Chapter 2.3
Innovation, Sustainability and the new Frontier of Competitiveness in the Agrifood Sector

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Introduction

The global agricultural trade landscape is experiencing a structural transition. The longstanding emphasis on volume and price is increasingly being complemented—and in some cases replaced—by value-based considerations, whereby production processes - "how" products are produced- carry weight comparable to production outputs - "what" product is produced. This evolution reflects the growing integration of sustainability, traceability, and environmental performance criteria into global value chains and market access conditions (World Bank, 2024; OECD, 2023). For Latin America and the Caribbean (LAC), a major contributor to global net agrifood exports, this shift represents both a challenge and an opportunity to consolidate its role as a sustainable food supplier (OECD-FAO, 2024).

Although sustainability challenges demand collective global solutions, the increasing inclusion of sustainability provisions in bilateral trade agreements and the proliferation of unilateral measures are reshaping trade governance (WTO, 2023). Justified on the grounds of preventing "social and environmental leakage," these measures are distorting international trade flows and disproportionately affecting certain sectors and countries (UNCTAD, 2023). Although presented as environmentally motivated, the measure may inadvertently introduce trade distortions, suggesting the possibility that environmental objectives are intertwined with implicit protectionist effects (Böhringer et al., 2022).

In this scenario, LAC countries face a dual imperative: to ensure that emerging sustainability measures remain grounded in science, transparency, non-discrimination, fairness, and proportionality under the WTO and United Nations

Framework Convention on Climate Change (UNFCCC) principles, while simultaneously accelerating domestic investments and innovation to strengthen climate mitigation and showcase the sustainability attributes of regional agrifood systems.

In the lead-up to the MC14, the intersection of trade, innovation, and sustainability was increasingly shaping global competitiveness. This chapter examines how LAC can leverage its natural capital and technological capabilities to lead this transition. It also underscores the role of the multilateral system in effectively regulating the issue, thereby promoting positive outcomes for both trade and the environment.

Sustainability as a differentiating factor of competitiveness

Sustainability regulations and due diligence requirements are playing an increasing role in international trade (Weber et al, 2025; IMF et al, 2024). However, there remains no clear consensus on the optimal combination of policies and instruments required to enable an effective and equitable climate transition within the framework of sustainable development (Weber et al, 2025; IMF et al, 2024; Pienknagura, 2024).

In any case, sustainability is no longer an external consideration to trade, it has become a central determinant of market access and competitive positioning, compelling both economic sectors and governments to accelerate innovation and institutional adaptation (IMF et al, 2024; Lumempouw, 2024; Bellelli and Xiu, 2022).

Over the past decades, companies have increasingly integrated sustainability considerations into their strategic decision-making, recognizing them as a key source of competitive advantage in accessing and expanding into new markets. Initially, these strategies—mostly voluntary in nature—emerged primarily to respond to market positioning objectives and to demands from new consumers and other actors across global value chains (Lumempouw, 2024; Pienknagura, 2024). However, the emergence of mandatory frameworks, encompassing multiple dimensions of sustainability, most notably the European Renewable Energy Directive (EU RED)[22] or the European Union Deforestation Regula-

22 Regulation (CE) 2009/28

tion (EUDR),[23] marks a shift from voluntary standards toward hard binding regulatory requirements (Papendieck and Elverdin, 2025; Evenett et al, 2024).

The urgency of responding to sustainability concerns is prompting governments to adopt increasingly unilateral and sector-specific policy approaches in recent years. Over 71% of government "reindustrialization" measures taken in 2023 were linked to import restrictions, potentially affecting up to 22% of global trade.

While these measures potentially incentivize firms to enhance innovation as a means of maintaining market competitiveness, it must be ensured that they comply with WTO standards and do not function as hidden barriers to trade.

The crossroad of the "mirror effect"

Between 2009 and 2020, more than 5,500 climate-related measures were reported to the WTO. Half of these were regulatory (non-tariff) measures, affecting 26% of global trade (IMF et al, 2024). In these evolving global trade landscape, a "mirror effect" is emerging as sustainability standards set by importing economies increasingly influence domestic regulation and production practices in exporting countries (Weber et al, 2025; Ramos et al, 2024).

