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Voluntary Sustainability Standards in Global Agrifood Systems: Emerging Challenges and Policy Pathways

ABSTRACT

Agrifood production systems drive environmental degradation and deepen social and economic inequalities, particularly in developing countries. Voluntary Sustainability Standards (VSS) have emerged to promote economic viability, social equity, and environmental protection within global value chains. This narrative review critically examines their role in advancing sustainability across production systems, focusing on environmental practices, livelihoods, market access, and power relations. The schemes analyzed include Fairtrade, Rainforest Alliance, organic agriculture, GLOBALG.A.P. (Good Agricultural Practice), RSPO (Roundtable on Sustainable Palm Oil), and 4C (Common Code for the Coffee Community). Evidence shows that VSS can enhance smallholder livelihoods and market integration, build technical capacity, foster sustainable environmental management (e.g., biodiversity conservation, reduced deforestation), and improve governance, traceability, and market compliance. However, effectiveness remains constrained by high certification and compliance costs,

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unequal value distribution, limited inclusivity of marginalized producers, context-dependent environmental outcomes, and weak monitoring systems. The study calls for targeted policy support, such as incentive payments or compensatory subsidies, to alleviate compliance burdens, and for better data systems and digital tools to reinforce credibility and accountability. Overall, VSS can meaningfully contribute to sustainable agrifood systems only when embedded within comprehensive policy and institutional frameworks that address structural inequities and build local capacity.

KEYWORDS: Voluntary Sustainability Standards (VSS); agrifood value chains; small-holder farmers; responsible consumption and production; policy implications

INTRODUCTION

Global agriculture trade has expanded over the past decades, contributing to economic development in various parts of the world. This expansion has led to the emergence of various sustainability provisions and standards, and efforts are increasingly directed towards initiatives that aim to make production activities along the global value chain (GVC) more sustainable. These standards, including multi-stakeholder private initiatives, certification schemes, and eco-labels, are collectively known as Voluntary Sustainability Standards (VSS) (Marx et al., 2024; United Nations Conference on Trade and Development [UNCTAD], 2025). The standards have the potential to mitigate the uneven distribution of the benefits and costs of global agri-food trade between the developed and developing world. For years, there has been debate about the morals and ethics of global trade, which depend on creating sustainability outcomes that integrate a healthy and clean environment, economic profitability, social and economic equity, and the capacity to adapt to climate change (Robinson, 2018). In this context, the success of voluntary sustainability standards (VSS) and associated sustainability labels depends to a large extent on consumers' choices. As of 2026, there are over

400 different VSS operating globally, covering up to 10% of the world's agricultural land (United Nations Forum on Sustainability Standards [UNFSS], n.d.; UNFSS, 2022a). The UN Trade and Development (UNCTAD) explains that

Voluntary Sustainability Standards are non-mandatory, market-driven certifications such as Fairtrade, Rainforest Alliance, Forest Stewardship Council (FSC) that ensure products meet specific environmental, social, or economic criteria, such as, for instance, reducing carbon emissions, protecting labor rights, or improving biodiversity. They promote sustainability along global value chains and provide consumers with identifiable labels, often helping producers access green, high-value markets (UNCTAD, n.d.).

VSS can be conceptualized as a form of entrepreneurial authority, whereby a private actor must secure the consent of other private and public actors to its authority to formulate rules, standards, or practices and, consequently, to the legitimacy of these regulatory outputs. VSS comprise a broad and heterogeneous set of instruments, including: (1) voluntary government-led certification, e.g., United States Department of Agriculture Organic (USDA Organic), EU organic agriculture standards; (2) non-governmental (NGO) certification, e.g., Fairtrade, Rainforest Alliance, Common Code for the Coffee Community (4C) and multi-stakeholder certification, e.g., Forest Stewardship Council (FSC), Roundtable on Sustainable Palm Oil (RSPO); (3) industry standards (e.g., GLOBALG.A.P.) and company-led standards, e.g., Unilever Sustainable Code (Lambin & Thorlakson, 2018).

FSC standard is a tool to promote responsible forest management and traceability of derived products, and the impact of this standard on the economic and organizational results (Galati et al., 2017). RSPO is a certification scheme in the oil palm sector that uses independent third-party audits of large-scale producers to

tackle key sustainability issues, such as deforestation, fires, biodiversity loss, peatland drainage, forced labor, and land tenure conflicts. In doing so, RSPO is intended to function as a sustainability standard for palm oil production that directly targets the sector's most critical social and environmental risks (Bishop & Carlson, 2022).

GLOBALG.A.P. has been one of the most influential voluntary certifications for food quality and safety. GLOBALG.A.P. suppliers are required to comply with an extensive set of standards relating to food quality and safety, as well as labor conditions, and environmental protection. Although the scheme operates as a business-to-business standard and is rarely communicated to end consumers, it is designed to signal that producers meet minimum requirements and is often presented as a "ticket" to participation in global markets. The literature, however, highlights a key concern: while certification is formally voluntary, producers in developing countries who cannot obtain GLOBALG.A.P. certification risk being excluded from the more profitable European and North American markets (Mook & Overdevest, 2021), which is at odds with the concept of sustainable development.

