



Intellectual Property, Sustainable Innovation and Legal-Environmental Governance: A Case Study of Green Business in Florencia, Caquetá, Colombia

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Abstract

In Amazonian territories such as the department of Caquetá, high biological wealth coexists with deep institutional asymmetries that hinder the articulation between productive sustainability, innovation and legal governance. In this context, this article analyzes the tension between the public policies of Green Growth and Intellectual Property in Colombia, examining its real impact on the consolidation of rural green markets. From a qualitative legal-empirical approach, a multiple case study applied to three Green Businesses in the municipality of Florencia is developed, with the purpose of evaluating the levels of innovation and the degree of appropriation and use of Intellectual Property instruments. The results show structural gaps in the management of intangible assets, a low appropriation of legal protection mechanisms and a weak territorial incorporation of sustainable innovation, which limits the competitiveness, scalability and economic sustainability of these ventures. The study concludes that the disarticulation between environmental sustainability, innovation and Intellectual Property erodes environmental governance and restricts the transformative potential of green markets, underscoring the need for integrated strategies that strengthen protected innovation as the axis of sustainable development in rural contexts of high biodiversity.

Keywords: Intellectual property, Green business, Green growth, Sustainable innovation, Public policies.

Introduction

Green Growth has established itself as a cross-cutting paradigm of sustainable development, aimed at making productivity growth and economic competitiveness compatible with the protection of natural capital, climate change mitigation and social inclusion. In this framework, green businesses emerge as a strategic category that not only promotes environmentally responsible productive practices, but also seeks to strengthen the economic capacities of local

communities and their insertion in differentiated markets, especially in territories with high environmental and biodiverse wealth.

At the same time, Intellectual Property (IP) is configured as a key legal instrument for the protection, valorization and circulation of intangible assets associated with eco-innovation processes, traditional knowledge, sustainable technological developments and distinctive signs linked to green goods and services. In contexts of sustainable economies, IP fulfills a function that transcends mere legal exclusivity, becoming a potential mechanism for economic governance, access to specialized markets and generation of added value in environmentally responsible production chains.

However, in Colombia, despite the existence of public policies aimed at both Green Growth and the strengthening of the Intellectual Property system – in particular documents CONPES 3934 of 2018 and CONPES 4062 of 2021 – a structural fracture persists between the two policy frameworks. This institutional and regulatory disarticulation limits the ability of green businesses to effectively appropriate IP instruments, restricting their competitiveness, their productive scaling and their insertion in differentiated national and international markets.

This problem is particularly acute in peripheral and rural territories, such as the department of Caquetá, where, on the one hand, there is a significant supply of green business initiatives – particularly in the biotrade sector – and, on the other, low levels of knowledge, use and appropriation of Intellectual Property mechanisms.

This gap is not only due to technical or informational deficits, but also reveals deeper tensions related to the legal governance of sustainable innovation, the institutional capacity of the State, and the adequacy of IP instruments to rural and environmentally strategic productive contexts.

In this sense, the following research question arises: *How does the lack of articulation between the public policy of Intellectual Property and the green business strategy affect the strengthening, positioning and sustainability of green markets in Florencia Caquetá, Colombia?*

The central thesis argues that the weakness in the articulation between both regulatory regimes operates at multiple levels – institutional, territorial and productive – generating a marginal use of IP in green businesses and limiting its potential as a tool for innovation, differentiation and sustainable economic governance. To support this hypothesis, an empirical analysis of a territorial nature is developed, based on the study of cases of green businesses located in the municipality of Florencia (Caquetá), with emphasis on biotrade initiatives that incorporate sustainable practices, responsible use of natural resources and local dynamics of innovation. The study critically examines the degree of knowledge, appropriation and use of Intellectual Property instruments in rural contexts, as well as the structural obstacles that condition their effectiveness as a tool for sustainable development.

Methodology

The research adopted a qualitative approach of a legal-empirical nature, developed through a multiple case study applied to three green businesses located in the municipality of Florencia, Caquetá, with the purpose of analyzing the degree of articulation between Intellectual Property instruments and sustainable production models in rural contexts with a high biodiversity index.

In a first phase, a dogmatic-documentary analysis of the main public policies that guide Green Growth and Intellectual Property in Colombia was carried out, in particular the documents CONPES 3934 of 2018 and CONPES 4062 of 2021, in dialogue with the specialized literature on eco-innovation, green business and valorization of intangible goods. This phase made it possible to delimit the relevant legal and analytical categories, as well as to identify the objectives, scope, and gaps in the normative and institutional articulation of these policies.

In a second phase, the multiple case study was developed, selecting three green businesses accredited by Corpoamazonia, belonging to the biotrade sector. To collect empirical information, a structured questionnaire was applied, designed based on the guidelines of the World Intellectual Property Organization (WIPO) and the Oslo Manual, aimed at identifying innovation practices, levels of knowledge and use of Intellectual Property, as well as the mechanisms for the protection of intangible assets used by productive actors. The information collected was analyzed through a qualitative-descriptive procedure, contrasting the empirical findings with the regulatory framework and current public policies.

Finally, the research incorporated a methodological triangulation strategy between regulatory sources, public policy documents and territorial empirical evidence, which made it possible to strengthen the consistency of the analysis and support the formulation of recommendations aimed at the design of differentiated innovation and sustainability policies, adapted to the particularities of rural ecosystems and green markets.

