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Financial and Sustainable Management in Brazilian Agribusiness
The Perspective of Global Value Chains: Challenges and Strategies
FOR THE PERMANENCE OF RURAL BUSINESS

FINANCIAL AND SUSTAINABLE MANAGEMENT IN BRAZILIAN AGRIBUSINESS FROM THE PERSPECTIVE OF GLOBAL VALUE CHAINS: CHALLENGES AND STRATEGIES FOR RURAL BUSINESS LONGEVITY

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SUMMARY

This scientific article provides an in-depth analysis of the imperative need for professionalization of management in Brazilian agribusiness, focusing on advanced practices in financial engineering and corporate sustainability (ESG). Within a context of a globalized and highly volatile market, the study discusses how rural producers can mitigate systemic risks through capital market instruments and *hedging strategies.* The research addresses the transition from the traditional family management model to corporate governance, rigorous cost management, and the adoption of innovative technologies as drivers of productivity and access to green credit.

It can be concluded that the long-term viability of rural businesses depends on the synergistic integration between agronomic excellence and sophisticated administrative and financial management.

Keywords: Agribusiness. Financial Engineering. Capital Markets. ESG Sustainability. Corporate Governance.

ABSTRACT

This scientific article performs a deep analysis of the imperative professionalization of management in Brazilian agribusiness, focusing on advanced financial engineering and corporate sustainability (ESG) practices. Inserted in a globalized and highly volatile market context, the study discusses how the rural producer can mitigate systemic risks through Capital Market instruments and hedging strategies. The research addresses the transition from the traditional family management model to corporate governance, rigorous cost management, and the adoption of innovative technologies as vectors of productivity and access to green credit. It is concluded that the longevity of the rural enterprise depends on the synergistic integration between agronomic excellence and the sophistication of administrative and financial management.

Keywords: Agribusiness. Financial Engineering. Capital Markets. ESG Sustainability. Corporate Governance.

1. INTRODUCTION

Brazilian agribusiness has transcended its historical status as a mere supplier of raw materials to consolidate itself as one of the most sophisticated and technologically advanced *players* in Global Value Chains (GVCs). However, this productive gigantic scale has exposed the sector to unprecedented financial vulnerability. The modern rural enterprise operates in an environment of radical uncertainty, where uncontrollable variables such as weather, international commodity prices on exchanges like Chicago (CBOT) and New York (ICE), and dollar exchange rate fluctuations determine the success or failure of a harvest. In this scenario, management based solely on intuition and family tradition has become an existential risk. Contemporary rural management demands the rigorous application of concepts from Corporate Finance, Controllership, and International Economics to protect assets and guarantee profitability.

The central problem addressed in this study lies in the disparity between the technology applied "within the farm gate"—with autonomous machines and cutting-edge biotechnology—and the archaic management practices "outside the farm gate," often characterized by a lack of budgetary planning, a mix of family and business assets, and a lack of knowledge of financial protection instruments. Neves (2012) warns that agronomic efficiency alone does not guarantee economic sustainability if the producer fails in marketing or in managing the capital structure. The objective of this article is to demonstrate how the professionalization of management, based on solid academic foundations, is the only way to mitigate these risks and take advantage of the opportunities of a capital market that is increasingly open to agriculture.

2. MARKET RISK MANAGEMENT: THE ENGINEERING OF THE HEDGE AND DERIVATIVES

Volatility is the only certainty in the agricultural commodities market. By economic definition, a farmer is a price *-taker,* meaning they have no power to dictate the selling price of their final product. Given this reality, financial management should focus on what it can control: profit margins. The use of financial derivatives—
such as Futures Contracts, Forward Contracts, *Put* Options , and *Call* Options —
This forms the backbone of the price protection strategy known as *hedging.* Unlike speculation, which seeks profit from price fluctuations, *hedging* aims to lock in operational profitability, ensuring that the selling price covers production costs and provides the expected return on capital, regardless of future market fluctuations.

Hedging planning should begin well before planting, at the time of purchasing inputs. Since fertilizers and pesticides are dollar-denominated, there is a risk of currency mismatch if the revenue from future sales does not keep pace with dollar fluctuations. The concept of *Barter* (Barter), where the producer pays for inputs with a fixed quantity of product to be delivered at harvest, is a form of natural *hedging* that locks in the exchange relationship. However, for the portion of production not committed in the barter, financial management must use B3 or bank over-the-counter trading desks to fix prices. Assaf Neto (2014) explains that the use of derivatives requires a

A clear risk management policy, defining what percentage of the harvest will be protected and at what times, preventing the producer from being exposed to margin calls that could deplete cash flow during the production cycle.

