RELISE

RURAL ACCOUNTING: ANALYSIS OF THE CONTRIBUTION OF CASH FLOW AND THE USE OF SUSTAINABLE TECHNIQUES TO INCREASE THE ECONOMIC AND FINANCIAL RESULTS OF A SMALL RURAL PROPERTY[1]

CONTABILIDADE RURAL: ANÁLISE DA CONTRIBUIÇÃO DO FLUXO DE CAIXA E DO USO DE TÉCNICAS SUSTENTÁVEIS PARA AUMENTAR O RESULTADO ECONÔMICO-FINANCEIRO EM UMA PEQUENA PROPRIEDADE RURAL

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ABSTRACT

The study aimed to analyze the contribution of Cash Flow information combined with sustainable management techniques to enhance the economic and financial performance of a rural property. A descriptive research was conducted using a case study approach with a qualitative methodology. The study took place on a small rural property in Nova Prata do Iguaçu-PR, based on financial documents and information provided by the owners for the year 2023. The cash flow analysis highlighted the income and expenses of the property's economic activities, with a focus on soybean cultivation and milk production, which stood out. Five management techniques were identified and analyzed concerning economic, environmental, and social aspects, emphasizing the importance of rural sustainability, as demonstrated in Table 2. The results underscored the significance of managerial control and sustainable practices in financial decision-making, even for small rural properties.

Keywords: rural property, cash flow, management techniques, sustainability.

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RESUMO

O estudo objetivou analisar a contribuição das informações contidas no Fluxo de Caixa em conjunto com as técnicas de manejo sustentáveis para aumentar o resultado econômico e financeiro de uma propriedade rural. Realizou-se uma pesquisa descritiva, com procedimento de estudo de caso e abordagem qualitativa. A pesquisa ocorreu em uma pequena propriedade rural na cidade de Nova Prata do Iguaçu-PR, e foi construída a partir de documentos e informações financeiras fornecidas pelos proprietários, referente ao ano de 2023. Através do fluxo de caixa evidenciou-se as entradas e saídas das atividades econômicas exercidas na propriedade com ênfase no cultivo da soja e na produção de leite, que se destacaram. Nas técnicas de manejo, foram identificadas cinco técnicas praticadas e relacionadas com os aspectos econômicos, ambientais e sociais, em que visou-se demonstrar através do Quadro 2 a importância da sustentabilidade rural. Os resultados demonstraram a importância do controle gerencial e a conduta sustentável para a tomada de decisões financeiras, mesmo em pequenas propriedades rurais.

Palavras-chave: propriedade rural**,** fluxo de caixa, técnicas de manejo, sustentabilidade.

INTRODUCTION

A rural enterprise or rural property is characterized as one in which the owner works for its maintenance and for their own benefit; it is predominant in the agricultural sector and is managed by the rural entrepreneur (an individual) together with a few employees or, most often, family members. All acquired capital comes from the owner's resources or from third parties through bank loans, with the rural entrepreneur being responsible for all decisions as an individual (Queiroz, 2014).

Rural activity is broad and encompasses several segments, the vast majority of which involve agriculture and livestock farming, both of which undergo continuous modernization and adaptation through technological innovations applied to this sector.

The need for monitoring and managerial controls that demonstrate all

economic and financial movements is highlighted, presenting positive or negative results for precise decision-making, since it is an activity subject to various factors that influence outcomes, including seasonality and climatic factors.

However, despite economic growth on a smaller scale, the problem lies in the lack of use of accounting tools. According to Silva (2017), when accounting is applied to rural properties, whether small, medium, or large, it brings significant benefits, as it records costs related to inputs, land preparation, planting, fertilization, harvesting, processing, and others. From the economic perspective of the rural enterprise, it is important to emphasize the possibility of carrying out planning capable of assisting in the protection of regions in order to avoid the use of methods that harm green areas and to ensure the sustainability of the location.

Cash flow is one of the most widely used instruments for analysis in companies, as it is important to maintain a safety margin in cash to support business operations, considering that production in the countryside may face unforeseen events such as losses related to climatic factors due to frost, storms, and losses caused by crop diseases, for example (Calgaro; Faccin, 2012). The organization of information regarding cash inflows and outflows can provide managers with visibility into profit or loss margins.

Correia (2023) also demonstrates that the rural producer, as the key agent of the property, plays an important role in the country's sustainability. Through dedication to the cultivation of plants and animals, society is fed, making it an essential profession from a socioeconomic and environmental perspective. Sustainable agricultural practices include reducing the use of agrochemicals, energy, and water, as well as conserving natural resources and biodiversity (Natalli et al., 2020). In the field, these practices impact productivity, consumption, time, technology, and producer profitability, providing better development for the property.

In this context, the theme presented in this research aims to extract

accounting data using the cash flow tool, through which resources allocated to sustainability were applied, enabling improvements in daily field management and ensuring economic development in a planned and organized manner.

Following the technological revolution and the emergence of automated machines in favor of agriculture, global agriculture experienced a significant leap in the economic sphere; however, there was a regression in sustainability. Caldas Júnior (2009) states that modern agriculture has existed for only a few years and already demonstrates the collapse of its techniques; consequently, it cannot be considered sustainable agriculture.

According to Crepaldi (2019, p. 41), “the main goal of rural planning is to organize the property's production plans aiming at better use of production factors.” Furthermore, it is worth emphasizing the importance of managerial training for small producers so that they can master daily management processes and develop their properties.

Crepaldi (2019) further emphasizes that an important measure is to separate managerial accounting from tax accounting and to separate personal banking expenses from farm expenses, a characteristic of the entity principle. Based on this, an important managerial accounting tool for controlling these expenses is cash flow. According to Bertoldo (2019), cash flow enables company managers to plan and monitor the inflows and outflows of all resources, allowing the company to make decisions according to its strategies and established goals, whether short-term or long-term.

In this context, the need for sustainable development also arises. The challenge is to reconcile activities that preserve the environment while simultaneously generating profits for farmers.

Sustainable development encompasses different environmental, economic, social, political, and cultural dimensions, reflecting various concerns: with the present and future of people; with the production and consumption of

goods and services; and with basic subsistence needs (Damasceno, Khan, Lima, 2011). Based on this ideal, the economic dimension seeks productive practices that balance property growth and environmental preservation, while the social dimension ensures the appreciation of family farming through public policies aimed at strengthening culture.

As explained by Natalli et al. (2020), sustainability aims at the balanced use of both renewable and non-renewable resources in order to reduce environmental degradation. Therefore, it is important that measures be taken both by farmers and by those making decisions at the governmental level to reduce soil and water degradation in rural areas, preserve springs and rivers, and ensure a better world for future generations.