While these external demands can enhance sustainability performance, they also entail significant risks of exclusion, particularly for producers and countries facing financial, technological, or institutional constraints (Papendieck and Elverdin, 2025; IMF et al, 2024; Lumempouw, 2024). Limited transparency and insufficient adaptation to the realities of exporting countries, may generate asymmetric compliance costs, reducing income and competitiveness in exporting economies, reinforcing existing inequalities or creating unintended barriers to participation in global value chains (World Bank, 2025; IMF et al, 2024).

While these sustainability measures are justified as attempts to prevent potential leakage, their design and implementation may conflict with the principle of common but differentiated responsibilities of the Paris Agreement. In the absence of complementary support mechanisms, such measures risk increasing exclusion and market concentration, thereby constraining the development prospects of relatively less developed regions (IMF et al, 2024; WTO, 2022). These measures are proliferating rapidly, even though empirical evidence of their effectiveness in preventing carbon leakage is limited (IMF et al, 2024).

23 Regulation (EU) 2023/1115

Competitiveness is increasingly shaped by the social and environmental footprint of traded goods. For agri-food systems in LAC, this implies strengthening the quantification of environmental impacts through robust scientific evidence and harmonized metrics, while simultaneously increasing innovation and adopting mitigation strategies.

As a result, trade dynamics are shifting from a "race to the bottom" focused mostly on cost toward a "race to the top", where sustainability functions as reputational capital. Producers who can scientifically demonstrate environmental performance -such carbon sequestration, zero deforestation, biodiversity conservation, etc.- are better positioned to access high-value markets and reduce exposure to price volatility.

Promoting innovation to enhance the value of differentiated sustainable attributes of agri-food production and trade

Innovation constitutes a central driver for enhancing the economic value of differentiated sustainability attributes. In this context, innovation encompasses not only technological change—farm-level practices, logistics, MRV systems–but also organizational and institutional innovation—data governance, interoperability rules, and public–private coordination. This transformation entails a transition toward nature-positive production systems that leverage digital technologies, data analytics, and biotechnology to optimize resource efficiency and reduce environmental externalities (OECD, 2023).

Environmental regulations (such as the EUDR) can trigger 'innovation offsets' that improve production efficiency and product quality. For LAC, these measures act as a catalyst, forcing the transition from commodity-based competition to one based on dynamic capabilities and high-value sustainable attributes. While sustainability regulations may entail significant risks of market exclusion and concentration, compliance can stimulate innovation processes, encouraging firms to upgrade production systems and adopt more efficient technologies (Bellelli and Xiu, 2022).

However, adaptive capacity remains uneven across countries and firms. Access to financing, technological infrastructure, and technical capabilities (largely shaped by national economic conditions and institutional environments) strongly influence the ability to respond to sustainability-driven trade require-

ments (IMF et al., 2024; World Bank, 2023). Organizational capabilities and firms' dynamic capabilities also play a decisive role in shaping innovation readiness and absorptive capacity (Teece, 2007).

More broadly, innovation tends to concentrate in sectors closely linked to export performance, particularly those deeply integrated into global value chains (GVCs), where knowledge spillovers and competitive pressures are stronger (Bellelli and Xiu, 2022; OECD, 2021). Nevertheless, trade restrictions imposed by third countries may generate heterogeneous sectoral effects: they can stimulate domestic innovation when affecting upstream segments of the value chain but may hinder competitiveness and innovation when constraints emerge in downstream, market-facing activities (Bellelli and Xiu, 2022).

Enhancing sustainability performance in LAC

Innovation in LAC has increasingly moved beyond a traditional focus on yield maximization toward systemic transformations aimed at improving both productivity and environmental performance. Empirical evidence from the region suggests that conservation and regenerative practices (such as no-till farming and silvopastoral systems) can enhance soil carbon stocks, improve water retention, and stabilize yields under climate variability while maintaining competitive production levels and economic performance (FAO and IICA, 2022).

