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Historical Reconstruction of Subordination in a Local Context: Agroecosystems with Sugarcane in Veracruz, Mexico

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ABSTRACT

Objective: To rebuild the historical transformation of agroecosystems based on sugarcane in the sub-humid tropic, as a consequence of the change in public policies of the Mexican State in the last three decades.

Design/methodology/approach: The transformation of sugar cane agroecosystems was studied in the continuum of reality, as changes in their resource management and management practices. Thus, methodologies used included life stories, field diary, and documentary review. The information collected was transcribed and classified in a database, using keywords for their previous identification by categories. The statements were identified and ordered based on their content, interpretation, and underlying concepts.

Results: During the last century, public policies directed towards the sugar sector encouraged the existence of sugarcane agroecosystems as a monoculture. This implied changes in the management of time, work organization, orientation of the production, dependence on credits driven by the mills, and a process encouraged by the individualization of production, eroding the collective and solidarity work that lay behind other crops.

Study limitations/implications: It is important to compare these findings with other investigations done in sugar cane producing municipalities.

Findings/conclusion: Neoliberal public policies aiming the sugar sector deepened the producers' financial dependence on mills; as a consequence, they lost their autonomy in the management and use of their agroecosystems.

Keywords: Individualization, management practices, oral history, public policies, social trust, subordination.

INTRODUCTION

The presence of sugar cane plantations in the central-south part of the state began in 1519, when it was introduced by the Spanish conquistadors in the region of San Andrés Tuxtla (González, 1994). In colonial times, just like in other producing regions of New Spain, sugar cane growing in Veracruz was based on a system of haciendas, which suffered financial falls during the War of Independence. The result was that, during the first decades of Independent Mexico, the Mexican State acted as a

protector of cane activity by enacting a law that prohibited the introduction of sugar and honey from abroad in 1824 and established a series of levies to the imports of these products in 1856 (Aguilar-Rivera, 2012). By the end of the 19th and 20th century, sugar cane production was developed under favorable conditions with the increase of exports and the internal demand generated by industrial growth. During this period, Veracruz became one of the main sugar cane producers (Banko, 2005). This changed by the end of the 20th century, when the Mexican State, through public policies framed within a neoliberal development model, limited credit supports, technical assistance and allowed the import of sugar substitute products, which induced the producers to make changes in the management and handling of their agroecosystems (Rubio, 2001; Millán, 2008; Baca de Moral & Cuevas, 2018). Currently, sugar cane producers from the Mexican subhumid tropic continue their activity by enduring the deep crisis derived from the fall in productivity (field and factory), the decrease in international sugar prices, decrease in domestic consumption with the substitution of sucrose for high-fructose corn syrups and non-caloric artificial sweeteners, as well as the instability of petroleum prices, among others (Aguilar-Rivera, 2012; Jiménez, 2017). In areas of greater understanding about the perspective of those that are main actors, this study sought to rebuild the manner in which producers, ejido owners and small owners, from their local domain, construct the impact of public policies boosted by the Mexican State in their agroecosystems.

MATERIALS AND METHODS

This research was performed in the towns of El Mango and El Faisán, municipality of Paso de Ovejas, Veracruz, Mexico, located between the coordinates 19° 17' - 19° 22' north latitude and 96° 20' - 96° 38' west longitude, with a height of 10 to 400 m (INEGI, 2010). The initial recognition of the area of study and their main characteristics was through secondary sources; both conventional maps and Google Earth and Google Maps were used. A script for deep interviews with key informants was prepared in order to know their life stories with the reconstruction of the social-historical process told through their protagonists; this sought a better understanding of the phenomenon from its social, cultural, economic and political character of what happens in what Lara (2014) has named micro-societies and their environment. The intended sample of participants (n = 27) was obtained with the snowball technique (Taylor & Bogdan, 1987), when the information began to be redundant (Baker & Edwards, 2013). Information was transcribed and classified in a database based on keywords (Mayring, 2002), which implied the previous identification of categories. Finally, the statements were identified and ordered based on their contents, construction and underlying concepts.

RESULTS AND DISCUSSION

The part of the agroindustry in the conversion of sugar cane as single component in an agroecosystem

In 1931, sugar entrepreneurs incorporated the Sugar and Alcohol Stabilizing Company, the function of which was to regulate markets to balance sugar production and consumption; this allowed avoiding national overproduction and, therefore, the plummeting of prices. Azúcar S.A. was incorporated in 1932

as a para-state body that represented the main producing zones and cane mills of the country, which were bound to sell their entire sugar stock to the company (Banko, 2005).

From 1946 to 1952, agricultural and industrial development encouragement practices continued within the framework of an increasing economic action by the Mexican State and the application of protectionist mechanisms. The national sugar industry experienced an unprecedented growth, which allowed covering the internal demand and obtaining surplus that was placed in the international market (Banko, 2008). In 1950 the First Sugar Plan was approved in Mexico. It integrated offers of credit resources, social security and retirement for producers. Producers began growing cane in their agroecosystems with the initial use of areas with the poorest irrigation lands and salinity or sewage issues (Thiébaud *et al.*, 2013).

