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## Introduction

Mexico produces five spirit beverages with Denomination of Origin which are: Tequila, Mezcal, Bacanora, Sotol and Charanda. Michoacán is the only state that has three drinks with Denomination of Origin: Tequila and Mezcal (agave distillates) and Charanda that is made from the fermentation and distillation of sugar cane. The objective of this study is to analyze the competitiveness of Mezcal Etúcuaro producers, with the purpose of implementing innovative strategies to improve the economic development of producers.

## Relevant Literature

<p>Salinas y Chávez (2023)</p> <p>It identifies the factors that determine the competitiveness of mezcal in Mexico: efficiency in the production process, quality and access to new markets.</p>	<p>Godínez, Calderón y Becerra (2019)</p> <p>It studies the sustainability strategies of mezcal companies in Michoacán.</p>	<p>Salinas, Alcaraz, Durán y Chávez (2023)</p> <p>It identifies the scope and limitations of the mezcal appellation of origin in Mexico.</p>	<p>Servicio de Información Agroalimentaria y Pesquera (2023)</p> <p>Dataset used to analyze the production of agave and the average rural price of all the municipalities of the state of Michoacán.</p>	<p>Consejo Nacional de Población (2020)</p> <p>Datasets used to know the marginalization degree (lag in education, housing, population distribution and monetary income) of the municipalities with DOM.</p>	<p>Instituto Nacional de Estadística y Geografía (2020)</p> <p>Dataset used to identify the years of schooling and internet availability per household in the municipalities with DOM.</p>
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## Importance and Contextualization of the Problem

In Mexico, the alcoholic beverage with the highest production volume is beer (65% of total gross production), followed by agave distillates, representing 31.7% of total gross production (INEGI, 2020). The Mezcal-producing region in Michoacán comprises 29 municipalities mainly dedicated to agriculture and, for the most part, to producing Mezcal as their main activity (Godínez Reyes et al., 2018).

It is important to note that municipalities protected by the Denomination of Origin of Mezcal (DOM) are also characterized by their educational lag and low internet availability per household, significantly limiting access to certification in the production chain. Salinas and Chávez (2023) identified multiple obstacles in the mezcal sector that range from the planning of their businesses to the paperwork for their trademark registration or the management of legal procedures for their proper operation. They also highlight weaknesses in marketing areas, the lack of personnel with experience and knowledge in export issues, and the inability to establish commercial relations with other countries.

## Methodology and data

This research consists of three phases to collect detailed information on the socioeconomic characteristics of the population and factors that determine the competitiveness of producers with DOM in the state of Michoacán.



Figure 1. Phases of the methodology.

**Step 1.** Documentary research and compilation of secondary information (books, scientific articles, websites, etc.).

**Step 2.** Analysis of publicly available data for the year 2020: "Censuses and Counts of Housing Population" of the National Institute of Statistics and Geography (INEGI), National Population Council (CONAPO), and the Agri-Food Information System of Consultation of the Agri-Food and Fisheries Information Service (SIAP).

**Step 3.** Fieldwork with structured interviews with key agents of the production chain of the Mezcal industry in Michoacán to understand the role of non-profit organizations in the Mezcal production value chain. We interacted with the Association of Mezcal Women of Michoacán A.C., and two mezcal producers from the municipality of Madero and Turicato.

## Situation analysis

The municipalities that are on the "Mezcal Route" are the ones with the highest agave production; however, the average rural price of agave is not better than the other municipalities with Denomination of Origin of Mezcal (DOM) in the Michoacán state. It is worth mentioning that, in most municipalities with DOM, the average education level is an incomplete secondary school, and the internet is available only in 8% to 24% of households, which are crucial variables to access the certification of the mezcal production chain.