At the same time, the diffusion of precision agriculture technologies, including Internet of Things (IoT) applications and satellite-based monitoring systems, is enabling producers to optimize input use through data-driven decision-making, reducing the application of agrochemicals and lowering both environmental impacts and operational costs (World Bank, 2023). Furthermore, a critical pillar of this innovation is the region's leadership in biotechnology, particularly in gene editing (CRISPR).[24]

These technologies allow for the development of crops with enhanced nitrogen-use efficiency and drought resistance, directly contributing to the reduction of the carbon footprint per unit produced without compromising yields. Together, these innovations illustrate a shift toward knowledge-intensive production models in which sustainability and efficiency become mutually reinforcing drivers of competitiveness within global agrifood markets.

24 Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) is a high-precision gene-editing technology that allows for the modification of specific plant genes to improve agronomic characteristics without necessarily introducing DNA from other species. This is why it is often distinguished from traditional genetically modified organisms (GMOs).

From a public policy perspective, these innovations signal a structural transformation in which technology adoption functions not merely as an efficiency tool but as an institutional lever to align agricultural competitiveness with land-use governance and environmental sustainability objectives.

Intangible public goods at the service of innovation

An advantage for several LAC countries is the existence of intangible public goods, institutional frameworks, and data systems originally created for other purposes that can now be repurposed for sustainability compliance.

Repurposing existing systems

Systems designed for animal health, fiscal control, forest monitoring, or land tenure are being transformed into tools for environmental traceability and due diligence statements. LAC countries have extensive experience in implementing public monitoring, supervision, and control mechanisms at various stages of agri-food chains, which constitute a particularly relevant inherited asset in the current context. Georeferenced rural land registries, sanitary traceability systems, and goods transit documents can be integrated to provide high-granularity geolocation tracking data, enabling product tracking throughout the supply chain at a fraction of the cost required to build new systems from scratch.

There are numerous concrete examples of public goods in the region that can be leveraged for the implementation of comprehensive traceability systems. In the case of Argentina, for example, the possibility of linking the National Sanitary Registry of Agricultural Producers (RENSPA)[25] number with the Unique Livestock Identification Code (CUIG)[26] and the Electronic Transit Document (DT-e)[27] allows for guaranteeing individual, georeferenced, and segregated traceability from the birth of the bovine to the products derived from its slaughter.

These documents are commonly used and mandatory in production and commercial operations, including for transactions within the domestic market. RENSPA is a registry where producers must upload their farms with their georeferenced polygons. The CUIG, for its part, is the mandatory individual

25 See https://www.argentina.gob.ar/senasa/micrositios/renspa

26 See https://www.argentina.gob.ar/senasa/programas-sanitarios/cadenaanimal/bovinos-y-bubalinos/bovinos-y-bubalinos-produccion-primaria/registros-y-habilitaciones/bovinos-y-bubalinos-produccion-primaria/identificacion-animal

27 See https://www.argentina.gob.ar/senasa/micrositios/dte

identification that each animal must carry permanently, forming the basis of the national bovine health system. Finally, the DT-e is the document that records all animal movements outside the establishment. During the DT-e application process, all transported animals must be identified with their corresponding CUIG.

With different elements and scopes, this type of example can be replicated for different sectors in many of the countries of the region (Olmos Soto and Palomo, 2025; Papendieck and Elverdin, 2025).

The use of these public goods reduces the compliance tax on producers. When the state provides the underlying data infrastructure, the private sector can focus on innovation rather than bureaucracy, leading to an improvement in the sector's systemic competitiveness.

The role of digitalization and interoperability

The future of trade lies in the "interoperability" of data. This not only implies ensuring that a digital certificate issued by a local official agency is recognized by an importing customs authority but also requires that the supporting information used to issue the certificate be available for processing and analysis by the importer and/or the competent authority at the destination. Interoperability should be understood across three complementary layers: (i) technical interoperability (secure data exchange through APIs, common data formats, and digital identities); (ii) semantic interoperability (shared definitions, taxonomies, and sustainability metrics so that the same variable means the same thing across jurisdictions); and (iii) institutional interoperability (mutual recognition arrangements, governance protocols, and auditability that make data exchange legally and procedurally usable).

