

Available online at www.sciencedirect.com

SciVerse ScienceDirect

<http://www.elsevier.com/locate/biombioe>

Survey of sugarcane industry in Minas Gerais, Brazil: Focus on sustainability

Karina R.O. Viana*, Ronaldo Perez

Departamento de Tecnologia de Alimentos, Universidade Federal de Viçosa, Avenida PH Rolfs s/n, Campus Universitário, Viçosa, MG 36570-000, Brazil

ARTICLE INFO

Article history:

Received 7 July 2012

Received in revised form

19 February 2013

Accepted 2 August 2013

Available online 2 September 2013

Keywords:

Ethanol plants

Sugarcane producers

Sustainability

International requirements

Minas Gerais

ABSTRACT

Sugarcane industry is one of the most important agribusiness sectors in Brazil, which receives foreign investments for expansion, due to great international interest. However, its expansion has been subject to control and restrictions related to sustainability imposed by foreign institutions and governments in developed countries. The present work aimed to assess the progress of ethanol plants from the region of Triângulo Mineiro, located in the state of Minas Gerais, and their sustainability. It also provides information that can support local development and industry structure, based on the discussion of important issues to business, government and society. To obtain all the necessary information, a survey questionnaire was prepared and applied in the sugar ethanol plants and associations of sugarcane producers. This survey instrument included questions pertaining to current sustainability requirements, and questions to characterize producers and industries in this meso-region. The results revealed that companies and farmers are aware of the international and national agreements regarding sustainability and they are trying to meet all the requirements stated by those policies. The study not only demonstrates the evolution of the sector, but also the high level of the sustainable practices being adopted.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Sugarcane industry is one of the strongest agribusiness sectors in Brazil and is currently undergoing the expansion of its capacity and implementation of significant changes in its operations, mainly including the intense modification in the procedures for planting and harvesting, strong growth in bioenergy production, deployment of new technologies and new products, such as bioplastics, biobutanol and cellulosic ethanol, as well as profound changes in corporate structures of plants.

Ethanol is a sector of international interest, which brings trade and technology responsibilities. It has received significant foreign investment and expanded exports of sugar and

ethanol. Due to its expansion, the sector has also been subject to the control and restrictions imposed by importing countries.

In 2010, according to the Brazil's National Supply Company (Conab) [1], Minas Gerais state was ranked the second largest producer of sugarcane in the country, with approximately 56 million tons, following São Paulo, which produced 362 million tons in that year. The meso-region of Triângulo Mineiro is the most important in volume of production in Minas Gerais state, according to the data from the Union of Alcohol Manufacturing Industry of Minas Gerais (SIAMIG) [2] and Conab [1]. According to Cane Mapping via Satellite Images and Earth Observation (CANASAT) [3], sugarcane production in the Triângulo Mineiro represents 60% of the total

* Corresponding author.

E-mail addresses: karina.viana@ufv.br (K.R.O. Viana), rperez@ufv.br (R. Perez).

0961-9534/\$ – see front matter © 2013 Elsevier Ltd. All rights reserved.

<http://dx.doi.org/10.1016/j.biombioe.2013.08.006>

cane processed in the state, occupying an area of 453,000 ha, which is 14% of the total regional area.

The present work aimed to study the input chain development in the Local Productive Arrangement (APL) in Triângulo Mineiro, given the importance of this meso-region to the sugarcane sector in the state. The results of this work demonstrate the aspects of the organization of the agricultural production, location and participation of input and services suppliers, and their mechanisms of interaction with the APL; aspects of the structure of ethanol plants and levels of potential fulfillment of the international norms regarding market and sustainability. The present work intends to provide information that can support local development and industry structure, based on the discussion of important issues to business, government and society.

Such information and discussions are important for sugar ethanol plants, since, in many forums, like in Rio +20 (United Nations Conference on Sustainable Development) [4] they have been accountable for negative actions against the environment and society, including the destruction of native forest areas, decreased diversity in rural production, release of vinasse in rivers, soil pollution and erosion, pollution of water resources by pesticides, emission of pollutants into the atmosphere by sugarcane burning, destruction of biodiversity, elimination of small and medium enterprises and increased exodus from rural areas.