Results and Discussion

1. Theoretical Foundations of Green Growth and Sustainable Green Business

The concept of green economy was introduced early on by Pearce, Markandya, and Barbier (1984), who defined it as a system of economic activities aimed at the production, distribution, and marketing of goods and services that improve human well-being in the long term, without compromising future generations through significant environmental risks or scenarios of ecological scarcity. This early formulation already warned of the need to rethink the relationship between economic growth and environmental limits, overcoming the traditional extractive paradigm¹.

Along the same lines, Sukhdev and Berghöfer (2007) deepen the approach by arguing that the green economy is oriented towards the efficient and responsible management of natural capital, both renewable and non-renewable resources, as an indispensable condition for the

¹ Zúñiga-González et al., 2015, 32.

materialization of sustainable development. From this perspective, the green economy not only seeks to reconcile growth and conservation, but also incorporates specific environmental objectives, such as the protection of biodiversity, the mitigation of climate change and the reduction of pollution levels, generating positive effects on ecosystems and human quality of life².

For its part, the Organisation for Economic Co-operation and Development (OECD) has developed the concept of Green Growth as a category closely linked to the green economy, but with a particular emphasis on economic dynamics. According to the OECD, green growth promotes sustained and inclusive economic development, ensuring that natural assets continue to provide the resources and environmental services essential for human well-being. In this framework, technological innovation, efficiency in the use of resources and investment in sustainable sectors are conceived as catalysts for new economic opportunities, capable of articulating competitiveness, environmental sustainability and social cohesion³.

In line with the above, the Global Green Growth Institute (GGGI) argues that green growth constitutes a new paradigm of structural transformation of development, whose support lies in an economic model oriented primarily to environmental and climate sustainability. From this perspective, green growth is not limited to mitigating negative externalities, but aims to directly address contemporary environmental challenges, through the creation of institutional and productive mechanisms that facilitate a more efficient distribution of resources and guarantee sustainable access to essential raw materials⁴.

Thus, in view of the imperative need to create synergy between economic growth and environmental sustainability, on June 20, 2012, at a meeting held in Rio de Janeiro, Brazil, the States signed the *"Agreement for the Establishment of the Global Institute for Green Growth"* with the purpose of adopting green economic models. thus turning towards a future of a sustainable and sustainable economy. Consequently, the Colombian State issued Law 1954 of 2019 through which it approved the aforementioned agreement, specifying that the GGGI pursues an objective that adheres to the obligational facet of the State regarding the healthy environment, particularly in relation to guaranteeing and promoting sustainable development.

In this context, Green and Sustainable Business (NVS) emerges as a concrete expression of the green growth paradigm. These are conceived as economic activities aimed at the supply of goods and services that generate verifiable positive environmental impacts, incorporating good environmental practices under a life-cycle approach and contributing directly to the conservation and sustainable use of the natural capital that sustains territorial development (Ministry of Environment and Sustainable Development, n.d.).

From this perspective, green businesses or markets are configured as initiatives that actively respond to the contemporary challenges of sustainable production, distribution and consumption, by articulating organisational and productive models compatible with environmental protection. Its value proposition is based on the offer of environmentally

² Sukhdev; Berghöfer, 2007, 223

³ OECD, 2009, 22-23.

⁴ National Planning Department, 2016, 11.

responsible products and services, aimed at differentiated market niches that privilege criteria of sustainability, traceability and low ecological impact⁵.

In this order of ideas, Green and Sustainable Businesses stand as a real alternative to conventional markets, insofar as they structure their operation on four fundamental pillars: (i) the supply of goods and services with differentiated environmental attributes; (ii) the transversal incorporation of sustainability principles in production processes; (iii) the ability to transcend traditional markets through environmental value-added schemes; and (iv) an explicit commitment to environmental protection and responsible management of natural resources⁶.

Under this framework, the role of the State is decisive, as it is consolidated as a facilitator of green growth, by having regulatory, institutional and financial capacities to encourage the supply of sustainable products and services. In a complementary way, its intervention makes it possible to promote social dimensions that are essential for the sustainability of these markets, such as community empowerment, the inclusion of rural populations and the durability of production models over time⁷.

The strategic value of Green and Sustainable Business in Colombia

Based on the above, it is necessary to examine the scope of the Public Policy for Green Growth, materialized in CONPES 3934, through which the Colombian State adopts guidelines aimed at the implementation of environmentally and economically sustainable development models. However, the effectiveness of such a policy depends, to a large extent, on the ability to mobilize investments aimed at economic and environmental sustainability in strategic sectors such as energy, transport, agriculture, biotechnology, circular economy and basic sanitation.

In this context, various studies warn that a structural characteristic of Green and Sustainable Business in Colombia is its **marked territorial anchorage**, particularly in rural areas. According to García-Castiblanco et al. (2021), a significant proportion of these enterprises are developed in sustainable agrosystems, in the use of non-timber forest products, and in ecotourism activities, which shows their close relationship with biodiversity and local community-based economies⁸.

However, this territorial roots have not consistently translated into high economic performance or a solid insertion in national and international markets. On the contrary, the leaders and managers of these businesses themselves recognize the insufficiency of the institutional, financial and technical support necessary for their consolidation, which limits their ability to scale, differentiate their products and access more sophisticated value chains. This situation

⁵ Rodríguez, 2011, 62.

⁶ Borges; García, 2011, 15.

⁷ Díaz-Ariza et al., 2022, 297.

⁸ García-Castiblanco et al., 2021, 9.

reveals the need to strengthen the strategic positioning of Green and Sustainable Businesses, not only as environmental initiatives, but as viable and competitive economic units⁹.

