The Sociocultural Dimension of the Maize Value Chain in Chiapas, Mexico

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ABSTRACT

Objective: To analyze the sociocultural dimension of the maize value chain in the Frailesca region, Chiapas, Mexico, in order to contribute to a comprehensive understanding of the system.

Design/Methodology/Approach: The research was exploratory and descriptive, combining quantitative and qualitative methods. The value chain and systems analysis approaches were integrated. Two types of information were used: primary data, through semi-structured interviews with actors in the production chain, and secondary data, through available official statistical information.

Results: The main results indicate that traditional management, product use, and technological modernity influence marketing channels in a non-linear manner. The production link is based on family labor; the transformation and consumption links are based on local food culture. The sociocultural factor is a determinant of the maize agroecosystem value chain in Chiapas.

Study Limitations/Implications: It is necessary to consider sociocultural aspects in the development programs for maize production and consumption in La Frailesca, with an approach that goes beyond value chain analysis and recognizes networks and production-consumption systems. Analyzing the value chain of agricultural product use and transformation from a scientific research perspective contributes to identifying critical limitations among actors and their relationships for the improvement of the agroecosystem.

Findings/Conclusions: The production link is based on family labor and small production systems with diverse potentials in the four municipalities studied. The transformation and consumption links are driven by local food culture, creating feedback that also affects the production sector. The maize value chain in the Frailesca region is characterized by encompassing family and local domains, with significant sociocultural influence, where the value addition flow is far from linear. Although not hegemonic, the sociocultural factor plays a predominant role in the maize agroecosystem value chain in La Frailesca.

Keywords: *Zea mays* L., ethnobotany, tradition, value chain, self-consumption.

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INTRODUCTION

Globally, in 2022, approximately 206 million hectares of maize (*Zea mays* L.) were planted, producing about 1,160 million tons of grain (FAO, 2022). In Mexico, maize is the most important crop, not only as a staple food but also for its economic, social, and political significance. In terms of planted area, with 5.8 million hectares, it ranked 8th in the world, after the United States, China, and Brazil. In terms of production, approximately 26.5 million tons placed it 7th, following the United States, China, Brazil, Argentina, India, and Ukraine. This was the lowest production in four years, as in 2021 it was 27.5 million tons (FAO, 2022).

Mexican producers establish the maize agroecosystem across a wide range of altitudes and climatic variations, from sea level to 3,400 meters above sea level (CONABIO, 2020). Within this great variability of environments, indigenous and peasant farmers, through their knowledge and skill in crop management, have successfully adapted and maintained an extensive diversity of native maize varieties (González *et al.*, 2013; Coutiño *et al.*, 2015; Vázquez *et al.*, 2018; Guevara *et al.*, 2019).

The uses and values of communities extend across multiple aspects of Mexicans' survival strategies. Maize grain is used to prepare various foods, with tortillas and their variations being the most notable (Cadena *et al.*, 2012). The annual *per capita* consumption is 346.5 kg (SADER, 2022). Authors such as Barros (2009) and Esteva and Marielle (2003) have highlighted aspects of using the entire maize plant, including roots and stalks, which serve as fertilizer or fuel. The stubble is used as forage, the cane (stem) is used in house construction, pasture fences, and other parts of the plant are used to make figures, medicines, wrappings, fertilizer, fuel, and refreshing or alcoholic beverages.

The maize leaf serves as a wrapper for tamales, for making ritual or artisanal objects, and as containers. The corncob husk, or "olote," is used as fuel and animal feed, as a tool for husking corn cobs, polishing wood and pottery pieces, or as stoppers or lids for containers. Maize is also employed for medicinal purposes, curing various illnesses of the "body and soul," according to regional traditions.

In order for the diversity of maize products and by-products to reach consumers, they go through a series of value aggregation stages known as the Value Chain (Neven, 2015), which includes, basically, primary production, marketing, and consumption (USAID, 2019). Within this chain, social actors and economic agents coexist, each with diverse capacities to organize and coordinate the flow of added value until consumption (Sandoval, 2015).

The analysis of the value chain for the use and transformation of agricultural products, from a scientific research perspective, contributes to the task of identifying critical limitations in actors and their relationships, aimed at improving the system. This is verified by revitalizing distribution channels and developing producers' and transformers' vision through exploring new alternatives in the mobility of goods and services.

