

Analysis of socioeconomic indicators in sugarcane producing areas: comparative analysis in São Paulo and Alagoas

Oliveira, J.G.¹; Walter, A.^{1, 2}

¹University of Campinas (FEM) – Brazil; ²Brazilian Bioethanol Science and Technology Laboratory (CTBE) - Brazil

Keywords: Sugarcane producing. Indicators. Socioeconomic. Brazil

1 Introduction

The objective of this paper is to analyse the socioeconomic indicators at the municipal level in some of the main sugarcane producer states in Brazil (São Paulo, in Centre-South region, and Alagoas, in northeast region). For this purpose, publicly available indicators for different years at municipal level were gathered.

The selection included indicators and indexes (related to social issues such as education, income distribution, health/longevity and development) for the years 1970, 1980, 1991 and 2000 for both States. The statistical analyses included the evaluation of average values and the standard deviation for indicators considering two groups of municipalities: those with and without sugarcane, defined according to the amount of sugarcane produced.

The comparison between the groups was done considering the statistical analysis T-test (of Student) which considers confidence intervals (95% adopted here). The analysis made possible to evaluate the performance of socioeconomic indicators vis-à-vis the sugarcane production in a historical perspective. Regarding socio-economic analysis at the level sugarcane production takes place, the results presented are partially based on a PhD research (OLIVEIRA, 2011).

2 Results

The analysis of socioeconomic indicators is based on indicators taken from the IPEADATA (Brazilian federal institution that uses as source the Brazilian Statistical and Geography Institute – IBGE micro data Census) of 1970, 1980, 1991 and 2000. The indicators considered through the analysis are the following (OLIVEIRA, 2011):

- Human Development Index at municipal basis – HDI-M;
- Deaths up to 1-year old (fatalities per 1,000 thousand births).
- Share of illiterates older than 15 years old;
- Income – Inequality – L-Theil Index (is commonly used as a measure of inequality of income distribution. The index is 0 when there is perfect equality and tends to infinity in case of extreme income inequality).
- Percentage of households connected to sewer system.
- Percentage of households with access to electric lighting service.

In each state the municipalities were classified in two groups according to the amount of sugarcane produced. The municipalities in which sugarcane production amounted 90% of the total production defined the group of large sugarcane producers; the population range was defined according to this group. The second group has municipalities with small production or no production of sugarcane at all. In order to allow proper comparison between groups only municipalities within the same population range (based on the group of sugarcane producers) were kept in the second group (OLIVEIRA, 2011).

In each group average and standard deviation values were calculated for the indicators listed above. The comparison between groups was done considering the procedure known as t-test of Student, taken into account confidence intervals with probabilities larger than 95%. Groups were considered different only in case tests indicated confidence higher than 95%.

The results for the state of São Paulo for 1970, 1980, 1991 and 2000 can be interpreted as follows: statistically, the municipalities in which sugarcane production is present have better parameters than those where it is absent, and, in addition, with confidence of at least 95% it is possible to assure that the groups are different. This is the conclusion regarding all indicators presented.

In São Paulo State a specific index was analysed: São Paulo Social Responsibility Index (IPRS) for municipalities with and without sugarcane production for most recent years: 2000, 2002, 2004 and 2006. This index is calculated just for São Paulo state (by SEADE Foundation) and it is equivalent to the Human Development Index (HDI) composed by other three indexes (Municipal wealth, longevity, education). The same procedure of analysis was adopted and it is possible to conclude that the indicators are better for sugarcane municipalities and the groups are statistically different with 95% of confidence. The only exception is the indicator for Education in 2006 (OLIVEIRA, 2011).

The same procedure was applied for Alagoas and the indicators for the set of municipalities with significant sugarcane production were also compared with those of the set of municipalities without sugarcane. Results for 1970, 1980, 1991 and 2000 show that the set of municipalities in which sugarcane production is important has better results regarding the set of other municipalities with the same population range for most of the indicators. Statistically, the municipalities where sugarcane production exist have better performance on the above mentioned parameters than those without sugarcane production (OLIVEIRA, 2011).

3 Conclusions

This paper presents the assessment of socioeconomic indicators associated with sugarcane activity. The study has focused on sugarcane production in the states of São Paulo and Alagoas.

The main conclusion is that socioeconomic parameters in the set of municipalities in São Paulo and Alagoas in which sugarcane production is significant are better than in equivalent municipalities in which sugarcane has low (or no) importance.

The best results and the relative advantage of the sugarcane municipalities are clear in São Paulo, where all indicators are better. In Alagoas, only for some indicators, the

municipalities with sugarcane have excelled to the other group, mainly in the parameters of percentage of households with electric lighting access, human development and income - inequality.

These conclusions are based on averages for a set of municipalities and cannot be generalised for specific cases. Overall, we conclude that for the cases analysed, with rare exceptions, there is no evidence that sugarcane activity provides disadvantages to municipalities under a socioeconomic approach.

Reference

OLIVEIRA, J. G. (2011) Indicadores socioeconômicos em estados produtores de cana-de-açúcar: análise comparativa entre municípios. Faculdade de Engenharia Mecânica, Universidade Estadual de Campinas. Tese de doutorado. Campinas, SP: [s.n.], 2011.

Supported by:

Scholar of CNPq, Brazil. (Oliveira, J.G.)

Authors Publications

OLIVEIRA, J. G. (2011) Indicadores socioeconômicos em estados produtores de cana-de-açúcar: análise comparativa entre municípios. Faculdade de Engenharia Mecânica, Universidade Estadual de Campinas. Tese de doutorado. Campinas, SP: [s.n.], 2011.

WALTER, A. C.; DOLZAN, P.; QUILODRÁN, O.; OLIVEIRA, J.G.; SILVA, C.; PIACENTE, F.; SEGERSTEDT, A. (2010). Sustainability assessment of bio-ethanol production in Brazil considering land use change, GHG emissions and socio-economic aspects. *Energy Policy* (2010), doi: 10.1016/j.enpol.2010.07.043 (on line version).

WALTER, A. C.; DOLZAN, P.; QUILODRÁN, O.; OLIVEIRA, J.G.; SILVA, C.; PIACENTE, F.; SEGERSTEDT, A. (2008). Sustainability Analysis of the Brazilian Bio-ethanol. British Embassy and DEFRA (Department for Environment, Food and Rural Affairs), Campinas, nov. de 2008.

This document was created with Win2PDF available at <http://www.win2pdf.com>.
The unregistered version of Win2PDF is for evaluation or non-commercial use only.
This page will not be added after purchasing Win2PDF.