Centralized, digital platforms are essential to democratize access to information, allowing even small and mid-sized producers and exporters to compete on the global stage. However, digitalization alone is insufficient without metric standardization. LAC should pursue an equivalence-based pathway for the international recognition of national metrics, combining transparent methodological baselines (e.g., life-cycle assessment and MRV protocols), interoperability-ready registries, and cooperative verification mechanisms. This would prevent a 'spaghetti bowl' of conflicting environmental standards and ensure that local digital certificates are accepted globally as valid proof of sustainability.

In practice, these platforms function as sectoral digital public infrastructure (DPI) for trade and sustainability—publicly governed systems that lower transaction costs, reduce duplication, and enable private innovation on top of shared rails (identity, registries, verification, and secure data exchange). To be credible, interoperability also requires robust MRV pipelines and data integrity safeguards: versioned geospatial registries; audit trails; tamper-evident records; and cybersecurity-by-design. Without these elements, digital certificates risk becoming 'paperless paperwork'—easy to issue but weak as evidence in due diligence disputes.

The case of Uruguay's Environmental Value-Added System for Agricultural Production platform (SVAAPAG) is a concrete and highly valuable example in this regard.[28] Initially created to meet the requirements of the EUDR, this platform is designed as a broader strategy for adding value to the attributes of the country's agri-food production. With its creation, the Uruguayan government has centralized and made available to producers various public certificates that guarantee complete traceability and segregation, from farm to ship, throughout the beef value chain. These certificates can be submitted electronically by producers to exporters or other downstream actors in the value chain to verify the absence of illegal deforestation or to confirm compliance with additional production requirements, such as legal, tax, and labor compliance.

Beyond the Uruguay-specific context, three design principles are transferable: (i) modular architecture that integrates existing registries rather than replacing them; (ii) role-based access and API connectivity so downstream actors can verify claims without over-collecting sensitive data; and (iii) end-to-end traceability logic ('farm-to-ship') aligned with due diligence workflows.

Faced with a growing demand for traceability and the mitigation of legal, environmental, and social risks through due diligence schemes, facilitating access for producers and stakeholders in the value chain to relevant digital, free, and centralized records, certificates, and other public documents becomes a fundamental element for minimizing exclusion and increasing the competitiveness of agri-food systems.

Given that many of the public goods that can be useful for demonstrating compliance with export market requirements are dispersed across different government bodies, progress in this area requires a public-private governance model specifically designed to the particularities of each country, but it must have

28 See https://www.inac.uy/innovaportal/file/26975/1/eudr---uruguay-solution---paris.102024.pdf

clear leadership and a mandate to avoid overlapping and incomplete solutions. The EUDR requirements generated numerous responses and examples to consider. In any case, even in purely private initiatives to demonstrate production conformity, the use of public registries has facilitated and reduced implementation costs (Papendieck and Elverdin, 2025). Therefore, working with the private sector, identifying potential public goods that could be useful in ensuring compliance with requirements, and facilitating access to these resources digitally and remotely becomes a priority.

Regional challenges: the risk of exclusion

Despite the potential, the sustainability agenda carries a significant risk of marginalizing large segments of the agri-food value chains in LAC region, especially small and informal producers.

- The Digital and Knowledge Divide: While large agro-industrial complexes can easily adopt satellite tracking, smallholders and others small actors in the value chain often lack the connectivity, financial capacity to make technological investment or lack the technical training to meet complex georeferencing requirements.
- Informality and Land Tenure: In many parts of LAC, unclear land titles make it difficult for producers to "prove" legal production according to international standards. Although not all external regulations require a land title to demonstrate the legality of production (as is the case with the EUDR), proving the legal use of land is not always easy.
- Supralegality: The scope of many due diligence requirements for sustainable supply chains far exceeds the legal requirements in the countries of origin. However, governments and the private sector in LAC must work to demonstrate legality in a simplified manner, limited to the material scope of external regulations and based on readily available and easily accessible documentation. Claiming overcompliance will increase compliance costs, undermine sectoral competitiveness, and raise the risk of exclusion (Papendieck and Elverdin, 2026).
- The Threat of Trade Diversion: If compliance costs become too high, buyers may shift their sourcing to large-scale producers, effectively de-linking smallholders from global value chains and potentially pushing them toward more unsustainable activities. To address this, policy must focus on the provision of traceability and relevant digital documentation for compliance with due diligence requirements as a universal public service. By ensuring that smallholders can access govern-

ment-led digital platforms for free or at a low cost, the region can avoid trade diversion and ensure that sustainability leads to inclusive growth.