In addition, despite the fact that Colombia is recognized as a megadiverse country, structural obstacles to the development of green markets persist. These include the weak consolidation of local markets, the lack of knowledge about the economic opportunities associated with these production models, the limited capacities for the formulation and structuring of sustainable projects, as well as the fragmentation and low institutional articulation in the strategies for promoting the green economy¹⁰.

In short, Green and Sustainable Business acquires a strategic value in the transition to a low-carbon, resilient and socially inclusive economy, by articulating the conservation of ecosystems, the mitigation of climate change and the generation of employment and local development in historically marginalized territories. However, the absence of clear legal recognition and effective instruments for its economic and competitive strengthening limits its transformative potential and hinders its consolidation as the structural axis of a truly sustainable economy.

It is precisely at this point that Intellectual Property emerges as a key legal tool for sustainable innovation, as it allows the protection, valorization and projection of intangible assets associated with Green and Sustainable Businesses, facilitating their differentiation, access to specialized markets and economic sustainability in the long term.

2. Intellectual Property: Sustainable Innovation

From a classical perspective, Intellectual Property has been conceived as a normative discipline aimed at granting legal protection to intellectual creations derived from work, effort and human skill, recognizing their owners exclusive rights over such creations (Rengifo García, 1996). This protective function plays a central role in structuring incentives for creativity, innovation and knowledge transfer¹¹.

In a contemporary reading, IP transcends its strictly patrimonial dimension to be configured as a strategic asset capable of generating wealth, quality employment and sectoral sustainability. In this sense, Maíllo (2021) argues that IP has a direct impact on the dynamics of free competition and the organization of markets, insofar as it places innovation as a structural axis of economic development¹².

Within the framework of current environmental challenges, various conceptual categories have emerged to refer to those innovations aimed at reducing negative impacts on the natural environment. Among them, green innovation or eco-innovation is used to describe goods and

⁹ Díaz-Ariza et al., 2022, 301.

¹⁰ National Planning Department, 2018, 29.

¹¹ Rengifo, 1996, 23.

¹² Maíllo, 2021, 29.

services, production processes, marketing methods, and organizational structures that generate significant and verifiable environmental improvements¹³.

From this perspective, eco-innovation is configured as a sustainable innovation modality in which environmental considerations are integrated in a transversal way into the research and development (R+D) processes, as well as the commercialization and production scaling phases. This makes it possible to articulate technologies, products and services that not only respond to criteria of economic efficiency, but also explicitly incorporate environmental sustainability objectives¹⁴.

In this context, green innovation is projected as a central component of the so-called Green Intellectual Property, understood as the set of legal mechanisms aimed at the protection of innovations that contribute, directly or indirectly, to the preservation of the environment (Deren & Skonieezny, 2022). This category acquires special relevance in sectors associated with biotrade, the circular economy and the sustainable use of biodiversity¹⁵.

Within this framework, the concept of Green Intellectual Capital emerges, defined by Chen (2008) as the set of intangible assets, knowledge and capacities – both individual and organizational – aimed at protecting the environment. Thus, Green Intellectual Property is materialized, among other instruments, in patents that protect sustainable technological innovations, in trademarks and industrial designs that allow differentiating products with environmental attributes, and in trade secrets associated with eco-efficient production processes. These instruments not only prevent unfair competition practices, but also make it possible to monetize intangible assets through licensing and technology transfer schemes¹⁶.

Consequently, Intellectual Property is consolidated as a regulatory mechanism for technological development and the protection of intangible assets, which cannot remain oblivious to the transformations derived from the new sustainable production models. On the contrary, its adaptation to these realities is essential to guarantee the integrity of markets, the legal certainty of innovators and the effective protection of the rights of those who promote environmental solutions from the business and community ¹⁷spheres.

Adaptability of the IP regime to the reality of Green Business

The Public Policy on Intellectual Property, adopted through CONPES 4062, arises as a response to structural problems associated with the low generation and management of intangible assets, weaknesses in the use of IP instruments, the scarce effective defense of these rights and the limitations in the processes of formation and social appropriation of knowledge. For its part, the Public Policy for Green Growth (CONPES 3934) is aimed at maintaining and increasing

¹³ Kemp; Pearson, 2007, 5-6.

¹⁴ Clark; Charter, 2007, 9-10.

¹⁵ Theirs; Skonieezny, 2022, 2.

¹⁶ ECIIA, 2025. (online first)

¹⁷ Acosta, 2019. (online first)

the country's economic dynamism through sustainable sources of growth, based on the responsible use of natural capital.

As has been pointed out, Green and Sustainable Businesses are predominantly located in rural areas with high potential for the generation of goods and services based on the sustainable use of natural resources. Paradoxically, these same territories face significant restrictions in access to information, training and technical support in the field of Intellectual Property, which limits their ability to protect and value their intangible assets.

In this scenario, while IP policy emphasizes education, training, and the strategic use of protection instruments, the Green Growth policy promotes productive sustainability and a low-carbon economy. However, the lack of effective articulation between the two policies highlights the need to unify regulatory and institutional criteria, so that developers of green technologies and entrepreneurs of sustainable markets have adequate tools to protect their innovations and turn them into competitive advantages with a positive environmental and economic impact.

The National Development Plan, by incorporating both public policies, sets the objective for Intellectual Property to have a significant impact on the circular economy and Green Business, contributing to the development of solutions to environmental challenges through an efficient and sustainable use of natural resources. However, the realization of this purpose requires evaluating, from an empirical perspective, the real degree of articulation between the IP regime and sustainable production models in the territories.

It is from this analytical need that the empirical analysis of the articulation between Intellectual Property and Green Business in the department of Caquetá is addressed in the following section, in order to identify gaps, existing practices and opportunities for institutional and regulatory strengthening.