Among agricultural practices, cover crops stand out as essential for preventing soil erosion and the loss of nutrients necessary for plant development, as well as the adoption of irrigation systems to avoid excessive water waste while ensuring that pasture receives the necessary hydration (Silva, 2022).

In light of this, this research is justified by the limited dissemination of information and studies related to accounting with a focus on managerial tools combined with sustainability in the agricultural sector, which highlights the originality of the proposed study, in addition to the researcher's interest in and proximity to the rural environment. The theoretical contribution of this work aims to demonstrate the importance of filling the gap left by the limited number of studies that consider smaller rural enterprises. Furthermore, the choice of the sustainability variable shows that it is essential to discuss sustainability, as the effects of poor environmental practices are already evident in our daily lives.

From a practical perspective, the analysis of the cash flow implemented on the property aims to demonstrate the relevance of managerial organization even in small properties. Furthermore, the tool can be used by the owners themselves without dependence on external professionals, providing greater

security in managing financial transactions while supporting the use of sustainable practices in the organization's daily activities.

Accounting plays an important role in the management and growth of businesses; however, it is still not widely disseminated in rural areas, with most of its application concentrated in urban enterprises. As a consequence, small farmers face limitations in information that result in management failures on their properties. With the automation of agricultural machinery and the growth of large farms, small farmers face financial difficulties in remaining on their land, as they have become targets of large landowners seeking fertile and cleared land, creating concern for rural planning that demonstrates financial results.

Therefore, the general objective is defined as follows: to analyze the contribution of the information contained in Cash Flow, together with sustainable management techniques, to increase the economic and financial performance of a rural property.

This research is limited to the field of managerial accounting combined with sustainability, focusing on the cash flow tool and the sustainable techniques used on the property. The research uses data from the year 2023 collected for the preparation of the cash flow statement, analysis, and composition of sustainable techniques. The property is located in the rural area of Nova Prata do Iguaçu-PR, in the locality of Linha Aurora.

LITERATURE REVIEW

This section addresses the theoretical foundations regarding the concepts and definition of rural property, rural accounting together with the managerial tool of cash flow, and sustainability, relating them to studies conducted by authors in the field.

Rural property

The main objective of rural properties is to ensure the subsistence of producers and, furthermore, to promote economic development in order to guarantee comfort for families. Marion (2005) highlights that rural enterprises are responsible for exploiting the productive capacity of the soil through land cultivation, animal husbandry, and the processing of certain agricultural products.

Despite this, there are obstacles within this environment that are faced daily, especially by small farmers, such as sudden climate changes and significant fluctuations in market prices, which make access to resources more difficult. Crepaldi (2019, p. 47) emphasizes that “all rural activities, no matter how small they may be, require efficient control, since the impacts of administrative decisions are fundamental to good management.” Therefore, detailed financial organization becomes necessary in order to ensure control over both costs and revenues generated by each activity carried out.

It is noteworthy that the rural property is responsible for supporting families over time and is passed down from generation to generation, making use of the wisdom of older generations while remaining updated through younger generations who possess the skills to research and innovate processes on their properties.

Rural contability

Rural Accounting is defined as a specialization of Accounting, with the main objective of controlling the assets of agricultural properties. As defined by Crepaldi (2019, p. 86), the purpose of rural accounting is to “control the assets of rural entities, determine the results of rural entities, and provide information about the assets and results of rural entities to the various users of accounting information.”

Unlike conventional urban accounting, rural accounting is determined in

different ways depending on the economic activity being analyzed. The fiscal year necessarily ends on 12/31, but the determination of the results of a crop occurs at the time of harvest, when the closing of operations takes place. As highlighted by Marion (2005), upon completing the harvest or the birth of calves and subsequently completing the commercialization of the harvested products, the annual agricultural cycle comes to an end. The agricultural year represents the season dedicated to planting, harvesting, and commonly the sale of agricultural products.

Given the above, small farmers do not usually have the habit of carrying out any type of control over their production, especially when it comes to products intended for self-consumption (Grisa; Mazolla; Schneider, 2010). This fact can be explained by generational customs, since rural accounting is not widely disseminated among small properties and is usually more present in large properties classified as legal entities, which have a greater volume of ancillary obligations.

In this context, possibilities arise for controlling and monitoring the procedures and activities carried out by small farmers. Among the various tools that can assist in this process, cash flow is suggested, which will be detailed in the following section.

Cash flow as a managerial tool

Managerial accounting can be understood as an information system whose objective is to provide financial, economic, asset-related, physical, and productivity information in order to assist its users in decision-making (Marion; Ribeiro, 2014). It is noteworthy that managers are able to carry out internal controls and analyze financial statements, which consequently leads to the reduction of costs and expenses within their companies.

According to Pereira (2006), cash flow consists of the inflows and

outflows of resources over a given period, using the company's economic and financial information to improve the decision-making process. Furthermore, based on this instrument, it is possible to obtain information regarding the company's liquidity status, accounts payable and receivable, sales, expenses, investments, and all movements of financial resources. In this context, some authors have conducted studies similar to this one in the rural sector and used Cash Flow as a managerial tool in their research.

Calgaro and Faccin (2012) analyzed the actual situation of managerial control in rural properties located in the 3rd District of Flores da Cunha, in the state of Rio Grande do Sul. Through their research, they identified the main cash inflows and outflows, as well as the expenses associated with each economic activity analyzed. Using exploratory analysis, they concluded that a large portion of property owners do not use any managerial tool for internal control; however, if there were a simple model for recording transactions, it could motivate small farmers to begin implementing such controls.

In a more recent study, Melo et al. (2021) reported the difficulties faced by producers in their daily activities and the feasibility of techniques for preserving the environment in an economically viable manner. Through a bibliographic study, the development of the research made it possible to observe that some producers remain resistant to adopting control tools. Therefore, the authors emphasized the importance of good rural management.

Sustainability in rural areas

Sustainability is based on the idea of maintaining and replenishing environmental resources, whether through natural or artificial processes, by means of rational use in order to avoid waste and adopt recovery and recycling processes (Wahrlich et al., 2020). Based on this ideal, it is important that measures be adopted, especially by companies, with the aim of reducing the

emission of gases and polluting waste. It is important to emphasize that the adoption of these techniques is not limited to large industries; awareness of the need to contribute to environmental preservation should also extend to small businesses, whether urban or rural.

