctions	Noncompliance with standards bears consequences for certified entities	Presence of procedure to sanction (repeated and/or major) noncompliances in the form of certificate suspension or withdrawal
	Independent third-party auditing	Audits are conducted by auditors from an organization that is different and independent from the VSS organization	Presence of procedure requiring that audits are conducted by auditors from an organization different from the VSS organization Presence of procedure requiring that audits are conducted by auditors from an organization independent from the VSS organization
	Certification bodies competence	Certification bodies competence is ensured through their accreditation by ISO	Presence of procedure requiring certification bodies to be ISO accredited
	Certification bodies performance	The VSS organization prescribes for oversight procedures on certification bodies to ensure their performance	Presence of procedure requiring certification bodies to regularly self-report on their performance, or requiring them to be assessed by an accreditation body regularly Presence of procedure for the VSS organization to conduct regular oversight activities on certification bodies (e.g., performance assessments, shadow audits)
	Auditors competence	Individual auditors are trained on procedural and substantial elements of certification	Presence of procedure requiring individual auditors to be trained on ISO standards (procedural elements) Presence of procedure requiring individual auditors to be trained or experienced in the issues that the VSS organization aims to tackle (substantial elements)
	Auditors independence	Auditors' independence from certified entities is guaranteed	Presence of policy requiring the absence of conflict of interest between auditors and the certified entity Presence of audit allocation system (allocating auditors to a certified entity based on performance assessment of auditors and/or on risk assessment of the certified entity) Presence of procedure limiting the number of subsequent audits an auditor can conduct for the same certified entity

(*Continues*)

Table 1 Continued

Mechanism	Attribute name	Attribute definition	Indicators
Market incentives	Minimum price	Producers are guaranteed a minimum price for the sale of certified products	The VSS organization fixes a minimum price buyers need to pay to producers for certified products
	Price premium	Producers receive a price premium for the sale of certified products	Presence of procedure requiring buyers to pay a price premium to producers for certified products The VSS organization fixes the amount of a price premium that buyers need to pay to producers for certified products
	Marketing	Certified products can be marketed with a consumer-facing (B2C) label, as opposed to B2B certificates	The VSS organization issues a consumer-facing (B2C) label for certified products
	Traceability system	A traceability system (or Chain of Custody certification) allows to keep track of certified products along the value chain to validate claims about certified products and allows to connect producers and buyers	The VSS organization provides a traceability system that requires Identity Preservation/Segregation of certified products The VSS organization provides a traceability system that allows for Mass Balance The VSS organization provides a traceability system that allows for Credit Trading
	Free-of-charge program	Except from audit and compliance costs, the VSS program is free for certified entities to operate	Presence of fee for certified entities to operate the certification program (e.g., membership fee, volume-based fee) which is distinct from audit and compliance costs
	Add-on certificates	Add-on certificates reward the implementation of additional sustainability practices (beyond compliance)	The VSS organization issues add-on certificates to reward the implementation of additional sustainability practices (beyond compliance)
Capacity-building	Trainings and technical support	Certified entities have access to trainings and technical support to implement the standards	The VSS organization provides trainings or technical assistance to help certified entities implement standards The VSS organization provides trainings or technical assistance for free
	Financial and material assistance	Certified entities have access to financial assistance or material support to implement the standards	The VSS organization provides financial assistance (e.g., support fund, advance payments) or material assistance (e.g., free provision of agricultural inputs) to certified entities
	Guidance documents on requirements and procedures	Guidance documents on standards and procedures provide further information to certified entities on how to interpret and implement the standards	The VSS organization provides additional guidance on standards and procedures through short explanations of the requirements and list of changes The VSS organization provides extensive guidance on standards and procedures through additional dedicated documents, for example, Q&As, translations, examples

(*Continues*)