By aligning with United Nation (UN) sustainability agendas, Fairtrade and Rainforest Alliance has emerged as a prominent VSS within the global agrifood system (Kemper et al., 2025). Far from just a niche ethical initiative, Fairtrade now function as market-based mechanism designed to promote social, economic and environmental sustainability across the global agricultural value chain (Salim et al., 2025). Fairtrade through certification schemes establishes measurable standards that serve as practical tools and market-based mechanism that guide traders, producers' retailers, and manufacturers toward more equitable trading practices, improved livelihoods and environmentally responsible production. Through voluntary certification and labelling schemes, Fairtrade enables actors within agricultural value chain to meet ethical and ecological objectives (Development International e.V., 2022).

The Rainforest Alliance distinguishes itself from Fairtrade systems through its comprehensive approach of people and nature in the global value chain. It provides a critical bridge for companies seeking to meet stringent global regulations, such as the European Union Deforestation Regulation (EUDR), while ensuring that smallholder farmers remain competitive in a sustainable global agrifood market (Uribe Leitz & Ruf, 2020; Cosimo et al., 2024). In 2018, the Rainforest Alliance merged with UTZ, a global certification program originally founded as “UTZ Kapeh” (meaning “good coffee” in the Mayan K’iche’ language). While the Rainforest Alliance historically focused on biodiversity and forest conservation, UTZ specialized in improving farm management, productivity, and supply chain transparency for crops such as cocoa, coffee, and tea (Vermeulen et al., 2022). Today, the Rainforest Alliance (including the former UTZ program) promotes responsible farming by encouraging Good Agricultural Practices (GAP), efficient farm management, fair labor standards, and environmental protection (Iddrisu et al., 2020). Through this framework, farmers are trained to improve crop yields and product quality while maintaining sustainability, ultimately aiming for greater competitiveness in the global market (Soh Wenda et al., 2024).

Global value chains (GVCs) are rapidly expanding, particularly for high-value agricultural products such as coffee and cocoa. These products gain substantial value through processing, branding, and marketing stages that are often located in countries (developed countries) other than those where they are produced (developing countries). Highly developed countries, especially European ones, benefit the most, capturing the largest share of value added (Greenville et al., 2019). Furthermore, the products travel long distances, which places a significant burden on the natural environment. Thus, the expansion of GVCs may contribute to environmental degradation and inequality. Therefore, sustainability issues related to cocoa and coffee consumption need to be examined within the global value chain, including all production

stages and the post-consumption phase (Utrilla-Catalan et al., 2022; Parra-Paitan et al., 2024). The 4C certification scheme is built on the common code for the coffee community and now sets baseline economic, social, and environmental requirements for the sustainable production, processing, and trade of coffee and cocoa, explicitly prohibiting practices such as forced labor, human trafficking, lack of access to safe drinking water, and the destruction of primary forests or other natural resources. It adopts a supply chain perspective by defining core sustainability principles and good practices for all actors in the coffee/coca value chain, from farmers and producer organizations to mills, exporters, and traders (Wahyudi et al., 2020).

Coffee and cocoa are among the most widely traded agricultural commodities in the world, with annual production concentrated largely in developing countries. Coffee and cocoa exports have contributed significantly to the economic growth of many Global South countries and to alleviating poverty, particularly in rural areas (Salim et al., 2025; Wahyudi et al., 2020). The cultivation of these crops is highly labor intensive, requiring significant human effort at every stage of production. Their value chain is complex and involves numerous production stages and actors operating in different parts of the world, ranging from smallholder farmers and local traders to processors, exporters, manufacturers, and ultimately final consumers (UNCTAD, 2018; Fairtrade International, 2026; Utrilla-Catalan et al., 2022). Actors operating in the early stages of the supply chain are typically located in developing countries, whereas the subsequent stages, including processing, distribution, and consumption, take place in high-income countries. There remains a persistent problem of the limited participation of smallholder farms in developing countries in the creation of value added, and VSS are regarded as a mechanism aimed at achieving a more equitable distribution of value added along the chain.

Despite the expansion of global value chains in a wide range of agri-food products, the underlying trade dynamics remain strongly asymmetrical. The distribution of wealth continues to favor developed importing countries, whereas producing developing countries capture only a disproportionately small share of the total value generated. In this context, the adoption of VSS can play a significant role in fostering a more equitable distribution of economic gains among different actors across the value chain. This narrative literature review investigates and critically assesses the role of VSS in enhancing sustainability outcomes across production systems, focusing on environmental practices, livelihoods and market access, and power relations within value chains.

A narrative literature review was selected because it enables a broad, integrative perspective on a topic and can trace the emergence and development of a problem and its management over time. Narrative overviews frequently engage with theory and context, and can help to stimulate debate and critical reflection (Green et al., 2006). Relevant publications were identified through a structured search of the Scopus database, a widely recognized academic index that provides extensive coverage of research in Business, Management and Accounting, Economics, Econometrics and Finance, and related social sciences fields (Mongeon & Paul-Hus, 2016).