Within this context, Potrich, Grzybovski, and Toebe (2017) highlight the perceptions of Brazilian family farmers regarding sustainability in small rural properties. The study explored the idea of how to keep people in rural areas and encourage the proper use of natural resources in order to generate the least possible environmental impact through the practices employed. The results indicated that family farmers on small rural properties do not adopt production practices that cause fewer consequences to the environment. Property owners are guided by practices that generate sufficient income to support family members, practices that are commonly observed on large rural properties.

Furthermore, Natalli et al. (2020) aimed to verify the environmental practices carried out on rural properties, with the purpose of characterizing socioeconomic aspects, identifying the level of importance of the techniques used, and determining the reasons that encouraged the adoption of these practices. The results of the study showed that 55% of the properties analyzed implement some sustainability practices, 41% do not, and 4% are not applicable. The authors concluded that the reasons for adopting such measures are the reduction of costs, compliance with legislation, and increased productivity.

The importance of providing clarification regarding aspects related to sustainability and environmental care should be emphasized, as natural resources are valuable assets that must be preserved in accordance with the applicable legislation.

Sustainable management techniques and rural development

Solar energy is considered a strong investment in sustainable alternative energy, aiming to replace electrical energy, which remains a fundamental component in agricultural operations. In this way, photovoltaic energy can assist in the implementation of more effective production techniques and improve living conditions for the rural population (Micheletti; Correia, 2022). The authors further emphasize that energy obtained from sunlight is considered a form of renewable energy capable of reducing the various damages caused to the Earth through greenhouse gas emissions. Renewable energies aim to promote sustainable rural development.

Crop rotation and cover pastures are also included among the sustainable techniques used in rural areas. Silva (2022) states that the cultivation of cover crops between harvests provides economic and commercial benefits through soil maintenance and recovery. Based on this, in order to achieve maximum efficiency of the environment's productive capacity, crop rotation planning should consider not only commercial plant species, such as corn and soybeans, but also those intended for soil cover, including African star grass, brachiaria grasses, and others.

Another technique that has become popular among farmers is biological control, which consists of using natural enemies, such as parasitoids, to combat organisms harmful to plants. It is considered an attempt to minimize the negative impacts caused by pesticides, and the use of this method aims to improve the quality of agricultural products without leaving residues in food (Renzi et al., 2019).

Supported by these techniques, pasture management has a significant influence on the profitability of dairy cattle. Through well-ventilated spaces, appropriate equipment, and adequate nutrition, cows are able to produce more milk and also generate organic fertilizers for the property through manure. It is

easier to observe and analyze dairy cows than pasture plants, since animals are larger and demonstrate their condition through dynamic and easily perceptible behavior (Silva and Maixner, 2015). It is emphasized that sustainable management techniques provide better results for activities carried out in rural areas.

Previous studies

In the search for studies on the subject, three research works can be cited that demonstrate the concern with combining rural accounting and the environment in order to achieve satisfactory results regarding the issue: Ratko (2008), Potrich, Grzybovski and Toebe (2017), and Birkhahn et al. (2022).

Ratko (2008) developed a case study on a rural property located in the interior of the state of Paraná. The author implemented tools capable of generating the information necessary about the property in order to demonstrate its strengths and weaknesses. In addition, all accounting statements were prepared, including the balance sheet and income statement, and finally, Rural Accounting was implemented on the property. The choice of a study published 15 years ago aimed to highlight the fact that accounting in rural areas is not a recent practice, but rather one that is still not widely practiced and disseminated.

The author suggests, as a future action regarding the Cash Flow Statement (CFS), that the property carry out a comparison between the actual CFS and the projected CFS using the current and upcoming harvests, so that the resources required in relation to future costs and expenses can be visualized. The study also demonstrates the importance of further research involving various economic activities, since the research focused exclusively on soybean cultivation.

Potrich, Grzybovski, and Toebe (2017), in turn, conducted an exploratory study on small rural properties in order to analyze farmers' perceptions regarding

sustainability. In this regard, the authors argued that one of the propositions of sustainable development in the new rural context is the interaction of three variables that combine different forms of production and property management: productive diversity, pluralism, and multifunctionality. These variables aim to contribute to the economic inclusion, social representation, and environmental concerns of small family rural properties. The authors emphasized the importance of public policies directed toward small rural properties that support sustainability in rural areas.

Finally, Birkhahn et al. (2022) analyzed how sustainability indicators in the economic, social, and environmental dimensions can assist rural producers in promoting improvements in the management process on a small rural property in the northwestern region of Rio Grande do Sul, based on the MASPPR model. The study was classified as descriptive, documentary, qualitative, and a case study. The authors used several indicators for individual analysis, such as the cash flow tool in the economic dimension and soil cover in the environmental dimension. The results indicated a sustainability rate of 72.08%, achieved based on data obtained in the economic (59.09%), social (57.14%), and environmental (100%) dimensions.

METHODOLOGY

Regarding its objectives, the research is classified as descriptive. According to Silva and Menezes (2000, p. 21), “descriptive research aims to describe the characteristics of a given population or phenomenon, or the establishment of relationships between variables.” In light of this, the research seeks to describe the study environment, as well as the techniques and activities practiced in the daily routine of the property owners through semi-structured interviews, in order to identify the importance of sustainability and accounting within a small rural property.

Regarding the procedures, a case study approach was chosen. According to Gil (1999, p. 57), “a case study is characterized by the deep and exhaustive study of one or a few objects, in a way that allows broad and detailed knowledge of them.” In this context, a small rural property was selected for the study in order to demonstrate the importance of using the Cash Flow tool to extract data related to the application of sustainable techniques, given that research in this area is scarce, as it tends to focus on large companies in urban settings.

The approach to the problem is qualitative. In qualitative research, the researcher goes into the field to capture the phenomenon under study with the objective of considering all viewpoints of the people involved; therefore, various types of data can be collected and analyzed (Godoy, 1995). Based on this definition, the present study seeks, through a qualitative approach, to explain the processes carried out on the property, as well as to analyze cash flow data.

Definition of research propositions

Pires and Silveira (2017) state that the meaning of a proposition is related to the set of interpretations to which a thought is directed. Thus, the meaning of a proposition corresponds to everything that may contribute to the conclusion of an argument. For the research problem mentioned, the following propositions were identified:

P1: The proper implementation of Cash Flow truly contributes to the economic and financial performance and to cost reduction on a rural property;

P2: Sustainable management techniques, when properly applied, truly contribute to the economic and financial performance and to cost reduction on a rural property.

Case study protocol

Yin (2015) demonstrates that a case study protocol is an effective way to increase the reliability of case studies. Furthermore, it contains not only the instrument itself but also the procedures and general rules that should be followed when using the instrument.

Based on this, questions were developed in support of the specific objectives of the research, using data collection procedures to answer them, as described in Chart 1.

