

Good news for sugarcane

In addition to environmental benefits, an increase in ethanol production has helped to improve people's lives in the countryside

Maurício Puls

PUBLISHED IN JANUARY 2016

Established in 1975 to reduce expenditures on imported petroleum, the National Alcohol Program (Proálcool) profoundly altered Brazil's energy matrix, reducing pollution and greenhouse gases. However, beyond the environmental benefits, recent expansion of the sugarcane agroindustry has positively affected Brazil's social indicators, according to the study *Socioeconomic impacts of Brazilian sugarcane industry*, published in Issue No. 16 of the *Environmental Development* journal (December 2015).

Backed by an extensive survey of bibliographic works, Márcia Azanha Ferraz Dias Moraes of Luiz de Queiroz College of Agriculture of the University of São Paulo (Esalq-USP), Fabíola Cristina Ribeiro de Oliveira of the program in Economic Sciences offered by the Methodist University of Piracicaba (Unimep), and Rocio A. Diaz-Chavez at the Environmental Policy Centre at Imperial College London used data from the National Household Sample Survey (PNAD) and the National Report on Social Information (RAIS) to compare the situation of sugarcane field workers with that of workers in other agricultural segments. They also compared social indicators for the descendants of sugarcane field workers with those working with other crops to determine whether the conditions of parents influenced their children's status.

The study showed that workers involved in sugarcane production receive higher wages, have achieved higher levels of education, and are more likely to be formally employed when compared to the average indicators for the other analyzed crops. It was also noted that the descendants of those employed in sugarcane farming enjoy a higher economic status and experience higher mobility in terms of transitioning into endeavors outside agriculture. "We can say that the expansion in sugarcane that we experienced starting in 2008 has helped improve agricultural social indicators," Moraes says. However, those victories are relatively recent, the professor warns. "When Proálcool was created, its primary focus was finding alternatives to petroleum; environmental or social issues were secondary." In those days, the priority was to reduce, by any means possible, Brazil's dependence on imported oil, which accounted for more than 80% of total consumption.

That economic objective was achieved: sugarcane production rose from 88.9 million tons in 1975 to 588.5 million tons in 2013. This enabled ethanol output to soar from 555 million liters to 23.2 billion liters during the same time frame and contributed to reducing Brazil's dependence on imported oil to 18% of domestic consumption in 2013. Proálcool also had other direct benefits, as described in the 2011 study *Social externalities of*



Mechanized harvesting of sugarcane in Piracicaba (São Paulo) in 2007: better working conditions



Sugarcane is received for the start of the ethanol production cycle in Nova Europa (SP): economic, environmental, and social benefits

fuels by Moraes, Ribeiro de Oliveira, and other authors. The researchers found that the expansion of the sugar/alcohol complex increased ethanol production, created jobs and boosted income in vast regions of Brazil's interior, while oil refineries have always been concentrated within a small number of coastal cities.

TWO DIFFERENT TIME PERIODS

However, from a social point of view, the situation was unsatisfactory. "When we look at the literature produced in the 1980s on the subject, we see that working conditions in the sugarcane industry were pretty bad; there was tremendous informality in terms of employment status and even child labor," says Moraes. The picture was not much better on the environmental plane; the burning of fields produced enormous clouds of smoke. According to Moraes, these problems were associated with the manual harvesting procedures that employed migrant workers who had come to São Paulo. "Living and working conditions were problematic, and then there were the 'gatos' [middlemen who recruit labor]. From the research carried out by our team we were able to identify an important change in working conditions. There are two completely different periods. There is no longer any reason to talk about slave labor in the sugarcane fields."

Other studies cited by Moraes had already pointed in this direction. The thesis *Indicadores socio-econômicos em estados produtores de cana-de-açúcar: análise comparativa entre municípios* [Socioeconomic Indicators in sugarcane-producing states: a comparative analysis among municipalities], by Janaina Garcia de Oliveira, defended at the University of Campinas (Unicamp) in 2011, concluded that the Human Development Index (HDI) in the municipalities where sugarcane is produced trended upward from 1970 to 2000: "Sugarcane municipalities in all states showed better indicators of income distribution and access to infrastructure services, mainly to water and sewer facilities."

Progress for working conditions has intensified since then. What factors contributed to this change? "The first reason was that the Labour Prosecutor's Office was very strict in ensuring the rules were actually observed," the author says. Government inspection work was reinforced by international interests, which gained importance as Brazil began increasing its exports of sugar and alcohol. The intense competition in the world market among producers of those commodities, as well as the concern expressed by purchasers of sugar and ethanol who began to audit the social and environmental practices of their Brazilian suppliers more strictly, also contributed to the adoption of more sustainable practices.

MECHANIZATION

The inflow of foreign investors to the sector, starting in 2000, contributed to the adoption of more responsible management practices when those companies introduced new managerial and labor standards. According to Moraes, not all Brazilian companies had reproachable practices, but the foreigners helped raise social and working condition standards.