Harmonizing attributes and generating incentives for fairer sustainable trade: the role of the WTO

There is no doubt that current production and consumption patterns contribute to environmental degradation. In this context, promoting the transition to more sustainable production and consumption systems requires global coordination. Unilateral climate transition policies could lead to tariff races, technical requirements, and increased protectionism (Weber et al., 2025; IMF et al., 2024; Evenett et al., 2024). A lack of cooperation could create perverse incentives, leading to the relocation of production and distortions in trade flows, without resulting in a real improvement in the sustainability indicators of traded goods (Enssle et al., 2025; Weber et al., 2025).

In the context of global fragmentation, such as the one we are experiencing, incentives for cooperation are reduced. However, it is necessary to prevent the pursuit of sustainability from becoming a pretext for "green protectionism". The multilateral trading system must provide a framework for achieving harmonization. To the constant increase in sustainability regulations and trade barriers, we must also add the growing number of private standards and labels. According to the ITC Standards Map,[29] the number of active voluntary sustainability standards has grown to 373 (191 of them specific to the agricultural sector), and ecolabels have reached 456 (Ecolabel Index[30]).

This increasing unilateral implementation of public and private interventions increases the risk of excluding a significant number of actors from international markets, generating greater market concentration and increasing price volatility. Furthermore, there is also a risk that the geographical location of production could become more closely linked to financial or regulatory incentives related to climate transition policies rather than to countries' comparative environmental advantages for sustainable production (Weber et al., 2025; Evenett et al., 2024).

If sales prices fail to offset the incremental costs of implementing compliance measures, the distributional effects of these trade policies will disproportion-

29 See https://www.intracen.org/resources/tools/standards-map
30 See https://www.ecolabelindex.com/

ately impact producers, especially micro, small, and medium-sized enterprises (MSMEs), which have less capacity to influence prices or stockpile production while awaiting better market conditions.

The requirement for traceability and product segregation implies an increase in logistics and storage costs, which not all production actors are able to absorb. For example, the EUDR traceability cost in the palm oil in Indonesia is estimated between USD 9 and USD 15 per ton, plus an additional USD 68 for the due diligence process along the value chain (Drost et al, 2022). In Argentina, the costs of segregation in the soybean supply chain could exceed USD1 billion annually, while in Paraguay it would cost USD16 per ton (Papendieck and Elverdin, 2025a).

But it is not only the increase in costs that worries actors in LAC. In the absence of clear, standardized parameters, a heightened perception of environmental risk is likely to lead not only to changes in trade flows but also in investment volumes and financing costs (Weber et al., 2025; Knoblich, 2024). This is not insignificant, considering that low- and middle-income countries are more exposed to sustainability-related pressures and already face higher trade costs. (WTO, 2022), so the proliferation of unilateral and uncoordinated standards will generate even higher costs and greater exclusion if these restrictions are not accompanied by financing that allows the economic sectors of LAC and other developing countries to fully participate in the climate transition.

These dynamics reinforce the importance of multilateral regulatory approaches to govern environmentally related trade measures effectively.

The multilateral negotiation space between the CTE, the TESSD, and the Committee on Agriculture

Although WTO Members retain the general authority to negotiate new trade disciplines within existing institutional structures, the organization currently lacks a specialized negotiating body or formal mandate explicitly devoted to trade–climate rulemaking (Van Asselt and Zelli, 2024).

The Trade and Environmental Sustainability Structured Discussions (TESSD) were launched in November 2020 within the WTO framework as a plurilateral and open-ended initiative designed to advance deliberation on the relationship between international trade governance and environmental sustainability.

Established through a Joint Statement by participating Members, TESSD aims to complement existing institutional mechanisms (particularly the WTO Committee on Trade and Environment (CTE) by fostering dialogue outside a formal rule-making negotiation on how trade policy instruments can contribute to climate mitigation and broader environmental objectives while maintaining the rules-based multilateral trading system.