The study is organized into seven sections. Following the introduction, the second section examines VSS within the global agrifood system. The third section provides a comparative analysis of certification schemes in agrifood value chains, while the fourth section synthesizes empirical evidence on the influence of VSS certification and associated labels on consumer choices. The subsequent section explores the broader contributions of VSS, and the sixth section outlines policy pathways and directions for future research, followed by a concise summary of the key findings.

THE EXPANDING FOOTPRINT OF VSS-CERTIFIED AGRICULTURE

VSS in the global agrifood system reflects broader transformations in global trade, governance and sustainability practices. The evolution of VSS is closely linked to major milestones in global development. The concept arose during the United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro, Brazil, and was further shaped by the Millennium Development Goals (MDGs) (Negi et al., 2020).

In the late 20th century, various civil society organizations and NGOs globally began promoting ethical production and consumption through labels such as Fairtrade and Rainforest Alliance. These initiatives emerged in responses to growing concern over environmental degradation, labor exploitation and unequal trade relations (UNFSS, 2022a). Initially, these standards focused on a limited number of specific commodities, such as coffee and cocoa, but over time they have been extended to other types of goods. While VSS vary in their structure and focus, most of them share a common framework in which an organization establishes environmental and social standards alongside verification procedures. These procedures encompass first-party self-assessment, second-party reviews by stakeholders, and third-party monitoring conducted by independent auditors (Lambin & Thorlakson, 2018). Once compliance is confirmed, producers receive certification which is often communicated to consumers via a label (Willer et al., 2022; UNFSS, 2022a).

Over time, the expansion of VSS has become deeply embedded in the globalization of agri-food supply chains and the growing importance of Corporate Social Responsibility (CSR). While early initiatives remained relatively niche (with the exception of organic agriculture), the scope of VSS has broadened and now widely covers a range of commodities, including palm oil, soy, tea, bananas, and cotton (UNFSS, 2022a; Wollni et al., 2025). This growth reflects

a significant shift in market dynamics, driven by increasing pressure from consumers, retailers and multinational corporations for transparently sourced and sustainably produced goods. Suppliers also shape a firm's competitive advantage. Consequently, VSS have transitioned from simple labelling schemes into essential tools for managing environmental and social risks across complex agrifood production and supply chain (Martins et al., 2022).

Among VSS, organic farming exhibits the widest geographical coverage (Table 1). This system has operated the longest, since the mid-20th century, and has been promoted by numerous NGOs and by governments in many countries around the world, for example through per-hectare payments for organic farming (Kowalska, 2010). VSS such as GLOBALG.A.P., Rainforest Alliance and RSPO operate at smaller scale, each representing nearly 0.1% of global farmland. While organic agriculture, RSPO, Rainforest Alliance and GLOBALG.A.P. have shown significant area growth since 2019, there are signs of declining interest in Fairtrade and 4C certification. However, the global agrifood system is characterized by steady growth of various certification standards (Kemper et al., 2025).

Table 1. The global reach of VSS

Certification label	Area certified (million hectares)	Number of producers engaged (million)	Share of global agricultural area	Change in cultivated area over 2022–2023 (%)	Change in cultivated area over 2019–2023 (%)
4C	0.88	0.31	0.02%	5.83%	–6.18%
Fairtrade	3.03	1.72	0.06%	–1.73%	7.20%
GLOBALG.A.P.	4.52	0.19	0.09%	0.20%	10.40%
Organic agriculture	98.87	4.33	2.07%	2.33%	37.39%
Rainforest Alliance	5.33	7.90	0.11%	1.60%	23.08%
RSPO	5.16	0.17	0.11%	5.38%	23.92%

Note. Own analysis based on ITC Standards Map (2026).

A key aspect of the evolution and transformation of VSS within the global agrifood system is the shift from voluntary to quasi-mandatory requirements for producers in developing countries seeking to participate in global value chains. For example, GLOBALG.A.P certification has been integrated into the sourcing strategies of major European and North American retailers (Kemper et al., 2025). Furthermore, there is increasing convergence between private VSS and public regulatory framework, as governments integrate sustainability criteria into trade agreements, due diligence regulations and national standards systems (Rifai et al., 2026)

The contribution of VSS to global development gained significance with the establishment of the Sustainable Development Goals (SDGs) and the 2030 Agenda for sustainable development in 2015, which reinforced the role of voluntary mechanism in achieving global sustainability objectives (Blankenbach, 2020). The main linkage between VSS and the SDGs is their focus on all dimensions of sustainability within the production and supply chains of the agrifood system. In practice, VSS operationalize these sustainability dimensions through concrete criteria and certification systems applied at different stages of agrifood value chains. For example, environmental requirements in VSS often include restrictions on deforestation, pesticides use and water management, thereby contributing to attainment of SDG 15: Life on land, SDG 12: Responsible consumption and production, SDG 6: Clean water and sanitation, and SDG 3: Good health and well-being (D'Annolfo & Demaria, 2026; Wollni et al., 2025).