2. Empirical analysis of the articulation of IP & Green Business in Caquetá

In line with the theoretical and regulatory framework previously developed, the Research Project "*Strengthening innovation through the protection of Intellectual Property of Green Businesses in Florencia – Caquetá, Colombia*" aimed to empirically analyze the level of innovation and the degree of appropriation and use of Intellectual Property instruments in Green Businesses located in the municipality of Florencia. Caquetá.

To this end, a structured questionnaire was designed and applied aimed at identifying innovation practices, differentiation mechanisms and strategies for the protection of intangible assets, with emphasis on productive units accredited as Green Businesses before Corpoamazonia.

The three selected cases —*Cosechas de mi Finca S.A.S.*, *El Rancho de la Vaca Muu* and *Frutos de mi Tierra*— belong to the **Biocommerce** sector, understood as that which develops activities of collection, production, transformation and commercialization of goods and services derived

from native biodiversity, under criteria of environmental, social and economic sustainability, see:

Table 1. Characterization of green businesses

Sustainable Green Businesses	Harvests from my farm S.A.S	The Muu Cow Ranch	Fruits of my Land
Sector	Biotrade	Biotrade	Biotrade
Address	Finca San Isidro Vereda la Esperanza, Florencia - Caquetá	Puerto Arango	Km10 Corregimiento Santo Domingo, Florencia - Caquetá
Since what year have you been accredited in CorpoAmazonia?	2022	2021	2017
Products or services offered	Bee products (honey)	Dairy, catering and events, restaurant at table and tourist services	Turmeric, agro-tourism services

Source: Authors.

These businesses show differentiated productive trajectories and different levels of organizational maturity, which allows us to observe common and divergent patterns in the articulation between sustainable innovation and Intellectual Property in Amazonian contexts.

Instrument design and analysis criteria

The questionnaire addressed four dimensions of innovation – product innovation, process innovation, marketing innovation and organisational innovation – in line with the international standards proposed by the World Intellectual Property Organization (WIPO) and the Oslo Manual. These dimensions were analyzed not in isolation, but in their functional articulation with Intellectual Property, understood as the set of legal instruments aimed at protecting, valuing and projecting the results of innovation in the market.

In this sense, the empirical analysis is not limited to identifying the existence of innovative practices in the Green Businesses studied, but examines to what extent these innovations translate – or not – into protectable intangible assets, such as trademarks, trade secrets, designs, copyrights or eventual patentable developments. The absence, weakness or fragmentation of these mechanisms of legal appropriation constitutes a central variable to evaluate the economic sustainability and the capacity to scale of the production models analyzed.

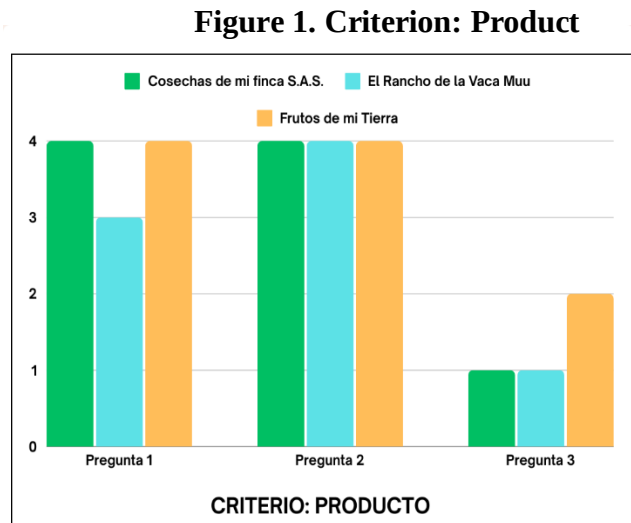
The rating scale used was ordinal, with four levels: *Never*, *Sometimes*, *Almost Always* and *Always*. The results are presented in an aggregate manner and are interpreted based on their relationship with the degree of formalization, protection and management of intangible assets, allowing the identification of structural gaps between sustainable innovation, Intellectual Property and positioning in green markets.

a) Product innovation

Question 1: Do the goods or services offered by the business differ from the competition?

Question 2: Have any significant improvements or changes been made to the business in the last 2 years?

Question 3: Have you received distinctive awards and/or recognition for the products you offer in your business?



Source: Own elaboration. In original Spanish language

The results show that the three Green Businesses make significant efforts to differentiate their products, either through specific production practices, continuous improvements or infrastructure adaptations. However, these innovations do not translate into systematic strategies for the protection, valorization or exploitation of intangible assets.

The innovation observed is predominantly incremental and adaptive, aimed at responding to the ecological and productive conditions of the Amazonian context. However, this innovation is not accompanied by trademark registrations, distinctiveness schemes, protection of production processes or strengthening of the business reputation as an intangible asset.

In the absence of formal mechanisms of recognition and legal protection, access to differentiated value chains is restricted, consumer confidence is weakened, and the possibility of capturing rents associated with the sustainability and territorial origin of products is reduced, despite the fact that these attributes are highly valued in biotrade markets.

At the individual level:

- *Harvests from my Finca S.A.S.* It presents a differentiation based on the quality of the honey and the particularities of the extraction process; however, this uniqueness is not fully perceptible to non-specialized consumers, which limits its commercial positioning.
- *The Rancho de la Vaca Muu* incorporates distinctive elements through its own recipes in its dairy derivatives and complements its offer with tourist services, configuring a hybrid model that articulates production and experience.
- *Frutos de mi Tierra* shows a higher level of innovation through the consolidation of laboratories and the incorporation of an apiary, which expands its portfolio and reinforces its sustainable profile

Overall, the data allow us to conclude that, although there are relevant innovations in products and services, these are not transformed into sustainable competitive advantages due to the absence of Intellectual Property strategies that allow their protection and valorization in the market.

