

O Papel das Meso-instituições no Cumprimento da Legislação Europeia Contra Desmatamento: Análise da Cadeia do Café no Brasil e na Colômbia

The Role of Meso-Institutions in Complying with European Legislation: Analysis of the Coffee Supply Chain in Brazil and Colombia

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Resumo: Este estudo explora como configurações meso-institucionais moldam os mecanismos de coordenação que permitem o cumprimento do Regulamento da União Europeia para Produtos Livres de Desmatamento nas cadeias produtivas de café do Brasil e da Colômbia. Utilizando um arcabouço de economia institucional e um desenho qualitativo, o estudo recorre a entrevistas semiestruturadas e a documentos institucionais para avaliar como as meso-instituições traduzem, monitoram e se adaptam às normas regulatórias. Os resultados mostram que a Colômbia, por meio da coordenação da Federação Nacional de Cafeicultores, apresenta um padrão mais integrado de conformidade regulatória, sustentado pela legitimidade institucional e pela disseminação de informações. O Brasil, por sua vez, opera sob uma estrutura descentralizada, na qual meso-instituições, incluindo o CECAFÉ e cooperativas, promovem a conformidade por meio de estratégias diversas e adaptadas aos contextos locais. Inovações tecnológicas e organizacionais emergem como resultado desse processo, com instituições implementando plataformas digitais de rastreabilidade, sistemas de georreferenciamento e iniciativas de capacitação. Os achados destacam que diferentes trajetórias institucionais podem sustentar a conformidade regulatória quando alinhadas às estruturas históricas de governança. A análise indica que a forma como as meso-instituições estrutura a tradução de regras, a coordenação de informações e a redução de incertezas molda o surgimento desses arranjos como respostas adaptativas às exigências regulatórias europeias, em vez de constituírem tipos de inovação analiticamente distintos.

Palavras-chave: Meso-instituições; EUDR; café; coordenação institucional; Brasil; Colômbia.

Abstract: This study explores how meso-institutional configurations shape coordination mechanisms that enable compliance with the European Union Deforestation-Free Regulation within the coffee supply chains of Brazil and Colombia. Using an institutional economics framework and a qualitative design, the study uses semi-structured interviews and institutional documents to assess how meso-institutions translate, monitor, and adapt to regulatory norms. Results show that Colombia, through the coordination of the National Federation of Coffee Growers, presents a more integrated pattern of regulatory compliance supported by legitimacy and information dissemination. Brazil operates under a decentralized structure where meso-institutions, including CECAFE and cooperatives, promote compliance through diverse, locally adapted strategies. Technological and organizational innovations emerged as an outcome of the process, with institutions deploying digital traceability platforms, georeferencing systems, and capacity-building initiatives. The findings underscore that different institutional paths can support regulatory compliance when aligned with historical governance structures. The analysis indicates that the way meso-institutions structure rule translation, information coordination, and uncertainty reduction shapes the emergence of these arrangements as adaptive responses to European regulation requirements rather than as analytically distinct types of innovation.

Keywords: Meso-institutions, EUDR, Coffee, Institutional coordination, Brazil, Colombia.

1. Introduction

This study examines the European regulation (Bill 2021/0366), which establishes a ban on the trade of agricultural products associated with deforestation. The European Union Deforestation-Free Regulation (EUDR), scheduled to enter into force in December 2026,

mandates the verification of the origin of imported products, ensuring that they were not produced in areas deforested after December 2020.

The production of commodities subject to the EUDR is linked to high rates of deforestation and ecosystem degradation. Consequently, their inclusion in the regulation reflects an effort to reduce the European market's contribution to global deforestation and promote more sustainable commodity supply chains (Basik & Saunders, 2021). Although smallholders are not the direct targets of the EUDR, the regulation may have significant implications for them (McDermott et al., 2025). As suppliers in European supply chains, they will be required to meet strict traceability standards, including geolocation data and proof of compliance with local environmental laws. The lack of clarity regarding compliance criteria, combined with the high associated costs, is particularly concerning for small producers who have limited technical and financial capacity. Without adequate support, there is a risk of their exclusion from international markets, further exacerbated by asymmetric contractual practices that may shift the burden of non-compliance onto them (Germanwatch, 2024; Mai, 2024).

This scenario challenges commodity-producing countries to adjust their production and monitoring processes to ensure compliance with these requirements. Coordination among actors along the supply chain will play an important role in facing this challenge and maintaining competitiveness in the European market (Cesar de Oliveira et al., 2024). However, as argued by Ménard & Martino (2025), the coordination of economic activities does not arise automatically from the existence of general rules or norms. Instead, it depends on how these rules are interpreted, operationalized, and mediated by intermediary institutions that structure interactions among agents or classes of agents. In this sense, laws and standards defined at the macro-institutional level are not spontaneously implemented at the micro-level; they require intermediate mechanisms capable of translating abstract principles into operational devices, shaping expectations, reducing uncertainty, and linking enforcement mechanisms to actual behavior (Ménard, 2017).