Generally, the evolution and development of VSS has been driven by several factors including rising consumer demand for ethically produced goods, corporate commitment to sustainability, NGO advocacy and the increasing complexity of global supply chains; technology advancement, especially in traceability and digital certification systems. This shows that VSS in the global agrifood system has shifted from small-scale initiatives to

widely adopted governance tools integrated in global markets and policy frameworks (Martins et al., 2022; Kemper et al., 2025). Using the example of FSC certification, it can be observed that signaling considerations are the primary drivers of entrepreneurs' decisions to adopt certification, while moral and ethical motivations play a secondary role. The evidence also shows that firms face higher operating costs to comply with the scheme, and these costs are only partly offset, not through higher prices for certified products, but through enhanced opportunities to build new business relationships and consequently increase sales volumes (Galati et al., 2017).

CERTIFICATION SCHEMES IN GLOBAL AGRIFOOD VALUE CHAIN: COMPARATIVE ANALYSIS OF VSS

VSS standards were developed by non-state actors including private firms, NGOs and multi-stakeholder initiatives seeking to address environmental degradation, social inequalities and economic instability through market-based mechanisms (Dröge et al., 2024). From 1999 to 2023, as shown in Table 2, available data set shows a strong and consistent expansion of organic production. Other sustainability standards begin appearing around 2008-2010 and generally shows small-scale growth rate, where by Fairtrade, GLOBALG.A.P, Rainforest Alliance and RSPO increase gradually by time indicating broader adoption of diverse certification schemes. Overall, the data reflects a clear long-term trend toward increased certified sustainable production, led by organic certification alongside a gradual diversification of other certification schemes.

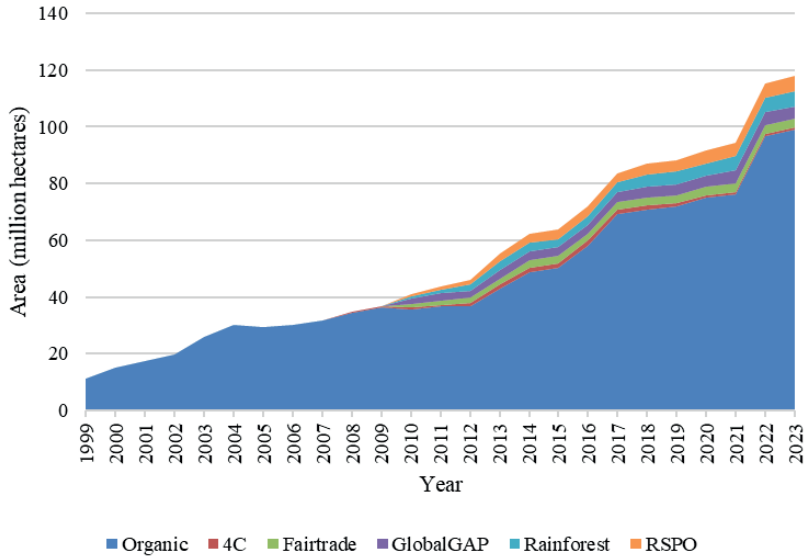
Table 2. VSS-certified agricultural land between 2010 and 2023 (million hectares)

Year	Organic agriculture	4C	Fairtrade	GLOBALG.A.P	Rainforest Alliance	RSPO
2010	35.71	0.44	1.25	2.22	0.71	0.60
2011	36.67	0.57	1.37	2.67	1.11	1.14
2012	36.87	1.03	1.82	2.56	2.26	1.62
2013	43.07	1.46	1.95	2.81	3.24	2.65
2014	48.69	0.166	2.61	3.09	3.20	3.16
2015	50.30	1.59	2.48	3.11	2.90	3.46
2016	57.97	1.83	2.31	3.29	3.11	3.30
2017	69.18	1.52	2.63	3.55	3.46	3.30
2018	70.90	1.33	2.65	3.85	4.48	3.74
2019	71.96	0.94	2.82	4.09	4.33	4.16
2020	74.93	0.85	3.00	44.14	4.14	4.43
2021	76.23	0.79	3.16	4.42	5.21	4.56
2022	96.61	0.83	3.08	4.51	5.21	4.89
2023	98.87	0.88	3.03	4.52	5.33	5.16

Note. Own analysis based on ITC Standards Map (2026).

As previously indicated, VSS standards began emerging in the late 20th century as global trade expanded and concern about sustainability in agriculture and nature resources grew. Fairtrade traces its roots to 1988, when the first label was launched in Netherlands. GLOBALG.A.P. started in 1997 originating from EurepGAP driven by European traders seeking common standard for food safety and sustainable farming. Organic certification was developed in 1990s following formal regulations including EU organic regulation in 1991. The Rainforest Alliance was founded in 1987 and began certifying farms in early 1990s. The RSPO and 4C was established in 2004 and 2003 respectively (Fransen et al., 2018; UN Trade and Development, 2024; Kemper et al., 2025).

Figure 1. Growth of VSS certified agricultural land over the period 1999–2023 (million hectares)



Note. Own analysis based on ITC Standards Map (2026).

Despite their shared foundations, these schemes differ considerably in their focus, priorities, governance structures, and mechanisms for delivering sustainability outcomes. Furthermore, each VSS has its own distinct logo. In practice, these logos are communicated to consumers by brand owners and retailers, who place them on product packaging and in marketing materials to justify the premium price and encourage consumers to choose certified products (see Table 3).