## Preliminary Results

- Since 2012, the average rural price of agave has gradually increased in municipalities with Denomination of Origin of Mezcal (DOM). However, contrary to what is expected of this group, this price is lower than the state average. This would be explained by the scarce trademark registration among producers, lack of economic resources, and lack of information about institutions that can help them improve their conditions.
- The municipalities with DOM with the highest agave production are Vista Hermosa and Jiquilpan, which also have Tequila Denomination of Origin (DOT) as they border the state of Jalisco. They are followed by Madero, Queréndaro, Tzitzio, Morelia, and Charo, which belong to the "Mezcal Route."
- Among them, Madero and Tzitzio stand out as having the state's highest degrees of marginalization (low schooling, greater poverty, and precariousness).
- 28 municipalities with DOM have an average of 9 years of schooling, below the state average (Michoacán). 20 municipalities show an average per household internet availability well below the state (33%) and national average (42%).
- 5 organizations participate in the mezcal production chain, but two are profit-making. This limit access to small producers with limited economic resources.

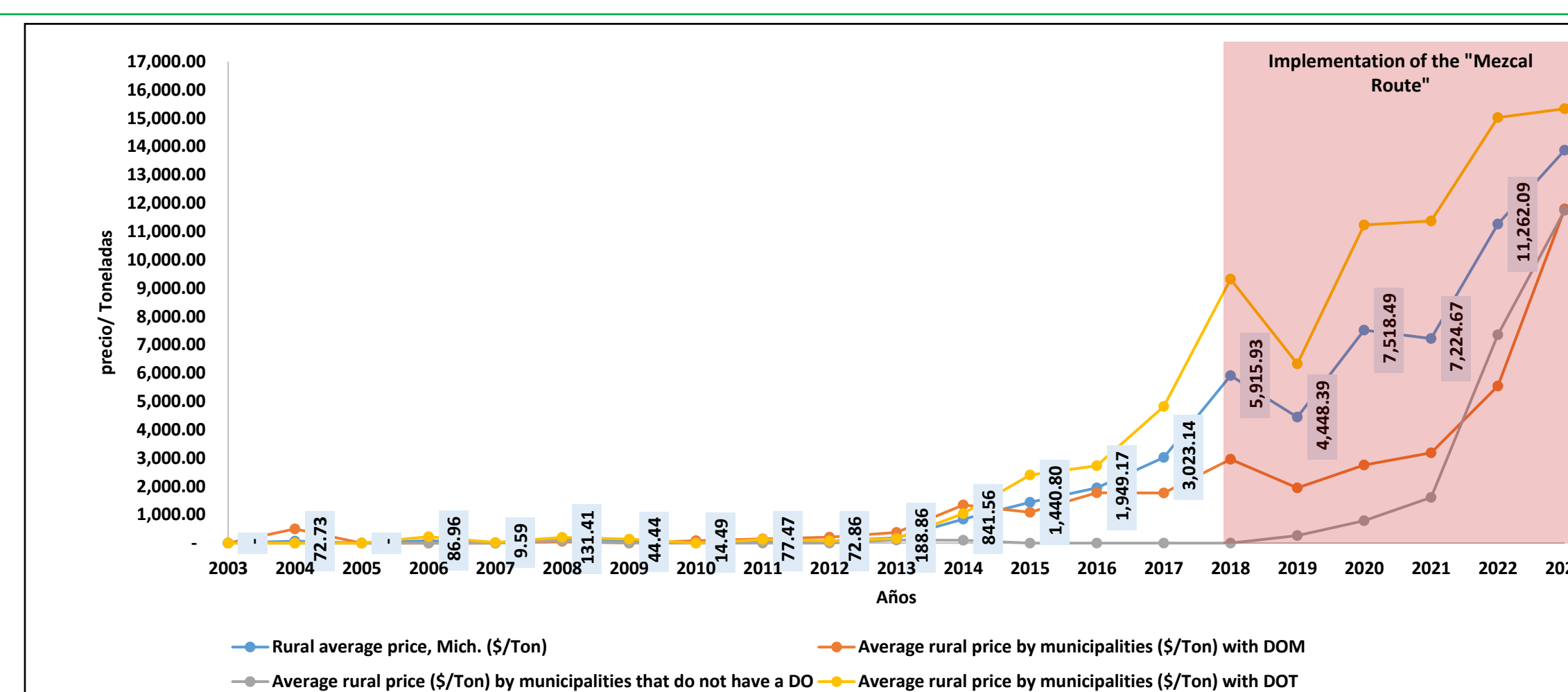


Figure 2. Average rural price of agave by municipalities with Designation of Origin (DO).