These intermediary mechanisms are referred to as meso-institutions. By creating governance structures and supporting monitoring and enforcement processes, meso-institutions enable decentralized interactions along supply chains to converge toward coordination equilibria—whether efficient or inefficient—thereby influencing cooperation, value creation, and the achievement of collective goals, or coordination failures and socially undesirable outcomes (Ménard & Martino, 2025).

Meso-institutions may emerge through different governance configurations, ranging from fully public and verticalized arrangements to hybrid structures characterized by the complementary participation of public and private organizations, or even a hybrid structure with

the prominent involvement of private organizations, such as certification schemes, with public organizations playing a secondary role (Cashore, 2002; Paavola, 2007, Ménard et al., 2022)

The implementation of coordination mechanisms depends on support organizations that facilitate the process of change and monitoring, bridging the gap between regulation and the agents subject to these standards. These entities, known as meso-institutions, have the function of translating and encouraging the use of rules, monitoring, and enforcing them; they play a fundamental role in complying with regulations, as they are responsible for creating governance structures and ensuring the effectiveness of regulations (de Mello et al., 2024).

The meso-institutions can be established in different ways, whether through fully verticalized and public governance, a hybrid structure characterized by the complementary participation of public and private organizations, or even a hybrid structure with the prominent involvement of private organizations, such as certification schemes, with public organizations playing a secondary role (Cashore, 2002; Paavola, 2007).

Despite growing recognition of their relevance, empirical evidence on how meso-institutions operationalize coordination under transnational regulatory pressure remains limited (Ménard, 2018). Empirical evidence on how this intermediate layer affects coordination, performance, and compliance across different contexts remains limited (Cordeiro et al., 2022). In particular, there is still insufficient understanding of the concrete transmission mechanisms through which macro-level regulations shape organizational behavior at the micro-level (Jensen & Ménard, 2024). This study contributes to addressing this gap by applying the meso-institutional framework to the novel context of transnational environmental regulation, focusing on the implementation of the European Union Deforestation-Free Regulation (EUDR) in global coffee supply chains.

Given that the degree of coordination within supply chains is shaped by the effectiveness with which public regulations and private monitoring instruments are translated and implemented by meso-institutions, this study aims to explore how different meso-institutional configurations shape coordination mechanisms that enable compliance with the EUDR within the coffee supply chains of Brazil and Colombia, two distinct historical institutions and two major coffee-producing countries.

The article proceeds as follows: reviews institutional theory, then examines Brazil and Colombia's coffee sectors, outlines a methodological approach, discusses results, and concludes with policy implications for EUDR compliance.

2. Theoretical Foundation: Meso-Institutions and Coordination in regulated value chains

Institutional analysis makes significant contributions to understanding economic relations, particularly the institutional conditions for the successful implementation and enforcement of regulations (Black, 2008, Ménard & Martino, 2025). Various studies of economic institutionalism have explored changes in the capitalist system since the 19th century, considering the role of formal and informal institutions in organizing the productive system and society (North, 1990; Scott, 2008).

As North (1990) argues, the “rules of the game” shape how organizations perform and therefore play a key role in economic development. However, when adopting a new law, it is important to note that economic agents face conflicts of interest, favoring or contesting a status quo that generates uncertainty (Joffre et al., 2018). Furthermore, there is a diversity of stakeholders, each with different motivations and priorities (Dietz et al., 2018). Additionally, other factors can affect the implementation of rules, related to market competition and fragmentation, and levels of ambiguity, with adverse effects on micro-institutions and society as a whole (Levy et al., 2016).

The literature on regulation and agricultural value chains is extensive. It examines institutional and economic incentives (Fulponi, 2006), the governance of value chains through the interaction between public regulations and private standards (Henson & Humphrey, 2010), the legislative, executive, and judicial dimensions of private standards governance (Tallontire et al., 2011), and the role of government regulations in shaping private regulatory strategies (Guo et al., 2019). However, little is said about the devices and mechanisms through which regulations and the strategies of economic agents interact, and even less about the role these intermediary institutions play in fulfilling their functions (Ménard, 2018). Ménard et al. (2018) identify three key functions of meso-institutions in implementing rules and allocating rights and obligations: translating rules into practice, inducing compliance through enforcement and incentives, and generating feedback mechanisms that support learning and institutional adaptation.

There are three specific general modes of compliance with European legislation in implementing the regulation: meso-institutions through fully verticalized public governance, hybrid meso-institutions, where public and private organizations are complementary, and prominent participation of private organizations (such as certifiers), where public organizations play a secondary role.

