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Dichotomy between urban and rural areas: statistical data may not reveal the synergy between these two existing spaces

The gains in non-agricultural activities represents a new dynamic in rural Brazil and now has representation in Brazil from the 1990s. In this perspective, the Brazilian countryside is undergoing a reconfiguration, pointing to an intensification of the urbanization of rural areas, especially in peri-urban areas. The installation of industries in rural areas, the deployment of agribusinesses and food exporters and utilization of rural labor for those industries, are tying the stretches between urban and rural areas. Thus, rural households are increasing income through agricultural and non-agricultural activities. The rural environment is no longer exclusively agricultural. It went on to have a diversified productive base and integrated economy in the region. Since there is a growing rural human being mobility, as well as an improvement in communication and access to information and greater integration between markets reducing the dichotomy between urban and rural. On the other hand the expansion of the cultivation of sugar cane on a region can increase the (Gross National Product) GNP per capita of the region and enable an increase economical activity. Thus, the rural household pluri-activity can be an alternative to increase the income of these families as they, increasingly integrate with the local market. It is known that with rising incomes and improving the welfare of the rural population can reduce the rural exodus that became increasing in the country since the 1970s. However, in areas with predominantly or expansion of monoculture, as an example of cane sugar, may be an increased land concentration and a worsening of income distribution in a region, and to record an increasing in rural migration, Environmental degradation and reduced local production diversification. An analysis of several indicators, socio-economic and environmental, through the Dashboard of Sustainability is possible to tell which category has the highest rate of farmer sustainability, whether smallholders or monoculture. However, the secondary data available in Brazil today does not support a thorough analysis of the participation of each actor and to which the interconnection between the actors and their synergy in local economic activity. Since, given the narrowing between urban and rural, the statistical data available are not able to demonstrate the extent to which gives the rural-urban dichotomy. Thus, it is relevant to point out and discuss ways to provide consistent statistical data and be, in fact, able to demonstrate the local reality of a region within the welfare actors.

Keywords: Welfare; Dichotomy; Economic Activity.

Dichotomia entre áreas urbanas e rurais: dados estatísticos podem não revelar a sinergia entre esses dois espaços existentes

Os ganhos nas atividades não agrícolas representam uma nova dinâmica no Brasil rural e agora tem representação no Brasil a partir da década de 1990. Nesta perspectiva, o campo brasileiro está passando por uma reconfiguração, apontando para uma intensificação da urbanização das áreas rurais, especialmente nas áreas periurbanas. A instalação de indústrias nas áreas rurais, a implantação de agronegócios e exportadores de alimentos e a utilização da mão de obra rural para essas indústrias, estão ligando os trechos entre áreas urbanas e rurais. Assim, as famílias rurais aumentam a renda através de atividades agrícolas e não agrícolas. O meio rural não é mais exclusivamente agrícola. Continuou a ter uma base produtiva diversificada e uma economia integrada na região. Uma vez que existe uma crescente mobilidade humana rural, bem como uma melhoria na comunicação e acesso à informação e maior integração entre os mercados, reduzindo a dicotomia entre o urbano e o rural. Por outro lado, a expansão do cultivo de cana-de-açúcar em uma região pode aumentar o PNP per capita (Produto Nacional Bruto) per capita da região e possibilitar o aumento da atividade econômica. Assim, a pluri-atividade familiar rural pode ser uma alternativa para aumentar a renda dessas famílias à medida que elas se integram cada vez mais com o mercado local. Sabe-se que com o aumento dos rendimentos e a melhoria do bem-estar da população rural pode reduzir o êxodo rural que cresceu no país desde a década de 1970. No entanto, em áreas com predominância ou expansão da monocultura, como exemplo de açúcar de cana, pode haver uma maior concentração de terra e um piora da distribuição de renda em uma região e registrar um aumento na migração rural, degradação ambiental e diversificação da produção local reduzida. Uma análise de vários indicadores, sócio-econômicos e ambientais, através do Painel de Sustentabilidade, é possível dizer qual categoria tem a maior taxa de sustentabilidade dos agricultores, sejam eles pequenos agricultores ou monocultivos. No entanto, os dados secundários disponíveis no Brasil hoje não suportam uma análise minuciosa da participação de cada ator e a qual a interconexão entre os atores e sua sinergia na atividade econômica local. Uma vez que, dado o estreitamento entre o urbano e o rural, os dados estatísticos disponíveis não são capazes de demonstrar até que ponto a dicotomia rural-urbana dá. Assim, é relevante apontar e discutir maneiras de fornecer dados estatísticos consistentes e ser, de fato, capaz de demonstrar a realidade local de uma região dentro dos atores do bem-estar.

