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ORIGINAL

The importance of sustainability in agro-industrial companies: A comprehensive approach for the future

La importancia de la sostenibilidad en las empresas agroindustriales: Un enfoque integral para el futuro

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ABSTRACT

Introduction: sustainability has become a fundamental pillar for agricultural companies due to the growing demand for responsible practices that integrate economic, social, environmental, and institutional aspects. This study explored the implementation of a sustainability matrix in a company dedicated to the production and marketing of chickens and eggs, activities that represent a significant part of the agricultural sector in Argentina.
Objective: the objective is to implement a unified sustainability measurement system based on Wehbe et al. Sustainability Matrix, to optimize the company's overall performance, considering not only financial aspects but also its social and environmental impact.
Method: an analysis of production processes and profitability and sustainability strategies for the year 2024 was conducted. Key performance indicators (KPIs) aligned with the four dimensions of sustainability: economic, social, environmental, and institutional were identified. Based on these KPIs, a composite sustainability indicator was calculated to assess the company's overall performance. Finally, an annual action plan was designed to correct the detected deviations and promote continuous improvement.
Results: the results show an improvement in the strategic diagnostic capacity thanks to the integration of multidimensional indicators.
Conclusion: it is concluded that the implementation of the Sustainability Matrix as a management tool allowed the company to move toward a comprehensive performance view. The systematization of indicators facilitated strategic decision-making, improving profitability and social and environmental impact. The proposed approach provides a solid foundation for the continuity and competitiveness of the agricultural business in an increasingly demanding environment in terms of corporate responsibility.

Keywords: Sustainability; Indicators; Impacts; Management.

RESUMEN

Introducción: la sostenibilidad se convirtió en un eje fundamental para las empresas agropecuarias, debido a la creciente demanda de prácticas responsables que integran aspectos económicos, sociales, ambientales e institucionales. Este estudio exploró la implementación de la matriz de sostenibilidad en una empresa que se dedica a la producción y comercialización de pollos y huevos, actividades que representan una parte significativa del sector agropecuario en Argentina.

Objetivo: el objetivo es implementar un sistema unificado de medición de sostenibilidad basado en la Matriz de Sustentabilidad de Wehbe et al. con el fin de optimizar el desempeño integral de la empresa, considerando no solo los aspectos financieros, sino también su impacto social y ambiental.
Método: se realizó un análisis de los procesos productivos y de las estrategias de rentabilidad y sostenibilidad correspondientes al año 2024. Se identificaron indicadores clave de desempeño (KPIs) alineados con las cuatro dimensiones de la sostenibilidad: económica, social, ambiental e institucional. A partir de estos KPIs, se calculó un indicador compuesto de sustentabilidad que permitió evaluar el desempeño global de la empresa. Finalmente, se diseñó un plan de acción anual orientado a corregir los desvíos detectados y fomentar la mejora continua.
Resultados: los resultados muestran que se evidencia una mejora en la capacidad de diagnóstico estratégico gracias a la integración de indicadores multidimensionales.
Conclusión: se concluye que la implementación de la Matriz de Sustentabilidad como herramienta de gestión permitió a la empresa avanzar hacia una visión integral del desempeño. La sistematización de indicadores facilitó la toma de decisiones estratégicas, mejorando la rentabilidad y el impacto social y ambiental. El enfoque propuesto constituye una base sólida para la continuidad y competitividad del negocio agropecuario en un entorno cada vez más exigente en términos de responsabilidad corporativa.

Palabras clave: Sustentabilidad; Indicadores; Impactos; Gestión

INTRODUCTION

Sustainability has become a fundamental focus for agribusinesses, driven by the growing demand for responsible practices that address economic, social, environmental, and institutional aspects. Its implementation responds to ethical concerns and is essential for long-term financial viability and competitiveness in an increasingly demanding market.