A key concept to understanding the impact of meso-institutions on the adaptation of agri-food chains is coordination. In this study, coordination is understood as an institutionally mediated mechanism through which heterogeneous actors align their actions, share information,

and adjust practices in response to changing regulatory constraints. From an institutional perspective, coordination emerges when rules, norms, and governance arrangements reduce uncertainty and stabilize expectations, thereby enabling collective adaptation (North, 1990). On the meso-institutional discussion, coordination is further conceptualized as a collective function performed by intermediary institutional arrangements that translate regulatory requirements into operational practices, mitigate conflicts among actors, and reduce coordination and adaptation costs along the supply chain (Ménard, 2017; Ménard & Martino, 2025). In this sense, coordination facilitates adaptation by enabling responses to regulatory demands that individual actors would be unable to implement independently.

2.1 Determinants of Meso-Institution Governance Choices

The capacity of a meso-institution to implement rules depends on a variety of elements linked to the specificities of the supply chains in which they operate (Cordeiro et al., 2022). Based on institutional literature, we considered three key elements to analyze how a meso-institution operates: legitimacy, centrality, and heterogeneity. It is important to emphasize that these elements are not functions of meso-institutions, but analytical dimensions that condition their capacity to perform core functions such as rule translation, monitoring, enforcement, and feedback.

Legitimacy refers to how the meso-institution is perceived by the actors in the supply chain as a legitimate representative of the sector's interests, which depends on the history of the organizations and previous regulations (Perosa & Azevedo, 2019; Suchman, 1995). Meso-institutions recognized by the state tend to have a higher level of legitimacy than those without any public backing.

The second dimension, centrality, refers to the representativeness that an organization has in sectoral coordination, considering whether the network of actors involved in the sector somehow "depends" on this organization to represent its interests (Menard, 2017). In network theory, centrality is a measure that quantifies the importance or influence of a vertex (or node) within a network (Zhang & Luo, 2017). In a social network, degree centrality can indicate popularity, while betweenness centrality can identify key influencers who facilitate the dissemination of information (Sparrowe et al., 2001).

The third dimension, heterogeneity, refers to the profile and interests of sector actors, which defines the meso-institution's ability to unite sectoral interests. This element is key in determining legitimacy and centrality, as higher levels of these dimensions depend precisely on the meso-institution's "representativeness" among actors. The ability to unite the interests of a meso-institution refers to the organization's capacity to mediate negotiations among the actors involved in seeking a common agenda and "voice" (Menard, 2017).

The more heterogeneous the sector, the greater the challenge in uniting interests, as demands may be very divergent. However, heterogeneity, depending on the context, facilitates access to different resources, knowledge, and opportunities. It has a relevant strategic role, allowing the organization to be cohesive enough to maintain a common identity and culture while remaining flexible and open to new influences and external changes (Ostrom, 2005). Table 1 presents the key drivers' legitimacy, centrality, and heterogeneity that influence the coordination capacity of meso-institutions in agricultural value chains.

Table 1 – Factors Affecting the Coordination Capacity of Meso-Institutions

Category	Definition	Constructs	References
Legitimacy	Having its actions accepted by sector actors to engage participation and make coordination more efficient.	Acceptance Index of members and stakeholders (reputation) Compliance and Adherence	Black (2008); Perosa and Azevedo (2019); Suchman (1995)
Centrality	Representativeness in the dissemination of information and greater influence and ability to shape policies and regulations.	Degree Centrality Betweenness Centrality Closeness Centrality	Ménard (2017); Sparrowe et al. (2001); Zhang and Luo (2017)
Heterogeneity	Ability to bring together diverse interests.	Connection Diversity Sectoral Coverage Collaboration Index	Brousseau and Raynaud (2011); Ménard (2017); Ostrom (2009)

In addition, the elements related to the capacity of meso-institutions to enable adaptation to changes depend on issues related to the costs and benefits of transformations. On the cost side, the main issues concern the changes that will be necessary to comply with the given production standard. Besides these direct costs, there are also indirect costs associated with monitoring and communicating new production practices. Often, monitoring costs are higher than those incurred in changes to the production system. In this sense, the presence of sectoral organizations carrying out coordination, such as meso-institutions, allows for greater efficiency and a reduction in the costs of monitoring and communication, which has already been observed in the adoption of certification systems (Perosa and Azevedo, 2019).

On the benefits side, the productive changes depend on the gains that producers can obtain by adapting to a certain standard, which can occur through price premiums or access to strategically important markets. Production standards more accepted by consumer markets tend to be adopted by a greater number of producers, given that the advantages of being part of this network will bring greater gains, which could be considered a form of positive network externality (Perosa and Azevedo, 2019).