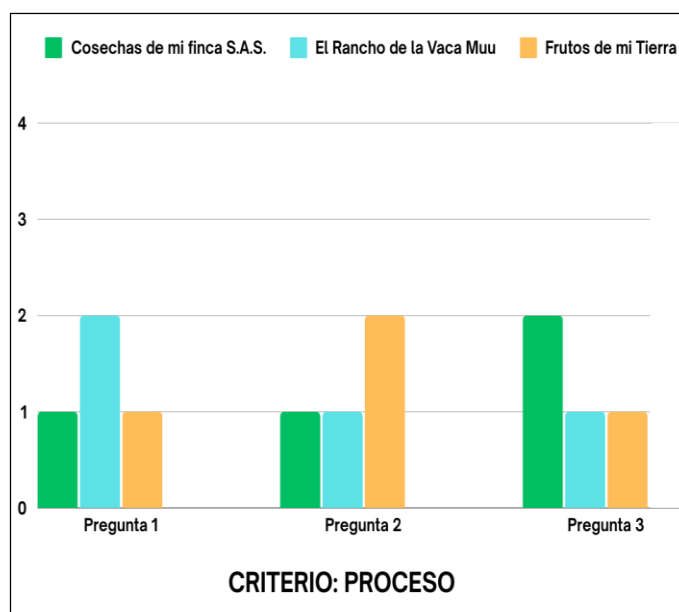
b) Process innovation

Question 1: Do you have business software that allows you to efficiently integrate all the company's operations accounting, inventory management and production planning?

Question 2: Do you have supply chain management systems in place to optimize the flow of incoming materials and final products?

Question 3: Are the business personnel trained to use new methodologies in the company's processes?

Figure 2: Criterion: Process



Source: Own elaboration. In original Spanish language

The analysis of the process criterion reveals structural weaknesses in the three businesses studied. None of them has integrated business software systems that allow efficient inventory management, accounting or production planning, which limits the organization of information and the traceability of products.

Similarly, the use of supply chain management systems is nascent or non-existent, making it difficult to control inputs, standardize processes, and verify quality. This absence has a direct impact on the stability of the final product and, from the perspective of Intellectual Property, prevents the proper documentation of production methods, an essential requirement to prove originality, novelty or ownership in eventual protection schemes.

In addition, staff training levels are low, reducing the possibility of implementing new production methodologies or consolidating innovative processes in a sustained manner. Since innovation is highly dependent on human capital, this gap translates into a structural weakness that affects both economic sustainability and the potential protection of intangible assets

In summary, although the Green Businesses analyzed generate specific innovations, they lack formalized and standardized processes that allow these innovations to be converted into assets

that can be protected through Intellectual Property instruments. Without documentation, traceability and systematization, it is unfeasible to protect technical improvements through trade secrets, trademark registration, industrial design or other mechanisms available in the IP regime.

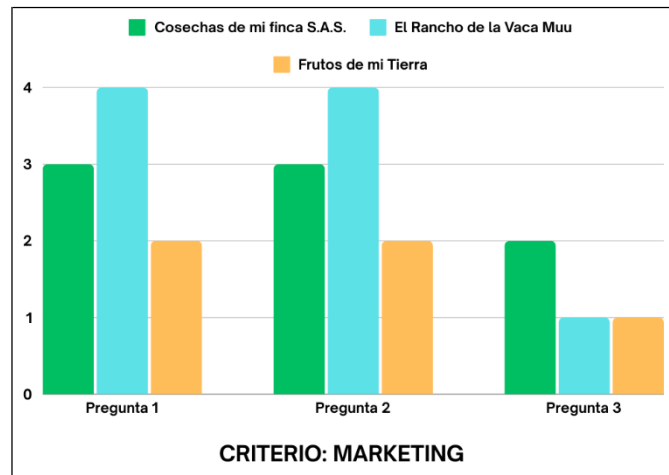
c) Marketing

Figure 3. Criteria: Marketing

Question 1: Do you have a web platform and/or social networks to promote the products?

Question 2: Are campaigns created that connect emotionally with customers and generate a positive response from the brand?

Question 3: Do product packaging have a differential value compared to the competition?



Source: Own elaboration. In original Spanish language

The results of the marketing criterion reveal a common pattern among the Green Businesses analyzed: although there are efforts aimed at making products visible and contacting consumers, the strategies implemented are heterogeneous, fragmented and lack a structured support that allows consolidating a brand identity, generating sustainable differentiation and legally protecting distinctive signs through Intellectual Property tools.

There is evidence of uneven adoption of digital platforms. *Rancho de la Vaca Muu* has the largest presence on social networks and a more consistent ability to execute campaigns that generate interaction with customers, which strengthens its positioning in the local market. *Harvests from my Finca S.A.S.* it shows an intermediate performance, with an acceptable management of social networks, although without a consolidated communication strategy or aligned with sustainability attributes. For its part, *Frutos de mi Tierra* exhibits a limited digital presence, which restricts its commercial reach and reduces its ability to effectively communicate the environmental and territorial value of its products.

The weakest dimension of the marketing criterion relates to differentiation through packaging. The scores obtained are low in two of the businesses and barely moderate in the third, which is particularly relevant if one considers that, in green markets, packaging is a strategic vehicle for communicating environmental attributes, sustainable origin, clean processes and values associated with the territory. The absence of distinctive designs and protection strategies (industrial designs or three-dimensional trademarks) limits the potential of Intellectual Property as an instrument of commercial differentiation.