Table 1 Continued

Mechanism	Attribute name	Attribute definition	Indicators
	Continuous improvement	Certified entities gradually implement the standards through a continuous improvement approach	The VSS organization allows for a gradual implementation of the standards through increasing the number or stringency of standards certified entities need to comply with over a pre-defined timeframe
	Internal management plan	Certified entities develop an internal management plan to identify areas for sustainability improvements, set goals and determine actions to reach them	Presence of procedure requiring certified entities to develop an internal management plan Presence of procedure requiring certified entities' internal management plan to be assessed or reviewed regularly
	Smallholder standards	Standards are adapted to smallholders' capacities	The VSS organization issues standards that are adapted to smallholder's capacities or explicitly identifies standards that are not applicable to smallholders
	Localized standards	Standards are adapted to local contexts	The VSS organization issues country- or region-specific standards or explicitly identifies standards that are not applicable to specific countries or regions

Standards Map and the GIZ "Not fit-for-purpose" report which applies the MSI Evaluation Tool to 10 VSS in a pilot analysis (MSI Integrity, 2020). These sources were also used to triangulate data. When data was found in none of these sources, we conservatively assumed the attribute is not present.

In addition to attribute data, we collected VSS data related to their history, mission, sectors, and countries of activity, founding stakeholders, and other identity attributes, as well as coverage data from ITC State of Sustainable Market report 2022 (Willer et al., 2022) to enhance our interpretation of the results and discuss the relevance of the findings. The cross-sectional nature of our dataset (except for the Rainforest Alliance-UTZ merger case as abovementioned) constitutes a limitation of our empirical analysis especially since VSS are dynamic entities subject to continuous change over time (Auld, 2014). The proposed analytic framework can nonetheless be used for future longitudinal analyses of VSS institutional design for compliance.

5.2. Scoring

To apply our analytic framework in an empirical analysis, we develop a scoring system similar to previous approaches (e.g., Dietz et al., 2018; Fiorini et al., 2019; Marx, 2014; Schleifer, Fiorini, & Fransen, 2019; van der Ven, 2019) in order to assess each VSS on the diversity and extent to which they integrate mechanisms for compliance in their institutional design. We provide "attributes scores" from which we derive "mechanism scores" that represent the extent to which a VSS uses the respective mechanisms to generate compliance. From these mechanisms scores, we generate an overall "institutional design for compliance score" which reflects the degree to which the institutional design of a VSS is compliance-oriented. This scoring system shall not be interpreted as absolute, nor does it capture the effectiveness of each attribute relative to others in generating actual compliance, but rather provides an avenue to conceptualize and assess institutional design through a compliance lens, and compare it across VSS and across mechanisms. In this section, we describe the scoring methodology in more details.

5.2.1. Attribute scores

Each attribute can receive a score between 0 and 1. Some attributes are operationalized by a single indicator. In most cases, an indicator refers to a specific and identifiable feature of a VSS design in the form of a binary categorical variable, that is, either present or absent. Attributes operationalized by a single binary categorical indicator receive a score of 0 when the indicator is absent and a score of 1 when present. Other indicators allow for a more

fine-grained measurement of a feature in the form of a numerical variable between 0 and 1. The score for the attribute hence takes the numerical value of the indicator when it is operationalized by that single indicator.

Other attributes are operationalized by several binary categorical indicators. We combine these indicators and determine empirical cut-off categories to which we assign scores. An attribute score of 0 reflects the absence of all the indicators. A score of 0.5 is assigned to an attribute when some minimum threshold indicators are present but not all indicators. A score of 1 is assigned when minimum threshold indicators as well as additional indicators are present. Specific scoring guidance is provided for each attribute in a scoring grid in Supplementary Material 2.

5.2.2. Mechanism scores

We generate "mechanism scores" by aggregating the scores from each attribute for the three mechanisms separately. A mechanism score represents the extent to which a VSS uses a mechanism to generate compliance and is calculated as the sum of attribute scores divided by the number of attributes in the mechanism. Mechanisms scores range between 0 and 1, with 1 reflecting a VSS that integrates a mechanism to generate compliance most strongly. Mechanism scores can be compared across mechanisms to understand where an individual VSS allocates most efforts to foster compliance through its institutional design, as well as across VSS to study whether they differ in their approach to foster compliance.