Major certification schemes differ primarily on governance, standard setting, monitoring, and thematic focus. Government led systems like organic agriculture rely on public authorities and international bodies to define standards centered on environmental and health protection, while multi-stakeholder initiatives

Table 3. Key differences in the approaches of major certification schemes

Standard and logo	Lead stakeholder	Who sets	Who monitors	Focus
Organic agriculture 	Government & organic movements	National governments & international bodies	Independent third-party, accredited certification bodies	No harm to environment, human health, plant health, or animal health and welfare
Rainforest Alliance 	Multi-stakeholder NGO	Rainforest Alliance	Independent third-party, accredited certification bodies	Environmental protection and farm management practices
Fairtrade 	Multi-stakeholder organization including producer networks	Fairtrade International	FLOCERT supervised by Fairtrade International	Social justice and equitable trade
4C 	Multi-stakeholder membership association	Global Coffee Platform	Independent third-party, accredited certification bodies supervised by 4C Services GmbH	Coffee sustainability
GLOBALG.A.P. 	Group of retailers & producers	FoodPLUS GmbH	Independent third-party, accredited certification bodies supervised by GLOBALG.A.P. Integrity Program	Food safety and quality
RSPO 	NGOs, companies, producers	RSPO	Independent third-party, accredited certification bodies	Sustainable palm oil production

Note. Own analysis based on Kowalska et al. (2021), Robinson (2018), Robinson et al. (2025), ITC Standards Map (2026).

such Rainforest Alliance, Fairtrade, and RSPO involve NGOs, companies, and producer networks, each emphasizing distinct proprieties like environmental conservation, social equity, or sustainable commodity production. Across all certification schemes, independent third-party certification bodies play a central monitoring role but oversight structures differ reflecting differences in accountability and sector specific goals (Robinson, 2018).

Among the widely recognized certification systems, Fairtrade and Rainforest Alliance represent two distinct approaches to sustainability governance. Fairtrade is fundamentally rooted in principles of social justice and equitable trade, its model canters on improving the livelihoods of smallholder farmers and workers through economic redistribution. Certified producers benefit from guaranteed minimum price designed to buffer against market volatility as well as additional premium that is invested in community development (Salim et al., 2025). The governance structure of Fairtrade emphasizes producer participation, reflecting its origin in solidarity based movements (Meier et al., 2020).

In contrast, Rainforest Alliance adopts a more holistic sustainability framework, with a strong emphasis on environmental protection and farm management practices such as biodiversity conservation, soil health and climate resilience (Soh Wenda et al., 2024). Its operating in over 60 countries and reaching millions of farmers, promoting biodiversity, climate resilience and rural livelihoods. In 2018, Rainforest Alliance merger with UTZ which solidified its position as the world largest initiative for sustainable coffee and cocoa. As of 2026, it has further evolved by launching its Regenerative Agriculture Standards, moving beyond do not harm to actively restoring ecosystem through science based advanced tools like automated deforestation risk mapping and digital traceability (Rainforest Alliance, 2026).

While it also includes social criteria, its primary strategy is to enhance productivity, efficiency, and environmental stewardship through training and compliance with detailed standards (Dröge

et al., 2024). Unlike Fairtrade it does not guarantee minimum prices instead it promotes shared responsibility across supply chain including voluntary sustainability investment by buyers (Meier et al., 2020). These differences reflect a broader philosophical distinction, as Fairtrade can be categorized as a benefit redistributive model seeking to correct structural inequalities in global trade, whereas Rainforest Alliance represents a market-oriented approach focused on improving practices within existing system (Dröge et al., 2024).

Organic certification scheme focuses primarily on the ecological integrity of agrifood production by safeguarding environmental and health concerns through the prohibition of synthetic inputs such as pesticides, fertilizers and genetically modified organisms (GMOs) while prioritizing soil health and biodiversity (Wiggins & Nandwani, 2020). However, while organic certification advances ecological sustainability, it does not provide guarantees regarding labour conditions and equitable income distribution among producers (Meshram et al., 2026).

GLOBALG.A.P serves a different function, emphasizing food safety, and quality. It is a business to business standard, often required by retailers and is less visible to consumers as the main focus is compliance and risk management for producers and retailers rather than a sustainability label (Arunfred & Bini Marin, 2023). While organic certification guides farmers to produce in harmony with ecosystems, GLOBALG.A.P act as a quality assurance framework. It ensures food safety for consumer, mandates fair treatment for workers through social assessments and requires thorough documentation to maintain accountability throughout the supply chain (Mirabella, 2025; Bavec & Bavec, 2015).

Specific initiatives such as RSPO in palm oil and the 4C in coffee are global certification standards designed to ensure that agrifood commodities palm oil and coffee respectively are sustainably produced. These standards often function as entry level industry wide benchmarks, though they have been subject to

criticism regarding enforcement and impact (Roundtable on Sustainable Palm Oil [RSPO], 2024; Meier et al., 2020). While RSPO and 4C target different products, both frameworks operate on similar sustainability pillars including social responsibility, environmental protection and economic transparency by ensuring fair labor practices and respecting land rights and equal distribution of economic benefits. RSPO certification in the palm oil sector contributes to mitigating environmental degradation, while the 4C standard establishes a baseline for sustainability in the coffee value chain, seeking to enhance smallholder farmers' livelihoods and simultaneously reduce the overall environmental footprint of coffee production and consumption (Piao et al., 2019; Ekaputri et al., 2025).