Chart 1 – Case study

Specifci objeticves	**Related questions**	**Actions for answering**
Verify the information that makes up the financial management system that is part of the cash flow on the rural property.	What are the components of the financial management system on the rural property?	Documents and information were collected from the property owners through visits in order to understand the day-to-day economic activities of the property.
Identify the sustainable management techniques applied on the rural property, taking into consideration economic, environmental, and social aspects.	What sustainable management techniques related to economic, environmental, and social factors are implemented within the property?	Interviews were conducted with the property owners through visits in order to understand the activities and their respective management methods practiced in the daily routine of the property.
Analyze the financial impact resulting from the use of management and sustainability techniques on wealth generation and cost reduction for a rural property.	How does the adoption of management techniques influence wealth generation?	Information was extracted from the Cash Flow statement, and a comparison was made of cost reductions and increases in economic and financial results before and after the use of sustainable management techniques on the property.

Source: Adapted from YIN, (2015).

In this context, the data collection procedure of the study used what are known as primary sources: semi-structured interviews with the property owners in order to clearly understand the day-to-day operations of the property. A semi-structured interview begins with a prior guide containing key questions developed to meet the objectives of the study, and throughout the conversation,

complementary questions may and should be implemented to deepen the information obtained (Manzini; Lupetina, 2024). These interviews were conducted in person and transcribed into a Word document to ensure that no information obtained during the procedure was lost. They were also conducted remotely when the presence of the researcher in the field was not possible.

Guerra (2010) argues that the relationship between the researcher and the interviewee that occurs during interviews allows the interviewer to gain access not only to the interviewee's opinions and perceptions, but also to the motivations and values that support the interviewee's particular view of the topic under discussion.

Another procedure to be considered was conducting visits with the objective of observing and collecting data and information for the development of the research. During data collection, all necessary documents from the year 2023 were provided digitally for the financial analysis of the company's situation; however, physical data were also collected during the visits.

Research limitations

Regarding the limitations of the study, the property owners possess limited knowledge concerning the use of managerial tools. Therefore, the influence of opinions and reliance on superficial internal controls contribute to the limitation of a deeper analysis by the researcher. Furthermore, because it is a small property, there is a lack of economic data regarding results from previous years for possible comparisons with the period defined in the research.

Another limitation that should be taken into consideration is the sample size. It is important that, in future studies, researchers seek a larger and broader sample and consider more than one organization so that comparisons of results can be made among different properties.

PRESENTATION AND ANALYSIS OF DATA

This section aims to present and analyze the results obtained from the company's cash flow and the sustainable management techniques used by the property owners.

Property context and cash flow characteristics

The company that is the object of this study is primarily focused on the economic activities of grain production, such as soybeans, corn, and wheat, as well as milk production through dairy cattle, in addition to beef cattle farming. The property was established in 1995 in the locality of Linha Aurora, in the rural area of the municipality of Nova Prata do Iguaçu, in the southwest region of Paraná, when the farming couple settled there with their first two children. Initially, the family's main source of income was dairy cattle production, which was responsible for supporting the household and paying monthly expenses. As the business grew, crop farming gained prominence and today represents the largest portion of the profit generated.

Through semi-structured interviews, both in person and remotely, with the property owners, the information necessary for the presentation and analysis of the results related to the research topic was collected, supported by a series of basic questions transcribed in Chart 1.

Based on this, the financial documents of cash inflows and outflows from the year 2023 were analyzed using the cash flow tool and presented according to Table 1, which demonstrates the consolidated result at the end of the year divided among the economic activities carried out.

Table 1 – Casho flow legend

Inputs	
SOYBEANS	**R$ 395.696,79**
WHEAT	**R$ 44.922,15**
CORN	**R$ 18.001,60**
MILK	**R$ 330.345,76**
BEEF CATTLE	**R$ 72.892,68**
Outputs	
FINANCING	**R$ 143.269,69**
MILK PRODUCTION COST	**R$ 122.189,61**
CROP PRODUCTION COST	**R$ 298.785,35**

Source: The authors (2025).

The data that make up the cash flow statement were prepared according to the model proposed and applied by Thomas, Rojo, and Brandalise (2015), which separates the information by type of activity. Table 2 and Table 3 present the data that compose the Cash Flow statement for the year 2023.

Table 2 – Cash flow 1st semester 2023 (in Brazilian Reais)

REVENUE	Jan/23	Feb/23	Mar/23	Apr/23	May/23	Jun/23
Soybeans	-	-	153.993,56	-	1.329,81	-
Wheat	-	930,7b9	20.872,73	-	66,92	-
Corn	-	-	-	-	-	-
Beef Cattle	-	-	-	-	-	-
Milk	31.704,29	27.676,63	29.943,02	26.346,78	23.512,54	29.102,91
I - TOTAL INFLOWS	**31.704,29**	**28.607,42**	**204.809,31**	**26.346,78**	**24.909,27**	**29.102,91**
Crop Production Financing	64.379,29	12.130,43	65.895,86	-	1.986,46	430,99
Dairy Production Financing	2.745,37	4.816,27	16.649,63	9.355,12	9.355,12	10.554,42
Loan Financing	-	-	16.403,04	4.706,99	77.486,88	-
II - TOTAL OUTFLOWS	**67.124,66**	**16.946,70**	**98.948,53**	**14.062,11**	**88.828,46**	**10.985,41**
III - OPERATING RESULT	**35.420,37**	**11.660,72**	**105.860,78**	**12.284,67**	**63.919,19**	**18.117,50**
Opening Balance	**Not informed**	**-35.420,37**	**-23.759,65**	**82.101,13**	**94.385,80**	**30.466,61**
V - FINAL CASH BALANCE	**35.420,37**	**-23.759,65**	**82.101,13**	**94.385,80**	**30.466,61**	**48.584,11**

Source: Research data. Adapted from Thomas, Rojo, Brandalise (2015).