Palavras chave: Bem-estar; Dicotomia; Atividade Econômica.

Topic: **Engenharia Ambiental**

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INTRODUCTION

From the 1990s, the Brazilian countryside now presents a new dynamic, with the main effect of the increase in income of farmers, arising mainly from non-agricultural activities. However, in areas with predominantly or expansion of monoculture, as an example of cane sugar, an increased concentration of land ownership, a worsening of income distribution, and increased rural migration, environmental degradation and reduced diversification local production is observed (CAMARGO et al., 2008). According to Castro et al. (2010), the expansion of sugar cane cultivation in Goiás is taking place in areas were grain production and livestock were in place. Since 2007, there has been an intensification in the expansion of monoculture of sugar cane in Goiás. This expansion is advancing on areas of grain and pasture, mainly in the regions of Central and South Goiás.

According to data from SEPLAN, the municipality of Goiatuba, which is located in the southern region of the state of Goiás, experienced an accelerated expansion of the cultivation of cane sugar. The sugar cane harvested area jumped from 11,350 ha in 2004 to 23,370 ha in 2011 (+105.90%). The expansion of sugar cane contributed to improve socioeconomic indicators such as GDP per capita and number of formal employments. The GDP per capita increased from R$ 15,365.19 in 2003 to R$ 21,934.02 in 2011 (+42.75%). The number of formally employed people increased by 133.90% in the same period.

This study aimed to discuss the effects of the expansion of sugar cane cultivation on other rural activities in the municipality of Goiatuba (Goiás state, Brazil). To achieve this goal, we conducted a field study using a questionnaire with open and closed questions. This questionnaire was applied to 76 family farmers (diversified and not diversified) of Goiatuba municipality and to 11 sugar cane providers to sugar mills.

THEORETICAL FRAMEWORK

Rurality

The rurality's can be defined as typical objects and actions of the countryside. They characterize the identity of the rural population, while urbanities have features typically urban. In this perspective, Kay (2009) argues that the Brazilian countryside is undergoing a reconfiguration, pointing to an intensification of the urbanization of rural areas, particularly in peri-urban areas. The setup of industries in rural areas, deploying and exporting agro food and the use of rural labor by these industries, is tying the stretches between urban and rural areas. Thus, rural households are increasingly earning income through agricultural and non-agricultural activities. According to Veiga (2006), this new rurality is based fundamentally on three vectors, namely: rural tourism attraction with environmental conservation, conservation of local biodiversity and the use of renewable energy.

According to Favareto (2010), the income of rural households has grown considerably in Brazil, from the 1990s, due to the increase of employment in non-agricultural activities. The author highlights the jobs in urban areas near the rural areas also because of increased services or drafting of the products inside the

agricultural establishment or growth of income transfers associated with social programs from the federal government.

The rural areas, as well as towns, takes on new functions, causing an economic and social dynamism. Among the "new features" of the rural areas that are increasingly gaining prominence are the leisure activities such as rural tourism, second homes and rural pensions (LINDNER, 2008). Thus, "new jobs and enterprises come into existence over time, which comes to exert direct effects to the multiplication of activities and the development of the territory as a whole" (RADOMSKY & SCHNEIDER, 2007).

To Wanderley (2001), this dynamism of rural areas is the result of several converging factors. The first factor is economic decentralization, where several plants are installed in some rural areas, precisely because of economic and social attractiveness of this area. Another factor is the economic and social equity that rural population that has access to the same goods and services produced in modern urban centers as well as income levels closer to those of urban dwellers. Finally, another factor is the demographic in favor of reducing the rural-urban migration and the attraction to the rural areas of other social categories.