With the adoption of its 2022 work programme, discussions have been organized into four thematic working groups (Trade-Related Climate Measures, Environmental Goods and Services, Circular Economy, and Subsidies) each addressing distinct trade–environment interaction pathways. Recent activities have focused on analytical exchanges and convergence-oriented outputs ahead of WTO Ministerial Conferences, positioning TESSD as an emerging forum contributing to soft-law norm development and epistemic coordination on trade and environmental sustainability (WTO, 2024).

While the CTE embodies the traditional institutional approach whereby environmental issues are examined through review and dialogue functions under its Marrakech mandate rather than through rule-making negotiations, TESSD represents a deliberative plurilateral space designed to address emerging sustainability challenges through policy dialogue, knowledge exchange, and soft coordination mechanisms.

Consequently, in the specific case of the agri-food sector, the establishment of a multilateral regime for environmentally efficient agricultural products within the WTO framework would ultimately need to be negotiated within the Committee on Agriculture in Special Session, given its competence over market access and domestic support disciplines under the Agreement on Agriculture.

Special trade regimen for environmentally efficient agrifood-products

From a LAC perspective, the development of a preferential trade regime for environmentally efficient agricultural products requires rethinking the regulatory foundations through which environmental differentiation is incorporated into multilateral trade law.

Existing Environmental Goods and Services (EGS) initiatives have predominantly focused on industrial goods characterized by environmentally beneficial end uses, leaving largely unaddressed agricultural products whose environmental performance derives primarily from process and production methods

(PPMs). Advancing an agricultural sustainability regime, therefore, necessitates an institutional framework capable of operationalizing environmentally relevant production attributes in a manner consistent with WTO non-discrimination disciplines.

The implementation of such a regime would first require the establishment of a sustainability standards mutual equivalence system within the WTO framework, enabling Members to recognize differing regulatory approaches as comparable where they achieve equivalent environmental outcomes. Drawing conceptually on the equivalence logic embedded in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures, this mechanism would rely on harmonized methodological baselines grounded in life-cycle assessment (LCA). Environmental efficiency would be assessed through cradle-to-market accounting frameworks incorporating greenhouse gas emissions intensity, land-use change dynamics, soil carbon performance, biodiversity indicators, and resource-efficiency metrics, while integrating geographically differentiated impact factors reflecting agroecological conditions and regional production systems. Equivalence would therefore be outcome-based rather than method-based, allowing regulatory diversity while ensuring scientific comparability through transparent reporting, independent certification, and verifiable monitoring procedures.

In this sense, the proposed equivalence framework reflects a broader maturation of the WTO "like product" analysis—from a static comparison centered on functional substitutability toward a dynamic assessment incorporating scientifically measurable environmental externalities embedded across production systems. By anchoring differentiation in verifiable environmental performance rather than origin-based distinctions, climate-conditioned market access could be reconciled with WTO principles of non-discrimination, transparency, and predictability, thereby enabling sustainability-oriented trade preferences to emerge within, rather than outside, the multilateral trading system.

Building on ongoing discussions on trade-related environmental measures and sustainability standards, a shared framework defining environmentally sustainable agricultural production could provide the legal and technical basis for differentiated tariff treatment negotiated multilaterally under existing agricultural market-access disciplines. Such an arrangement would require incorporation into Members' schedules of concessions and be subject to multilateral notification, peer review, and oversight mechanisms designed to ensure even-handed application and to prevent arbitrary or unjustifiable discrimina-

tion. Properly structured, preferential treatment would therefore operate not as a unilateral environmental exception but as a collectively agreed modality of market access reflecting comparable environmental performance.

Operationally, tariff differentiation would be conditioned on verified compliance with agreed sustainability benchmarks assessed through transparent methodologies, accessible certification pathways, and regulatory cooperation mechanisms facilitating participation by developing-country producers. In this configuration, preferential tariff treatment would function as a WTO-consistent incentive mechanism supporting the transition toward lower-emission and resource-efficient food systems while preserving competitive neutrality and legal certainty. Ultimately, such a regime would illustrate an endogenous evolution of multilateral trade law, whereby sustainability performance becomes integrated into the definition of competitive equivalence itself, marking a shift from trade–environment accommodation toward the structural embedding of environmental performance within the governance of agricultural market access.