5.2.3. Institutional design for compliance score

The mechanism scores are combined into an overall "institutional design for compliance score" which reflects the degree to which the institutional design of a VSS is compliance-oriented. It is calculated as a simple average of the three mechanism scores and ranges between 0 and 1.

5.3. Results

Figures 1 and 2 provide the results of the empirical analysis for the 13 selected VSS. Scores range between 0 and 1 and show the extent to which VSS use the respective compliance mechanisms in their design (mechanism scores) and the extent to which, overall, their design is compliance-oriented (institutional design for compliance score). We describe the results and turn to a broader discussion on how we can interpret them in the next section.

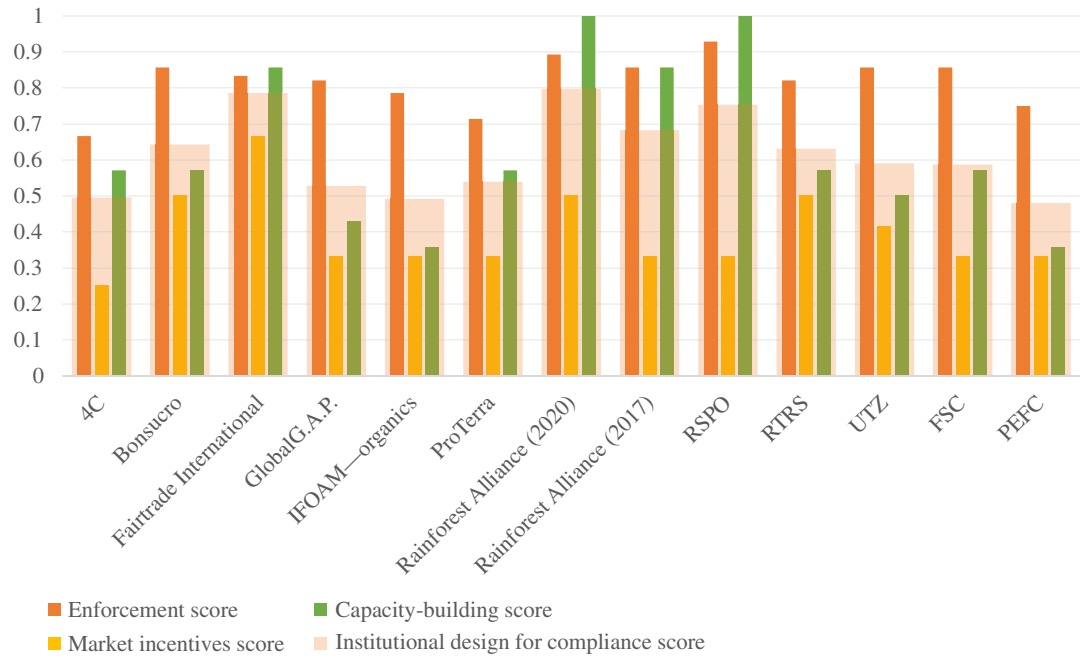

Figure 1 Voluntary sustainability standards institutional design for compliance: Mechanisms scores and overall score.