According to Silva (2002), the new Brazilian countryside consists of four subsets: a) modern agriculture - Brazilian agribusiness b) subsistence activities with rudimentary agriculture c) non-agricultural activities (housing, leisure services) d) new agricultural activities (farming, floriculture, and small livestock). The Brazilian countryside is not only seen as agriculture or livestock and agriculture related activities only. The new activities in rural areas may mischaracterize many producers. On this new phase pluriactive families arise. These families carry out on-farm and off-farm activities. Many of off-farm activities are carried out in urban industrial sector or new activities developed in the countryside.

According to Schneider (2007), the rural non-farm activities are important, especially in Latin America. They can solve three major problems in rural areas, which are rural poverty, the transformation and the technical - scientific modernization of the agricultural sector. Since the non-agricultural activities may represent the only way for farmers to obtain cash income, especially in activities upstream and downstream industry.

Pluriactivity

What defines and characterizes the plural is the effective combination of agricultural and non-agricultural activities, allowing the social reproduction of farms working primarily based on family labor. Since it is considered pluriactive the family household in which at least one of the members of this unit performs any activity other than agriculture. It is considered as non-agricultural activity that does not involve the cultivation of land and livestock management (SCHNEIDER, 2001). The pluriactive to Fuller (1990), should be seen as an element of diversification of income that can be produced within the family or from the outside, because it works as a strategy that changes according to the dynamics of families and its relation to the agrarian structure. The pluriactive is the strategy of a family "for the purpose of - to diversify their activities outside the establishment - and ensure the reproduction of his tenure as a central reference point and convergence for all family members" (WANDERLEY, 2004).

According to Schneider (2003), "to the extent that families can have a more diverse portfolio of work options, making it pluriactive, their incomes tend to increase, to acquire greater stability, and sources tend to diversify" (SCHNEIDER, 2007). The pluri-productive practices is not unique to agriculture, and these activities can be performed both inside and outside the property, resulting in the increase in income and household income pluriactive. The trend is that the pluriactivity be generalized agricultural production areas, where the demand for labor, work diminish because of technological advancement, and in other rural areas, where the state spends to stimulate the development of other economic activities such as ecotourism and handicrafts. With pluriactivity is possible to increase the sources of income and access to family farmers. This happens through the diversification of their occupations both inside and outside the property.

In the 90s, the relative reduction in employment growth in rural agricultural strictly opposed to the increase in non-farm rural employment is presented as further evidence that the creation of non-agricultural jobs in rural areas. It is, therefore, the only possible strategy could to simultaneously retain that rural poor in their current places of residence and at the same time, raise their level of income (SILVA, 1999).

The growth of non-agricultural activities in rural areas should not be construed in a hurry, as a loss of importance of agricultural activities properly. "In fact, what we see is a process of diversification of production in these areas, probably related to the growth of economic and social commodification" (SCHNEIDER, 2000).

Is important to put the pluriactive by its very nature, implies the permanence of agriculture. The fact that income from non-agricultural activities were higher than that obtained with the results of domestic production cannot obscure the centrality of the family patrimony, whose reproduction in the present and in the future, is organized through activities of family members (WANDERLEY, 1999, 2003).

The difficulty of farming households is not due to the presence, but above all, the absence or weakness of offering non-agricultural activities in the local space. To Kageyama, "in Brazil as a whole, the plurictive has slowly grown: in 1995 there were 16.6% of rural households pluriactive, in 2003 this proportion increased to 17.2% and only 18.4% of rural households were pluriactive in 2005 (KAGEYAMA, 2008).

Dualism: Family Farming and Monoculture

For Ellis and Biggs (2000), small farmers are rational agents who make economic decisions are efficient and as capable as large farmers to take advantage of efficient combinations of inputs and thus have a successful cultivation. According to Sachs (2001), the family farm is the best form of occupation of rural areas, as it responds to social criteria, generating self-employment and income, and environmental criteria, having the function of being conservative guardians of the landscape and biodiversity.

As Buainain et al. (2003), "family farming intensively explores the scarce resources available and it is possible to generate agricultural income levels higher than the playback level of the family." The model of production based on intensive farming allows increased production and wealth. However, this model has an aggravating factor, in rural areas, reducing the use of labor-wage labor, rather than the use of modern technology sparing hand labor, and increasing damage to the environment (FAVARETO, 2010).