In La Frailesca, most research or technological and market development efforts have largely focused on maize agro-productivity (Hellin *et al.*, 2013; Caballero *et al.*, 2017; Delgado *et al.*, 2018; Guevara *et al.*, 2021). Meanwhile, aspects related to distribution, transformation, and consumption have not been sufficiently studied.

The Frailesca region is the second largest region by land area in Chiapas, comprising the municipalities of Villa Corzo, Villaflores, El Parral, Ángel Albino Corzo, Montecristo de Guerrero, Capitán Luis Ángel Vidal, and La Concordia. Its territory covers 798,023.9 hectares, representing 10.7% of the state's surface area. In 2022, 60,285 hectares were dedicated to maize cultivation, producing 30.3% of the state's volume and occupying 50.9% of the total planted area (SIAP, 2022; CEIEG 2022). Due to the importance of maize cultivation, Frailesca has been recognized as the 'granary of Chiapas', where farmers select varieties of maize, both native and hybrid, aiming for productivity and adaptability (Delgado *et al.*, 2018). Building upon the prior mentioned, the analysis focused on the sociocultural dimension within the productive relationships of the maize value chain links in the Frailesca region, aiming to thoroughly understand the system and identify factors influencing the behavior, trends, and configuration of its links.

MATERIALS AND METHODS

The Frailesca region, Chiapas, is located in the Pacific Coastal Plain and the Central Depression of Chiapas (Figure 1); the main soil types are lithosol, regosol, and agrisol. The predominant climate is warm sub-humid, followed by a semi-warm humid climate, both with summer rainfall (CEIEG, 2022).

The research was conducted from January to December 2021 and geographically covered 36 localities across the municipalities of El Parral, Villaflores, Villa Corzo, and La Concordia. Data was obtained from surveys conducted with 292 producers, 202 transformers-traders, and 259 consumers within the maize value chain in Frailesca, focusing on municipalities known for maize production (INEGI, 2018).

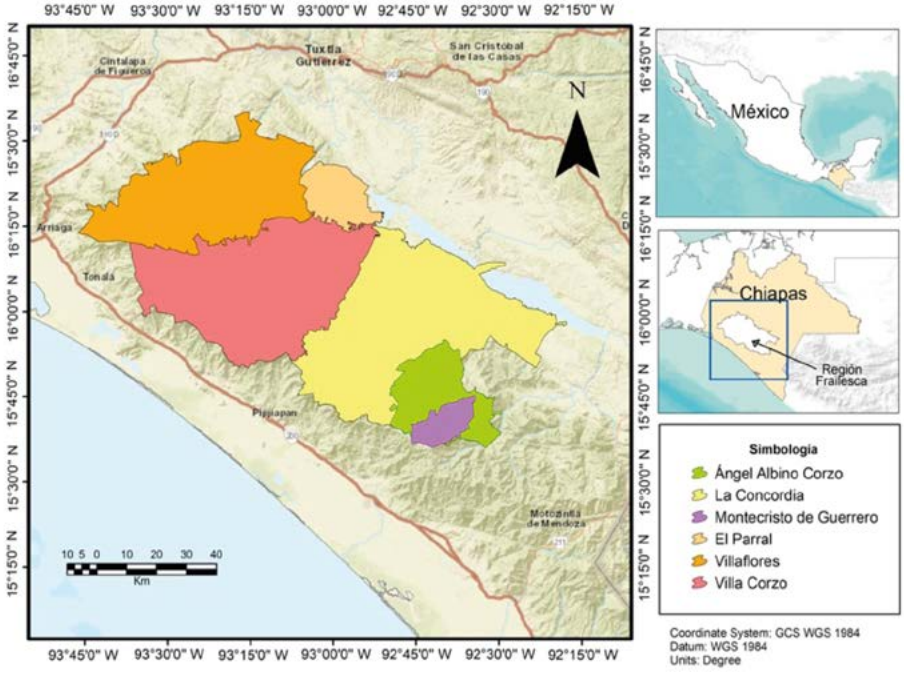

Figure 1. La Frailesca region in the state of Chiapas and its municipalities.

The research was exploratory and descriptive, employing a combination of quantitative and qualitative methods. For its design and implementation, value chain and systems analysis approaches were integrated (López, 2009). In this case, all components of the maize value chain, from production to consumption, were considered.

In the analysis, both primary and secondary information was utilized. Primary information was gathered through the application of semi-structured interviews with stakeholders involved in the links of the production chain, predefined from the theoretical perspective of the value chain approach (Table 1).