The agro-industrial industry faces a significant challenge: integrating sustainability into its operations. This includes the efficient management of natural resources, the reduction of environmental impacts, the optimization of costs, and the improvement of working conditions. Companies that do not adopt proactive strategies risk losing competitiveness, while those that incorporate clear indicators will be able to improve their profitability and operational efficiency.

From an economic perspective, sustainability translates into process optimization, efficient use of inputs, and leveraging opportunities for innovation. Sustainable companies tend to be more resilient to market fluctuations, have access to new sources of financing, and can strengthen their profit margins. Case studies, such as traceability certification in coffee value chains, show that companies that invest in water efficiency can reduce their operating costs by up to 15 % in a year of drought.[1]

In the social sphere, sustainability requires an inclusive approach that guarantees workers adequate working conditions, training, and well-being. Agribusiness plays a key role in the development of local communities, so its impact transcends mere production and becomes a cornerstone of regional development. Implementing biodigesters on pig farms, for example, reduces methane emissions (a GHG 25 times more potent than CO2) and generates a return on investment in energy in an average of 3 to 5 years.[2]

Environmental sustainability is the most urgent issue. Reducing emissions, improving waste management, and optimizing water consumption are essential for minimizing ecological impact. Regenerative agriculture and clean technologies offer concrete solutions that can be integrated into agro-industrial operations.

These instruments have proven effective in sustainability management in the poultry sector. Research such as that conducted by Mendoza, Espinoza Fuentes, and Pérez Pérez & Flores[3,4,5] has shown that economic-social evaluation matrices and environmental accounting models are essential tools for improving the sector's efficiency, "aligning profitability with compliance with environmental regulations."

From an institutional perspective, sustainability involves creating governance frameworks based on transparency and corporate responsibility. Implementing monitoring and evaluation systems, such as key performance indicators (KPIs), allows strategic decisions to be made based on reliable data.

Organizational performance management is a key strategic element in highly competitive sectors such as agriculture. In this context, tools such as the Dashboard and Key Performance Indicators (KPIs) have been widely adopted to identify inefficiencies, measure progress, and optimize decision-making.[6] For these indicators to be effective, they must adhere to SMART criteria, ensuring they are "specific, measurable, achievable, relevant, and time-bound".[7]

The role of the Sustainability Matrix

To address these challenges, agribusinesses must adopt tools that enable them to measure and manage their sustainability performance. The Sustainability Matrix by Wehbe et al.[8] offers a comprehensive framework for

assessing economic, social, environmental, and institutional impacts, facilitating decision-making based on quantifiable data.

Identifying specific KPIs is crucial in ensuring that sustainability actions are measurable and effective. Measuring the annual Sustainability Indicator will serve as a strategic tool for evaluating progress and identifying opportunities for improvement.

In this way, business profitability should not be separated from sustainability. The latter integrates multiple dimensions—economic, social, environmental, and institutional—ensuring that productive operations do not compromise future resources.[9] To visualize these impacts comprehensively, it is necessary to use tools such as the Sustainability Matrix by Wehbe et al.[8], which quantifies a company's degree of alignment with sustainability principles through a Productive System Sustainability Indicator (ISP).

Towards a sustainable and competitive approach

The integration of sustainability should not be seen solely as an ethical obligation, but as a business growth strategy. Agro-industrial companies that adopt sustainable practices will strengthen their profitability, efficiency, and positioning, ensuring their permanence and evolution in the global market.

This paper seeks to provide a comprehensive analysis of sustainability in agribusiness and propose clear and measurable strategies for its implementation. By developing indicators and using assessment tools such as the Sustainability Matrix, a solid foundation will be established for more efficient, responsible, and competitive management.