Understanding basis risk (the difference between the future price on the exchange and the local physical price) is fundamental to effective *hedging.* The manager must monitor export premiums at Brazilian ports and logistical costs to calculate the net price at the farm. A poorly designed *hedging* strategy that ignores basis risk can result in ineffective protection. Furthermore, the use of options (price insurance) allows the producer to establish a minimum selling price (floor), participating in potential market increases—a more sophisticated strategy that requires the payment of an initial premium but offers greater commercial flexibility than a rigid forward contract.

Managing climate risk through agricultural insurance is another indispensable aspect of risk management. With climate change intensifying the frequency and severity of extreme events such as prolonged droughts and late frosts, insurance ceases to be an accessory expense and becomes a vital component of production costs. Financial analysis should compare the cost of the premium with the potential impact of a crop failure on the balance sheet. An uninsured property puts at risk the entire patrimony accumulated over generations in a single climatic event. The administrator must negotiate policies that cover not only bank costs but also expected revenue, guaranteeing the company's solvency even in the worst-case scenarios.

The diversification of crops and activities (Crop-Livestock Integration) acts as a *hedge.*
Operational. By not putting "all their eggs in one basket," the producer reduces exposure to specific crop or market risks. Analyzing the correlation between the prices of different commodities (soybeans, corn, cattle) allows for the construction of a production portfolio that stabilizes cash flow throughout the year. Batalha (2009) reinforces that portfolio management in agriculture should follow the same logic of investment diversification as the financial market, seeking the efficient frontier between risk and return.

Finally, market intelligence *is* the foundation for all these decisions. The rural manager must monitor USDA reports, geopolitical trends, trade flows from China, and global macroeconomic indicators. The decision to sell or store, to lock in or wait, must be based on data and sound analysis, not on hunches or "neighborly gossip." Professionalizing marketing is what differentiates the producer who merely produces from the one who consistently generates wealth.

3. THE NEW FINANCING PARADIGM: CAPITAL MARKETS AND PRIVATE CREDIT

The traditional model for financing Brazilian agribusiness, heavily dependent on subsidized official Rural Credit (Plano Safra), is reaching its limits due to the sector's exponential growth and the State's fiscal constraints. This gives rise to a new paradigm: direct access to the Capital Market. Instruments such as Agribusiness Receivables Certificates (CRA), Agribusiness Credit Letters (LCA), and Investment Funds in Agro-industrial Production Chains (Fiagro) have opened a direct channel between Faria Lima (the financial district of São Paulo) and the countryside, allowing urban investors to finance rural production. To access these resources, however, rural businesses need to undergo a management and transparency overhaul.

Issuing a CRA (Certificate of Agricultural Receivables), for example, requires the farm to have its financial statements audited, structured corporate governance, and proven socio-environmental compliance. The financial manager plays a crucial role in preparing the company for this *due diligence process,* organizing accounting, formalizing processes, and ensuring legal compliance. Access to the capital market offers significant competitive advantages, such as extended payment terms (5, 7, 10 years) that align with the maturation cycle of investments in infrastructure or perennial crops, and interest rates that, depending on the *rating,*
Business credit lines may be more attractive than commercial bank lines of credit.

The Rural Product Certificate (CPR), in its physical, financial, and green versions, has established itself as the most versatile credit instrument in agribusiness. The new Agricultural Law (Law 13.986/2020) modernized the CPR, allowing for its electronic issuance and registration with centralized systems, which increased legal security for creditors and reduced the cost of credit for producers. Managers must master the financial engineering behind the CPR to use it not only as collateral but also as a strategic operational leverage instrument, financing crop costs without compromising their own working capital.

The Fiagros brought about a revolution in land and receivables liquidity. Through *Sales and Leaseback operations,* a producer can sell a property to a real estate fund and lease it back, freeing up a massive amount of capital that was tied up in the land to invest in technology, expansion, or paying off expensive debts. This balance sheet management strategy, transforming fixed assets into liquid cash, requires sophisticated financial analysis to ensure that the cost of the lease is bearable within the operating margin of the productive activity.

Credit risk management and real guarantees have also changed. With segregated assets, the producer can allocate a portion of the property or production to guarantee a specific operation, without compromising the entire farm. This provides greater flexibility and security in managing guarantees. The administrator must manage the company's guarantee portfolio strategically, avoiding overcollateralization , which hinders the ability to obtain new loans.
Capital structure management (Debt vs. Equity) should aim for the weighted average cost.

optimal weighted average cost of capital (WACC), leveraging shareholder profitability without jeopardizing the solvency of the business.