The fieldwork for data collection was based on the methodologies of ethnobotanical exploration (Hernández X., 1985) and ethno-agronomy (Guevara-Hernández, 2007), including visits to communities to look for key informants. Secondary information was obtained from available official statistics, sourced from databases of SADER, INEGI, SIAP, and SIACON. The representation of chain components was developed through the perceptions of interviewees and their relationships with other actors involved in the production, distribution, transformation, and consumption of maize and its derivative products.

Analysis of the information

Descriptive statistics and frequency analysis were used. A t-test was applied to determine the difference between acquisition prices via long or short value chains, and analysis of

Table 1. Variables used in the analysis of the maize value chain.

Link	Variable	Source of information
Primary producer	Annual production by municipality (t)	SIAP (2020) and INEGI (2020)
	Sample annual production (t)	Interview with the producer
	People you feed	Estimated according to Funes (2009)
	People he/she feeds	Estimated according to Funes (2009)
	Energy availability	Estimated according to Funes (2009);
	Production (t)	SIAP (2019)
	Maize yields (t ha^{-1})	
	Production value ($)	
	Type of labor	Interview with the producer
	Production destination	Interview with the producer
	Production scale	Interview with the producer
	Planted area, sample (ha)	Interview with the producer
	Area by municipalities (ha)	Source: SIAP, 2019.
	State surface area (ha)	SIAP (2020); INEGI (2020)
Local marketer/ transformer	Destination of national corn production in Mexico	SADER-SIAP (2019)
	Destination of local production	Interview
	Local corn products	Interview
	Unit production cost	Interview
	Selling price (one ton)	Interview
	Benefit cost ratio	Interview
	Criteria for price formation.	Interview
Consumers	Derived products consumed	Interview
	Frequency of consumption	Interview

variance was conducted using a general linear model to analyze differences in cost-benefit relationships among different actors in the chain. Associations between categorical variables were analyzed using Simple Correspondence Analysis (Hoffman and Franke, 1986). The associated variables included: municipalities, type of labor, destination of production, forms of preparation, and frequency of maize consumption as a human food. To facilitate graphical interpretation of factorial dimensions, variable scores were adjusted with linear or quadratic vectors. STATISTICA© software (data analysis software system), version 8.0 (StatSoft, 2007), was used.

RESULTS AND DISCUSSION

Representation of the value chain. In the Frailesca region, the maize value chain consists of the classic links: production, transformation, commercialization, and consumption (Casanova *et al.*, 2019 and Isaza, 2010). Based on farmers' perceptions, particularities were identified in the production link, highlighting family labor in various processes within the chain as a whole (Figure 2). Thus, production occurs on small plots (around four hectares), and a significant portion of maize and its by-products are used for self-sufficiency, including the raising of domestic animals. The grain is primarily marketed locally, either within the same community or municipal head, with the involvement of local and regional intermediaries.

The family and local nature of consumption foster interactions among the links of production, transformation, and consumption that are culturally defined by the uses and values attributed to maize by the community, in such a way that feedback is generated within the chain in the opposite direction of the value-added flow, leading to the co-evolution of its components.

In the context of agricultural development, the term "co-evolution" was coined by Norgaard (1994), Vara-Sánchez and Cuéllar-Padilla (2013), who described how co-