Problem Statement: Integration of Quantitative and Qualitative Approaches

Despite general recognition of the importance of sustainability, analyzed in light of its four dimensions (economic, social, environmental, and institutional), the specialized literature lacks a unified and quantifiable methodology that directly links the measurement of productive performance with a comprehensive assessment of the degree of sustainability in agribusinesses. Management tools such as the Scorecard and Key Performance Indicators (KPIs) have been widely adopted; however, their application tends to focus on operational or financial metrics, leaving the objective calculation of sustainability as a separate or qualitative process. This methodological gap hinders strategic decision-making, as business leaders lack a single Productive System Sustainability Indicator (PSSI) that allows them to assess their operations' real and simultaneous impact on all dimensions of sustainability.

This article fills this gap with a precise and reproducible methodological contribution. We propose adapting and applying the Sustainability Matrix developed by Wehbe et al.[8] to create a management model based on SMART indicators, capable of generating the Productive System Sustainability Indicator (PSSI). By merging operational control (KPIs) with a comprehensive impact assessment, this management tool not only provides a holistic view of performance but also offers agro-industrial companies a solid and quantifiable basis for optimizing their efficiency, strengthening their competitiveness, and, crucially, ensuring the viability of their future resources.

That is why a combination of quantitative and qualitative methodologies is recommended to overcome these obstacles. This allows for a more comprehensive assessment of the company's performance.

- Quantitative indicators, such as economic and environmental KPIs, allow for objectively measuring profitability and operational efficiency.
- Qualitative methods, such as surveys and interviews with workers and communities, provide strategic information on social and institutional impacts that cannot be measured exclusively with numbers.
- Life cycle analysis evaluates impacts throughout the production process, allowing for the identification of opportunities for improvement in efficiency and sustainability.

This integration of approaches will enable the company to make informed decisions, optimize its sustainability, and strategically position itself in the agro-industrial market.

METHOD

Research Design

The objective of this study is to recognize sustainable production management practices and evaluate the indicators used by the company under analysis.

The chosen methodology is mixed (qualitative and quantitative), predominantly of a single case study design with an exploratory and descriptive scope.

Following the definitions proposed by Hernández-Sampieri and Mendoza[10], data will be collected based on the numerical measurement of accounting variables and process indicators to establish patterns of the firm's behavior and its efficiency in sustainability management.

Likewise, the qualitative component will be used for the exploratory stage and for gathering critical contextual information through direct observation and interviews. This component is essential for understanding factors such as organizational culture, resistance to change, and the quantification of impacts across the four dimensions.[11,12]

The case study design is justified by conducting an in-depth diagnostic analysis of the firm, characterizing its current situation, production processes, and sustainability management in the value chain. Non-probabilistic convenience (or intentional) sampling was used, selecting the poultry company for its relevance and willingness to collaborate in the detailed analysis (voluntary).

Unit of Analysis and Context

The unit of analysis is a specific poultry company within the sector's value chain. It is dedicated to poultry breeding and reproduction, the subsequent processing and manufacture of products derived from this raw material, and the subsequent marketing of high-quality products. The company is medium-sized and located in the central region of Argentina.

To this end, it is necessary to observe the production process, each stage of the value chain, cost management, and the company's financial statements, seeking to automate and integrate information throughout the production chain through a matrix of indicators to provide updated, summarized, and immediate information on the direction of the company at all times, facilitating decision-making and the instantaneous application of corrective measures in the event of changes or deviations from what was planned.

To perform this analysis, the company's data for the year 2024 will be used as the basis for calculating the indicators, to implement the calculation of various KPIs to contribute to improving the organization's performance in terms of profitability and sustainability, measuring the economic, social, ecological, and institutional dimensions, seeking the relationships between them, and compensating and providing feedback on their different components.

Data Collection Techniques and Instruments

This study was conducted using a mixed approach to identify sustainable production management practices and evaluate the indicators implemented by a poultry farming company.

Primary and secondary sources were used to obtain representative data on sustainability management.

- Primary sources: direct observation of internal processes, operational records, and semi-structured interviews with the manager and production manager, allowing for in-depth analysis of strategic planning, cost structure, profitability objectives, and sustainability practices. Interviews were also conducted with employees and the surrounding population.
- Secondary sources: review of scientific literature on sustainability in agribusiness, including academic articles and previous case studies. The aim was to contextualize the state of the art in sustainability management, sustainable poultry management, and the application of the sustainability matrix.