Market structure plays a central role in shaping coordination demands and, consequently, the capacity of supply chains to adapt to the requirements imposed by the EUDR. More concentrated market structures, characterized by larger and better-resourced agents, tend to face lower coordination costs and exhibit a greater ability to mobilize financial, organizational, and informational resources. These conditions facilitate the aggregation of interests and the implementation of collective responses to regulatory demands. Conversely, more fragmented market structures generate higher coordination needs, increasing reliance on meso-institutions to organize interactions, align incentives, and translating regulatory requirements into operational practices. In this context, the degree of vertical and horizontal integration across supply-chain segments further conditions the effectiveness of coordination mechanisms, as higher levels of integration enable certain actors or institutions to assume coordinating roles.

Finally, it is worth noting that the trajectory of the productive sectors themselves conditions all the elements mentioned above. Sectors formed under strong state regulation tend to behave differently from those that developed in a less regulated, free-market environment. The concept of path dependence (North, 1994) explains the coordination difficulties faced by sectors where there is an abrupt change in coordination, as observed in Brazilian agriculture in the late 1980s.

In addition, these institutional dimensions — legitimacy, centrality, and heterogeneity — also shape a meso-institution's capacity to introduce or facilitate the adoption of new technologies within the sectors where they operate. In agriculture, technology adoption is often constrained by financial and institutional barriers and depends heavily on both public research institutions and private actors for dissemination. In this context, the role of cooperatives and other representative associations becomes particularly relevant in enabling technology adoption, especially in low-income countries (Abebaw & Haile, 2013).

2.2 The EUDR as a coordination challenge

The EU approved the EUDR, effective December 2026, banning imports of commodities from areas deforested after December 2020. Verification will be conducted through a due diligence system in which importing companies must monitor, address, and mitigate any negative impacts of their imports on forests, ensuring that European consumers do not contribute to the destruction of vegetation and biodiversity while also holding importers accountable (European Union, 2023).

Under the EUDR, operators must report compliance, though they may delegate this via authorized representatives (Verhaeghe & Ramcilovic-Suominen, 2024). Despite its approval, uncertainty remains on how operators will report origins and how authorities will verify them; all production areas must be identified, and mixing unknown origins avoided.

Thus, a traceability system will be necessary for each batch from the farms through each production link until it reaches the European market. To this end, operators must provide the geographical coordinates of the areas where the commodities were produced before the products are placed on the market or exported (European Union, 2023).

Finally, the legislation states that certification schemes can be used by supply chain members to help assess risks, provided the certification covers the necessary information to fulfill their obligations under the Regulation. It is the operators' responsibility to input this information into the system and ensure its accuracy (Verhaeghe & Ramcilovic-Suominen, 2024).

3. Materials and methods

This study adopted a qualitative and exploratory research design to facilitate an in-depth exploration of how meso-institutional configurations shape coordination mechanisms that enable compliance with the EUDR within the coffee supply chains of Brazil and Colombia. A qualitative approach was chosen for its capability to provide a rich understanding of institutional dynamics within specific contexts and populations (Jarzabkowski et al., 2021). This method enabled the conceptualization of key variables and allowed for the identification of emerging categories of analysis throughout the research process.

To ensure a comprehensive exploration of the phenomenon, a purposive sampling was employed, selecting participants directly involved in the compliance process. In total, nine semi-structured interviews were conducted with leaders and mid-level staff from the main Colombian and Brazilian institutions responsible for supporting compliance with EUDR. This approach mitigated elite bias by incorporating perspectives from multiple hierarchical levels and providing a holistic understanding of the institutional support process (Aguinis & Solarino, 2019). Additionally, four reports from the main studied institutions were included in the analysis, offering supplementary insights into policy implementation, compliance challenges, and institutional coordination efforts. These reports were selected based on their relevance to the compliance process. To enhance the robustness of the findings, primary and secondary data were systematically compared, ensuring the elimination of misinterpretations and inaccuracies through triangulation (Miles, 1994). Information about the sources of information is detailed on table 2.

Table 2: Sources of information

Code	Type of source	Institution	Country
B1	Interview	Brazilian Agriculture and Livestock Confederation (CNA)	Brazil
B2	Interview	Brazilian Council of Coffee Exporters (CECAFE)	Brazil

B3	Interview	Ministry of Agriculture, Livestock and Food Supply (MAPA)	Brazil
B4	Interview	Regional Coffee Growers Cooperative in Guaxupé (Cooxupe)	Brazil
C1	Interview	National Association of Coffee Exporters of Colombia (Asoexport)	Colombia
C2	Interview	National Federation of Coffee Growers (FNC)	Colombia
C3	Interview	Colombian Agricultural Institute (ICA)	Colombia
C4	Interview	Solidaridad NGO	Colombia
C5	Interview	Ministry of Agriculture y Desarrollo Rural (MADR)	Colombia
1	Report/document	Hub do café	Brazil
2	Report/document	FNC- Press release	Colombia
3	Report/document	Coffee Geography magazine	Brazil
4	Report/document	Solidaridad LATAM	Brazil/Colombia

The organizations analyzed in this study are classified as meso-institutions based on three criteria derived from the meso-institutional literature. First, they occupy an intermediary position between macro-level regulatory frameworks and micro-level actors, structuring interactions across segments of the supply chain. Second, they perform coordination-related functions, such as translating regulatory requirements into operational guidelines, facilitating information exchange, and supporting collective adaptation to regulatory change. Third, although they differ in their degree of centrality and scope of influence, they share the capacity to shape practices beyond the firm level. These criteria guided their inclusion as meso-institutions in the analysis.