In summary, although incipient practices of innovation in marketing are identified, Green Businesses urgently need to strengthen their commercial identity, professionalize their visibility strategies and articulate them with mechanisms for the protection and valuation of intangible assets, so that environmental sustainability is effectively translated into economic value recognized by the markets.

d) Organizational

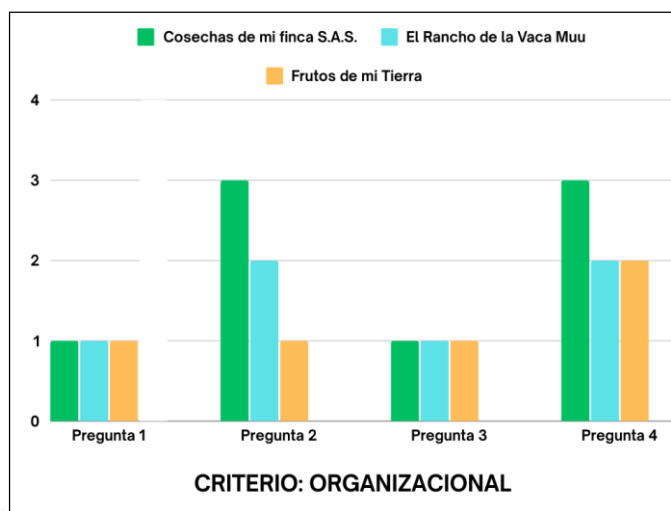
Figure 4. Criteria: Organizational

Question 1: Does the business have online collaboration tools?

Question 2: Are spaces for employee participation encouraged to contribute ideas and suggestions to improve processes or products?

Question 3: Is teleworking encouraged?

Question 4: Is the business model constantly adjusting to market trends?



Source: Own elaboration. In original Spanish language

The analysis of the organizational criterion shows common structural weaknesses in the three Green Businesses studied. The scores obtained reflect a limited or non-existent incorporation of digital collaboration tools, which is especially problematic in a context where digitalization is key to operational coordination, organizational efficiency, and the traceability of production processes.

None of the ventures has systematically integrated project management platforms, collaborative tools or internal digital channels. This situation suggests that internal processes depend mainly on face-to-face communication and traditional methods, which slows down decision-making, hinders the systematization of information and limits the ability to document processes susceptible to protection by means of Intellectual Property.

In contrast, *Cosechas de mi Finca S.A.S.* It stands out positively in the generation of spaces for worker participation, promoting the collection of ideas and suggestions for the improvement of processes and products, which denotes an organizational culture relatively open to innovation. *The Rancho de la Vaca Muu* shows intermediate progress in this regard, while *Frutos de mi Tierra* shows an almost total absence of formal mechanisms of internal participation.

In relation to teleworking, the results confirm its practical unfeasibility in these production models, given the agricultural and face-to-face nature of the activities carried out. However,

this limitation does not exclude the possibility of incorporating digital tools for process management, documentation and control.

Finally, a high degree of adaptability of the businesses to the trends of the Amazonian regional market is observed, which shows flexibility and responsiveness to consumer demands. However, this adaptability is not accompanied by robust organizational structures that allow capitalizing on these responses as long-term strategic assets.

(e) IP Knowledge

Question 1: Am I clear about what Intellectual Property is?

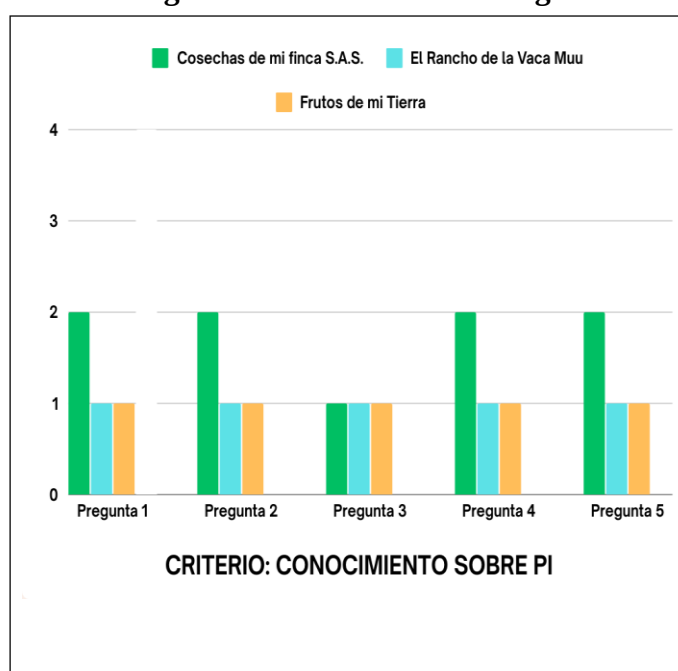
Question 2: Do I understand the importance of protecting the Intellectual Property of the business?

Question 3: Do I know the different types of Intellectual Property that exist (copyrights, patents, trademarks, industrial secrets, among others)?

Question 4: Do I know how to protect the innovations, information and creation of my business through Intellectual Property rights of my business?

Question 5: Do I know the benefits of registering IP for my business?

Figure 5. Criterion: Knowledge about IP



Source: Own elaboration. In original Spanish language

The results associated with knowledge about Intellectual Property reveal a significant gap between the businesses analyzed. *Harvests from my Finca S.A.S.* presents a moderate level of understanding of the general concept of IP and its importance for the protection of intangible business assets. In contrast, the other ventures show a limited or diffuse understanding, which makes it difficult to identify assets susceptible to protection.