VSS CERTIFICATION AND SUSTAINABLE CONSUMER CHOICES

In discussions on VSS, a key issue concerns their influence on consumers' purchasing decisions, as the diffusion of such standards largely depends on the demand for certified food products. Research in this field encompasses both general ecological certifications and specific certification labels, among which Fairtrade appears to be the most widely recognized. The existing literature includes both quantitative and qualitative studies. These studies primarily focus on label recognition, the influence of certification on purchasing decisions, consumers' willingness to pay a premium for certified products, their understanding of the significance of certification, and their level of trust in certification schemes. Recognition of certification labels varies considerably across countries: it ranges from approximately 30-40% of respondents in Brazil, Spain, and the United States, to around 50% in Poland, and reaches up to approximately 90% in countries such as Switzerland, Sweden, and Germany (Globescan, 2025).

Studies have consistently demonstrated that certain consumer groups are willing to pay a premium for certified products (Rausseau, 2015; Pelsmacker, 2005). However, research conducted by Basu and Hicks (2008) indicates that this willingness to pay (WTP) is limited to a certain threshold. Their findings show that, respondents exhibit an inverted U-shaped relationship between WTP and income guarantees for participating growers, meaning that WTP initially increases as growers' revenue rises, but after a certain point it begins to decline.

More recent research (Kalidoss et al., 2025) identifies a positive correlation between consumers' environmental awareness and their WTP more for eco-labeled products. Additionally, greater concern about sustainability issues in food production is associated with more frequent use of sustainability labels (Grunert et al., 2014). Research also indicates that women and individuals with middle or high incomes tend to value Fairtrade products as much as, or more than, lower prices (Conner & Mabaya, 2006). This finding is further supported by Grunert et al. (2014), who report that women are generally more concerned about sustainability and make more frequent use of product labels than men.

Previous studies have indicated that information and marketing factors play a significant role in shaping consumer attitudes toward certified products. A positive effect of information provision on consumers with prior experience in purchasing certified coffee was demonstrated by Takahashi et al. (2018). Van Loo et al. (2015) emphasized the importance of educating consumers about the meaning of sustainable labels. Furthermore, consumer attitudes are more likely to translate into corresponding environmentally friendly behaviors when information regarding the eco-friendliness of food products is readily accessible (Vlaeminck et al., 2014).

The substantial impact of marketing strategies should also be highlighted, as research shows that an extrinsic sustainability cue on the packaging increases the probability of purchasing certified coffee. The findings further suggest that insufficient provision

of sustainability-related information and ineffective marketing strategies may constitute major barriers to the demand for certified products (Takahashi et al., 2018; Conner & Mabaya, 2006).

Some studies indicate that certain certification schemes exert on consumer purchasing decisions than others. For instance, research suggests that Fairtrade labels are more likely to affect consumer attitudes and preferences than organic labels in the chocolate market in Belgium (Rausseau, 2015). A similar preference for Fairtrade over organic labels was identified by Loureiro and Lotade (2005) in the US coffee market. Moreover, in both the United States and Germany, Fairtrade labels appeared to exert a greater impact than national certification bodies and local growers' associations (Basu & Hicks, 2008).

There is also evidence suggesting that, in some cases, certification has only a limited influence on consumer choices. Research from 2018 indicated that information about certification programs or concern for environmental issues does not significantly affect consumers' purchasing behavior for certified coffee (Takahashi et al., 2018). Similarly, Kimeldorf et al. (2006) reported that consumers' awareness of certification related to fair working conditions in developing countries was not reflected in their purchasing of certified garments in the United States. A lack of purchases of certified products may be linked to insufficient consumer understanding (Grunert et al., 2014) as well as a lack of trust in labeling schemes (Rausseau, 2015). Finally, consumption may also be constrained by limited availability of labeled products and their higher prices (Vermeier & Verbeke, 2006).

THE CONTRIBUTION OF VSS TO GLOBAL AGRIFOOD VALUE CHAINS: BENEFITS AND CHALLENGES

The major benefit of VSS is their contribution to improving farmers' livelihoods and economic outcomes, as certification schemes

such as Fairtrade and Rainforest Alliance often provide smallholder farmers with access to premium markets, higher productivity, and better integration into global agrifood value chains. In addition, VSS help build technical capacity and strengthen value chain participation, particularly for smallholders in developing countries (Maertens et al., 2025).

While Rainforest Alliance focuses on sustainability and biodiversity, GLOBALG.A.P. primarily ensures that products meet international food safety and export standards (Soh Wenda et al., 2024; Richartz & Abdulai, 2025). Fairtrade certification offer price stability through minimum price mechanisms and social development projects (Salim et al., 2025). VSS offer significant benefits; however, their impact often varies depending on the scale of production and the specific implementation context. The high cost compliance can be prohibitive for smallholders, potentially leading to their exclusion from certified value chain. Consequently, certification must be coupled with robust capacity-building support to ensure inclusive and equitable outcomes (Rifai, et al., 2026).