"In 1950 I began growing cane, and I only grew 1 ha because most of the land was devoted to tomato, papaya, pepper." (I38, 72 years, Ejido Owner, El Mango).

In 1970, the National Sugar Industry Commission (CNIA) was created. It was responsible for planning and increasing sugar productivity and assuring both internal and external distribution of the product. The industry's financing and the establishment of an administration body for the cane mills that belonged to the public sector were fostered (Banko, 2005), which boosted the growing of cane and its gradual predominance in agroecosystems of the subhumid tropic of Veracruz in decades to come.

This situation changed radically as of 1980, when the Mexican State began reducing the public expense and implementing policies to deregulate the economy and release market forces (Millán, 2008). Under this context, Azúcar, S.A. disappeared and cane grower subsidies and credits were reduced. The Law of Sustainable Development of Sugar Cane was enacted in 1992. The Sugar Industry Reconversion Program was implemented to assure both the national and international demand of sugar. Also, for the first time, the quality of delivered cane was considered to establish its price (sucrose content, purity, juices and fiber). In other words, the standard base recoverable sugar kilograms (KARBE) parameter was abandoned and substituted for standard base sugar (KABE). In the KABE formula, the price of sugar was assigned per the actually recovered sugar. Also, the cane price was closely related to fluctuations in national and international sugar markets and the industry's capacity to adapt to said markets. This impacted producer income from cane growing and they began depending on efficient coordination for the delivery of cane with maximum sucrose and purity in every day of harvest, which should be processed according to the capacity of the sugar mill (this capacity decreased always due to reasons outside the producer).

This way, since the issuance of the sugar cane decree, the conditions for avoiding the rapid loss in sucrose in cane recently cut by the producer would be linked to the cane mill's operating conditions. The continuous operation of industrial machinery during the harvest in the reality of the subhumid tropic of Veracruz has been an exception

more than a rule. The certainty of income to be gained by producers increased when the government induced sugar-processing and growing groups to create trusts to assure the growing and payment of cane by taking the future sugar of the harvest as a guarantee (Singelmann, 2003).

The operation and signature of the North America Free Trade Agreement (NAFTA) in 1996, customs barriers that historically protected the national sugar production were demolished. The national production of sugar was threatened by the import of powerful and cheap artificial sweeteners such as corn fructose. Two corn syrup producing plants were installed in Mexico. These were affiliates of other companies in the United States, which would seek to satisfy 25% of the national artificial sweetener demand. In 1998, in order to protect sucrose production, compensation quotas for fructose were established, although its internal production continued based on yellow corn imported at subsidized prices and with no tariff as part of the NAFTA agreements (Loyola, 2003). The Mexican government introduced a commercial dispute that was solved by the NAFTA Binational Panel in 2001 by favoring the production and import of fructose as it did not consider it to be dangerous for the Mexican sugar industry. The World Trade Organization issued a ruling against Mexico and made it cancel the antidoping quota imposed to the import of fructose (levulose), which was 1.5 times sweeter than sucrose, with high fermentation, great humectation power, transparency and adequate viscosity, which turned it into the great substitute of sucrose (Loyola, 2003). This reduced the demand of sugar, which affected both the production and transformation of sugar cane (Thiébaud et al., 2013).

How did these changes affect producers and how were their ecosystems affected? The main changes observed during this research in the last three decades in the Veracruz subhumid tropic region are argued. This state is the third sugar producer of the country, with 20 out of 60 cane mills (Mestries, 2000).

Sugar Cane Agroecosystem Transformation in the Veracruz Subhumid Tropic in the Last Three Decades

Historically, cane-growing pioneers in the area of study were the self-named "original" ejido owners and small owners. The grown surface increased progressively, which led the marginalized corn and bean crops and the abandonment of livestock breeding.

"When people began growing more cane, livestock was sold as it occupied space. People have little land and may not have both cane and livestock" (199, Borrowed land, successor of land rights, 43 years old, El Mango).

Cane took a progressive occupation of spaces devoted to basic crops and livestock. Nevertheless, sugar cane growing was always linked to supports granted by the Mexican State. This is why, when their policies aimed at fostering cane production changed, cane producers were left defenseless against financing obtained through the resources of cane mills. Producers began losing their autonomy in the handling of their agroecosystems and were subject to decisions made from the cane mill bureaucratic management.

This led producers who turned into caretakers of cane mill interests. In exchange, they gained a weak income and healthcare as beneficiaries of the Mexican Social Security Institute (Vázquez-Palacios, 2003). Cane producers from the study area turned gradually into subordinates of adverse economic interests (Paré, 1987). This subordination was due to the fact that there was a nearby mill that purchased cane. The mill was installed there as it was an ideal place for growing cane and hence find the raw materials needed (Singelmann, 2003). Cane mills have had a direct influence in the pattern of cane varieties, from the substitution of sugar cane, a high producer of sucrose although sensitive to extreme temperatures and flattening (SIAP, 2013) to the introduction of existing varieties.