The semi-structured interview format provided the necessary flexibility to explore patterns, institutional mechanisms, and perceptions related to compliance processes (Bryman & Bell, 2011). The interviews were transcribed to preserve data richness and accuracy. In cases where transcripts and reports were in a language other than Spanish, a translation was conducted, and accuracy was verified through back-translation techniques to minimize interpretation bias.

The analytical framework for this study was based on institutional economics literature (Mernard, 2017; Brousseau and Raynaud, 2006; Suchman, 1995; Perosa and Azevedo, 2019), which allowed the which identifies three key elements for assessing the effectiveness of coordination of an organization or meso-institution: legitimacy, centrality and heterogeneity. To

strengthen validity, the interview protocol was reviewed and validated by an expert with extensive knowledge of the Colombian and Brazilian coffee sectors.

Theoretical saturation was determined when the contributions of new participants became minimal, indicating that the data captured were both relevant and complete. Data analysis followed the thematic analysis approach outlined by Braun and Clarke (2006), using Atlas.ti software to systematically analyze the information. The coding process involved three stages: (1) coding and categorization, based on codes and categories identified by the researchers in the theoretical review (2) thematic interpretation, which explored relationships between codes, categories, and overarching concepts. (3) The final stage involved constructing a thick description of the findings, integrating analyses to ensure a comprehensive understanding of meso-institutional roles.

To uphold research ethics, confidentiality was strictly maintained throughout the study, and voluntary participation and secure handling of interview data were warranted.

4. Results

The role of meso-institutions in the coffee chains of Brazil and Colombia shows points of convergence and divergence. The distinct histories of the two chains and the formation of meso-institutions help explain the differences, especially regarding coordination capacity.

Table 3 presents differences between Brazil and Colombia regarding the frequency with which codes related to coordination effectiveness — legitimacy, centrality, and heterogeneity — appear in interviews and documentary sources. While code frequency does not measure coordination performance per se, it provides an indication of the relative salience of these dimensions in each national context and helps illuminate how meso-institutional arrangements are perceived and enacted by sector actors.

Table 3 - Code Frequency Table: legitimacy, centrality, heterogeneity

Effectiveness of coordination	Definition	Brazil	Colombia
Legitimacy	Having its actions accepted by sector actors to engage participation and make coordination more efficient.	5	9
Centrality	Representativeness in the dissemination of information and greater influence and ability to shape policies and regulations.	9	15
Heterogeneity	Ability to bring together diverse interests.	14	8

We can highlight the importance of the higher occurrence of the heterogeneity code in the Brazilian case, resulting from the diversity of Brazilian producers, particularly in terms of

size and technology adoption, which makes the introduction of innovation more complex. In the interview with IB4, the representative of a large cooperative mentioned they represent farmers from 5 to 500 hectares with very diverse profiles and interests. In Colombia, coffee farmers present a more homogeneous profile.

Another noticeable difference is centrality, which can be explained by the history of coffee policy in Colombia, where a more centralized coordination (top-down) was built by farmers and the government. In Brazil, on the other hand, an abrupt and uncoordinated market deregulation has led to greater dispersion of initiatives (bottom-up), with cooperatives playing an important role in disseminating information.

For a more in-depth analysis of these constructs, we chose to analyze the main meso-institutions operating in Colombia (FNC) and Brazil (CECAFE). This choice was based on interviews indicating that the centrality of these organizations to coordinate the sector to create a structure that enables compliance with European Union regulations.

The FNC, although a private, non-profit organization representing the interests of coffee producers in Colombia, has an almost para-statal role as it performs public functions delegated by the government. Founded in 1927, it operates in marketing, research, and promotion of Colombian coffee, being primarily financed by contributions from coffee growers. The FNC manages the National Coffee Fund and maintains close collaboration with the Colombian government to promote the country's coffee and support producers. Despite being private, the strong articulation with public policies and the management of public resources gives FNC hybrid characteristics.

The FNC is developing a traceability platform to meet the new European Union requirements related to sustainability and deforestation prevention. The initiative aims to provide the geographical coordinates of coffee plots, ensuring compliance with European regulations and maintaining access to the EU market. Since the 1990s, the FNC has implemented a georeferencing system covering 100% of Colombia's coffee-growing area. Recently, more than 50,000 authorizations have been updated in the Coffee Information System (SICA), with the expectation that by December, 93% of producers will have authorized the georeferencing of their properties.