Environmental sustainability is another key benefit of VSS, particularly in schemes such as organic certification, Rainforest Alliance, and RSPO. These standards promote biodiversity conservation, reduced agrochemical use, and sustainable land management practices. VSS also help reduce commodity-driven deforestation, especially in high-risk commodities such as palm oil and cocoa, with certified production often associated with lower forest loss per unit of output (Rifai et al., 2026; RSPO, 2020; Meijaard et al., 2018). Organic certification enhances environmental outcomes by prohibiting synthetic inputs and encouraging ecological farming system while RSPO specifically target sustainable palm oil production by addressing deforestation, peatland protection and labor rights (Richartz & Abdulai, 2025; RSPO, 2020).

Furthermore, VSS contribute to improved governance, transparency, and social standards within global agrifood value chains. Initiatives such as 4C and GLOBALG.A.P. establish baseline

requirements for responsible production, including labor rights, occupational safety, and traceability. These standards help harmonize practices across countries and facilitate compliance with international regulations and corporate sustainability commitments (Piao et al., 2019; Arunfred & Bini Marin, 2023). VSS are increasingly recognized in public policy and trade agreements, reinforcing their role as complementary governance tools alongside national regulations. While debates remain regarding their overall effectiveness and inclusiveness particularly for smallholder farmers, the growing adoption and continuous evolution of VSS demonstrate their significant contribution to advancing more sustainable, transparent and resilient global agrifood system (Rifai et al., 2026).

VSS have the potential to contribute to the transformation of food systems towards greater sustainability; however, the mechanisms through which they have operated over the past few decades remain imperfect. At the same time, the rapid expansion and mainstreaming of VSS worldwide has given rise to a number of significant challenges. A major issue is the unequal distribution of value along the supply chain, which is rarely overcome through engagement in VSS. A large share of the economic gains from certification is often captured by downstream actors such as processors, retailers, and multinational companies, while smallholder farmers receive only a limited share of these benefits. This raises concerns about fairness and the actual impact of VSS on poverty reduction especially in developing countries (UNFSS, 2022b; Russo et al., 2023). The high cost of certification and compliance also hinders smallholder producers in developing countries, leading to their exclusion from certified markets and from participation in global value chains, which in turn reinforces existing inequalities. Even when farmers are able to participate, economic benefits are not guaranteed, as price premiums may be insufficient to offset the additional, unreimbursed compliance costs (UNFSS, 2022b; Marx et al., 2024).

In addition, market access remains uncertain as demand for certified products depends heavily on consumer WTP which can fluctuate over time and across regions (Organisation for Economic Co-operation and Development, 2023). The proliferation and fragmentation of standards also poses a significant problem, the existence of multiple VSS with different requirements increases complexity, raises compliance cost and creates confusion to both producers and consumers (Russo et al., 2023). Therefore, farmers are often compelled to comply with multiple overlapping standards to access different markets, while consumers must navigate an increasingly crowded certification landscape to make informed choices. Many producers are now subject to overlapping certifications such as organic certification plus Rainforest Alliance or GlobalG.A.P. which can create both synergies and inefficiencies (Dietz et al., 2020).

There are also important limitations in terms of inclusivity and accessibility. The poorest and most marginalized farmers, who most need to understand and benefit from these standards, often lack the resources, knowledge, or organizational capacity required to participate in certification schemes. As a result, VSS may unintentionally exclude those who could benefit the most, thereby reinforcing existing social and economic disparities (UNFSS, 2022b; Marx et al., 2024). Additionally, gender inequalities may persist, as women farmers often face greater barriers to accessing certification and its associated benefits (Raynolds, 2021).

From an environmental perspective, while VSS promote sustainable practices, their actual impact can be uneven and context specific. In some cases, improvements are limited to certified farms and not translate into broader landscape level change. There may also be trade-offs between environmental and economic objectives, where farmers prioritize income over strict environmental compliance. Moreover, monitoring and enforcement of standards can be inconsistent, raising concerns about the credibility and

effectiveness of certification system (Tscharncke et al., 2015; Smith et al., 2019; Romano et al., 2026).

Lastly, the effectiveness of VSS is constrained by their voluntary nature and dependence on market mechanisms. Without strong public policy support in developing countries, their impact remains limited. VSS alone cannot address systemic issues in global agrifood systems, such as structural inequalities, power imbalances, and unsustainable consumption patterns (UNFSS, 2022b; Blankenbach, 2020). Therefore, while VSS have the potential to contribute to more sustainable and inclusive food systems, addressing the challenges identified is essential to fully realizing their transformative potential.

ADDRESSING KEY CHALLENGES THROUGH FORWARD-LOOKING POLICY PATHWAYS

An important prospective policy pathway concerns the growing alignment between VSS, national regulations, and international sustainability agendas, such as climate and anti-deforestation commitments. While the literature shows that VSS are increasingly consistent with these public frameworks, it does not yet clearly demonstrate that governments formally recognize them or systematically rely on them for compliance or due diligence. This suggests that VSS could potentially be integrated more explicitly into public policy instruments in the future, provided they remain fully compatible with national laws (Uribe Leitz & Ruf, 2020).

