Chapter 76

Analysis of socioeconomic indicators of rural properties in Nova Esperança do Sudoeste - PR

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ABSTRACT

Obtaining income from farming activities is intrinsically linked to economic, social, and environmental bias. In this sense, seeking to understand income generation, eight rural properties in the municipality of Nova Esperança do Sudoeste - PR were studied, relating quantitative indicators of Gross Product (PB), Intermediate Consumption (CI), and Agricultural Income (RA). This analysis used the variables produced by the extension project and discipline Planning of Rural Properties that is practiced in an academic and social environment in the agronomy course of the Federal Technological University of Paraná, Campus Dois Vizinhos, whose methodology is divided into three main parts: diagnosis, rural planning and feedback to rural producers. In this context, information was used about the production systems of the properties mainly focused on dairy production, an agricultural area, PB/ha, CI/ha, AR/ha, and two indices calculated through the contrast between the indicators (RA(ha)/CI(ha)) and (RA(ha)/PB(ha)). In this analysis, different income generation strategies were noted, being differentiated by the degree of investment with inputs, where, in general, the properties that invested more, obtained better returns, with exceptions in which the gross wealth produced was not consistent with the amount invested, generating economic inefficiency of the activity.

Keywords: Investments, Agricultural income, Production systems.

1 INTRODUCTION

Over the years, Brazilian agriculture has undergone intense transformations. In the state of Paraná, in the Southwest region, a sharp process of modernization of agriculture took place in the 1970s, including in family farming, and modifying income generation strategies (SAVOLDI; CUNHA, 2010).

According to MAPA (2019), family farming is considered the internal arrangement of work on rural property, which is shared by the family members themselves, and the main source of income for the family is through agricultural activity.

Given this statement, it is possible to state that the success of a rural property is based on the efficient and intelligent use of the available productive factors, to extract the maximum economic income from the rural space, and make the rural property efficient in its agricultural activities.

For this, it denotes the importance of rural administration tools, which help the rural producer in the more efficient and rational use of the resources available in the environment in which they live, to promote lasting rural management and see the rural property as a company, and not just as a mere rural space (QUEIROZ, 2014).

In this sense, aiming to measure economic and productive efficiency, this study makes use of quantitative indicators that allow analyzing the economic, social, and productive aspects of the selected agricultural production units. In this way, the socioeconomic indicators summarize, in a summarized and structured way, the efficiency of the productive factors for the generation of family income (WAGNER ET AL., 2010).

Therefore, the main context is to analyze the rural socioeconomic indicators, namely the Gross Product per hectare (PB/ha), Intermediate Consumption per hectare (CI/ha) and Agricultural Income per hectare (RA/ha) of eight rural properties in the Linha Gavião community in the municipality of Nova Esperança do Sudoeste - PR, whose production systems are aimed at dairy cattle and grain production. We sought to understand the relationships between gross production, intermediate production costs, and the net wealth produced, inferring whether the intensification of the use of inputs in a given production system generates greater or lesser economic efficiency of the properties.

2 MATERIALS AND METHODS

The methodology used in this study is carried out due to the extension project called Planning of Rural Properties, developed in an academic environment at the Federal Technological University of Paraná, Campus Dois Vizinhos, Paraná.

The extension project is developed in line with the discipline of the 9th period of the curriculum of the Bachelor of Agronomy course, also called Rural Property Planning. This curricular unit is offered on a mandatory basis for students of the course and is intended to insert students into real field situations, where they develop, as a group, a complete study about an Agricultural Production Unit (UPA), and at the same time At the end of the work, feedback is presented to the rural producer on the proposals thought and worked on throughout the course on what can be improved within the properties.

The discipline of Rural Property Planning has been practiced in partnership with the IDR - PR (Institute of Rural Development of Paraná) since 2016. In 2019, the extension project emerged and was linked to this discipline of Agronomy. In this period to date, more than 100 rural properties in the Southwest region of Paraná have been studied.