Agave production color (Ton)	Municipality	Marginalization degree	Marginalization degree index	Average years of schooling	% internet availability per household	Agave production color (Ton)	Municipality	Marginalization degree	Marginalization degree index	Average years of schooling	% internet availability per household
48,555.00	Vista Hermosa	Very Low	56.662	8	33%	76	Sahuayo	Very Low	57.804	8	51%
22,560.08	Jiquilpan	Very Low	57.541	9	38%	75	Los Reyes	Very Low	55.83	8	33%
21,157.71	Madero	High	52.09	7	11%	103	Carranza	Low	56.265	7	38%
18,183.23	Queréndaro	Low	55.85	7	20%	51	Marcos Castellanos	Very Low	58.704	8	43%
9,625.20	Tzitzio	High	48.782	6	8%	83	Tancitaro	Low	55.918	7	23%
7,996.30	Morelia	Very Low	59.394	11	49%	19	Cajiao	Low	56.504	7	33%
7,646.98	Charo	Low	55.455	7	24%	74	Ejcomattán de Niguales	Low	56.221	7	26%

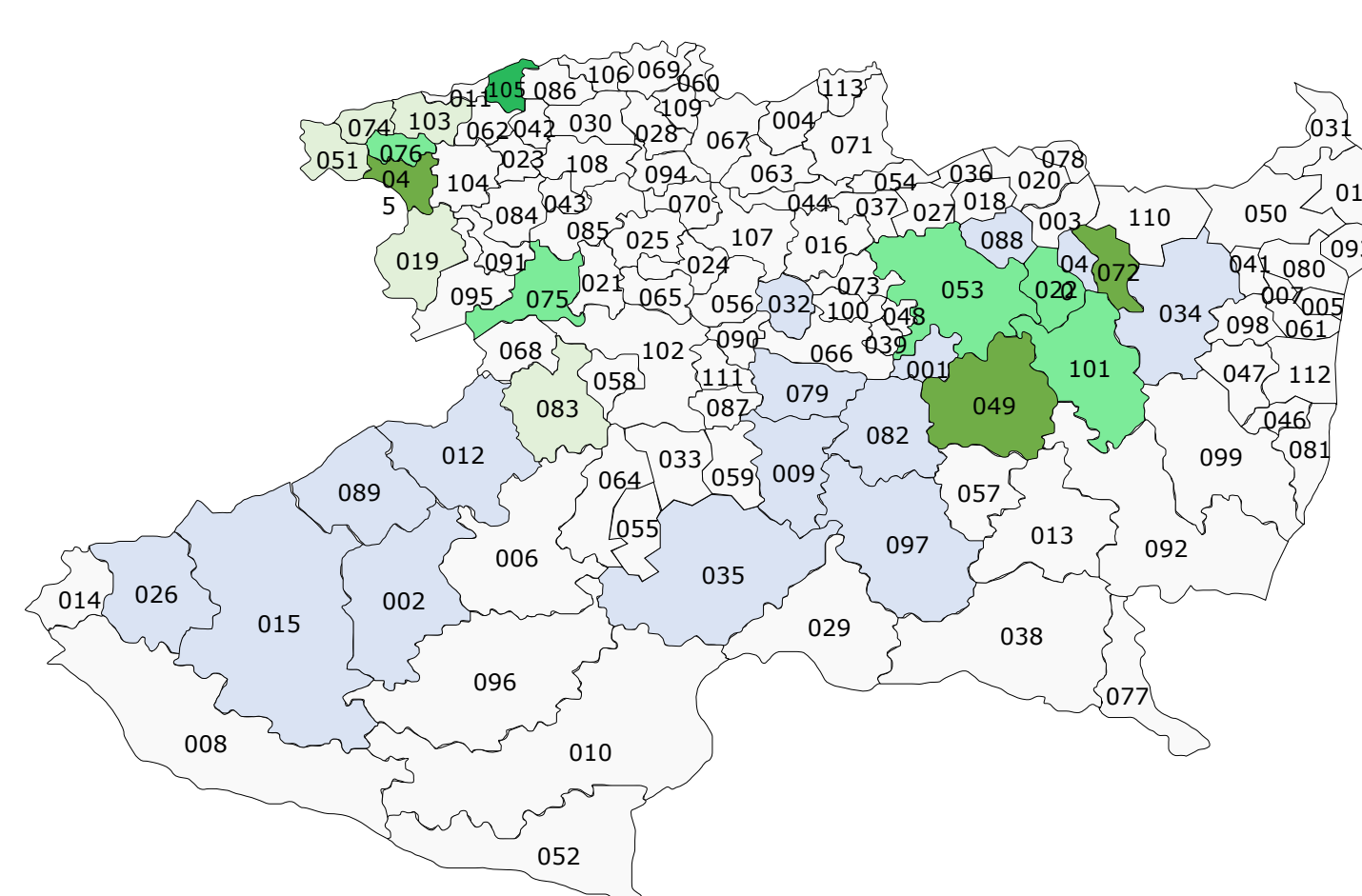


Figure 3. Map of Michoacán with the municipalities with Denomination of Origin of Mezcal (DOM) and their Agave Production in Tons (2023).