The presence of intensive monoculture implies the use of modern technologies and chemicals. Since the expansion of monoculture results in increased production of one or a few specific items and has caused the decrease in crop variety of other already consolidated in a region, thus generating the practice of monoculture production systems in regions that become specialized heterogeneous with each other for the same crop (KAGEYAMA, 2004).

According to Veiga (2001), "systems that combine beef cattle with grain or cane sugar absorb much less labor than others. Moreover, activities that require more work occupy negligible percentages of acreage. "For the author, the primary segment of the Brazilian agribusiness has as its basic premise the reduction of production costs through use of a modern technological package and specialization of farms that do not absorb or absorb low, unskilled labor. Since the spaces exclusively agricultural has the characteristic of having a high per capita income, however, income is concentrated in the hands of few people. Furthermore, these areas become monotonous, soil and water may be contaminated by agrochemicals and it can prevent these areas enjoy the main dynamics that rural areas are presenting today.

Expansion of the monoculture of sugar cane in Brazil and specifically in the state of Goiás

The expansion of the cultivation of cane sugar over consolidated areas of food crops and pastures began in the 1970s in the state of São Paulo. Because of this expansion, consolidated areas in soybean, cotton and cattle were incorporated for the cultivation of sugar cane. These cultures, which were replaced by sugarcane, advanced on pastures that migrated toward the center of the country (Castro et al., 2010).

The expansion of the cultivation of sugar cane in Brazil was consolidated, from the 1970s, with the creation of the National Alcohol Program (Proálcool). According Abdala and Ribeiro (2011), the first phase of the program, between 1974 and 1979, only two municipalities in Goiás were consolidated in the production of cane sugar, Santa Helena and Goianesia. In the second phase of the Alcohol Program, 1979-1986, other areas of the State of Goiás were incorporated into monoculture cane sugar. In this phase, especially areas that had good logistics infrastructure and transportation for transport of grain were incorporated. These areas belong to the north-southern state of Goiás Already the third phase of the program, from 1986 to 1995 is characterized by deregulation of this sector in Brazil and the reflection of that for Goiás was reduced harvested area of sugar cane in the state. The fourth phase of Proálcool is characterized by the large expansion of the cultivation of sugar cane in Brazil and Goiás State In this expansion was consolidated at the beginning of the XXI century.

According Pasqualetto and Zito (2000), the major environmental and social problems caused by the monoculture of sugar cane are related to: (a) the reduction of local biodiversity, caused by deforestation and the burning; (b) contamination of surface and groundwater and soil through the practice of excessive chemical fertilizer, lime minerals, and application of herbicides and pesticides; (c) soil compaction by heavy machinery traffic; (d) siltation of water bodies due to soil erosion in areas of reform; (e) air pollution through

the burning of sugarcane for harvest; and (f) for their processing, changing the landscape, land and income concentration.

The main environmental impacts arising from the cultivation of sugar cane, especially in areas that specialize in this crop, are deforestation and consumptive use of water (ABDALA & RIBEIRO, 2011). According Pasqualetto and Zito (2000), the sugar cane is grown on more fertile soils, which are more favorable to mechanization because of the low slope. The same authors state further that the expansion of monoculture of sugar cane is occurring mainly on areas of food crops and on pastures, as well as, in some areas, over large areas that often encompass small family farms. Thus, is occurring in many areas, increasing the concentration of land.

The municipality Goiatuba

The municipality of Goiatuba, with a population of 32,481 inhabitants (IBGE, 2010), belongs to the homogeneous microregion Vertente Goiana do Paranaíba. The municipality comprises the district of Marcianópolis and the communities of Serrinha, Posto Alvorada, Rochelândia, Santo Antônio and Venda Seca.

The economy of the municipality was, until 2004, anchored in the production of soybeans, corn and cotton. However, from that same year, the economy of Goiatuba grew based on the expansion of the cultivation of sugar cane. The expansion of the cultivation of sugar cane in the city began to expand on areas already used by other crops like soy, corn and cotton. Analyzing the data in Table 1 it is possible to realize the considerable increase in area harvested and the amount of sugar cane produced in Goiatuba.