CECAFE, in turn, is a private association representing Brazilian coffee exporters. Founded in 1999, it promotes the sustainable development of the production chain and advocates for the interests of the export sector, providing statistical data and technical support to its members. In collaboration with various meso-institutions, CECAFE has implemented initiatives that promote Brazilian exports, adopting best practice protocols in line with international buyers' demands.

CECAFE signed a partnership with Serasa Experian on August 19, 2021, aiming to develop the Brazilian Coffee Traceability Platform, which helps exporters meet the requirements of the EUDR. This platform is already available for CECAFE associates, compiling public databases that inform the production conditions of each farmer to comply with EUDR requirements.

Effectiveness of coordination

4.1 Legitimation

Legitimacy is an important variable for meso-institutions to effectively engage stakeholders in the coffee supply chain. The legitimacy of these meso-institutions' actions by actors facilitates acceptance and participation and enhances coordination efforts. The variable is qualified by the following attributes: compliance and adherence.

In both Brazil and Colombia, there is a recognition that national regulations need to align with the EUDR to ensure compliance. For example, in Colombia, the FNC is working on creating a legal reference framework that adapts the EUDR to the specificities of the Colombian coffee sector, particularly focusing on smallholder farmers, as mentioned by its CEO German Bahamon in a public statement: *"To ensure that Colombian coffee can continue accessing the European market, the FNC is preparing coffee growers and implementing a series of actions to facilitate the adaptation of Colombian exporters to the regulation. One of the most important actions is enabling access to the georeferencing of coffee lots. Exporters will be able to use this platform to verify the georeferencing of coffee lots."*

This effort to align national regulations with the EUDR aims to enhance the regulation's legitimacy by making it more relevant and applicable to local contexts. In Colombia, the FNC is perceived as a legitimate institution due to its long history of nearly 100 years of operation and its central role in coordinating the sector. The FNC in Colombia has taken a leadership role in coordinating efforts to comply with the EUDR by working with the Colombian government, the European Union, NGOs, and private sector actors.

In Brazil, there are different initiatives aimed at meeting the needs for compliance with the regulations. Although CECAFE plays an important role, some initiatives are coming from governmental players, like the Brazil Agro+Sustainable Platform, an initiative aimed at qualifying rural properties, as it is backed by the government and recognized institutions. There are also cooperative initiatives, such as Cooxupé, which is already selling *"EUDR-compliant"* coffee.

This multi-stakeholder approach helps to legitimize the regulation by ensuring that it is implemented in a way that considers the interests of actors in the supply chain. On the other hand, the excessive number of initiatives may create specific segments. However, by adapting to local

contexts, meso-institutions help ensure that producers can adhere to the regulation, even if they initially view it as a trade barrier.

One of the key challenges highlighted in the interviews is the mismatch between local agricultural practices and the requirements of the EUDR. For example, in Brazil, the Forest Code allows for legal deforestation under certain conditions, but the EUDR does not recognize these local legal frameworks, as is mentioned by IB1: *"For example, here in Brazil, we have a clear point of the cutoff date, right? December 31, 2020, which ignores our policy here regarding the Forest Code and the possibility of legal removal of native vegetation, with all the compensatory measures that the legislation already provides, Brazilian legislation, that's ignored, and that's the information the European Union asks for, and there I'm talking not only about Brazil, but mainly about other producing countries, right? What we have heard, from all this discussion that's already been going on for two years"*. This creates tension between national and international regulations, which can undermine the legitimacy of the EUDR in the eyes of local producers.

4.2 Centrality

Centrality represents the central role in ensuring compliance with the EUDR by disseminating information about the regulation to all stakeholders, influencing national and international policies to support EUDR implementation, coordinating efforts among stakeholders representing the interests of producers, especially smallholders, in discussions on the EUDR, and developing tools and platforms to demonstrate compliance. This variable was analyzed through the coordination attribute.

In Brazil, CECAFE launched digital campaigns and created a website with frequently asked questions and resources to inform producers and exporters about the EUDR. However, other meso-institutions are also playing a translation role for sector agents, such as cooperatives, trade associations, the Brazilian Rural Society, producer associations, and government agencies. In Colombia, the FNC, along with Solidaridad and Asoexport, conducted training programs to educate coffee growers. The FNC has been using its extension services to update coffee growers on EUDR changes and how they can meet the requirements.

CECAFE has used webinars, digital campaigns, and a dedicated page to inform stakeholders about the EUDR. As stated by IB2: *"The goal is to facilitate understanding of the new rules and their implications for coffee trade in Brazil, though, for example, Q&As aimed at producers, exporters, and importers."*

In Colombia, Asoexport, the Colombian Coffee Exporters Association, and the NGO Solidaridad have also used their networks to disseminate information on the EUDR. As stated by IC1: *"We are members of the Board of Directors of the Coffee, Forest, and Climate Agreement."*

Within this agreement, where exporters are also represented, we have worked with an organization called Solidaridad to develop communication and education tools." These information services are key for smallholders who face challenges in understanding the new regulation.