Data Analysis Strategy

To analyze the information collected, documentary research techniques were used, along with statistical and accounting analysis tools, facilitating the calculation of Key Performance Indicators (KPIs) related to economic, social, environmental, and institutional dimensions. These indicators were integrated into the Sustainability Matrix of Wehbe et al.[8], allowing for the evaluation of the company's efficiency in terms of profitability and sustainability:

- Calculation of KPIs: statistical and management accounting tools were used to calculate KPIs in the four dimensions of sustainability.
- Application of the Sustainability Matrix: the calculated KPIs were integrated into the Sustainability Matrix designed by Wehbe et al.[8]
- Homogenization and Index Calculation: the values in each quadrant of the matrix were homogenized using a scale from 0 to 1:
    - A score of 0,5 is considered the industry median (or reference value). A score above 0,5 indicates a better position, and a score below 0,5 indicates a level below the minimum reference.
    - The final rating for each component was obtained by calculating a weighted average of the perceptions of the firm's manager, the population (community), and the employees, assigning equal weight to the votes of the three parties.
- Comparative Analysis and Benchmarking: a comparative analysis was carried out with previous studies of the sector, applying benchmarking techniques to detect trends, good practices, and identify competitive advantages and specific opportunities for improvement for the company.

Ethical Considerations

To ensure the integrity of the research and protect the participating company, the following ethical considerations were followed:

1. Written informed consent was obtained from the company's manager for participation in the study and access to operational information. The voluntary participation of staff and management in the interviews was guaranteed.
2. The absolute confidentiality of sensitive data and accounting information, as well as the identity of the participating firm, was ensured. The results are presented in an aggregated and anonymized manner, avoiding direct identification of the firm (the Analysis Unit is generically referred to as "poultry company").
3. The data collected will be used exclusively for academic and research purposes, without profit or disclosure to third parties.
4. A commitment was made to return and discuss the results of the Sustainability Matrix analysis with management, ensuring that the company obtains a direct benefit from the research for decision-making.

RESULTS

Diagnostic findings: Key operational deficiencies

A detailed examination of internal processes, information flows, operating manuals, and production procedures provided by the company was carried out. Based on this analysis, several causes contributing to the current problem were identified. In summary, the main factors detected include:

- Insufficient information recording: the company does not have a structured documentation system; records are incomplete, mostly manual, and in some cases sporadically integrated into software.
- Lack of management measurement: the impacts of management are not systematically evaluated, which prevents knowledge of the effects that the absence of measurement has on business performance.
- Absence of quantifiable goals: there are no explicit quality and profitability objectives that can be measured through key performance indicators (KPIs).
- Deficient internal audits: periodic audits are not conducted to evaluate operational efficiency and identify potential areas for improvement.
- Lack of knowledge about profitability and sustainability metrics: there is no clear methodological framework for measuring and managing these critical aspects within the company.

After a thorough analysis of the information collected, the main causes of the problem were identified and categorized using the fishbone diagram or Ishikawa cause-and-effect diagram. This graphical representation allowed the causes to be organized into different categories, providing a structured view of the factors that affect business management. Figure 1 illustrates the diagram:

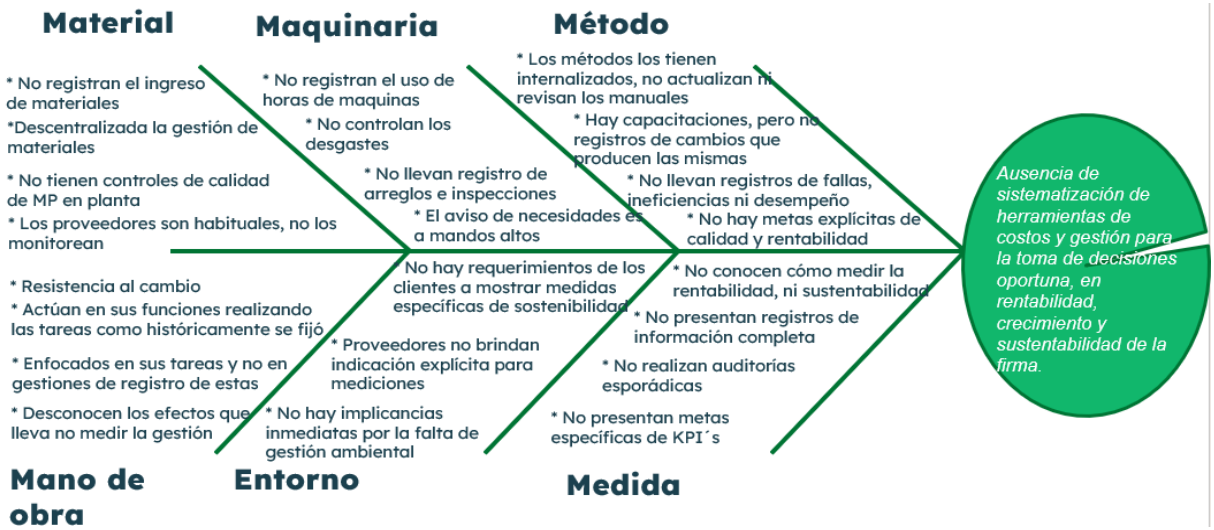

Figure 1. Ishikawa fishbone or cause-and-effect diagram

Summary of quantitative and qualitative performance

Given the company's problems, the sustainability matrix, which shows the social, economic, institutional, and environmental impacts of its policies, is proposed to be applied.

In the matrix, showing impacts, obtaining timely information, and being easy to implement have the same probability of occurrence. For the dashboard and the current software system, obtaining timely information and being easy to implement have the same probability of occurrence, while analyzing impacts with these tools has no probability of occurrence.

The company lacks systematization in its cost and management tools, which hinders timely and informed decision-making in key areas such as profitability, growth, and sustainability. The absence of management indicators prevents the timely identification of deviations, which negatively impacts the social, economic, environmental, and institutional dimensions.

According to the head of production, product costs are obtained late, without accurate records of material waste, residues, or the impact of their treatment. Although the company uses software to keep accounting records by production unit, it does not fully leverage its ability to generate reports that facilitate decision-making. In some cases, records are manual and are not integrated promptly with existing digital systems, making it challenging to obtain consolidated and up-to-date information.

The Process Manager performs control directly, which centralizes evaluation and causes delays in obtaining information. Although the company has procedure manuals, such as "Good Practices in Broiler Chicken Production," these are not updated regularly, which limits their effectiveness in operational management.

One positive aspect of the company is its compliance with health standards, although there is no detailed record of the associated impacts. A significant event to note is that the Environmental Suitability Certificate issued by the Ministry of Environment and Climate Change of the province where it is located has expired, and the company had not detected its impending expiration in time due to the lack of systematized indicators. This forced the company to initiate a regularization process that could have been avoided with more proactive management and the use of environmental indicators to submit the requested report on time.

Although the company treats waste and refuse appropriately, some are reprocessed in a new production cycle, and the lack of complete and systematic records makes it difficult to assess its social, economic, environmental, and institutional impact.

Some waste must be sent to an authorized landfarming facility, which incurs proper transportation costs. They also have a plant for the treatment of effluents, a process that, although it generates expenses, is carried out to comply with the regulations established by the province. Once the effluents have been treated using the appropriate processes, the water is returned to the rainwater system, for which a permit fee must be paid. The treatment of effluents and their return to the rainwater system is not comprehensively recorded, which could improve efficiency if managed with better practices and records.