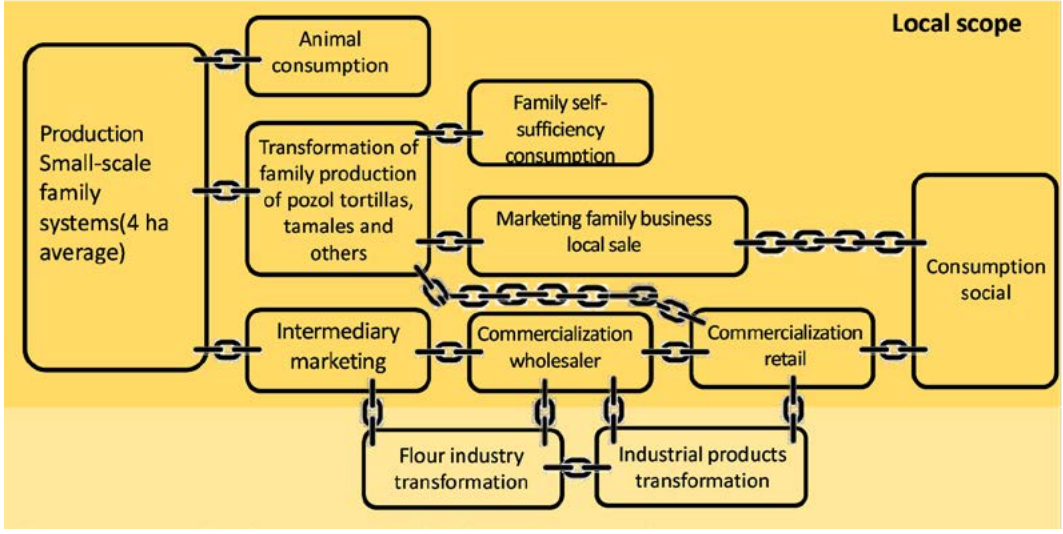

Figure 2. Representation of the maize value chain and its links and dynamic interactions in La Frailesca region (Source: own elaboration).

evolutionary processes have implications on biological resources, their natural and socio-economic environments. In the case of Mexico, the cultural mega-diversity is consistent with the genetic and usage diversity of the crop (Guevara *et al.*, 2019). In this case, the value chain serves as an analytical framework to understand the socio-economic environment of the crop.

In Frailesca, the boundaries of the agri-food system associated with maize are defined by the level of local consumption of the product. Therefore, the local culture not only sets guidelines for each added value but also influences agronomic practices in production and crop improvement.

The analysis of federal and state statistics allows us to understand that, based on maize cultivation, there is an energy availability of 277% for the inhabitants of La Frailesca. This can be interpreted as the fact that the region produces five times more maize than required to meet the energy needs of its population (Table 2).

The region meets local needs and exports maize to the rest of the state and country. However, not only the local culture may be dictating guidelines in the evolution of the value chain, as there is demand beyond the theoretical limits of the local agri-food system. In this regard, Casanova *et al.* (2019) emphasized the importance of context and demands on the performance of value chains.

The mentioned demand does not necessarily impose the same guidelines as those emerging from Frailescan and Chiapanecan culture. Thus, it is a value chain influenced by multiple cultural vectors. One of these is biocultural memory, and another could be modernity. These two vectors are not, in themselves, dichotomous categories. Instead, they intertwine to generate oscillating trends (Toledo and Barreras, 2008; Muradian *et al.*, 2012).

From the perspective of economic and social development research, different analytical lenses can be identified to influence these trends and prioritize one of these vectors (biocultural or modernist). In this regard, authors such as Muradian *et al.* (2012) emphasized two fundamental ones. On the one hand, economic and innovation approaches highlight the role of the market, mechanisms of income creation, and the distribution of benefits along the chain, as well as technological change and knowledge management. On the other hand, some approaches emphasize the social and cultural role in explaining the configuration of actors and the social construction of the meaning and attributes of products or use value.

Table 2. Analysis of maize production and theoretical self-sufficiency capacity in La Frailesca region, Chiapas.

Ambit	Surface [(1)] (ha)	Annual production [(1)] (t)	People you feed [(2)]	People that feeds/ha	People [(1)]	Energy availability (%)
State	798,023.9	353,585.65	1,269,511	1.59	5,543,828	23%
La Frailesca	60,285	227,261.70	815,958	13.54	294,812	277%
Coverage[(3)]	7.55%	64%			5%	

[(1)] Sources: SIAP (2022) and INEGI (2021).
[(2)] Own calculation based on an energy requirement per person of 1022 Mcal/year; energy contribution of maize (3,300 kcal/kg dry weight). According to Funes-Monzote's proposal (2009) for energy analyses.
[(3)] Proportion of La Frailesca region relative to the state indicator.

Use value is a concept derived from Adam Smith's theory of value, which states that, each good or service has the primary characteristic of satisfying a specific need (Economipedia, 2020). When applied to value chains, this concept helps to unravel the underlying relational models (Valdés, 2017). These models are based on frameworks of motivations or modes of justification assumed by the involved parties. Muradian *et al.* (2012) described these relationships as grammars of value or regimes of justification. Justifications explain how social links evolve within a production network (Cabrera, 2018).

A study related to value chains (Fair Trade Coffee; Raynolds, 2009) identified at least three analytical models: a) one that incorporates considerations for local development as part of business practices, b) another that adopts quality as the main driving force of relationships, and c) the third that is founded on the interest in traceability as a strategy to meet new hygienic-sanitary quality control requirements of markets. However, in the case of the maize agroecosystem value chain in the Frailesca region, these models do not seem sufficient to understand the relationships and frameworks of motivations mentioned. "Comercio Justo" (Fair Trade) is a socio-economic innovation that challenges modernity, while the case of Frailescan maize follows more traditional channels, such as bartering.