While *Cosechas de mi Finca S.A.S.* While it recognizes some basic protection mechanisms, such as trademark registration or the use of confidentiality agreements, other businesses lack clarity on the types of IP available and on the ways to protect their innovations, information, and creations.

This lack of knowledge constitutes a structural barrier to the strategic appropriation of IP, as it prevents recognition of its potential as a tool for competitiveness and economic sustainability in green markets

(f) IP generation

Question 1: Do I use a logo or sign to distinguish third-party products or services?

Question 2: When designing the signs, did I make sure that they could be registered?

Question 3: Have I registered trademarks and other distinctive signs that identify the products and services of the business?

Question 4: Do I carry out research to ensure that the distinctive signs adopted do not infringe the rights of third parties?

Question 5: Does the business have information that it considers commercially valuable and that it does not want competitors to have access to?

Question 6: Have I taken reasonable steps to protect information that I consider valuable from the business?

Question 7: Do I control access to information, for example, through password protection mechanisms, paper shredding machines, categorization of confidential documents, etc.?

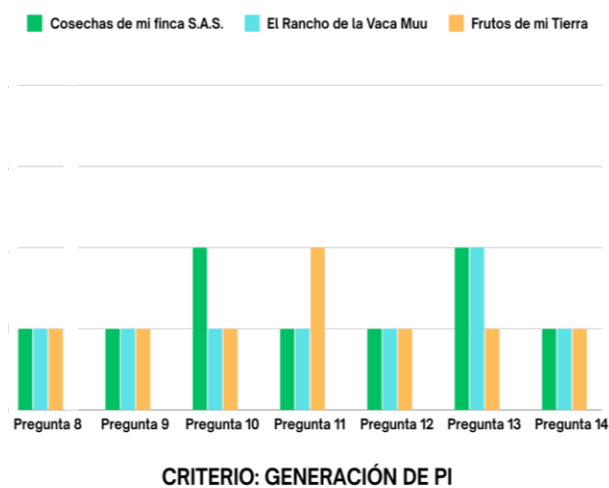
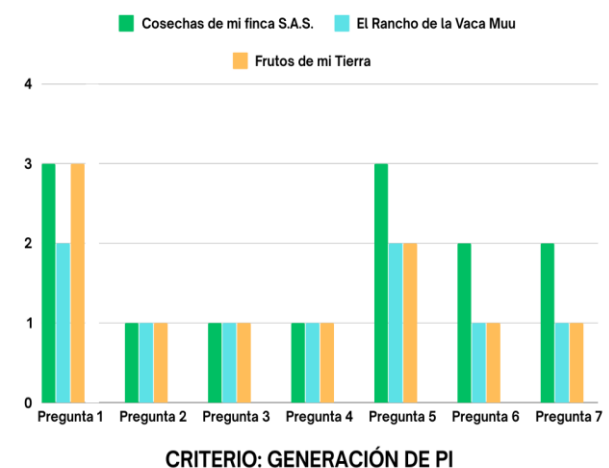
Question 8: Do I include clauses in the contracts of workers and external contractors that protect confidential information from being used, taken or shared without the authorization of the business?

Question 9: Do I explain to workers how to protect confidential business information?

Question 10: Is the product or process you develop in the business new and "inventive"?

Question 11: Have I invested budget for research and development activities?

Question 12: Have I registered a patent?



Source: Own elaboration. In original Spanish language

Question 13: Do I elaborate within the business, the material that is published on the website such as written content, photos, videos, graphics, etc.?

Question 14: Have you registered with the DNDA the works generated in the business?

The analysis of the IP generation criterion allows us to affirm that the Green Businesses studied are in an incipient phase of management of intangible assets. While some of them use logos or distinctive signs, the adoption of formal registration practices with the competent authorities is low or non-existent.

Harvests from my Finca S.A.S. and *Frutos de mi Tierra* have advanced in the construction of identity elements; however, none of the businesses has consolidated a systematic strategy of registration, protection or defense of these signs. This situation exposes them to risks of misappropriation, loss of exclusivity and weakening of their market positioning.

In addition, none of the enterprises has institutionalized minimum protocols for the protection of sensitive or confidential information, which limits the consolidation of trade secrets as Intellectual Property assets. In terms of research and development (R+D), the results are particularly low: only *Frutos de mi Tierra* reports the start of innovative activities, although these are not formalized or protected.

The absence of registrations with the National Directorate of Copyright and the absence of patent applications show that, although businesses generate potentially protectable content, processes and products, they do not consolidate their ownership or develop defensive strategies against third parties.

G) IP Management

Question 1: Do I have identified all the IP assets of the business?

Question 2: Does my business have clear policies and procedures for IP management?

Question 3: Do I have IP advisory staff?

Question 4: Do I make sure that the creations and innovations made by workers are protected by Intellectual Property rights?

Question 5: Do I add IP rights transfer clauses to the contracts of extreme workers and contractors?



Question 6: Do I take steps to protect the business's intangible assets from potential third-party infringements?

Question 7: Have I had claims by third parties for infringement of IP rights?

Source: Own elaboration. In original Spanish language

Question 8: Have I assessed the value of the business's intangible assets and their impact on our market strategy?

Question 9: Do I have procedures for transferring IP to third parties (licensing)?

Question 10: Does the business have a defined strategy for the commercial exploitation of IP?