4.3 Heterogeneity

In Brazil, given the heterogeneity among producers in terms of technology and size, the challenge of complying with complex regulations becomes greater. Meso-institutions play a role in ensuring that the EUDR is implemented fairly and is feasible for all producers, regardless of their size or resources. As noted by IB1: *"From the perspective of positioning in the production chain, CECAFE takes the lead, as it acts as the interface with importers responsible for due diligence. However, since this is a structural matter, all actors in Brazil's coffee production chain have participated in shaping policies, decisions, and the implementation of these tools to comply with the EUDR."*

Still, the CECAFE system is not accessible to many coffee farmers who do not export directly. Large cooperatives, which in many cases trade coffee from smallholders, play a central role in working with different farmers' profiles to inform and enable the adaptation of producing practices. As noted by IB3, many farmers get most of their information about environmental requirements, like EUDR, by cooperative communications, like an internal "newspaper" and videos sent by mobile phones. These communications explain the requirements and which actions may be taken by affiliates to access the European Market. These cooperatives also access the monitoring system from CECAFE to generate compliance reports for these small farmers.

The lack of access to information and monitoring systems may generate an unintended exclusion of small holders of the European market. As explored by Solar et al. (2025), family farmers may be impacted by the EUDR due diligence requirements, due to the increase of transaction costs involved in the generation of information.

4.4 Technological and Organizational Instruments Supporting Coordination

During the data collection process, technological and organizational innovations emerged as a relevant manifestation of how meso-institutions operationalize coordination under regulatory pressure. These technological innovations are understood as outcomes of meso-institutional coordination, reflecting how processes of legitimization, information centralization, and accommodation of heterogeneous actors are translated into concrete and actionable practices. By translating rules, coordinating information flows, and by reducing uncertainty, meso-institutions indirectly induce technological and organizational innovations in the supply chain.

In Brazil, meso-institutions such as CECAFEE are designing and implementing the Brazilian Coffee Traceability Platform, a system that integrates satellite imagery, georeferencing,

and publicly available databases to monitor deforestation risks. This platform offers real-time data to exporters and serves as verifiable evidence for compliance with the EUDR. IB1 explained how the platform supports producers by linking geospatial information to traceability systems, stating: *“CECAFE takes the lead, as it acts as the interface with importers responsible for due diligence... all actors in Brazil's coffee production chain have participated in shaping policies and decisions to comply with the EUDR”*.

In Colombia, the SICA, operated by the FNC, fulfills a similar function by providing detailed georeferenced data on coffee plots. This system has been progressively updated to ensure that most Colombian coffee growers are included in the traceability framework. According to IC2, the FNC has secured georeferencing authorization from over 50,000 producers, with an anticipated 93% compliance rate by the end of the year. Beyond digital tools, meso-institutions have developed innovative educational and training methodologies to build compliance capacity among producers. Notably, Solidaridad in Colombia has implemented online courses and webinars tailored to producers' informational needs. These educational innovations aim to close knowledge gaps and empower stakeholders to navigate regulatory complexity. As explained by IC4: *“Webinar serve as an invitation to partners, and anyone interested... This is to explain to them, for example, how the IDEAM platform works, the field records, and how to help them understand what is available and how they can use it, among other things.”*

These efforts demonstrate that innovation is not limited to technological deployment but includes new ways of organizing information, building capacity, and aligning actors. Furthermore, collaborative innovation—between meso-institutions, government entities, and international organizations - has emerged as a governance strategy. For instance, CECAFE's collaboration with Serasa Experian and the Ministry of Agriculture in Brazil, and the FNC's coordination with the European Forest Institute, exemplify hybrid institutional innovation processes.

These innovation outcomes are closely intertwined with legitimacy, centrality, and heterogeneity as their emergence depends on existing coordination structures and, in turn, may reinforce perceptions of institutional effectiveness.

5. Discussion

The results confirm the perception that the Colombian and Brazilian coffee sectors operate under different institutional coordination dynamics, which lead to divergent responses in communicating with and monitoring coffee producers in relation to European Union requirements, particularly the EUDR. As North (1990) argues, “history matters”: these

differences stem from specific institutional trajectories that have shaped current governance arrangements.

In Brazil, a more pluralistic and decentralized model is observed. Since the dissolution of the Brazilian Coffee Institute, various organizations have assumed key roles in sector coordination. Research and innovation have also become decentralized, with multiple actors developing parallel solutions. This institutional structure fostered the emergence of initiatives such as the Brazilian Coffee Traceability Platform, coordinated by CECAFE. The platform integrates satellite imagery, georeferenced data, and other information sources to monitor deforestation. This tool not only streamlines the compliance process but also provides exporters with verifiable evidence.