Briefly, the project is divided into three main phases, where the first phase is composed of the application of a diagnosis with rural producers. The second phase is composed of the planning of the properties themselves, containing proposals, actions, and activities on rural properties. All propositions are evaluated by a panel of specialist professors in the agronomic area and by rural extension technicians, whose suggestions are added to improve the work. And the third and final phase is made up of the final presentation of the projects to rural producers and their families, through an event called feedback to rural producers.

Because of the above, the socioeconomic indicators used in this study were collected in the first semester of 2022. Information was collected from eight agricultural properties in the municipality of Nova

Esperança do Sudoeste - PR, containing socioeconomic indicators, including Gross Product, Agricultural Income, and Intermediate Consumption, used in this analysis.

The explanation of such indicators used to base the study is presented according to Lima et. al (1995), discussed below.

- Gross Product (PB): This value includes all products sold, consumed, or stored by the rural producer in the last agricultural year.

- Intermediate Consumption (CI): This value includes all the inputs used in the production of the property and various expenses related to the production systems.

- Agricultural Income (AR): This value includes the net wealth that is left over to the rural producer, discounting all expenses that were used in the production process.

Thus, to determine the efficiency of agricultural production units, previously calculated indices will be used that relate to the socioeconomic indicators presented. Thus, the variables and relative characteristics of the rural properties used in this study will be used, which will contrast the production systems, an effective amount of agricultural area in hectares (SAU), Gross Product per hectare (PB/ha), Intermediate Consumption per hectare (CI/ha), and Agricultural Income per hectare (AR/ha). All these indicators will be divided by the SAU to account for the differences in the area between one and another production unit. Therefore, it is necessary to emphasize that the landowner who has the highest SAU and PB will not always obtain the best economic efficiency from the property.

Therefore, intending to determine the economic efficiency of rural properties, the socioeconomic indicators presented will be used to determine, in a comparative way, two relative numerical indices. Since such values will contrast the net income obtained per unit area of rural properties, with the amount invested and returned from agricultural activities. Thus, the greater these relationships are, the more efficient the properties are.

In the first index, the objective will be to determine the rate of return for each real investment, which can be summarized as the profitability of agricultural activities carried out within the properties. Therefore, the index will be given by the ratio between the Agricultural Income per hectare (RA/ha) by the Intermediate Consumption per hectare (CI/ha) multiplied by 100.

In sequence, the other calculated index will seek to establish the effective profit rate of rural properties, after discounting all expenses and costs, being assigned in this case as the profitability rate. To obtain the value, the index will be given by the ratio between the Agricultural Income generated per hectare (RA/ha) by the Gross Product per hectare (PB/ha), multiplied by 100, generating the percentage value of effective profit.

3 RESULTS AND DISCUSSION

In this sense, to measure the economic efficiency between the different production systems and within a system itself, with different levels of productive intensification, expressed by the high value of intermediate consumption, in the properties of Nova Esperança do Sudoeste - PR, table 1 contains the relevant information.

The agricultural properties will be presented by the nomenclature of groups, referenced by their specific numerical sequence, followed by the main activity they carry out, and the UAA (Useable Agricultural Surface) in hectares. Afterward, the values of the socioeconomic indicators Gross Product per hectare (PB/ha), Intermediate Consumption per hectare (CI/ha) and Agricultural Income per hectare (AR/ha) will be presented, used to determine the two economic efficiency indices.