The most critical results focus on the IP management approach. None of the Green Businesses systematically identifies their intangible assets, nor does it have policies, internal procedures or specialized advice on Intellectual Property. Nor are clauses on the assignment or protection of rights included in employment contracts or with third parties.

This lack of management translates into a total lack of strategies for preventing infringements, assessing the economic value of intangible assets and commercial exploitation schemes, such as licenses or technology transfers. Consequently, IP is not incorporated as an axis of corporate governance, despite its relevance in green economy and sustainable entrepreneurship models.

Findings

Overall, the findings allow us to identify a consistent pattern: the Green Businesses analyzed exhibit a real innovation ecosystem, but predominantly incremental, adaptive and territorially conditioned, which is deployed in response to the demands of the Amazonian context (climate, natural supply, logistics, local demand and infrastructure constraints).

This innovation is manifested more intensely in the product dimension (differentiation by practices, improvements and portfolio expansion) and, to a lesser extent, in marketing and organization. However, these are innovations that remain at an operational and experiential level, without translating into strategic capabilities for business consolidation.

The central problem is not the absence of innovation, but the rupture between innovation and legal appropriation of value. In the four criteria linked to the Oslo Manual, innovation is not accompanied by formalization mechanisms – documentation, standardization, traceability, internal protocols, registries or brand strategies – that allow innovative results to be converted into protectable intangible assets. As a result, innovation does not become a sustainable competitive advantage: it remains exposed to appropriation by third parties, loses its capacity

for differentiation in expanded markets and limits access to value chains in which reputation, distinctiveness and sustainable origin are determining factors.

This gap becomes especially visible in the process dimension. The absence of management tools (software, supply chain, systematic training) not only impacts the productivity and consistency of the final product, but also weakens the minimum budgets to activate figures such as trade secrets, the protection of know-how or even the construction of technical evidence on originality and ownership. Similarly, in marketing, the low differentiation of packaging and the absence of consolidated brand identity strategies prevent the capture of rents associated with environmental and territorial attributes, which in green markets are usually the main factor of added value.

Added to the above is a second layer of the gap: the deficit of Intellectual Property capabilities, observable in the low knowledge of instruments, the scarce generation of protectable assets and the almost non-existent management of IP. IP appears as a peripheral element within the business model, not as a component of corporate governance. This situation cannot be explained only by individual decisions, but by a territorial environment characterized by asymmetries of access to information, technical support, legal capacities and opportunities for institutional articulation.

From a legal-environmental governance perspective, the empirical results suggest that the disarticulation between the Green Growth framework (CONPES 3934) and the Intellectual Property Policy (CONPES 4062) materializes in the territory as a "translation gap": public policies exist and formulate objectives, but fail to become effective capacities for green businesses to protect, value and scale their intangible assets. In megadiverse territories such as Caquetá, this gap acquires a structural effect: the ecological and cultural value incorporated in the products is not transformed into tangible and sustainable economic value for the communities.

In summary, the case of Florencia shows that the strengthening of Green Businesses does not depend only on environmental financing or accreditation, but also on the construction of territorial innovation ecosystems that integrate legal tools (IP), organizational capacities and technical support. Without this articulation, green innovation remains a local productive effort that is not consolidated as a sustained competitive advantage, limiting the potential for green growth as an inclusive and resilient development strategy in biodiverse regions.

Conclusions

The comprehensive analysis developed in this study allows us to affirm that the articulation between Green Growth and Intellectual Property in Green Business in the municipality of Florencia, department of Caquetá, presents structural weaknesses that compromise the consolidation of an effective model of legal-environmental governance oriented to sustainable development.

Although Colombia has relevant regulatory and public policy instruments—particularly CONPES 3934 on Green Growth and 4062 on Intellectual Property—the findings show a significant gap between their institutional design and their effective implementation in rural Amazonian territories. This disarticulation translates into a low appropriation of the mechanisms for the protection and valorization of intangible assets by sustainable enterprises, despite operating in contexts of high biodiversity and generating environmentally relevant innovations.

The empirical multi-case study applied to Cosechas de mi Finca S.A.S., El Rancho de la Vaca Muu and Frutos de mi Tierra shows that innovation in the Green Businesses analyzed is predominantly incremental and adaptive, aimed at responding to the ecological and productive conditions of the territory. However, this innovation does not manage to consolidate itself as a sustainable competitive advantage, due to its weak articulation with Intellectual Property instruments that allow its legal protection, its economic valorization and its projection in differentiated markets.

The deficiencies found in the identification of intangible assets, the registration of distinctive signs, the protection of confidential information, the capitalization of creations and the absence of strategies for the commercial exploitation of Intellectual Property significantly limit the ability of these businesses to effectively integrate into national and international value chains. In this sense, environmental innovation, without legal appropriation, is revealed as a vulnerable innovation, easily replicable and with a low impact in terms of long-term economic sustainability.

Likewise, the results show that the absence of an Intellectual Property culture, coupled with limited technical and legal capacities, low levels of business formalization and a weak territorial implementation of public policies, constitutes a critical barrier to environmental governance and the strengthening of green markets in Amazonian regions. This situation prevents the ecological and territorial value of sustainable products and services from translating into tangible economic value for local communities.

Consequently, the study underscores the need to move towards an effective articulation between sustainable innovation, Intellectual Property and environmental governance, through integrated training strategies, technical support, institutional strengthening and territorial adaptation of public policies. Only through this convergence will it be possible to consolidate robust, resilient and competitive Green Businesses, capable of transforming biodiversity into a strategic asset that promotes sustainable development, not only in Caquetá, but in the national territory as a whole.

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