Colombia, by contrast, follows a highly centralized institutional model led by the FNC, which historically has concentrated functions including political representation, commercialization, production, and management of the National Coffee Fund. The FNC uses the SICA to generate georeferenced data on rural properties, supporting exporters in adapting to the EUDR. Additionally, it has launched educational and training programs for producers, with support from organizations such as Solidaridad. These two institutional models represent “ideal types” of coordination. Colombia has been able to respond swiftly to new regulatory demands through a strong and legitimate institution. In Brazil, although the model is more fragmented, the response has also been prompt, driven by coordination among public and private meso-institutions such as cooperatives, associations, and the Ministry of Agriculture. The availability of public data and private tools has complemented monitoring efforts.

These different approaches to solving the same problem of communicating and monitoring compliance with the EUDR are directly related to the analytical dimensions considered in this study. In Colombia, the dominance of a single, strong meso-institution, results in frequent references in interviews to dimensions of centrality and legitimacy, reflecting actors’ trust in the FNC’s coordinating capacity. In Brazil, the institutional environment is more fragmented, with multiple actors operating simultaneously, leading to a greater emphasis on heterogeneity. However, in plural contexts such as Brazil’s, institutional fragmentation, while potentially hindering consensus, also fosters innovation, local adaptation, and the engagement of a wider range of actors.

Moreover, while information systems represent significant progress, their effective use for EUDR compliance also depends on the structure of value chains and the capacity to aggregate and standardize information from heterogeneous producers. In this sense, large-scale producers are often preferred by exporters and buyers due to lower transaction costs, more stable supply, and simplified traceability processes. This dynamic poses challenges for the inclusion of

smallholders, especially in countries like Brazil, where the production base is highly diverse and fragmented. Cooperatives, associations, and other hybrid forms of coordination emerge as mechanisms to reduce information asymmetries, standardize compliance practices, and facilitate the aggregation of data necessary for traceability. Therefore, promoting the involvement and strengthening of meso-institutions is key to ensuring that the digitalization of compliance mechanisms does not exacerbate existing inequalities in market access but instead contributes to more inclusive value chains.

In Brazil, the coordinating role has been taken on by CECAFE, but it could equally have been assumed by other entities such as the National Coffee Council (CNC), the Brazilian Confederation of Agriculture and Livestock (CNA), or the Ministry of Agriculture itself. This highlights that there is no single model of effective coordination, but rather multiple institutional possibilities.

6. Conclusion

This study aims to explore how different meso-institutional configurations shape coordination mechanisms that enable compliance with the EUDR within the coffee supply chains of Brazil and Colombia. Drawing from institutional economics literature, the analysis focused on three dimensions to assess the coordination effectiveness of meso-institutions in both national contexts.

This study found that meso-institutions are intermediaries in translating regulatory requirements into actionable practices, fostering compliance through enforcement, incentives, and feedback mechanisms. Their ability to do so is shaped by their historical legitimacy, central positioning within sectoral networks, ability to unify heterogeneous actors, and capacity to enable innovation.

The empirical findings reveal that Brazil and Colombia represent two distinct institutional configurations, each with specific strengths and limitations in fostering compliance with the EUDR. In Colombia, the FNC exemplifies a centralized and highly legitimate meso-institution with deep historical roots and extensive coordination capacity. Its long-standing relationship with producers and the government allows for efficient dissemination of information, unified response mechanisms, and early development of compliance infrastructure. However, the system's centralization may reduce competitive pressures for innovation.

In Brazil, the meso-institutional landscape is more fragmented, with multiple actors such as CECAFE, cooperatives, and private certifiers contributing to the compliance process. This heterogeneity introduces coordination challenges but also fosters local adaptability and innovation, as evidenced by the development of the Brazilian Coffee Traceability Platform.

Brazil's meso-institutions must work within a more diverse producer landscape, increasing the complexity of building legitimacy and implementing uniform compliance mechanisms. Including small holders on the monitoring tools seems to be a big challenge in Brazil, demanding a more integrated system among meso-institutions.

Overall, the study confirms that there is no single model of effective meso-institutional coordination. Instead, the ability of meso-institutions to ensure EUDR compliance depends on how well their governance structures align with their institutional histories and the socio-economic characteristics of their sectors. While Colombia's centralized approach benefits from strong coordination and legitimacy, Brazil's decentralized model leverages diversity to innovate and adapt.

These findings highlight the importance of context-sensitive institutional design. Policymakers and international regulators should recognize the diverse paths through which compliance can be achieved and support tailored strategies that build existing institutional capacities rather than imposing uniform solutions. Furthermore, the capacity of meso-institutions to mediate between global standards and local realities remains essential for fostering both environmental protection and economic inclusion in commodity-producing countries.

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