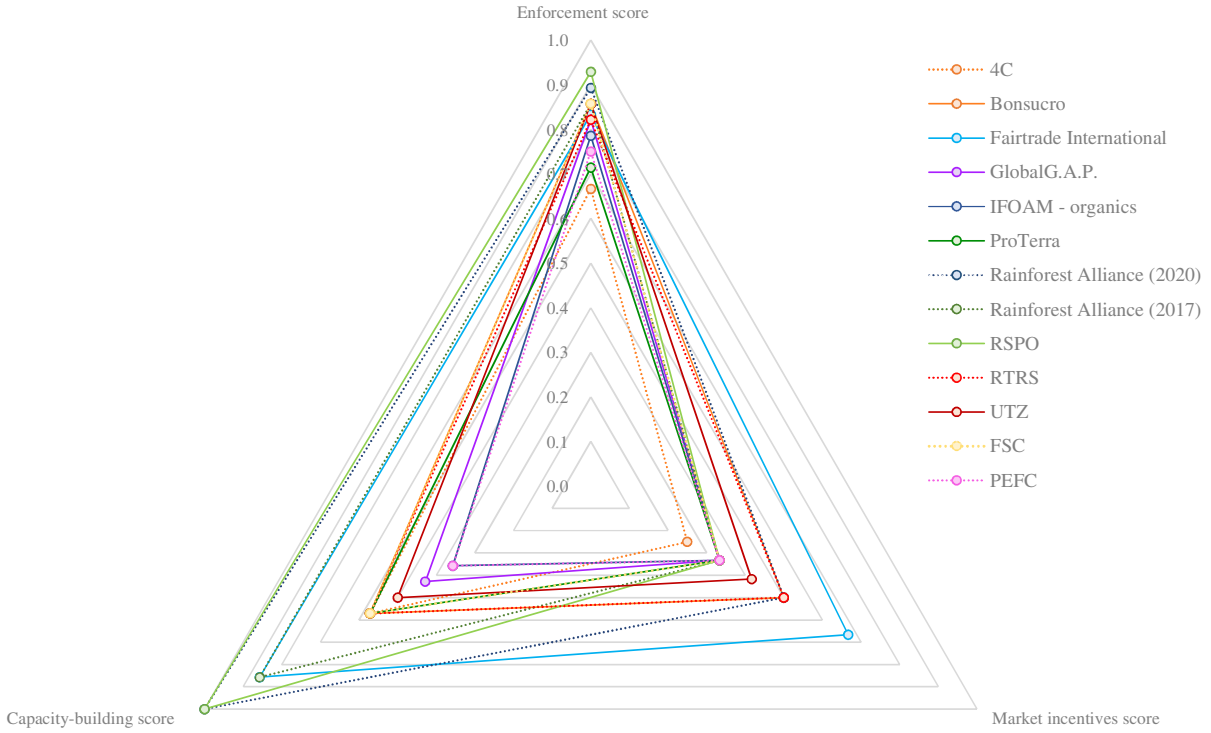

Figure 2 Combinations of institutional design mechanisms for compliance.

Several observations can be made based on these results. First, none of the mechanisms consistently scores 0 across the 13 VSS, confirming that there are different ways in which VSS can be designed to foster compliance and that the identified mechanisms and their operationalization are relevant. Second, we observe significant variation in the degree to which different mechanisms are used and the way they combine, as depicted in Figure 2. Overall, the enforcement mechanism is used to a significant extent (i.e., high scores) across all VSS, with the lowest score being 0.66 for 4C and the highest being 0.93 for RSPO. In contrast, scores on the market incentives mechanism remain overall relatively low, ranging from 0.25 for 4C to 0.66 for Fairtrade International. In addition, most variation can be observed in the degree to which the capacity-building mechanism is used across VSS, from IFOAM—organics and PEFC scoring 0.35 to RSPO and Rainforest Alliance (2020) scoring 1.

Third, we observe variation in overall institutional design for compliance scores (Fig. 1), ranging between 0.48 for PEFC and 0.8 for Rainforest Alliance (2020), which further attests to VSS institutional diversity and shows that for some VSS, their institutional design is relatively maximized to generate compliance in comparison to other VSS, by combining different compliance mechanisms.

Relatedly, different VSS with similar overall institutional design for compliance scores vary in their use of the different mechanisms. For example, although their overall score is similar, Fairtrade International uses the three mechanisms to a relatively comparable degree, whereas the RSPO concentrates its efforts on enforcement and capacity-building but much less on market incentives. Similarly, VSS with similar scores on one mechanism can vary in how they use the mechanism through different design attributes.