Tabela 3 – Fluxo de Caixa 2º semestre 2023 (in Brazilian Reais)

REVENUE	Jul/23	Aug/23	Sep/23	Oct/23	Nov/23	Dec/23
Soybeans	122.035,39	350,94	115.126,90	656,70	508,96	1.694,53
Wheat	-	23.051,71	-	-	-	-
Corn	18.001,60	-	-	-	-	-
Beef Cattle	62.692,68	-	-	-	-	10.200,00
Milk	33.529,35	31.182,34	26.152,05	25.287,41	22.687,31	23.221,13
I - TOTAL INFLOWS	**236.259,02**	**54.584,99**	**141.278,95**	**25.944,11**	**23.196,27**	**35.115,66**
Crop Production Financing	6.328,04	80.465,98	38.024,37	20.150,88	2.870,25	6.122,80
Dairy Production Financing	11.795,56	10.515,10	15.953,20	9.744,64	10.249,18	10.456,00
Loan Financing	-	30.287,76	9.328,02	57,00	-	5.000,00
II - TOTAL OUTFLOWS	**18.123,60**	**121.268,84**	**63.305,59**	**29.952,52**	**13.119,43**	**21.578,80**
III - OPERATING RESULT	**218.135,42**	**66.683,85**	**77.973,36**	**4.008,41**	**10.076,84**	**13.536,86**
Opening Balance	**48.584,11**	**266.719,53**	**200.035,68**	**278.009,04**	**274.000,63**	**284.077,47**
V - FINAL CASH BALANCE	**266.719,53**	**200.035,68**	**278.009,04**	**274.000,63**	**284.077,47**	**297.614,33**

Source: Research data. Adapted from Thomas, Rojo, Brandalise (2015).

It was evident that soybean cultivation and dairy farming stood out among the activities in terms of cash inflows.

In soybean production, planting takes place between September and October, and harvesting occurs between January and May of the following year. Based on the proposed cash flow statement, both stages occurred during 2023, although the actual sale of the grains was not carried out immediately after the May harvest, and part of the inflows still referred to the previous year's crop. This is because, in the agricultural market, it is important to evaluate the period in which selling prices are higher so that farmers can make sales under more favorable conditions. In this regard, the total inflow of R$ 395,696.79 during the year was distributed among the months of March/23, May/23, July/23, August/23, September/23, November/23, and December/23, with emphasis on higher values in March, July, and September, which achieved more attractive prices.

The same occurred with the wheat crop, which is cultivated between May

and September, with sales taking place in February, March, May, and August, generating a total inflow of R$ 44,922.15. Corn cultivation occurs between February and July, with a single sale in July amounting to R$ 18,001.60. The total production cost for grain cultivation during the year was R$ 298,785.35. These amounts include agricultural chemicals, fertilizers, seeds, and fuel used in all activities carried out.

In addition, the financing account is characterized by installments related to investments in agricultural machinery. In the cash flow statement, the months of May and August contain a greater number of installment payments.

Finally, in livestock production, dairy cattle generate results within the same month of production, unlike crop farming. In this regard, the months of January/23, July/23, and August/23 stood out in dairy revenue, which exceeded R$ 30,000.00, from a total annual revenue of R$ 330,345.76. The sale of beef cattle occurred in July and December. Thus, the costs of livestock activities totaled R$ 122,189.61, including feed, medications, mineral supplements, replacement equipment used in dairy operations, veterinary services, and others.

Management techniques

Among the main techniques used, crop rotation stood out, since the property produced three different types of grains in the same areas during a given period of the year—soybeans, wheat, and corn—with the objective of conserving and restoring the soil while diversifying family income. This practice was combined with the cultivation of cover pastures, including brachiaria and African grass, which sought to control soil erosion by protecting the soil from rainfall and controlling weeds, thereby reducing the need for herbicides. Chioderoli et al. (2012) highlighted the importance of sowing soybeans and corn over desiccated brachiaria as a means of adopting the no-till farming system, considering that the pasture serves as excellent ground cover during the summer, contributing to

increased soil organic matter and enabling crop rotation.

Brachiaria is a grass species with deep roots, which facilitates water absorption in the soil and prepares the land for subsequent crops. In the cultivation of African star grass, in addition to preventing soil erosion and serving as pasture for cattle, it was used in conjunction with another sustainable method: biological control.

During the process, in September, following rainfall and high humidity, the property owners applied the fungus called *Metarhizium anisopliae* through agricultural spraying on the African grass pasture. It was used to combat insects and pests such as leafhoppers, which can cause damage to other plant species, such as corn, serving as an alternative to the use of agricultural pesticides. Furthermore, the fungus can remain established in the soil for a long period, extending pest control to other cultivated crops.

The solar energy system installed in March brought significant savings to the property through an investment of R$ 66,000.00. Electricity bills that reached approximately R$ 1,000.00 in February 2023 decreased to as little as R$ 20.00 after the installation, as shown in Table 4, which expresses in monetary terms the impact of the new sustainable energy source implemented on the property.

Table 4 – Energy bills (in Brazilian Reais)

Apr/2022	**May/2022**	**Jun/2022**	**Jul/2022**	**Aug/2022**	**Sep/2022**	**Oct/2022**
1.141,65	816,05	1.040,24	606,31	1.093,21	1.102,75	1.144,71
Nov/2022	**Dec/2022**	**Jan/2023**	**Feb/2023**	**Mar/2023**	**Apr/2023**	**May/2023**
1.112,10	1.050,88	1.029,38	1.363,64	17,05	16,84	16,76
Jun/2023	**Jul/2023**	**Aug/2023**	**Sep/2023**	**Oct/2023**	**Nov/2023**	**Dec/2023**
16,79	19,63	20,00	20,06	20,08	20,00	19,98

Source: The authors (2025).

Lastly, in livestock farming, the breeds of cows used in dairy management are Holstein and Girolando. The activity involving the twenty-two cows begins at 6:30 a.m. with the cleaning of the teats using water and a pre-dipping product used to disinfect the udders before milking. In addition, the so-called “paddle test” or California Mastitis Test (CMT) is performed once a week.

This test consists of placing a reagent in a paddle along with a small amount of collected milk. If the milk forms a gel-like substance, it indicates that the animal has mastitis, meaning that its mammary glands are infected. According to Oliveira et al. (2024), the CMT is a method for evaluating the quantity of somatic cells in milk. This test is carried out with the aid of a paddle, where the milk and reagent are placed, followed by circular movements to obtain the results. The formation of a gel indicates a change in the composition of the milk from the analyzed quarter of the udder, which characterizes the onset of mastitis.

After milking, the milk is cooled to a temperature below 4 degrees Celsius, and the owners again apply a post-dipping product as a procedure to prevent infections, inhibit bacterial proliferation, and assist in removing any remaining milk from the animals' teats.

The cows are then released to the feeding area, where they are fed corn silage and feed concentrate. Furthermore, in order to reduce stress and avoid interfering with milk production, the producers maintain a routine schedule, provide ventilation in the milking parlor, and spray water over the animals, especially during the summer, to reduce heat stress.

During the cleaning process of the equipment at the end of milking, a chlorine-based chemical product is added to water heated to seventy degrees Celsius, and twice a week the procedure is performed using an acid-based product. The milking parlor is cleaned by removing the animals' waste, which is then deposited in an appropriate location and subsequently transformed into organic fertilizer for the crops.