The institutional plausibility of such an approach is reinforced by ongoing deliberations within the TESSD, which increasingly address the interaction between sustainability standards and market access conditions. While no WTO Member has formally advanced a proposal establishing preferential tariff treatment for environmentally efficient agricultural products, several developing-country Members (notably Brazil, Ecuador, El Salvador, and Paraguay) have introduced discussions emphasizing the environmental dimensions of agricultural trade and the implications of sustainability-related regulatory requirements for agri-food exports. These interventions marked a significant expansion of a dialogue initially centered on industrial environmental goods, bringing agricultural production systems and sustainability standards into the multilateral conversation.

Final remarks

The growing integration of sustainability requirements into international trade governance reflects a structural transformation in the organization of global economic regulation. Agricultural trade, historically governed through tariffs, domestic support, and export competition disciplines, is increasingly shaped by sustainability performance criteria embedded in regulatory standards, market access conditions, and value-chain governance.

In this emerging landscape, sustainability is becoming a central determinant of competitiveness in the agri-food sector. Market access, investment decisions, and supply-chain sourcing increasingly depend on verifiable environmental performance, marking a transition from price-based competition toward sustainability-conditioned competitiveness in global agri-food markets. Competitiveness is therefore increasingly tied to data readiness.

However, this transformation is advancing largely outside coordinated multilateral rulemaking. The proliferation of climate-related standards and certification schemes risks regulatory fragmentation, rising compliance costs, and widening asymmetries between countries with unequal technological and institutional capacities. For developing agricultural exporters, the core challenge lies not in environmental ambition itself, but in the absence of internationally recognized mechanisms capable of translating diverse sustainability practices into mutually accepted trade outcomes.

This study has argued that a multilateral sustainability standards equivalence framework could bridge environmental objectives and existing trade disciplines. Building on equivalence principles already embedded in WTO practice, such a framework would allow Members to recognize distinct regulatory approaches as comparable where equivalent environmental outcomes are achieved. Operationalization would rely on harmonized methodological baselines grounded in life-cycle assessment (LCA), enabling outcome-based comparability while preserving regulatory autonomy and scientific credibility. A preferential regime for environmentally efficient agricultural products could operationalize a governance innovation by linking tariff advantages to verified sustainability performance within existing WTO institutional structures. Properly designed, such a regime could align trade incentives with climate and biodiversity objectives while preserving transparency, predictability, and non-discrimination.

Ongoing deliberative initiatives on trade and environmental sustainability further illustrate how soft institutional processes are shaping future trade norms through regulatory learning and epistemic convergence preceding formal negotiations. In this context, preparations leading up to MC14 called for proactive engagement from LAC. A pragmatic innovation agenda beyond MC14 could prioritize: (i) scaling interoperable traceability systems as digital public infrastructure; (ii) establishing MRV baselines and harmonized sustainability metrics grounded in an equivalence-based approach; (iii) mobilizing financing mechanisms and technical assistance to support MSME onboarding; (iv) deploying regional interoperability "sandboxes" to pilot mutual recognition

across countries and value chains; (v) strengthening public–private governance arrangements to avoid fragmented compliance architectures; and (vi) advancing WTO-compatible incentive schemes that link verified sustainability performance to preferential tariff treatment under agreed multilateral principles and mutual recognition frameworks, thereby creating market-based incentives to scale sustainable production.

By advocating science-based and non-discriminatory approaches that recognize diverse sustainable production models, LAC countries can help shape emerging trade–environment governance rather than adapt to externally defined standards. Ultimately, the integration of sustainability performance into agricultural trade governance represents a systemic choice for the multilateral trading system: unmanaged fragmentation or cooperative multilateral adaptation. Embedding sustainability through equivalence-based cooperation offers a pathway to align environmental effectiveness, competitiveness, and inclusive development, positioning sustainability as the new frontier of competitiveness in the global agri-food economy. Properly designed, these infrastructures generate positive spillovers beyond exports—improving sanitary control, fiscal transparency, land-use governance, and climate policy implementation—turning compliance into an engine of endogenous innovation and institutional upgrading.

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