Moreover, we observe an interesting strengthening of Rainforest Alliance's institutional design for compliance when comparing the 2017 version with the 2020 version when it merged with UTZ, with its overall score increasing from 0.68 to 0.8 and each mechanism score improving as well. This raises questions on the extent to which Rainforest Alliance (2017) and UTZ were complementary or overlapping in their design and calls for further analysis of the respective attributes of these VSS that were taken on board for the merger and of the power relations that were at play. This opens avenues for further research on the evolution of institutional design for compliance within VSS, which can contribute to the debate in the VSS literature on whether VSS "ratchet up" or not (Judge-Lord et al., 2020; Schleifer, Fiorini, & Fransen, 2019; van der Ven, 2019).

6. Discussion

The empirical application shows that VSS vary in the extent to which they use mechanisms to generate compliance, with, notably, enforcement being consistently extensively used. In this section, we ask how we can understand variation in institutional design for compliance, how it matters for effectiveness, and how the mechanisms relate to actual compliance.

First, VSS institutional design for compliance is partly determined by the initial mission and history of individual VSS (Auld, 2014). Fairtrade International, for example, was initially set up rather as a development tool to improve farmers' capacity, especially in terms of getting fair prices, than as a regulatory initiative, hence its relatively high scores on the capacity-building and market incentives mechanisms. In contrast, GLOBALG.A.P., for example, emerged from EUREPG.A.P., a standard to help producers comply with European food safety standards and other sustainable production methods following food safety scandals in the 1990s, hence the enforcement-oriented approach of GLOBALG.A.P.

Besides, VSS are dynamic instruments that evolve over time, although their design tends to be sticky ("path-dependency effect") (Auld, 2014). Table 2 shows that older VSS score higher on institutional design for compliance, and that this holds particularly true for the enforcement and capacity-building mechanisms, showing organizational learning and innovation dynamics over time as they respond to scrutiny and external pressures (Auld et al., 2015).

Relatedly, VSS institutional design for compliance is shaped by dynamics in their socio-political and economic context (Auld et al., 2015; Cashore et al., 2021; Fransen et al., 2019; van der Ven & Barmes, 2023). The consistently extensive use of the enforcement mechanism across VSS makes it appear as a necessary condition for VSS to operate and attests to the "audit culture" as a paradigm in the global economic order (Sneyd, 2014). The way private regulatory institutions enforce their standards, mostly through independent third-party auditing, has become a key determinant of their legitimacy and credibility (Marx, 2014; Schleifer, 2019) as reflected in ISEAL Alliance membership conditions and other recognition frameworks, which arguably results from the direct influence of auditing firms in the global economy (Fransen & LeBaron, 2019).

In contrast, the lower use of the market incentives mechanism and the larger variation in the use of the capacity-building mechanism reflects the lower priority given to these approaches in the wider economic order, yet mounting attention toward the importance of premiums and pledges for living wages (Bennett, 2018; Dietz et al., 2019) might lead to evolutions in the extent to which the market incentives mechanism is used. The increased market incentives mechanism score of Rainforest Alliance 2020 compared to its 2017 version and UTZ might attest to this. Evolutions in the socio-political and economic context and paradigms hence contribute to explaining evolutions in VSS institutional design, but also determine the legitimacy of VSS. In this way, the three identified mechanisms feed into the fourth (legitimacy-based) mechanism referred to in Section 3.

Overall, our analysis shows that while enforcement appears to be necessary for VSS to operate, the use of this mechanism does not necessarily generate tensions with the use of other mechanisms (Auld et al., 2015; Grabs, 2020; Riisgaard et al., 2020; Wijen & Flowers, 2022) as VSS evolve over time, which may result from an enhanced access to resources associated with age (and persistence), and a more diverse resources allocation resulting from external pressures.