Finally, the milk is collected by the dairy plant every two days. At the time of collection, the responsible employee performs an acidity test to verify product quality and obtains a sample to take to the dairy processing facility for analyses and testing for the presence of medications. In summary, the entire process is carried out with caution and hygienic care. Table 5 summarizes the price of milk

per liter during the year 2023:

Table 5 – Milk price

Milk price/liter					
Jan/2023	**Feb/2023**	**Mar/2023**	**Apr/2023**	**May/2023**	**Jun/2023**
R$ 2,90	R$ 2,90	R$ 3,00	R$ 3,00	R$ 2,60	R$ 2,70
Jul/2023	**Aug/2023**	**Sep/2023**	**Oct/2023**	**Nov/2023**	**Dec/2023**
R$ 2,55	R$ 2,30	R$ 2,10	R$ 2,10	R$ 2,10	R$ 2,15

Source: The authors (2025).

Based on the analyzed results, Chart 2 summarizes the impact of management techniques on economic, environmental, and social aspects:

Chart 2 – Impact of management techniques on economic, environmental, and social aspects

Management Techniques	Economic	Environmental	Social
Crop Rotation	Crop diversification provides lower dependence on chemical fertilizers, since some plants are capable of releasing substances into the soil in order to fertilize it naturally. Furthermore, crop rotation prevents the depletion of these substances, which favors more productive and profitable crops.	Carrying out crop rotation reduces the incidence of pests and also decreases soil erosion through the cultivation of plants with deep and shallow roots, thereby enabling soil structuring and the replenishment of organic matter.	It is a practice used primarily in family farming and thus promotes the diversity of different types of food crops while also strengthening the income of small farmers.
Cover Pasture	Some cover pastures are used as animal forage, improve soil structure and fertility, and contribute to erosion control. In this way, these benefits contribute to increased productivity and profitability of the property.	Increases the presence of organic matter in the soil. The plants used as cover crops enable the conservation and cycling of nutrients for various different crops, which also impacts soil conservation.	This practice avoids the use of pesticides, ensuring greater health and quality of life both for the farmer, who has direct contact with the production process, and for those who will consume products from the production chain.

continues

Chart 2 – Impact of management techniques on economic, environmental, and social aspects - continuation

Management Techniques	Economic	Environmental	Social
Biological Control	Reduces costs related to agricultural pesticides and also helps reduce crop losses by decreasing the number of agricultural pests.	With the reduction in the use of chemical products, neither the soil nor nearby water sources are contaminated. Furthermore, the introduction of natural enemies also contributes to ecological balance, with the objective of controlling invasive species.	Like cover pasture, biological control has the same objective of avoiding the use of pesticides, which ensures better health and quality of life both for the farmer who has direct contact with the production process and for those who will consume products from the production chain.
Solar Energy	Provides a reduction in electricity bill costs. It does not require fertile soil preparation for installation, as it can be installed on the roofs of houses.	It is a clean and renewable energy source, generates no negative environmental impacts, and is inexhaustible, since sunlight is the primary source of raw material.	The installation of solar energy systems on small properties contributes to quality of life; in locations where instability in electricity supply was constant, solar energy can significantly improve the availability of power.
Dairy Management	The adoption of technological practices during the milking process and the efficient management of animal nutrition reduce losses and maximize milk production.	Animal waste can be used as organic fertilizer, thereby reducing the environmental impact resulting from the use of inorganic fertilizers.	Milk production carried out in accordance with sanitary regulations and standards contributes to the food security of thousands of people, since milk is a basic source of nutrition for families.

Source: The authors (2025).

In support of the idea of Damasceno, Khan, and Lima (2011), management techniques impact the quality of life of farmers through the reduction in the use of pesticides and the proper preparation of the soil, as well as benefiting those who consume the cultivated food, thereby ensuring food security and, ultimately, contributing to the appreciation and strengthening of family farming.

FINAL CONSIDERATIONS

The objective of this research was to analyze the economic and financial contribution of cash flow and the sustainable management techniques carried out in daily rural activities. The study sought to extract information from the operations conducted on the rural property corresponding to the year 2023.

In view of this, a detailed collection and analysis of the financial information related to the economic activities carried out on the property was performed, with emphasis on soybean production and dairy production, which are responsible for the majority of the property's inflows. From Jan/2023 to Jun/2023, the month that stood out the most was March, with an inflow of R$ 153,993.56 from soybeans, followed by R$ 20,872.73 from wheat and R$ 29,943.02 related to the monthly dairy activity. Total outflows also stood out in March, amounting to R$ 98,948.53, including crop production costs, dairy production costs, and financing payments. From Jul/2023 to Dec/2023, July stood out with inflows of R$ 122,035.39 from soybeans, R$ 18,001.60 from wheat, R$ 62,692.68 from beef cattle sales, and R$ 33,529.35 from milk production. Outflows were most significant in August, totaling R$ 121,268.84 in production costs and financing payments.

In summary, it was verified that the cash flow statement clearly expressed financial inflows and outflows, allowing the small property to access information about its resources in a simplified manner. As a result, these data assist in decision-making regarding the financial liquidity of the activity.

Regarding sustainable management, five techniques were identified: crop rotation, cover pasture, biological control, solar energy, and dairy management. These were subsequently related to economic, environmental, and social aspects, aiming to demonstrate through Chart 2 the importance of rural sustainability.

Among the first three techniques mentioned, it was possible to observe

that the adoption of these practices in agriculture ensured environmental preservation through the reduction in the use of fertilizers and chemical pesticides. In addition to reducing pesticide-related costs, they promote soil health and balance and prevent water contamination, thereby improving the quality of life of both property owners and the final consumers of agricultural products.

With solar energy, a reduction in electricity costs was evidenced through Table 4 between the months of March/23 and December/23, the period during which the solar panels were installed on the property. This generated not only an economic impact but also a sustainable one, since solar energy is clean and renewable.

In livestock farming, dairy production demonstrated that the proper handling of technologies and sanitary care related to animal health promote milk quality and safety, while also contributing to increased profitability of the dairy cows.

Based on the analyzed results, the data presented in proposition (P1) can be genuinely accepted, since Tables 2 and 3 showed that cash flow provides financial control and management of inflows and outflows for the property owners and consequently contributes to cost reduction. The second proposition (P2) can also be genuinely accepted, as Chart 2 and Table 4 demonstrated that management techniques can contribute to the economic and financial performance of the property and to cost reduction.