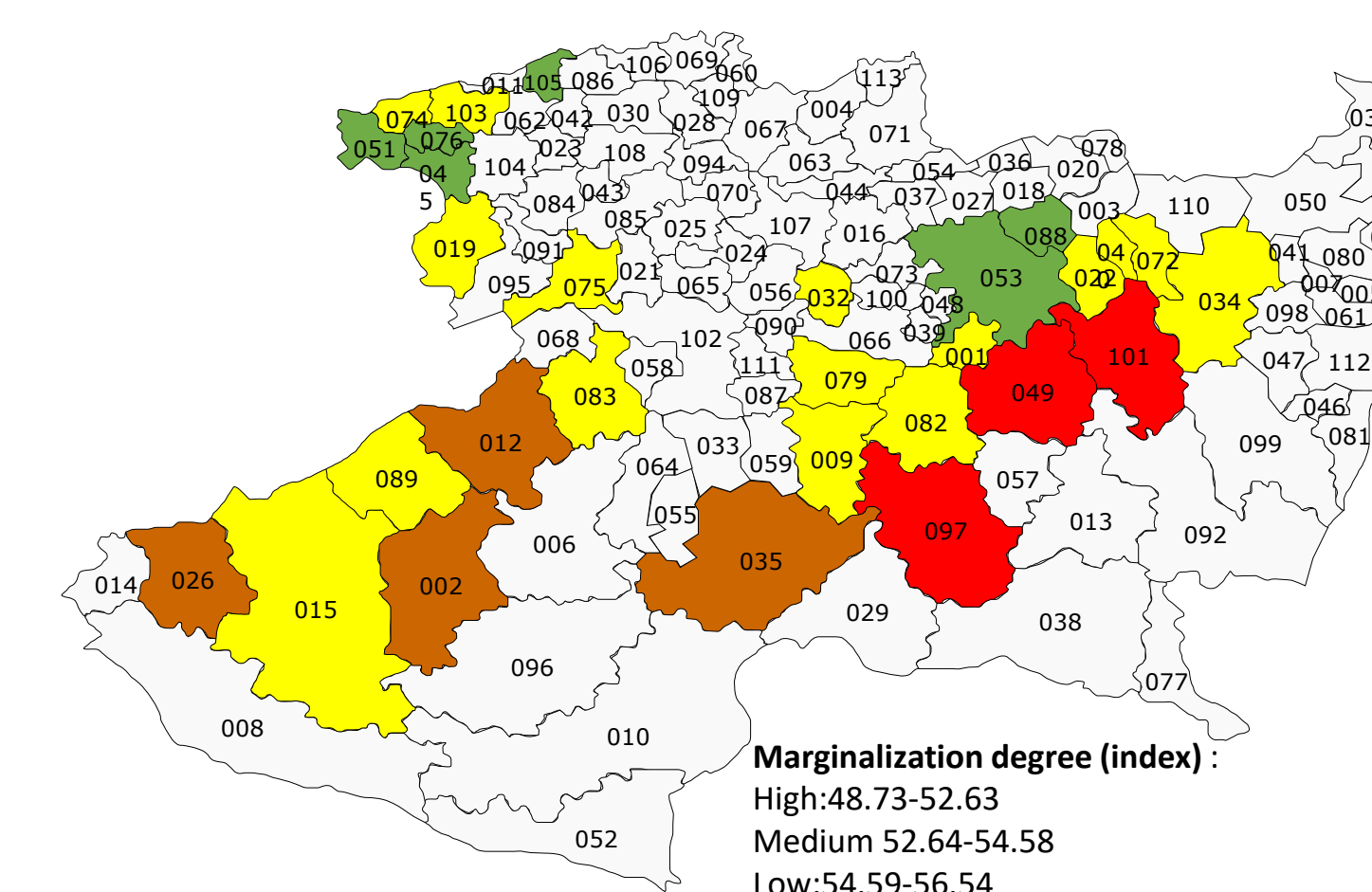


Figure 4. Map of Michoacán with the municipalities with Denomination of Origin of Mezcal (DOM) and their degree of marginalization (2020).

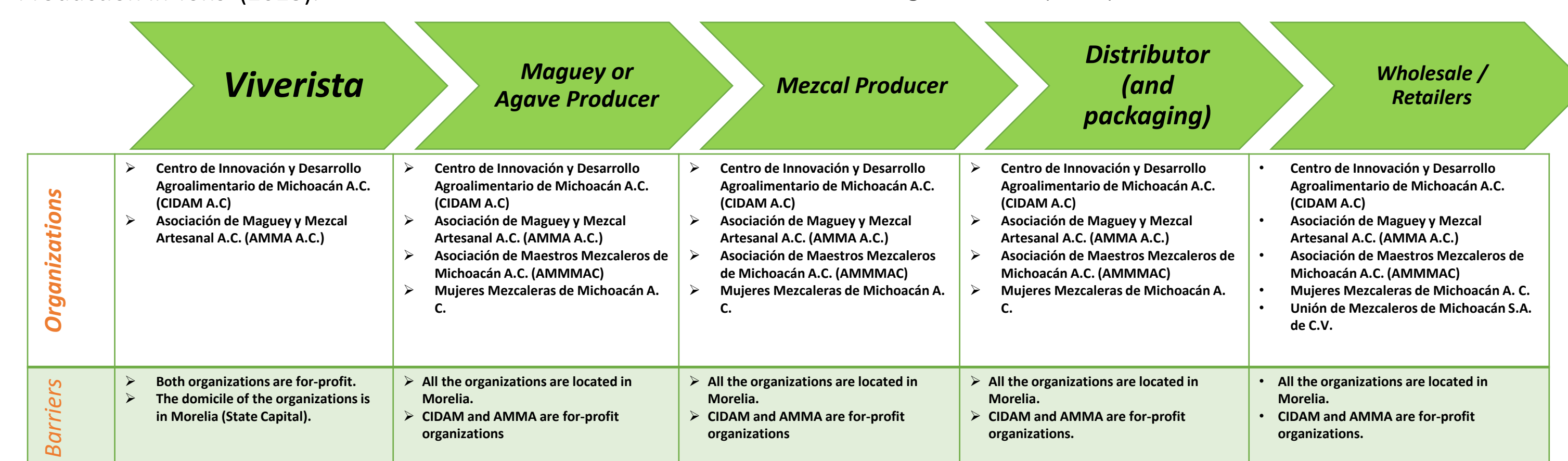


Figure 5. Mezcal production value chain with the participation of organizations in the state of Michoacán.

## Technological Reflections

- ✓ Dissemination of the product with DOM and points of sale on social networks, so the public knows the product value and sales store.
- ✓ Design a digital tool with current technologies for people who belong to the mezcal production chain and can access knowledge: product price, suppliers, and organizations that can help them improve their marketing conditions.

## References

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