Table 1: Production and harvested area of sugar cane in the municipality of Goiatuba, 2000-2011.

Year	Production (t)	Harvested Area (ha)
2000	411,420	5,244
2001	715,400	9,112
2002	688,880	8,720
2003	646,640	8,653
2004	925,025	11,350
2005	978,400	12,230
2006	1,101,870	13,356
2007	1,101,870	13,356
2008	1,525,200	18,600
2009	1,640,000	20,000
2010	1,640,000	20,000
2011	1,916,340	23,370

Source: SEPLAN/SEPIN, 2011.

According to data in Table 1, one can see that the area harvested cane sugar jumped from 11,350 ha in 2004 to 23,370 ha in 2011 (+106%). For the same period, the production amount also increased by 107%. According to data from SEPLAN / SEPIN, in the period 2005-2010, the soybean harvested area was reduced by 23%. For the same period the cotton harvested area decreased 67.20% and only corn harvested area increased by 26.08%.

The process of expansion of the cultivation of sugar cane, mainly in the Southwest Goiás is conditioned by variables such as location, soil fertility, topography and water resources. This expansion has

led to competition between sugar cane cultivation and other crops, such as soybeans and corn (Miziara, 2009).

METHODOLOGY

The present study is based on the first moment of a literature review that addressed the new dynamics of the Brazilian countryside. In a second step were structured indicators show that the socio-economic and environmental impact of family farmers (and settlers) and suppliers of cane sugar municipality Goiatuba. For the composition and calculation of the indicators used in the study was carried out field research in the municipality of Goiatuba. In this study were interviewed family farmers and sugarcane suppliers of the municipality. The indicators were divided into four dimensions - social, economic, environmental and institutional. To evaluate the performance of each dimension values of the indicators were shot in the tool Dashboard of Sustainability and a general index was calculated to determine which allowed actors (if family farmer or supplier of cane sugar) perform best within these four dimensions.

According to Bellen (2006), the Dashboard of Sustainability is an important tool to assist public and private stakeholders in making decisions and rethink strategies, previously taken for local or regional development. This tool is coordinated by the International Institute for Sustainability Development (IISD).

The dashboard calculates an index that aggregates several indicators; each indicator is inserted into four main groups. These groups represent the social, economic, environmental and institutional in a region. The specific indicator within a given group has equal weight. Each dial has the same weight and thereby generates an overall sustainability aggregate, which is Sustainable Development Index. An algorithm calculates the overall sustainability. Thus, the data of each indicator are grouped according to criteria of variations from 1 to 1000. 1 being the worst case and the best case for 1000. The system performance is evaluated using a set of colors ranging from dark red, which is the critical point, until the dark green, which is the optimum point.

In developing the indicators secondary data were collected by the IBGE, IPEA, SEPLAN DATASUS, primary data were collected near the municipal health and education of the municipality as well as field research with the farmers of the county to complete this data. The field research was to instrument data collection a questionnaire with open and closed questions. As the county has 341 farmers calculation was done to determine the sample size of the survey. Was used to calculate finite population and a simple random sample. In addition, for a significance level of 95% and 10% sampling error calculations indicated that it would be necessary to use as a total sample size of 76 family farmers and 11 vendors Goiatuba sugar cane.

RESULTS AND DISCUSSION

From the primary and secondary data collected was possible to create some indicators and build some sustainability indices, within the four dimensions identified by Bellen (2006), economic, environmental, social and institutional. The field research was conducted with 11 sugar cane providing farms and 76 family farmers. From the 76 family farmers, 32 are pluriactive and 44 are not pluriactive. In total, we interviewed

87 families of farmers Goiatuba. Moreover, for the 32 pluriactive family farms we consulted pluriactive a total of 112 people; for the 44 not pluriactive family farms, we consulted a total of 109 individuals. From the 11 sugar cane providing families, we checked a total of 43 people. Thus, the total sample considered was of 263 individuals belonging to 88 families.