Thus, this discussion highlights the biocultural vector to understand the relationships between actors in value chains for this case study. Toledo and Barreras (2008) noted that societies, like individuals, have memory. This attribute allows them to remember past events, and when there is an intersection between the biological and the cultural, biocultural memory results, which is a form of social memory, whose essence is traditional knowledge. These same authors placed Mexico among the top ten countries with the greatest biocultural wealth. This assertion is based on the country's biological, linguistic, and agricultural diversity, as well as the prevalence of indigenous, peasant, and rural populations. Regarding biological diversity, the nation ranks fourth among megadiverse countries (Sierra *et al.*, 2014) and fifth in linguistic diversity (Hernández and Maya, 2016).

On the other hand, the modernity vector corresponds to a sort of ideology of progress and development, which considers what it calls 'pre-modern knowledge' to be insufficient. This ideology confers upon itself a universal and totalitarian reach (Morin, 2016). Under this premise, traditional culture is often commodified by attempting to reflect in 'values' and quantify the qualitative aspects behind sociocultural dimensions, which would be termed exchange value (Economipedia, 2020).

From the relationship between both vectors, the trends of the maize agri-food chains and the co-evolutionary dynamics of their links in the Frailesca region emerge. Biocultural memory tends to favor family consumption and direct channels between producers and consumers, while the modernity vector encourages the participation of intermediaries, the milling industry, and exports.

Not necessarily are both vectors at odds. Rather, they are sources of dialogue and enriching interactions in the processes (Solleiro *et al.*, 2014). The traditional knowledge that supports biocultural memory is a living, resilient entity that reconfigures itself through praxis in continuous learning cycles (La O *et al.*, 2018). Therefore, it is ready to co-evolve with the value chain itself.

In terms of the productive link, the potential varies among the municipalities of the region. Villaflores, La Concordia, and Villa Corzo stand out for their production and yield (Table 3), where agriculture is the main economic activity, as more than 50% of the economically active population is directly involved in this primary sector (SIAP, 2018).

In the Frailesca region, three types of labor are prominent in maize production: hired, family, and mixed (Figure 3). Overall, family and mixed labor predominates. Mixed labor refers to family labor supplemented by temporary external hires for specific tasks like planting and harvesting. The figure shows that hired labor, though less frequent, is significantly associated ($p \leq 0.0001$) with the municipalities of Villaflores, La Concordia, and El Parral, falling within the general range between family and mixed labor, whereas Villa Corzo is more strongly associated ($p \leq 0.0001$) with family labor. This suggests that production in Villaflores is somewhat more oriented towards sales, possibly due to larger production units.

Table 3. Maize production and income in the municipalities of La Frailesca region of Chiapas. Source: SIAP, 2022.

Municipality	Sown area (ha)	Production (t)	Yield (t ha^{-1})	Production value ($ Mexican Pesos)
Captain Luis Angel Vidal	1,132	1,634.38	1.44	6,696.22
El Parral	2,611	9,623.76	3.69	49,139.54
Angel Albino Corzo	3,802	10,151.34	2.67	53,746.88
La Concordia	18,895	75,580.00	4.00	397,773.76
Monte Cristo de Guerrero	880	2,367.20	2.69	12,503.05
Villaflores	22,531	90,004.32	3.99	475,839.09
Villa Corzo	10,434	38,261.70	3.67	193,001.91