The company lacks key performance indicators (KPIs) in sustainability, which limits its ability to set clear goals and action policies. Although profitability is adequate, no specific objectives for continuous improvement are defined in social areas (staff training, job satisfaction, community participation), economic areas (profitability, sustainability), or environmental areas (energy efficiency, waste management). The lack of these indicators leads to reactive management, where decisions are only made when problems become apparent, rather than being able to anticipate and prevent them.

The impact of this lack of systematization and the absence of KPIs is evident in the dimensions analyzed: in the social sphere, the lack of indicators for training, performance, and job satisfaction can lead to dissatisfaction and staff turnover. Economically, the lack of clear goals and timely control affects the plant's profitability and sustainability. Environmentally, the absence of metrics hinders the efficient management of resources and compliance with regulations, which complicates the obtaining or renewing of environmental certifications. Finally, institutionally, not having social responsibility indicators limits the company's ability to promote actions that contribute to the community's well-being.

The following table shows the data collected from the company, which forms the basis for applying the Sustainability Matrix (table 1).

Application of Wehbe's Sustainability Matrix: Comprehensive Strategy for Sustainable Management

To overcome these challenges, we propose implementing the sustainability matrix developed by Wehbe et al.[8]. This matrix offers a comprehensive and flexible approach to assessing the sustainability of organizations, considering environmental, social, institutional, and economic dimensions. This matrix integrates these aspects into daily decision-making, providing key indicators for more efficient and responsible management. By implementing a KPI system and constant evaluation of deviations, you can set clear goals, improve your profitability and sustainability, and act proactively to benefit society and the environment.

This proposal's objective is to provide the company with a management control tool that allows it to measure the impact of its operations in four key dimensions: social, economic, institutional, and environmental.

The proposal establishes key performance indicators (KPIs) using the Sustainability Matrix. These KPIs are derived from analyzing the company's production processes and profitability and sustainability objectives. The indicators are classified into four dimensions: economic, social, environmental, and institutional, evaluating

the impacts that each dimension generates on the others. Table 2 presents the developed matrix.

Composite Sustainability Index

Using the indicators obtained in table 2, the values in each quadrant will be homogenized using a scale from 0 to 1 to calculate the sustainability index for each component.

The values within each cell express the assessment of the company's performance, based on the industry median, considered a rating of 0,5. A value greater than this means the company is in a better position than the median, while a value less than 0,5 indicates that it does not reach this minimum level. For the assessment, a weighted average is calculated from the evaluations of the company's manager, the population, and the employees, with the votes of the three parties weighted equally.

In the case of the company, the sustainability index is 0,595, which indicates a level slightly above the median (but well below one), with a total sustainability value of 9,52 out of a possible 16.