"[...] we have grown several varieties, 290, pineapple, RD, 208; said the sugar mill." (199, 43 years old, Borrowed land, successor of land rights, El Mango).

In the study area, grown varieties were introduced at least 30 years ago (RD 75-11 & MEX 91-662). Renewing cane plantations implies a big expense in a moment of low cane prices. In order to maintain their plantations, producers restore plants to the land, when the plantation gets into the recovery phase.

"Growing a new plantation is expensive. I've got these plants instead. When the time comes, we'll transplant them. That's cheaper." (142, Ejido owner, 76 years old, El Faisán).

A change in the harvesting manner has been implemented. This happened as of the first privatization of mills in the 1980s (Skerrit, 2008). New administrations reduced production costs, reason why the employment of machinery was increased both for truck loading at plantations and for increasing the use of harvesting machines in supply areas of the La Gloria and El Modelo cane mills.

Fertilization is fundamental, as it determines the yield of cane; upon decreasing the vigor of plantations, nitrogenated fertilization should increase with the number of cuts (second and third cuts). Upon obviating the foregoing, issues such as the decrease in nutritional level the compaction of soil and presence of plagues and diseases were generated (Aguilar *et al.*, 2013). The fertilization made by producers depends on the working capital loans granted by the cane mill and its financial

capacity; although this is not an option for all producers in the study area.

The logistics for the cutting of cane involves a Brix content study (total soluble solids present in the juice expressed in percentage), the contents of sucrose in juice or Pol (actual amount of sugar cane present in the juice) and the purity coefficient (percentage of sucrose with regards to total contents of juice soluble solids). Results are communicated to the zone inspector who in turn informs the cane representative and the latter to the land owner. Planning shall include the total surface to be grown, labor, expenses, machinery and potential units in relation to previous years or similar lands, without forgetting the receipt capacity held by the mill at that moment. This is made by mill personnel, which differs with what happened decades ago, when producers were in charge of hiring and managing labor.

"One used to hire laborers and work on everything that was needed. Now, you have to pay for files, meals and who knows what else. The mill collects. If you don't agree, you cope with it." (127, 52 years old, Ejido owner, El Faisán).

The result is that the growing of cane has become a single component in agroecosystems of producers in the study area, although the reproduction of the subsequent cycle is not assured anymore, and the economy of both the producer and his family is at risk. One option is to continue off-farm works of local and extra-local character, hoping that this critical situation will pass. This possibility depends on the behavior of the international market (Thiébaud *et al.*, 2013).

Some producers see possibilities in urban expansion above agricultural lands. *El Faisán* and *El Mango* have become areas with high land demand for urban settlements for the children or grandchildren of ejido owners and small owners, who work in neighboring cities and get back to the community every day. The Ejido Rights and Solar Title Certification Program allowed full dominion by the ejido, as its land title was changed for a private property title, which allows them to sell without asking the ejido (Thiébaud *et al.*, 2013).

Also, cane producers are being left alone, either because their sons migrated or they are no longer interested in continuing their activity. Terms such as "old-man", "widow" or "poor-man" plantation are common. "Widow

plantations" belong to women who inherited land rights from their husbands and work with some relative (sons-in-law, nephews, grandsons) in an improvised agreement. They are in charge of obtaining financing before the cane mill, enforce their rights as users of the irrigation system and have the surface to grow available. Their relatives are in charge of providing follow-up to plantation handling practices.

The price of cane has decreased substantially; government support received per hectare is laughable. Therefore, there is the possibility that producers abandon their agricultural activity as they can no longer have resources for the performance of the subsequent cycle or losses that prevent paying debts to the government. Arbitrary abuse or thefts by the mill management may be added to this uncertainty. Examples are disagreements in the establishment of KARBE, financial cost of credit, inefficient and unnecessary plague control through plane fumigation, change of parameters for defining the payment of the harvest and their progressive decapitalization. The consequence is that decisions that the producer may make with respect to this crisis are minimal, as fundamental management practices in the plantation respond to the mill's decisions. Therefore, adjustments made by the producer in his agroecosystems are minimal and limited to the reduction of the number of fertilizations, application of herbicides and pesticides.

CONCLUSIONS

Changes in public policies aimed at the sugar sector in the 1980s brought modifications in the management of time, work and production orientation. Conditions of greater economic uncertainty promoted the individualization of production, as collective and solidary work was eroded based on social trust. Nevertheless, the fundamental change was the loss of autonomy of producers in handling decisions for their agroecosystems before a decision subordination scheme made from the bureaucratic management of mills. This makes producers make the most radical decision with respect to the handling of their agroecosystems: to keep growing or abandon sugar cane production for good.

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