Many people know that most of those problems did not result from the introduction of sugarcane cultivation, but have been caused by the rural development established in Brazil for decades. However, the solution for these problems is now being required from the sugarcane sector, which is under strong pressure from the international community to provide guarantees of good working and environmental conditions in the development of ethanol production, in order to meet the guidelines and laws of the developed countries.

Therefore, it is not enough to demonstrate the importance of sugarcane cultivation for the development of a region, through the strengthening of economy (income generation, foreign exchange and taxes), with social (jobs and wealth in small cities) and environmental (mitigation of the negative consequences of climate change and improvement in air quality in cities) development. It is paramount that the actions taken and the level of compliance with international requirements be reported. Accordingly, the assessment of companies' knowledge on standards, national and international agreements related to sustainability has become the main objective of this study, given the relevance of this issue in the world today.

Thus, by proposing and assessing the organizational model of ethanol production and its integration with other productions, this study aimed to generate research results that will create conditions to increase the economic and social potential of ethanol production in the Triângulo Mineiro, by encouraging and ensuring the responsible use of natural resources.

2. Methodology

A survey instrument was developed in order to obtain the information necessary to characterize the sugar and ethanol

sector in the Triângulo Mineiro, and evaluate it regarding sustainability. The study aimed to evaluate how distant the sugar ethanol plants are from acquiring an international certification, like the Directive 2009/28 from the Europe parliament.

The survey instrument was a questionnaire with 47 questions related to current sustainability requirements and 42 aimed to characterize the sugarcane farmers and the sugar ethanol plants in this meso-region. It approaches questions about labor and environmental issues, harvesting mechanization, labor qualification and etc. The type of the questions varied between multiple choice and open-ended, as can be checked in [Annex 1](#).

The questions about sustainability were based on the Directive 2009/28/EC of the European Parliament and of the Council (EU) [5], which promotes the use of energy from renewable sources, and on the Environmental Protocol of Minas Gerais state [6], related to the elimination of sugarcane burning and the implementation of mechanical harvesting. The questions were based on the standards established by those agreements before cited. The respondents were not informed about those standards as were let themselves to define what they understood by sustainability and their indicators. This approach intends to evaluate the level of knowledge of the sugar ethanol plants about the theme and the level of adoption to those practices and requirements.

Meetings with experts on the area were held, including the head of the SIAMIG and the technical advisory coordinator of the FAEMG. In those meetings, all the 89 questions of the questionnaire were discussed, aiming to obtain an instrument as complete and comprehensive as possible, and to confirm that the questionnaire covered the main aspects on sustainability and sugarcane supply chain [7,8].

In order to validate the questionnaire and to train the team that would collect the data, the first questionnaire was applied in a sugar ethanol plant of another meso-region of Minas Gerais. This action also aimed to know in advance questions that could be raised and other issues related to the survey instrument, besides verifying whether it would be understood by respondents.

The Union of Alcohol Manufacturing Industry of Minas Gerais and the Agriculture and Livestock Federation of Minas Gerais (FAEMG) provided the contact lists containing all the plants associated to the SIAMIG and the sugarcane farmers related to the FAEMG [9]. At the time this study was conducted, there were 26 plants in operation and 13 sugarcane farmers associations (representing 198 sugarcane producers) in the meso-region of the Triângulo Mineiro. Out of these, 12 plants and 5 associations of sugarcane farmers answered the questionnaire. The survey was carried out in 2010. By that time, the sugar and ethanol plants and sugarcane farmers surveyed represented 53% of the cane crushing capacity, 55% of the ethanol and 51% of the sugar produced in the Triângulo Mineiro ([Table 1](#)).

The directors and managers of environment, industry and agricultural production of the sugar and ethanol plants and the presidents of the sugarcane farmers associations were interviewed. The goal of the research was explained to them before starting survey, and at no point were clarified the concepts and agreements pertinent to sustainability. Based on

Download English Version:

<https://daneshyari.com/en/article/7065008>

Download Persian Version:

<https://daneshyari.com/article/7065008>

[Daneshyari.com](https://daneshyari.com)