Economic dimension

For this dimension were raised seven economic indicators, which are: income per capita; access to credit; Gini Index; own private transportation; indebtedness ratio; dependency ratio and access to cash income transfer policies. Table 2 shows the values of each indicator to the following actors: pluriactive farmers, not pluriactive farmers and sugar cane supplying farmers.

Table 2: Indicators used for the Economic Dimension.

Indicators	Pluriactive farmers	Not pluriactive farmers	Sugar cane Supplying farmers
Per capita income	R$ 1,087.03	R$ 595.47	R$ 13,639.07
Credit access*	31%	47%	27%
Gini index	0.43	0.43	0.43
Own private transportation	40%	30%	100%
Debt ratio**	22%	35%	34%
Dependence rate***	21%	52%	67%
Access to cash income transfer policies	9%	21%	0%

* Represents, in percentage terms, the number of households that have access to credit to fund the planting or harvest.
** Indicates in percentage terms, how much income the farmer is committed to some agricultural finance.
*** Reveals the number of members of each family that depends on the total household income.

According to data in Table 2, one can see that the per capita income of sugar cane suppliers is much higher than the income of the other two farmer groups. Another favorable indicator of the sugar cane suppliers is represented by means of private transportation. This indicator shows that all families suppliers of sugar cane has at least one motor vehicle. For the category of pluriactive farmers, favorable indicators are debt ratio and dependence rate. This last indicator shows that only 21% of the Economically Active Population (EAP) of pluriactive farmers depend on family income, i.e. 21% of the labor force of pluriactive farmers not perform any income generating activity. For not pluriactive farmers, favorable indicators are access to credit and access to cash income transfer policies. According to Table 2, approximately 21% of not pluriactive farming households are beneficiaries of programs like rural retirement or 'Bolsa Familia' programs.

For a better analysis of the data, the values of all indicators pointed in the economic dimension have been shot in the tool Dashboard of Sustainability. Thus, one subindex was generated for each actor within this dimension. Analyzing Table 3 one can see the performance and the subindex for each type of actor.

Table 3: Comparison of rates of Sustainability - Economic Dimension.

Actors	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Points	419	357	610
Ranking	2	3	1

According to Table 3, sugar cane suppliers have the best ranking on the economic dimension of sustainability. The subindex for this category was 610 points. Pluriactive earned 419 points and not pluriactive farmers only 357 points.

Social Dimension

Indicators collected for the social dimension were: Proportion of the population living below the poverty line; Sewage treatment; Proportion of families with access to health care; Adults who reached high school, literacy rate and access to clean water. Through an analysis of Table 4 one can see which players have better indicators for the social dimension.

Table 4: Indicators used for the Social Dimension.

Indicators	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Population below poverty line	0%	13%	0%
Sewage treatment	0%	0%	0%
Proportion of households with access to healthcare	26%	26%	100%
Adults who have attained secondary education	35%	15%	90%
Literacy rate	98%	93%	100%
Access to clean water	0%	0%	0%

According to Table 4, all members of the families of sugar cane providers are literate and have medical assistance or have health insurance or have medical visit home at least once a month. In the case of pluriactive farmers 98% of the population is literate and only 26% of the population has access to health care. Not pluriactive farmers do have worst values for each indicator. We can see that 13% of the not pluriactive farmers are living below the poverty line. In this case, the portion of the population of not pluriactive farmers indicated in Table 4 live on less than half a minimum wage. Through Table 5 it is possible to check the performance of each actor through the subindex calculated by the set of indicators on the social dimension raised and rotated in the Dashboard of Sustainability.

Table 5: Comparison of rates of Sustainability - Social Dimension.

Actors	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Points	491	166	833
Ranking	2	3	1

According to the data of Table 5, sugar cane suppliers have the best ranking with 833 points. Pluriactive farmers obtained 491 points and the not pluriactive farmers showed the worst performance, with 166 points only.

Environmental Dimension

For this dimension were raised a total of eight environmental indicators which are: use of pesticides; arable land; degraded pastures; farm size; access to water supply system; area of natural pastures and

forests; area of deforested reserves and use of fertilizers. Table 6 shows the values of the indicators for each category of actors.

Table 6: Indicators used for the Environmental Dimension.