Finally, the study was limited to the analysis of only one year. For future research, it is suggested that studies be conducted in other regions of the country and encompass additional fiscal periods, in order to continue research on Brazilian agriculture and the importance of managerial control in small rural properties.

REFERENCES

BERTOLDO, Bárbara Christie Marques. **A importância da implantação do planejamento do fluxo de caixa nas empresas de micro e pequeno porte na cidade de Araguari**. Curso de Graduação em Ciências Contábeis, Universidade Federal de Uberlândia, 2019. Disponível em: https://repositorio.ufu.br/handle/123456789/25744. Acesso em: 27 out. 2023.

BIRKHAHN, A. P.; GARITO, C. L. dos S.; VIEIRA, E. P.; BRIZOLLA, M. M. B.; MOREIRA, M. A. F.; DUBAL, N. C.; SCHUH, P. L.; FILIPIN, R. Sustentabilidade na atividade rural: Um estudo em uma propriedade de pequeno porte no noroeste gaúcho. **Research, Society and Development**, v. 11, n. 2, 2022. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/24628. Acesso em: 11 nov. 2023.

CALDAS JÚNIOR, Giovanni Carício. **A pequena propriedade rural**: Um Estudo da sustentabilidade e da percepção ambiental dos pequenos agricultores na localidade de pacas, município de vitória de santo antão - PE. Orientador: Prof. Dr. José de Lima Albuquerque. 2009. 117 f. Dissertação (Pós Graduação) - Universidade Federal Rural de Pernambuco - UFRPE, Recife, 2009. Disponível em: http://www.tede2.ufrpe.br:8080/tede2/handle/tede2/4514. Acesso em: 21 out. 2023.

CALGARO, Noele C.; FACCIN, Kadígia. Controle financeiro em propriedades rurais: estudo de caso do 3º Distrito de Flores da Cunha. **Revista Global Manager Acadêmica**, v. 1, n. 1, 2012. Disponível em: https://web.archive.org/web/20180501085805id_/http://ojs.fsg.br/index.php/globalacademica/article/viewFile/67/66. Acesso em: 11 nov. 2023.

CHIODEROLI, Carlos A.; MELLO, Luiz M. M. de; GRIGOLLI, Paola J.; FURLANI, Carlos E. A.; SILVA, José O. R.; CESARIN, André L. Atributos físicos do solo e produtividade de soja em sistema de consórcio milho e braquiária. **Revista Brasileira de Engenharia Agrícola e Ambiental**, v. 16, n. 1, p. 37–43, 2012. Campina Grande, PB: UAEA/UFCG. Disponível em: https://doi.org/10.1590/S1415-43662012000100005. Acesso em: 12 jan. 2025.

CORREIA, Guilherme Farias. **Sistema de controle financeiro nas**

propriedades rurais: um estudo de caso sobre a integração com a contabilidade. 2023. Disponível em: https://repositorio.ufsm.br/handle/1/31062. Acesso em: 11 nov. 2023.

CREPALDI, S.A. **Contabilidade Rural:** Uma Abordagem Decisórial, 9 ed. São Paulo: Atlas, 2019.

DAMASCENO, N. P.; KHAN, A.S.; LIMA, P.V.P.S.. O impacto do Pronaf sobre a sustentabilidade da agricultura familiar, geração de emprego e renda no Estado do Ceará. **Revista de Economia e Sociologia Rural**, Brasília, v. 49, n. 1, p. 157-180, mar. 2011. Disponível em: https://www.scielo.br/j/resr/a/TJ4Bv78vmHmrTdTB7tQtgXb/?format=pdf&lang=pt. Acesso em: 12 mar. 2025.

GIL, Antonio Carlos. **Métodos e técnicas de pesquisa social**. 5. ed. São Paulo: Atlas, 1999.

GODOY, Arilda S. Pesquisa qualitativa: tipos fundamentais. **Revista de Administração de Empresas**, v. 35, n. 3, p. 20-29, mai./jun. 1995. Disponível em: https://periodicos.fgv.br/rae/article/view/38200. Acesso em: 30 jun. 2024.

GRISA, C.; GAZOLLA, M.; SCHNEIDER, S. **A "produção invisível" na agricultura familiar:** autoconsumo, segurança alimentar e políticas públicas de desenvolvimento rural. Agroalimentaria, v. 16, n. 31, julio-diciembre, 2010, p. 65-79. Disponível em: https://www.ufrgs.br/pgdr/wp-content/uploads/2021/12/786.pdf. Acesso em: 15 mai. 2024.

GUERRA, João Henrique Lopes. Proposta de um protocolo para o estudo de caso em pesquisas qualitativas. **Encontro Nacional de Engenharia de Produção**, v. 30, p. 1-13, 2010. Disponível em: https://abepro.org.br/biblioteca/enegep2010_tn_sto_133_848_14839.pdf. Acesso em: 15 mai. 2024.

MANZINI, Eduardo José; LUPETINA, Raffaela. Um estudo sobre a elaboração de roteiros para entrevista semiestruturada. **Revista Cocar**, v. 21, n. 39, p. 1-19, 2024. Programa de Pós-Graduação em Educação, Universidade do Estado do

Pará, Belém, Pará, Brasil. ISSN 2237-0315. Disponível em: https://periodicos.uepa.br/index.php/cocar/article/download/8418/4046/40446. Acesso em: 12 jan. 2025.

MARION, José Carlos. **Contabilidade Rural:** contabilidade agrícola, contabilidade da pecuária, imposto de renda pessoa jurídica. 8. ed. São Paulo: Atlas, 2005.

MARION, Jose Carlos; RIBEIRO, Osni Moura. **Introdução à contabilidade gerencial**. Saraiva Educação SA, 2014.

MELO, D. M.; FERNANDES, F.C.; COSTA, S.T.S.; SILVA, M.R.L.; ROBERTO FILHO, M.; CHAVES, P.V.A.. A importância da gestão rural e da sustentabilidade em pequenas propriedades rurais. **Revista GeTeC**, v. 10, n. 31, 2021. Disponível em: https://revistas.fucamp.edu.br/index.php/getec/article/view/2510. Acesso em: 21 out. 2023.

MICHELETTI, D. H; CORRÊIA, A. F. O uso da energia solar fotovoltaica como incentivo ao desenvolvimento rural sustentável. **Conjecturas**, *[S. l.]*, v. 22, n. 14, p. 650–670, 2022. DOI: 10.53660/CONJ-1790-2L06. Disponível em: https://conjecturas.org/index.php/edicoes/article/view/1790. Acesso em: 20 jul. 2024.