Improving inclusiveness and accessibility for smallholder farmers especially those from developing countries is another key important policy direction. Despite the benefits associated with sustainability certification schemes, high compliance costs and technical requirements often exclude the most vulnerable producers (Elamin & de Córdoba, 2020). Policy makers and development stakeholders can address this by subsidizing certification

costs, investing in capacity building and supporting cooperative models that enable group certification. Strengthening local institutions and extension services is also critical to ensure that farmers can meet standards such as organic or GLOBALG.A.P. without disproportionate financial burdens (Baldin, 2022; Mirabella, 2025). Furthermore, there is growing recognition of the need to ensure economic benefits such as price premiums in Fairtrade or productivity gains under Rainforest Alliance are more equitably distributed along the agrifood value chain (Uribe Leitz & Ruf, 2020).

Therefore, to strengthen the effectiveness of VSS there is a need to increase incentive payments or compensatory subsidies to help smallholder farmers offset all additional compliance costs including certification fees, investment in sustainable practices and monitoring. These subsidies should be proportional to production expenses to ensure that compensation is equitable and avoids creating disparities among producer groups. By ensuring that financial support fully covers the burden of adoption, VSS can better encourage the participation of marginalized farmers and promote more inclusive implementation (Smith et al., 2024; Russo et al., 2023).

Enhancing data transparency, monitoring and impact evaluation is another key pathway. While VSS have expanded rapidly, robust and comparable data on their outcomes remain limited. Policy makers can promote the development of shared data platforms and harmonized indicators across standards, enabling better tracking of environmental and social impacts (Marx et al., 2024). Digital technologies such as satellite monitoring for deforestation in RSPO certified areas and blockchain based traceability systems offer promising tools to improve accountability and credibility. Increased transparency can also strengthen consumer trust and support evidence based policy making (Uribe Leitz & Ruf, 2020).

CONCLUSION

VSS such as Fairtrade, Rainforest Alliance (including UTZ), organic certification schemes, GLOBALG.A.P., RSPO, and 4C have become integral components of contemporary agrifood governance. They offer a flexible, market-driven approach to addressing environmental and social challenges, contributing to improved farming practices, enhanced traceability, and better integration of producers into global value chains, and provide important information for consumers in the purchasing decision-making process. Despite the numerous shortcomings of these certification systems, evidence shows that such standards can support income generation, promote sustainable land use, and strengthen compliance with international market requirements.

However, the effectiveness of VSS remains uneven and context dependent. While certified producers may benefit from price premiums, increased productivity, improved livelihoods, and capacity building, barriers such as unequal distribution of benefits, high certification costs, and complex compliance requirements persist. Environmental gains, including reduced deforestation and improved biodiversity management, are evident in various contexts, yet concerns about leakage effects and inconsistent enforcement highlight the need for stronger accountability mechanisms. Without complementary public policies and institutional support, these limitations indicate that VSS alone are not sufficient to drive the transformation of global agrifood systems. It is worth emphasizing that the benefits arising from the development of these systems can be reaped not only by value chain actors but also by society as a whole, which underscores the potential for developing support instruments for VSS through actions at the governmental level and by international organizations.

Looking ahead, the future of VSS lies in deeper integration with regulatory frameworks, enhanced inclusiveness for small-holder farmers and more robust systems for monitoring and

impact evaluation. Strengthening collaboration among governments, private sector actors and certified bodies will be critical to scaling their impacts. At the same time, continued research is essential to better understand long-term outcomes, address trade-offs and optimize the interaction between multiple standards. Ultimately, when effectively implemented and supported, VSS can play a significant role in advancing more sustainable, transparent and resilient global agrifood systems contributing to broader sustainable development objectives.

Despite growing influence of VSS, awareness and understanding of these standards remain uneven among smallholder farmers and consumers. This knowledge gap can limit participation of different stakeholders in the global value chain, reduce the effectiveness of certification, and create barriers to equitable benefits within the value chain. For this reason, improving education and knowledge dissemination is essential to maximize the impact of VSS. Farmers need accessible training to understand certification requirements and benefits, while consumers require clear information to make informed purchasing decision. Strengthening outreach, transparency, and capacity building initiatives can help bridge this gap and ensure that sustainability standards are not only implemented but also widely understood and trusted.

Future research could assess the long-term, systemic impacts of VSS across commodities and regions, using longitudinal and comparative designs to examine effects on income stability, climate resilience, biodiversity conservation, and labor conditions. It could also explore key trade-offs, such as whether stricter environmental criteria unintentionally exclude smallholder producers. In addition, further work is needed on the role of VSS in broader sustainability transitions, particularly regarding regenerative agriculture, carbon markets, and climate adaptation in global agrifood supply chains. As sustainability expectations evolve, research can help ensure that VSS are continuously adapted into more

inclusive, effective, and impactful tools for global sustainable development.

Exploring the interactions between multiple standards and governance mechanisms is another important avenue for future research. Better understanding how to harmonize these systems is crucial for reducing redundancy, lowering transaction costs, and maintaining credibility while scaling sustainable production. Furthermore, more research is needed on consumer behavior and willingness to pay for certified products, since demand ultimately underpins the effectiveness and long-term viability of VSS.

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