Table 1 - Socioeconomic indicators of rural properties

Grupos	Grupo 1	Grupo 2	Grupo 3	Grupo 4	Grupo 5	Grupo 6	Grupo 7	Grupo 8
Atividades	Leite	Leite	Grãos/leite	Leite	Leite	Grãos/leite	Leite	Leite
SAU (ha)	11,14	12,2	40,73	24,32	7,75	8,4	18,13	33,79
PB/ha (R$)	17.310,59	87.624,59	23.989,54	19.539,47	40.877,42	5.355,59	22.238,28	6.778,78
CI/ha (R$)	12.309,88	54.001,94	13.980,77	9.631,11	25.655,13	1.378,92	17.432,15	2.110,36
RA/ha (R$)	4.828,38	25.247,76	3.680,42	9.293,58	14.677,38	1.526,19	3.511,00	4.642,34
RA(ha) / CI(ha) (%)	39	46	26	97	57	111	20	220
RA(ha) / PB(ha) (%)	28	28	15	48	36	28	16	68

Source: Prepared by the authors, 2022.

Subtitle: Groups
Group 1, Group 2, Group 3, Group 4, Group 5 Group 6, Group 7, Group 8
Milk, Milk, Grain/Milk, Milk, Milk, Grain/Milk, Milk, Milk

It is worth mentioning that all groups have the milk production system as their main source of income, and in groups 3 and 6 they add grain production to the system.

Analyzing the table, it is possible to verify that group 2 differs from the other groups with a milk production system because it presents greater intensification, understood here as revealing a higher intermediate consumption per hectare (PB/ha) and the highest gross product per hectare (PB /ha), being, therefore, the most intensive in terms of production and activity costs. Thus, it also has a higher Agricultural Income per hectare (AR/ha) than the other groups. This, however, causes the ratio (RA(ha)/CI(ha)) to be 46%, lower than other less intensive production units. The result was already expected given that the intensification results in a lower return per area. Likewise, the second index is similar to the others, or even lower than that of the properties with less investment in inputs for production. However, analyzing the absolute results, the Agricultural Income per land area responded positively to the intensification, of the increase in costs, but reduced the margins of investment return and effective profit. Group 5 presents a

similar behavior to group 2, being properties with a limited usable area, whose solution is to intensify production.

On the other hand, when analyzing the production unit with a dairy system, with the lowest AR/ha, the lowest IC/ha, and the lowest PB/ha, in the case of group 8, it is perceived that it presents a higher return on invested capital and, consequently, a higher profit percentage. However, the effective profit rate seems to be less sensitive to costing values. When comparing groups 01 and 02, we noticed similar rates between more or less intensive production units.

The two indices: rate of return per invested capital (RA(ha)/CI(ha)) and affective profit rate, after discounting all costs (RA(ha)/PB(ha)), in these two analyzed cases, do not are good indicators for decision making, if looked at in isolation. There is group 8, with a less intensive system, with low AR/ha, but with high rates of return. In this case, the family benefits from the extension of the area and not from the productive efficiency. And group 6, with area limits and non-intensive production, with a high rate of investment return, but with low effective profit.

Therefore, it is concluded that other income indicators are necessary to analyze income generation between production units with the same systems, but with different degrees of intensification, such as agricultural income per hectare. Group 7 is an example of non-productive efficiency about intermediate consumption. Possibly in this case, there are technical production problems, despite the expenses, which are approximately twice what group 4 spends, but which generates the same wealth, and the income per hectare is 1/3 of group 4.

In general, the Agricultural Income per hectare is a better indicator of productive efficiency, as it takes into account the productive and economic efficiency per unit of area, thus relativizing absolute numbers that can cover up productive deficiencies, especially if we use only the effective profit index.

4 CONCLUSION

The great paradigm of current agriculture is to produce more and more in the same unit of land area. The intensification of production and the consequent increase in production costs must result in higher absolute income values than non-intensification. To achieve this objective, it is essential to a contribution to technologies in the agricultural environment, used in all stages of agricultural production, which will require rural producers to have rural planning and efficient management, and specialized technical assistance (IZI GESTÃO AGRO, 2020).

Thus, it is clear that the two indices used in this analysis indicate the economic efficiency of agricultural properties and should be analyzed together, and never isolated because even when they are higher, they do not mean enough income for the family.

Analyzing the theme, it is clear that there are situations in which income depends on land area and in other cases on productive efficiency.

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