In short, the financial and capital markets offer an ocean of opportunities for agribusiness, but demand professionalism. "Credit" and verbal agreements have given way to complex contracts, financial *covenants ,* and external audits. The modern rural manager must be bilingual: speaking the language of agronomy within the farm gate and the language of finance outside the farm gate, connecting the reality of the field with the liquidity of the global market.

4. Sustainability (ESG) as a Financial Asset and Market Access

Sustainability in agribusiness has ceased to be a purely ecological or legal compliance issue and has become a central pillar of financial and commercial strategy. The concept of ESG *(Environmental, Social and Governance)* requires rural companies to demonstrate environmental responsibility, social care, and good governance. In the international market, especially in Europe, non-tariff barriers linked to deforestation and carbon emissions are a reality. Callado (2011) argues that proactive environmental management is the only way to guarantee the "passport" of Brazilian products to *premium markets.* Environmental compliance (CAR, Licensing) is a *sine qua non* condition for any credit operation or sale to large *trading companies.*

Financially, sustainability opens doors to Green Bonds *and* the carbon market. Properties that adopt regenerative practices, such as No-Till Farming Systems, Integrated Crop-Livestock-Forestry Systems, and the use of bio-inputs, can certify carbon sequestration in the soil and monetize this environmental service. The manager must treat carbon as a second crop, managing certification costs and seeking buyers for the generated credits. Furthermore, bank credit lines already offer reduced interest rates for producers with proven sustainability metrics, creating a direct economic incentive for preservation ("Green Crop Plan").

Efficiency in the use of natural resources is, ultimately, cost efficiency. Precision agriculture, which applies pesticides and fertilizers at variable rates only where needed, reduces production costs and environmental impact simultaneously. Smart irrigation projects and photovoltaic solar energy generation reduce the farm's water and energy footprint, shielding the business against energy inflation. Feasibility analysis of these projects (NPV/IRR) shows that the financial return on sustainability is increasingly attractive. Managers must lead the technological transition to low-carbon agriculture, not out of ideology, but out of economic rationality.

The social pillar of ESG involves people management, workplace safety, and community relations. The shortage of skilled labor in the field is a critical bottleneck. Companies

Rural companies that offer good working conditions, decent housing, security, and career development opportunities are able to retain talent and operate high-tech machinery efficiently. Strict compliance with labor laws prevents legal liabilities that can destroy the company's value.
Social management is, therefore, risk and productivity management.

Governance, the "G" in ESG, is the foundation of everything. Transparency, accountability, fairness, and corporate responsibility. Without governance, there is no trust, and without trust, there is no credit or business partnerships. Administrators must implement codes of conduct, whistleblowing channels, and advisory boards, bringing best practices from the corporate world to the rural reality. The company's reputation is a valuable intangible asset that needs to be managed with the same care as the crops.

In conclusion, sustainability is the social and economic license to operate in the 21st century. Producers who ignore ESG are doomed to sell *commodities* at a discount to marginal markets and pay higher interest rates. Sustainable producers access premium markets, cheap credit, and guarantee the long-term appreciation of their land assets. Management must integrate sustainability into the *core business,* understanding that preserving the environment is preserving the farm's own productive capital.

5. Innovation, Agtechs, and Data Management in Agriculture 4.0

The digital revolution in agriculture, known as Agriculture 4.0, has transformed the farm into an open-air data factory. Sensors, drones, satellites, and connected machines generate terabytes of information about soil, climate, pests, and productivity. However, Batalha (2009) emphasizes that raw data does not make decisions; it is necessary to transform it into managerial intelligence. The role of the administrator has changed from "personnel manager" to "information manager." The ability to analyze this data to optimize the use of inputs, predict the harvest, and manage logistics is the new competitive advantage.

Innovation management involves curating and adopting solutions from *AgTechs* (agribusiness startups). The innovation ecosystem offers tools for everything from financial management to biological monitoring. The manager must have the technical discernment to select technologies that deliver a real return on investment (ROI) and integrate them into farm processes. Interoperability between systems (machines from different brands communicating with management software) is a challenge that demands IT expertise. Digitalization is not an end in itself, but a means to reduce costs and increase productivity.

Connectivity in the field is the foundation of this revolution. Without the internet, the cloud doesn't work. Investments in private telecommunications infrastructure or partnerships with operators are strategic investment decisions. The connected farm allows for remote monitoring of operations in real time, increasing control and agility in decision-making.

The administrator can monitor the harvesters' performance via *smartphone* and correct operational errors instantly, preventing losses.

Digital agriculture also enables full traceability of the supply chain *(blockchain).* The end consumer wants to know the history of the food, and technology allows each stage of production to be recorded immutably. This adds value to the product and meets food safety requirements. Managers should see traceability as a marketing and differentiation tool.