Indicators	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Use of pesticides (tons)	0.686	1.248	23.953
Arable land (ha)	3.48	7.64	998.05
Degraded pastures (%)	94	99	100
Farm size (ha)	24.00	25.62	998.05
Access to water supply system (%)	100	73	100
Areas of natural pastures and forests (%)	20	20	13
Area of deforested reserves (ha)	0.15	0.15	18.96
Use of fertilizers (tons)	31.08	58.08	2,395.32

According to Table 6, it can be seen that pluriactive farmers have the best indicators in relation to the other two groups. For this category of actors, on average, only 3.48 (ha) of farm is intended for cultivation, has the lowest average farm size and all residents have access to treated water. In this case, it was found that access to clean water occurs either by tanker of from mines. Not pluriactive farmers as well as pluriactive farmers have 20% of the farm preserved and deforested only 0.15 ha for cultivation. Sugar cane suppliers represent the worst. Farmers are using more pesticides and chemical fertilizers. Their farms are larger, revealing a high land ownership concentration in this group. Analysing Table 7 it is possible to realize the performance of each farmer group in environmental dimension.

Table 7: Comparison of rates of Sustainability - Environmental Dimension.

Actors	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Points	1,000	765	125
Ranking	1	2	3

According to data in Table 7, it is clear that the category of pluriactive farmers represent the best performance among all analysed groups. Pluriactive farmers were in first place for the environmental dimension and obtained the maximum score that a dimension can get, if 1,000 points. Sugar cane suppliers due to the widespread use of chemical inputs and the large amount of arable land and native forests they had cleared, they earned the last placement.

Institutional Dimension

This dimension was surveyed nine indicators responsible for indicating the performance of each actor through access to computer technology, modern equipment to aid in communication and well-being of the rural population. Table 8 shows what these indicators and indicator data reveals.

Table 8: Indicators used for the Institutional Dimension.

Indicators	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Access to health	100%	79%	100%
Access to electricity	100%	100%	100%
Access the refrigerator	100%	100%	100%
Access to computer	6%	5%	100%
Access to telephone lines	94%	87%	100%

Access to internet	6%	5%	100%
Access to tractors	18.75%	13%	100%
Access to TV Channels	100%	100%	100%
Associations	41%	39%	100%

According to Table 8, sugar cane suppliers have the best indicators. Thus, all the sugarcane suppliers have access to all the variables studied in the institutional dimension. On the other hand, pluriactive and not pluriactive farmers present some indicators with low values, as in the case of farmers with access to computers and to internet. They are two important indicators as to facilitate access to information and are tools that help in managing the activities of farmers. These two categories have also reduced access to tractors to increase the labor productivity, and do not have a representative in the union as strong as in cooperatives to facilitate trade and enable increase in income. Table 9 shows the ranking of three actors considered for the institutional dimension.

Table 9: Comparison of rates of Sustainability - Institutional Dimension.

Actors	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Points	342	277	722
Ranking	2	3	1

Table 9 indicates that sugar cane suppliers outperform the institutional dimension than the other two farmer groups. The association, access to information and marketing channels are the strengths of these actors. Pluriactive and not pluriactive farmers have slightly different characteristics in the institutional dimension.

Analysis of pooled data - Dashboard of Sustainability

A joint analysis of the indicators through the Dashboard of Sustainability can reveal which category of actors performs better economic, social, environmental and institutional. Table 10 shows the sub-indices for each category of actor within the dimensions indicated and shows the general index and the overall performance of the actors studied in the present study.

Table 10: Comparison of Sustainability Indexes.

Actors	Pluriactive farmers	Not pluriactive farmers	Sugar cane suppliers
Economic Dimension (points)	419	357	610
Social Dimension (points)	491	166	833
Environmental Dimension (points)	1,000	765	125
Institutional Dimension (points)	342	277	722
General Index of Sustainability (points)	563	391	572
Ranking	2	3	1

According to data in Table 10, the sugar cane suppliers outperform global sustainability of pluriactive and not pluriactive farmers. For sugar cane suppliers the General Index of Sustainability reached 572 points, taking first place. Pluriactive farmers obtained 563 points, ranking in second place. There is a difference of only 9 points between these two groups. Not pluriactive farmers obtained only 391 points in the General Index of Sustainability. Thus, they are in the worst situation.