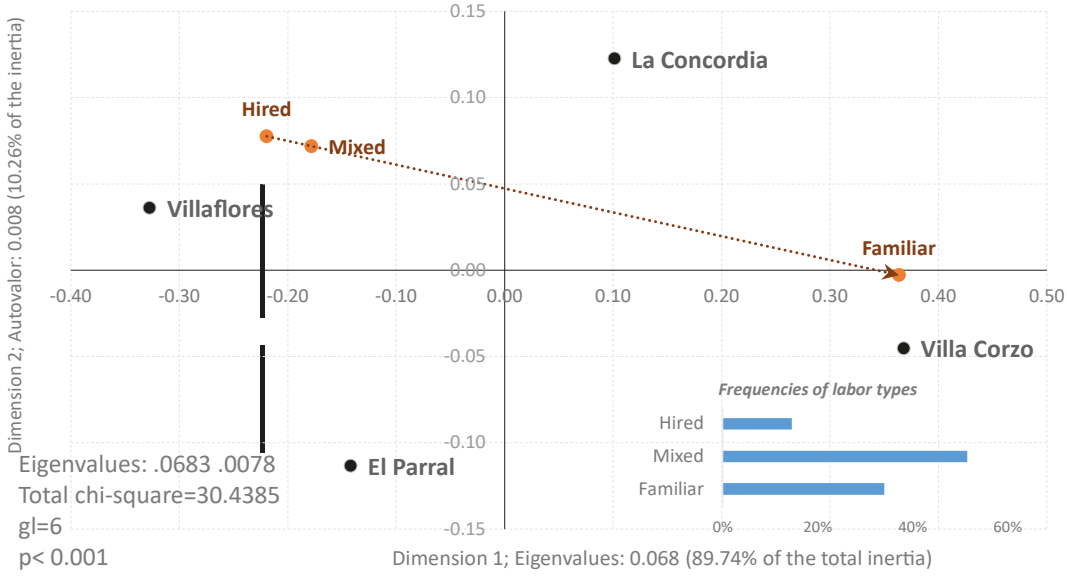

Figure 3. Type of labor involved in maize production in La Frailesca region. Relationships of municipalities with the type of labor vector, through simple correspondence analysis.

Family labor transforms maize cultivation into a space for the construction and socialization of traditional knowledge. It is called construction because collective productive activity is a source of continuous experiential learning cycles that influence the knowledge, beliefs, and skills of the group of people involved. Each experience is given meaning through the mental filters of culture, which can modify the practice itself to generate new cycles where learning is consolidated or events are "reinterpreted" (Pérez *et al.*, 2015).

In other words, the process is understood as socialization because it involves a social construction, wherein tacitly the entire preceding set of beliefs, knowledge, and skills is made available to those involved. According to Toledo and Barreras (2008), this entails the combination of kosmos (system of beliefs) –corpus (system of knowledge), which give meaning to a praxis (system of practices). This is the concrete mechanism through which the productive link of the value chain begins to receive cultural feedback, an effect that manifests in the reverse direction of the value flow within the chain, influenced by the patterns set by consumer culture.

In the value chain of the maize agroecosystem in the study area, various destinations for the grain were identified, but human consumption dominated in all municipalities (Figure 4). The milling industry was particularly present in La Concordia, while animal consumption was evident in Villa Corzo. Throughout the commercialization process, sales through intermediaries predominated.

Product destinations, in this case maize during the period 2015-2019, are indicators of the balance among channels of the agri-food chain (Table 4). According to national statistics, just over a third of the production flows through the channels of the milling industry at the national level. This turned out to be the main destination for the grain; however, livestock consumption and self-supply are also important destinations, which run through family consumption channels, together representing around 70%.