NATALLI, Luiz Henrique; MUNARETTO, Lorimar Francisco; BIANCHINI, Débora Cristina; HENKES, Jairo Afonso. PRÁTICAS DE SUSTENTABILIDADEAMBIENTAL EM PROPRIEDADES RURAIS. **Revista Gestão e Sustentabilidade Ambiental,** [*s. l.*], v. 9, ed. 1, p. 351-374, 2020. Disponível em: https://portaldeperiodicos.animaeducacao.com.br/index.php/gestao_ambiental/article/view/6997/4941. Acesso em: 21 out. 2023.

OLIVEIRA, Soraia Santos; BRAINER, Mônica Maria de Almeida; MACHADO, Alan Soares; PAIVA, Sérgio Côrtes; FABINO NETO, Ronaildo. Ocorrência de mastite clínica e subclínica no rebanho leiteiro do Instituto Federal Goiano Campus Ceres. **Revista Ciência Animal**, v. 34, n. 4, p. 39-49, 2024. Disponível em: https://revistas.uece.br/index.php/cienciaanimal/article/view/14715. Acesso em: 12 jan. 2025.

PEREIRA, Lutero de Paiva**. Financiamento rural**. Curitiba, Juruá, 2006.

PIRES, Jorge de Barros; SILVEIRA, Lauro Frederico Barbosa da. Sobre termos, proposições e argumentos. Trans/Form/Ação, Marília, v. 40, n. 4, p. 75-90, out./dez. 2017. Disponível em: https://www.scielo.br/j/trans/a/PSpwDTDhfKJVy93VfnWyVjq/. Acesso em: 11 mar. 2025.

POTRICH, Rafaele, GRZYBOVSKI, Denize; TOEBE, Carlisa Smoktunowicz. Sustentabilidade nas pequenas propriedades rurais: um estudo exploratório sobre a percepção do agricultor. **Estudos Sociedade e Agricultura**, 2017, vol. 25, n. 1, p. 208-228. Disponível em: https://revistaesa.com/ojs/index.php/esa/article/view/esa25-1_09_sustentabilidade. Acesso em: 21 out. 2023.

QUEIROZ, R. S. **Gestão da Pequena Propriedade Rural.** Em Gestão da Pequena Propriedade Rural. Brasília - DF. NT Editora, 2014.

RATKO, Alice Terezinha. **Contribuições Da Contabilidade Rural Para Propriedade Agrícola De Pequeno Porte**. Orientador: Prof. M. Sc. Antonio Cecílio Silvério. 2008. 74 f. Dissertação (Graduação em Ciências Contábeis) - UNIVERSIDADE TECNOLÓGICA FEDERAL DO PARANÁ - UTFPR, Pato Branco, 2008. Disponível em: https://revistas.utfpr.edu.br/ecap/article/view/11109. Acesso em: 21 out. 2023.

RENZI, Adriano; HENZ, Aline Patrícia; ZIDORA, César Benites Mario; SHIKIDA, Pery Francisco Assis. EVOLUÇÃO DO CONTROLE BIOLÓGICO DE INSETOS E PRAGAS NO SETOR CANAVIEIRO: UMA ANÁLISE NA PERSPECTIVA ECONÔMICA. **Revista em Agronegócio e Meio Ambiente**, v. 12, n. 2, p. 599-620, 2019. Disponível em: https://periodicos.unicesumar.edu.br/index.php/rama/article/view/6169/3420. Acesso em: 20 jul. 2024.

SILVA, Leidian Moura. Benefícios da Contabilidade Rural para a Agricultura familiar: um estudo sobre as famílias na cidade Capitão Poço – Pará. In:

Congresso UFU de contabilidade, 2, 2017, Uberlândia. 2017. Disponível em: https://eventos.ufu.br/sites/eventos.ufu.br/files/documentos/9373_-_beneficios_da_contabilidade_rural_para_a_agricultura_familiar_-_um_estudo_sobre_familias_na_cidade_de_capitao_poco_-_para.pdf. Acesso em 15 mar. 2024.

SILVA, E. L., MENEZES, E. M. **Metodologia da pesquisa e elaboração de dissertação**. Programa de Pós-Graduação em Engenharia de Produção, Universidade Federal de Santa Catarina, Florianópolis, 118p, 2000

SILVA, Gustavo Martins da MAIXNER Adriano Rudi**.** Manejo de pastagens para gado leiteiro. *In:* **CURSO DE PRODUÇÃO DE LEITE ORGÂNICO**, 2015, Concórdia. Anais. Concórdia: Embrapa Suínos e Aves, 2015. Disponível em: https://www.alice.cnptia.embrapa.br/alice/handle/doc/1034041. Acesso em: 10 dez. 2024

SILVA, M. A.; NASCENTE, A.S.; LANNA, A. C.; REZENDE, C. C.; CRUZ, D. R. C.; FRASCA, L. L. de M.; FERREIRA, A. L.; FERREIRA, I. V. L.; DUARTE, J. R. de M.; FILIPPI, M. C. C. de. Sistema de plantio direto e rotação de culturas no Cerrado. **Research, Society and Development**, *[S. l.]*, v. 11, n. 13, p. e376111335568, 2022. DOI: 10.33448/rsd-v11i13.35568. Disponível em: https://rsdjournal.org/index.php/rsd/article/view/35568. Acesso em: 20 jul. 2024.

SILVA, Valdivino Veloso . **Expansão agrícola e as transformações ambientais no município de Pedro Afonso**. 2022. 180 f. Dissertação (Mestrado em Geografia) Programa de Pós Graduação em Geografia, Universidade Federal do Tocantis, Tocantins, 2022. Disponível em: https://repositorio.uft.edu.br/handle/11612/4005. Acesso em: 15 mai. 2024.

THOMAS, Jorge André *et al*. **Reorganização financeira de uma empresa rural familiar**. Revista Tecnologias de Administração e Contabilidade, v. 5, n. 1, p. 1-14, 2015. Disponível em: https://www.researchgate.net/publication/313777871_Reorganizacao_Financeira_de_uma_Empresa_Rural_Familiar. Acesso em: 15 jun. 2024

WAHRLICH, J.; ALVARENGA, R. A. F.; HENKES, J.A.; ROSSATO, I.F.; SIMIONI, F.J.. Avaliação da sustentabilidade do ciclo de vida: uma

revisão. **Revista Gestão & Sustentabilidade Ambiental**, v. 9, n. 2, p. 183-201, 2020. Disponível em: https://portaldeperiodicos.animaeducacao.com.br/index.php/gestao_ambiental/article/view/5523/5198. Acesso em: 11 nov. 2023.

YIN, Robert K. **Estudo de caso:** planejamento e métodos. 5. ed. Porto Alegre: Bookman, 2015.