Table 1. Indicators obtained from the company under study

Environmental Indicators	Social Indicators	Economic Indicators	Institutional Indicators
• Treated water: 700 m3/ day (100 % of water) • Carbon footprint of 1,55 kg CO2eq/kg chicken • Water footprint: water footprint due to scarcity, the result was 0,58 m3eq/ kg of chicken • Efficient water use: for each kg of chicken, 0,012 liters of water are treated (100 % of the water returns to the system) • Water treatment costs: $857,15/m3 treated • ICA 45 (air quality index), considered safe • Number of environmental certifications: 1	• The local population and employees were surveyed, and no direct health impacts were observed in 60 years of operation. • They offer discounts at various educational institutions. • They offer vouchers for purchases at the store and a company checking account. • Participation of women/men in key roles ¼ management • Participation of employees in decisions about the management of the company, with respect to the total number of employees in management and leadership roles: 2/36 (0,055)	• Each month, they spend $59 500 000 on environmental impact treatments. • The company reprocesses its waste products and sells these by-products, which represent 12 % of total sales. This reprocessing accounts for 1,5 % of the company's total costs. • 1,4 % of the company's total expenses and costs are allocated to the operation of the rainwater plant. • They allocate 2,5 % of total sales to alleviate the situation in the sector. • They produce an average of 1 750 000 kg per month. • The average mortality rate for 2024 is 8 % of the flock. • Kg of chicken produced based on Kg of feed consumed: The average conversion in 2024 is 1,95. • Employment generation for 370 people at the plant (of which 140 are from the slaughterhouse). • Average salary level in 2024: $1 200 000 average monthly take-home pay. • They do not have access to financing for clean technologies. • They incur environmental certification costs: $120 000 per month.	• They provide employees with three training sessions on good environmental practices per year. • Total number of employees trained: 37,8 % of the company, 100 % of meatpacking plant employees. • Frequency of environmental audits: annual. • Investment in environmental infrastructure: average $35 000 000. • Expenditure on renewable energy or waste management = $18 000 000/month • Expenditure on reprocessing: $17,14/kg • Participation in associations or cooperatives: locally in the chamber of commerce, FECOL, CICAE business chamber, training in local schools. • Existence of internal environmental policies: ◦ Waste collection by third parties. ◦ Disposal of dead chickens in lime pits as required by SENASA. • The cost of the three types of waste represents 0,012 % of the company's total costs. • The sludge generated is transported to Santiago del Estero, at a cost of $10 000 000 per month. • Reprocessing generates: Oil: 30 000 L; Feather meal: 28 000 kg; Viscera meal: 80 000 kg. • Cost: $30 000 000 per month.

Table 2. Sustainability matrix

Relationships Environmental		Human Well-being				Aggregate demands
		Environmental	Economic	Social	Institutional	
Demands on different dimensions	Environmental	0,59	0,89	0,56	0,67	2,71
	Economy	0,67	0,89	0,39	0,89	2,84
	Social	0,48	0,48	0,64	0,35	1,95
	Institutional	0,5	0,32	0,65	0,55	2,02
Contributions to human well-being		2,24	2,58	2,24	2,46	9,52

It can be seen that the company must implement policies that meet environmental and economic demands, without neglecting social demands and the significant contribution to well-being that it has achieved in the institutional area (contribution above the demand in that sector).

Table 3. Matrix with KPIs

Relationships	Human Well-being				
Demands on different dimensions	**Environmental**	**Economic**	**Social**	**Institutional**	**Aggregate demands**
Environmental	Treated water: 700 m3/day (100 % of water) Carbon footprint of 1,55 kg of CO2eq/kg of chicken Water footprint: water footprint due to scarcity, the result was 0,58 m3eq/kg of chicken	Expenses for environmental impact treatments: $59 500 000/month Waste reprocessing: sales of by-products in pesos account for 12 % of total sales and incur 1,5 % of the company's total costs. Expenses for the operation of the rainwater plant: 1,4 % of the company's total expenses and costs. 2,5 % of total sales are allocated to costs and expenses in this sector.	In 60 years of operation, no direct impacts on the health of the population or employees have been observed.	Training in good environmental practices: 3 per year Total number of employees trained: 37,8 % of the company, 100 % of meatpacking plant employees. Frequency of environmental audits: annual.	Ecosystem services
Economic	Efficient use of water: for every kg of chicken, 0,012 liters of water are treated (100 % of the water returns to the system) Water treatment costs: $857,15/m3 treated	Total kg produced per month: 1 750 000 kg/month on average Mortality indicator. The average mortality rate so far in 2024 is 8 %. Kg of chicken produced based on kg of feed consumed: The average conversion so far in 2024 is 1,95	Access to employee benefits: education through discounts at various institutions. Vouchers for purchases at the market stall, company checking account.	Investment in environmental infrastructure: average $35 000 000 Expenditure on renewable energy or waste management = $18 000 000/month $/kg 10,29 Expenditure on reprocessing $/kg 17,14	Economic resources
Social	ICA 45 (air quality index), considered safe	Job creation: 370 people in the plant (of which 140 are in the cold storage facility). Average salary level: 1 200 000 average monthly take-home pay	Participation of women/men in key roles ¼ management	Participation in associations or cooperatives: locally in the chamber of commerce, FECOL, CICAE business chamber, training in local schools.	Social participation
Institutional	Number of environmental certifications: 1	Access to financing for clean technologies: none Environmental certification costs = estimated cost of obtaining indicators $/month 120 000.	Employee participation in decisions about company management, as a percentage of total employees in management and leadership roles: 2/36 (0,055)	Existence of internal environmental policies: Waste collection by third parties. Disposal of dead chickens in wells with lime, as required by SENASA. The cost of these three types of waste represents 0,012 % of the company's total costs. Sludge generated is transferred to Santiago del Estero, at a cost of $10 000 000 per month.	Adaptive management to achieve goals