A culture of innovation must permeate the entire organization. Experimenting with new varieties, testing new biological products, piloting new software. The "we've always done it this way" mentality is a recipe for obsolescence. The manager must foster an environment where controlled error is part of learning and the pursuit of efficiency is relentless. Innovation is the engine that maintains the competitiveness of Brazilian agribusiness against global competitors.

6. FAMILY SUCCESSION AND THE PROFESSIONALIZATION OF CORPORATE GOVERNANCE

The vast majority of rural businesses in Brazil are family-controlled. The passing of the baton from one generation to the next is the most fragile moment for the business. Statistics show that few family businesses survive to the third generation. The cause is usually not agronomic, but rather corporate conflicts and a lack of succession planning. The discipline of Law and Sociology applied to administration provides the basis for understanding the complexity of the human and patrimonial relationships involved.

Creating a Rural *Holding Company* is an essential legal and tax strategy for organizing assets and facilitating succession. By transferring land and machinery to a legal entity, the family establishes clear governance rules through a Shareholders' Agreement. This defines who can work in the company, how remuneration will be structured, how a partner can leave, and how dividends will be distributed. This professionalizes the heirs' relationship with the business, separating the "owner's hat" from the "manager's hat."

Succession planning is a long-term process that involves preparing successors.
It's not enough to be the owner's son; technical and managerial competence is essential. Academic training in administration, finance, and agronomy, combined with external experience in other companies, is fundamental to shaping the leaders of the future. The current manager should act as a mentor, gradually delegating responsibilities and allowing the new generation to bring innovations, while respecting the legacy built.

Professionalization can involve hiring external executives for key positions or even for the CEO role, if there are no suitable or interested successors within the family. Corporate governance, with the creation of Boards of Directors or Advisory Boards, brings unbiased external perspectives that enrich strategic debate and professionalize decision-making. The administrator

Finance plays a vital role in structuring these bodies and providing the audited management information that underpins governance.

Ultimately, family governance aims to preserve family harmony and business prosperity. Poorly managed conflicts can lead to property fragmentation, loss of scale, and economic unviability. Well-planned succession ensures that the legacy of work and the land remain productive for future generations, maintaining the social function of property and generating wealth for the country.

7. CONCLUSION

The extensive analysis presented in this scientific article corroborates the thesis that Brazilian agribusiness is experiencing a historical inflection point, where productive excellence must necessarily be accompanied by excellence in management. The variables that impact rural business have become global, financial, and digital, demanding a rural administrator profile with multidisciplinary skills and a systemic vision. Professionalization is no longer an option for those who wish to grow, but a condition for survival for those who wish to remain in the activity.

It has been demonstrated that financial management, through the use of derivatives, access to capital markets, and rigorous cost control, is the main tool for mitigating risks in an environment of extreme volatility. Producers who master financial engineering can stabilize their income, plan long-term investments, and grow sustainably, while those who ignore finance are at the mercy of luck and market vagaries. The ability to engage with the Faria Lima (a major financial district in São Paulo) and global markets is as important as knowing how to cultivate the land.

Sustainability, integrated into business strategy via ESG, has proven to be a driver of value creation, not a cost. Environmental preservation and social responsibility are assets that open markets, attract investment, and guarantee the license to operate in the future. Technology and innovation are the enablers of this sustainability, allowing for greater production with fewer resources. Information management and digitalization are irreversible and separate productive farms from unproductive ones.

Family governance and structured succession have emerged as the pillars that support the continuity of the business over time. Transforming the farm into a company, with clear rules, transparency, and professionalism, is the most important legacy the current generation can leave. The legal and administrative structure must be robust enough to withstand crises and flexible enough to seize opportunities.

It can be concluded, therefore, that the future of agribusiness belongs to managers who know how to integrate agronomic science with the science of administration. Higher education and continuous specialization are the investments with the greatest return for the rural producer. Brazil has the vocation.

Brazil is naturally destined to be the world's breadbasket, but the quality of its management will determine whether this vocation translates into lasting wealth and development for Brazilian society.

Research points to the need for a profound cultural shift in the field. Abandoning amateurism, informality, and short-sightedness in favor of planning, technique, and a long-term vision. The administrator specializing in finance and controlling is the architect of this new era, building bridges between the traditions of the field and the modernity of corporate management, ensuring that agribusiness continues to be the pride and engine of the national economy.

Finally, it is reiterated that success in agribusiness is a complex equation where land and labor are merely variables; management is the constant that multiplies the result. The longevity of rural businesses depends on the ability of their leaders to manage risks, innovate processes, and govern wisely, transforming the challenges of the 21st century into levers for growth and sustainable prosperity.

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