Table 2 Correlations of institutional design for compliance

	Age of standards	ISEAL membership[†]	Share of production area certified[‡]
Enforcement score	0.27	0.76	0.40
Market incentives score	0.04	0.57	−0.05
Capacity-building score	0.46	0.67	0.37
Institutional design for compliance score	0.38	0.81	0.32

[†]ISEAL membership scores: 0 = not member; 0.5 = community member; 1 = full code compliant members. [‡]Share of total production area certified by each VSS for the nine commodities in Willer et al. (2022), that is, bananas, cocoa, coffee, cotton, oil palm, soybeans, sugarcane, tea, and forestry. Data for Rainforest Alliance 2020: sum of Rainforest Alliance 2017 and UTZ (not accounting for double certification; conservative approach as Data Reports 2022 of the Rainforest Alliance 2020 for cocoa, coffee, bananas, and tea report even higher coverage).

How does institutional design for compliance matter for VSS effectiveness? While lacking systematic and comparable impact data for the 13 VSS in this analysis, we look at another necessary dimension for VSS effectiveness: adoption. Table 2 shows that institutional design for compliance scores positively correlate with VSS adoption, calculated as the share of total production area certified by each VSS across nine commodities based on data from the ITC State of Sustainable Markets 2022 (Willer et al., 2022). More specifically, higher enforcement and capacity-building mechanisms scores positively relate to adoption, while the market incentives mechanism does not. Building on van der Ven (2019), who argues that more widely adopted VSS become more stringent over time through heightened scrutiny (see also Haack & Rasche, 2021) and availability of resources, here we distinguish that this holds true for the enforcement and capacity-building mechanisms but not for the market incentives mechanism. Regarding this latter, a tension between adoption and the provision of incentives may hold, which can be explained by the direct costs that incentives represent for value chain actors, discouraging them from engaging in certification. Hence, while the fact that the most widely adopted VSS also tend to be strongly designed to ensure compliance through the enforcement and capacity-building mechanisms may be a positive first step toward effectiveness, VSS shortcomings in the use of the market incentives mechanism indicate that they continue to fail in ensuring that significant economic benefits are delivered to their adopters (Bennett, 2018, 2022).

Lastly, it is important to empirically assess how the three mechanisms relate to actual compliance. First, the different mechanisms are ideal types but one should test whether the assumptions of compliance theories hold true for mechanisms individually or if there is endogeneity among them. For example, some authors argue that verification systems can be conceived as learning mechanisms rather than enforcement mechanisms since, through repeated interactions and disclosure of results, they unveil noncompliances to adopters whose noncompliance might stem from a lack of knowledge (May & Wood, 2003; Sabel, 1994). Similarly, a strong use of verification systems can generate higher compliance through the market incentives mechanism rather than the enforcement mechanism. VSS have been increasingly recognized and integrated into public policy conditional on some institutional design criteria generally related to enforcement (UNFSS, 2020), which might enhance market access for adopters of these VSS and hence encourage them to comply.

Second, the effectiveness of the mechanisms in actually generating compliance should be investigated (Bartley et al., 2015). More specifically, the effects of individual mechanisms on compliance might run opposite to the assumptions, and their combined effects might involve tensions (nonadditivity of mechanisms). On the first point, authors warn, for example, that incentives-based mechanisms for compliance generation can decrease compliance through a "crowding-out" effect by replacing intrinsic motivations to comply by an extrinsic motivation (Frey & Jegen, 2001; Reinders Folmer, 2021). A strong enforcement mechanism might also fail to generate compliance by having adopters drop out of certification altogether (MSI Integrity, 2020, pp. 146–147).

On the second point, it has been argued that the simultaneous extensive use of different mechanisms for compliance is desirable as it can accommodate for different needs, capacities, and intrinsic motivations of adopters to comply (Ayres & Braithwaite, 1992; Gunningham, 2010; May & Wood, 2003; Nava & Tampe, 2022; Tallberg, 2002). This can not only ensure compliance to the letter but also foster long-term, deep-rooted changes in production practices (Dietz & Grabs, 2022), and can increase VSS acceptance and perceived legitimacy by relevant actors.