Sugar cane suppliers of have a high per capita income, around R$ 13,639.07. In addition, other indicators such private mean of transportation, access to healthcare, refrigerator, computer, internet, phone communication, tractors, TV channels and associations had maximum score. On the other hand, they experience some problems in the environmental dimension. They use large areas of planting sugar cane, use lots of chemicals (pesticides and fertilizers), which drop in the overall performance index of sugarcane suppliers.

Not pluriactive farmers do have a per capita income of R$ 595.47 only, which is below the minimum wage. As the main source of income is generated on the farm, through agricultural production, and farms generally have low yields, their income is low. It has been found in research that 13% of not pluriactive farmers do live below the poverty line. Additionally, 99% of their pastures are degraded and only 5% of farmers have access to the internet. Even though, only 21% of these farming families have access to income transfer policies. Thus, not pluriactive farmers do have a General Index of Sustainability with only 391 points.

According to data from field research, pluriactive farmers had an average income of R$ 1,087.03, which is well above the income of not pluriactive farms. The main sources of income is diversified agriculture, producing cassava, milk, orange, corn and beans. Part of the production is for self-consumption (subsistence) and the surplus is sold to consumer market through direct selling in the local free markets in the city of Goiatuba or by delivery of production to institutional markets created by the federal government. Additionally, pluriactive farmers have off-farm income sources. The main non-agricultural activities are a truck driver, teacher, cashier and grocery store salesman. The main highlight of this category, when considering the four dimensions outlined in the Dashboard of Sustainability, is the environmental dimension. From the data collected in the survey we can observe a low amount of chemicals used in agricultural production, as well as a small amount of land used for agricultural cultivation. In institutional dimension shows up some problems, such as low internet usage and access to small tractors.

FINAL CONSIDERATIONS

The study showed that even in areas with presence of monoculture small farmers can take advantage of the synergy that exists between rural and urban areas and thus improve their income and hence welfare. In this sense, it was found in the survey in Goiatuba pluriactive families can combine agricultural production with non-agricultural activities, increasing income, the welfare and contributing to environmental preservation. Since the non-agricultural activities carried out by some members of pluriactive farming families are related to formal jobs in the sugar mill and ethanol existing Goiatuba or activities related to local trade that spurred much from the expansion of sugarcane in Goiatuba.

Pluriactive families of Goiatuba have a per capita income above the income of not pluriactive small producers this municipality. Furthermore, among the three actors in the research studied pluriactive families represented the category that most contributed to environmental preservation. According to the environmental indicators raised in the survey, pluriactive farmers use less chemical inputs, have smaller farms, a smaller amount of reserves deforested, the smallest area of arable land and have many similar values

at the best indicators of sugar cane suppliers. Given the diversification of pluriactive farmers in Goiatuba, which participated in the survey, food insecurity was not detected or the level of food insecurity was low. A different situation of not pluriactive farmers, were about 13% of the family members live below the poverty line.

The calculation of the economic, social, environmental and institutional actors in the municipality of Goiatuba study showed that pluriactive farmers how sugarcane suppliers have nearly the same index of sustainability. According to the General Index of Sustainability (IGS) calculated by the Dashboard of Sustainability tool, sugar cane vendors obtained IGS score of 573 points, pluriactive farmers of 563 and the not pluriactive farmers of 391 points. Thus, not pluriactive farmers of Goiatuba showed worst performance. A comparative analysis of the data shows that for each dimension, to increase the welfare of both farmers groups (pluriactive and not pluriactive farmers), it is necessary to implement public policies that allow farmers to access associations, technology, tractors, better communication through internet access, as well as health and education. There are several indicators that can be improved to increase the welfare of small farmers living in rural areas of Goiatuba.

However, it was found that there is a synergy between rural and urban areas in the municipality of Goiatuba regarding obtaining income from rural tourism and ecotourism. Only agricultural activities are defining rurality in the municipality. Moreover, even if they have raised several indicators, the values are not able to indicate real contribution of the expansion of sugar cane in the county to the region's economic growth. Being necessary to improve the collection and pointing indicators that can actually represent and highlight the importance of each activity to improve local welfare.

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