However, the primary explanation for the change observed in rural areas is, according to the author, the mechanization of harvesting. The process was accelerated with the gradual elimination of the burning of sugarcane straw in the state of São Paulo, ordered by the 2007 signing of the AgroEnvironmental Protocol of the Sugar/Ethanol Sector and by regulatory state laws. The protocol brought enormous environmental benefits by ending the problems caused by field burnings, as well as permitting the use of straw for cogeneration in the electric power sector (as is already the case with bagasse).

On the other hand, mechanization had a negative effect in that it made manual harvesting of cane impractical, which consequently meant the loss of jobs. “Mechanization requires fewer workers,” the researcher says. “One harvester replaces, on average, 80 cane cutters.” From 2000 to 2012, the number of registered workers throughout the sugar/alcohol sector rose from 642,848 to 1,091,575—an overall increase of 69.8%. Breaking down the figures, we see that the number of formally employed workers rose by 205.2% in the alcohol distilleries and by 153.93% in the sugar mills. However, the number of workers in the sugarcane fields had a by 7.4% decrease, from 356,986 to 330,710 employees.

The falloff in employment in the industry has had one positive aspect, however. “Cutting sugarcane by hand is exhausting work,” says Moraes. Its arduousness is emphasized by other researchers. According to Maria Aparecida de Moraes Silva, a retired professor from the Araraquara campus of São Paulo State University (Unesp), “the working life of cane cutters spans 15 years at most: the work injures their backs, fists, and arms.”

In addition, as Francisco Alves, a professor associated with the Production Engineering Department of the Federal University of São Carlos (UFSCar) observes, mechanization did not eliminate manual cutting entirely. “Actually, the

mechanization model to which sugarcane farming adhered requires a combination of mechanized cutting with high-productivity manual cutting. Workers now employed in cutting cane must exhibit high productivity, over 14 tons per individual per working day,” Alves says. This results in an increase of work-related illnesses.

The gradual decline in demand for manual cutters was at least partially offset by the creation of jobs for drivers, tractor and harvester operators, as well as mechanics and electronics technicians, as Moraes noted in her 2007 study entitled *O mercado de trabalho da agro-indústria canavieira: desafios e oportunidades*, [The labor market in the sugarcane agroindustry: challenges and opportunities]. To alleviate the problem of unemployment created by mechanization, the author’s most recent study shows us that São Paulo employer and worker federations have arranged training and requalifi-

The decline in jobs for cane cutters was partially offset by the creation of opportunities in other functions

Manual harvesting in Olimpia (SP): exhausting work that is becoming obsolete





Sugarcane Technology Center in Piracicaba (SP): progress improves conditions but takes away jobs

cation courses for 3,000 workers every year. Some of these workers have also been absorbed into infrastructure construction in Brazil's Northern and Northeastern regions.

GENERATIONS

To better evaluate the scope of the significant changes, Moraes, Ribeiro de Oliveira, and Diaz-Chaves used data from government sources (the PNAD and RAIS), which enabled them to compare working conditions and education levels between two generations of workers. To prevent distortions in the comparisons with other agricultural sectors, the team did not take into account figures referring to those employed by alcohol distilleries and sugar mills.

Cross-checking the data revealed that the average income of the head of a family (or the "family reference person," the term currently used in official statistics) in the sugarcane farming sector was 46.5% higher than the average income in other agricultural sectors. The average educational level is five years among sugarcane workers, compared to four years for other workers. When compared to their parents, children of sugarcane workers averaged 8.4 years of education, while children of workers in the rest of the agricultural sector averaged 8.1 years. All of them, however, had a lower income than what their parents had earned (14.2% less in the case of sugarcane and 3.2% less for agriculture in general). Several factors influence worker income, which may explain why the children, despite having a better education, still earn less than their parents on average.

Considering heads of families, it was observed that in the sugarcane sector, 86.98% are registered workers, i.e., "their labor record cards are signed." By contrast, only 34.23% of workers in other agricultural sectors are registered workers.

Most descendants of sugarcane workers go into the service industry

When we compare descendants, we find that 70.05% of the descendants of sugarcane workers hold registered jobs, against 49.31% of the descendants in other sectors do. We therefore observe the influence of parents on the working conditions of their children, i.e., the fact that the majority of sugarcane workers have a signed labor record card probably influenced the choices made by their children. In the case of children of farm workers in general, 43.2% have continued to work in agriculture, but among the children of sugarcane workers, only 29.3% remain in farming, which indicates greater mobility toward other sectors.

Most of the descendants of those employed in the sugar/alcohol sector have found work in the service sector (35.3%). Manufacturing absorbs 20.9%; construction, 8.1%; and public administration, 4.9%. This greater social mobility probably results from the influence of family life. "The conditions of the family have a strong influence on the choices made by their children," Moraes explains. "The better working conditions experienced by the parents are opening up the possibility of better jobs for their children." ■

Scientific article

MORAES, M.A.D. *et al.* Socioeconomic impacts of Brazilian sugarcane industry. *Environmental Development*. Vol. 16, pp. 31-43, December 2015.