However, the three mechanisms for compliance are not necessarily additive in their effects, that is, scoring high on all mechanisms does not necessarily foster higher compliance. A strong enforcement mechanism might undermine the positive compliance effects of market incentives, for example (Auld et al., 2015). Hence, there might be tensions in the effects of the three mechanisms when used simultaneously. Empirical research should investigate the individual and combined effects of the mechanisms on compliance. In particular, comparative analyses of these effects at both the transnational level and at local levels would be particularly helpful to uncover potential tensions and their different sources.

This paper augments the understanding of VSS institutional design and the diversity therein through applying a compliance lens. We highlight that VSS are path-dependent yet dynamic institutions that respond to contextual developments through organizational learning and innovation, which explains evolutions in their design and the mechanisms they use to foster compliance. We show that VSS aim to generate compliance not only through

enforcement but also in combination with other mechanisms, that is, market incentives and capacity-building. Their respective and combined effectiveness in actually generating compliance remains however to be investigated.

7. Conclusion

The analytic framework developed in this paper proposes a comprehensive and systematic tool to conceptualize VSS institutional design for compliance. Based on the existing literature on compliance, institutional design effectiveness, VSS institutional design, and on VSS impacts, we distinguish three mechanisms through which VSS design fosters compliance: the enforcement mechanism, the market incentives mechanism, and the capacity-building mechanism, which we systematically operationalize into design attributes.

This analytic framework contributes to a better understanding of the mechanisms through which VSS, as regulatory institutions and agents of change, can generate impacts through compliance. It broadens the conceptualization of the institutional design of VSS not only as regulatory instruments, but also as market tools and as capacity-building initiatives. This has implications for VSS legitimacy, which is particularly important in the case of transnational private regulatory instruments which can face resistance from stakeholders in developing countries.

Accommodating for different contexts, motivations, and sensitivities can contribute to the acceptance and effectiveness of these transnational private governance instruments. This is of particular relevance in light of the recent regulatory developments on due diligence in GVCs, such as the European Union's deforestation-free products regulation (EUDR) (2023), the role they will give to value chain solutions such as VSS, and how they will influence the design of these instruments (Cashore et al., 2021; Sneyd, 2014; van der Ven & Barmes, 2023).

As avenues for future research, we suggest applying the framework to a larger sample of VSS, including less mainstream VSS to account for potentially larger variations in scores, as well as former versions of VSS in order to better understand evolution in their approaches to compliance. Furthermore, research should test the mechanisms as well as the institutional design attributes that are most effective in generating compliance, and how this relates to adoption. Relatedly, research should investigate the additivity of mechanisms in generating actual compliance, both transnationally and at local levels. When assessing VSS effectiveness, attention should also be paid to the standards that are prescribed, how compliance is operationalized, and the outcome indicators that are measured (Garrett & Pfaff, 2019; Wijen, 2014; Wijen & Flowers, 2022). This has important implications for resources allocation. Importantly, we call for further research on the potential discrepancies between how the mechanisms for compliance are operationalized in VSS provisions and how they are operationalized in practice, and what the implications are for actual compliance, for effectiveness, and for potential partnerships to emerge.

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DATA AVAILABILITY STATEMENT

The data that supports the findings of this study are available in the supplementary material of this article

Endnotes

[1] Not to be confused with "market-based instruments" (MBIs) in the field of environmental law and policy. On MBIs, see, for example, the work of Stavins (2003).

[2] https://standardsmap.org/

[3] https://www.siegelklarheit.de/

[4] IFOAM—organics is a membership-based international umbrella organization for organic certifications. Organic certifications are typically determined by standards at the national or regional level and usually operate within a single country or region. Not all national or regional organic certifications follow IFOAM standards. IFOAM currently endorses 52 organic certifications worldwide which all comply with IFOAM—organics standards. It is possible that these organic certifications go beyond IFOAM standards, but they (in theory) *at least* comply with IFOAM standards. Hence, we adopt a conservative approach by including IFOAM standards as the least common denominator for organic standards in our analysis.

[5] We adopt a similarly conservative approach for FSC and PEFC as for IFOAM—organics (see previous footnote). FSC and PEFC have national offices and standards but their global standards act as least common denominators.

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