				Reprocessing generates: Oil: 30 000 L. Feather meal: 28 000 kg. Viscera meal: 80 000 kg. Cost: $30 000 000 per month. Sales: 12 % of total sales.	
Contributions to human well-being	In order to achieve a healthy and productive environment	Achieving economic progress	Providing equitable social opportunities and prosperity	For participatory governance	System management in terms of sustainability

DISCUSSION

Implementation strategies for sustainable development

This case study identified specific deviations that limit the company's sustainable performance, and concrete actions were proposed to address the problems detected and improve the KPIs defined in the Sustainability Matrix. These include:[13,14]

1. Economic strategies: efficiency with traceability: after observing that there are a large number of unmeasured reprocesses and decisions based on incomplete data, it is proposed to implement a digital production traceability system that automatically records reprocesses and losses, thereby seeking to improve the operational efficiency indicator and reduce waste.
2. Environmental strategies: environmental certifications are expiring, and waste management is done manually, so it is proposed to create an automated certification renewal schedule and a hazardous waste classification protocol to improve the regulatory compliance indicator and reduce ecological impact.
3. Social strategies: To address women's low participation in strategic roles and the lack of systematization of training, we propose designing an inclusive leadership program and establishing mandatory quarterly training sessions, thereby improving related indicators.
4. Institutional strategies: The company must understand the importance of maintaining sustainability reports with comparable metrics, so an annual report with quantifiable indicators is being redesigned. Opening a dialogue with local actors is also advisable to improve transparency and strengthen territorial ties.

Sustainability index projection

With the proposed activities, it is estimated that the sustainability index will increase following the simultaneous improvement of critical KPIs, directly impacting the economic, environmental, social, and institutional dimensions.

CONCLUSION

Sustainability has become a strategic focus for agricultural companies, and this study confirms that a comprehensive approach—economic, social, environmental, and institutional—is possible through management tools such as the Sustainability Matrix. The application of this matrix allowed the evaluation of the overall performance of an Argentine poultry company, revealing a sustainability index of 0,595. Although this value reflects progress in responsible practices, it also shows significant room for optimization of processes and policies.

Systematizing key performance indicators (KPIs) facilitated a multidimensional diagnosis that enables more accurate strategic decisions. Within this framework, the proposed environmental and social recommendations emerge as concrete responses to the deviations detected and are aimed at strengthening operational efficiency, community well-being, and institutional legitimacy. Hazardous waste management, biogas production, animal welfare, treated water reuse, and emissions control are linked to social actions such as training in responsible production, gender equality, and leadership decentralization.

The systematic implementation of these strategies will not only raise the sustainability index. It will also generate positive impacts at multiple levels: economic (cost reduction and resource optimization), social (improvement of the organizational climate and development opportunities), environmental (reduction of the ecological footprint and regulatory compliance), and institutional (consolidation of a transparent and participatory governance model).

In short, this study provides a replicable methodology for the agricultural sector, demonstrating that sustainability is not an abstract ideal, but a measurable, manageable, and strategic practice. The call is clear:

move toward a business culture that integrates profitability and responsibility, positioning organizations as key players in building a sustainable future.

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CONFLICT OF INTEREST

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