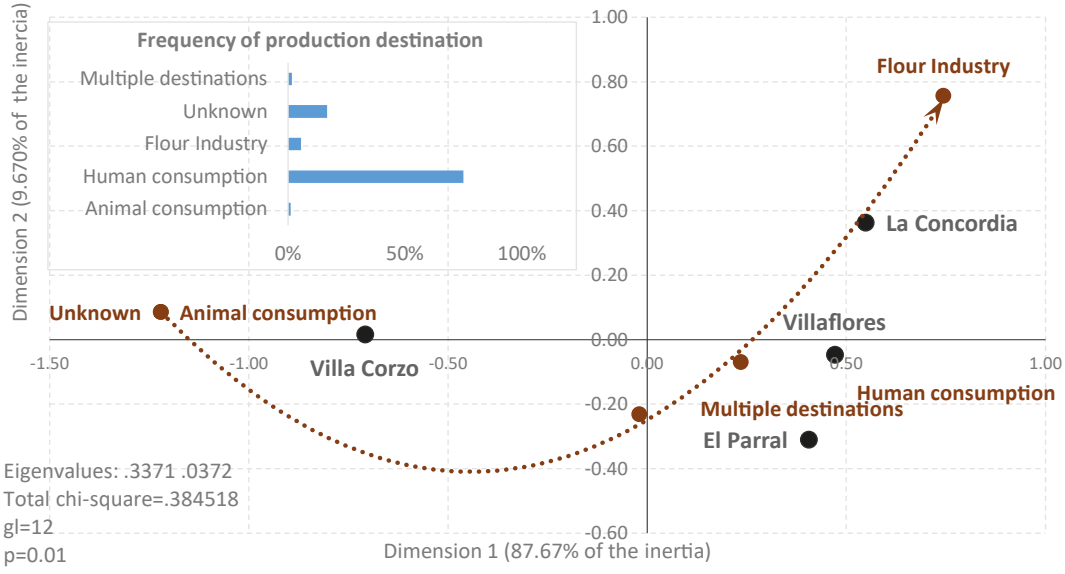

Figure 4. Destination of maize production in La Frailesca. Relationships of municipalities with the destination vector, through simple correspondence analysis.

Table 4. Destination of national maize production in Mexico, during the period 2015-2023.

Year	Offer (t)	Production (t)	Grain consumption		
			Flour mill (%)	Livestock (%)	Human (%)
2015	1,647	22,255	21.18	18.12	52.73
2016	1,843	22,335	18.02	18.75	52.37
2017	1,528	24,468	20.11	18.26	50.89
2018	2,106	24,384	20.72	19.23	51.68
2019	2,485	25,433	21.24	19.46	51.80
2020	3,296	23,575	19.48	19.97	52.65
2021	1,765	24,294	20.70	18.17	54.55
2022	2,159	24,564	20.69	18.11	54.55
2023	1,915	23,115	21.32	17.44	56.01

Source: f <. Data presented in thousands of tons (t).
Source: SADER-SIAP (2019 and 2023). Data presented in thousands of tons (t).

The local transformation-commercialization channel was the most relevant in the value aggregation flow, highlighting products such as tortilla, pozol, and tamal (Figure 5). This channel has three pathways: direct chain, short chain, and long chain. In this order, the number of participating actors increases. The increase in the number of actors, 'links' in a chain, leads to greater specialization and more extensive biophysical circuits (Ferrer *et al.* 2020). In this case, it is observed that locally produced maize 'returns' after passing through the milling industry and other local transformation processes that generate derived products and by-products, adding a significant burden of mobilization or transportation costs to the transformation expenditure structure.

The direct chain represents 45% of the transformer-commercializers studied. These are generally primary maize-producing families that reach consumers with locally or traditionally transformed products. This responds to survival strategies, as maize production

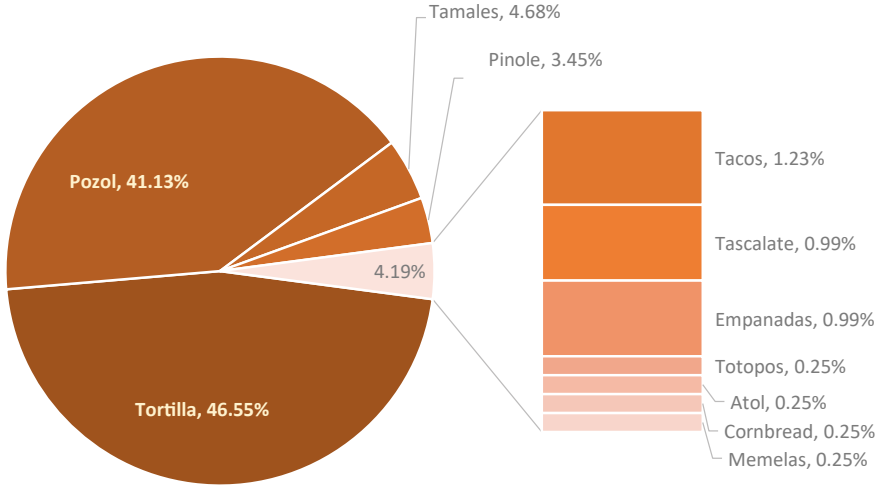

Figure 5. Main local products derived from maize transformation in La Frailesca.

occurs under rain-fed conditions and only occupies one-third of the year. The producer-transformer has a competitive advantage over others because they self-supply their own raw material while stabilizing their income. The transformation and commercialization links generate a better cost-benefit relationship than primary production (Table 5). In this sense, products like pozol and tortilla stand out with statistically significant differences ($p<0.001$) compared to primary production. This is another positive effect for the producer that extends to these links (Analuisa *et al.*, 2022).

The short chain represents 40% of the sample. These are local transformer-commercializers who buy directly from producers. The long chain represents 15% of the sample and includes intermediaries, industry players, and wholesale or retail marketers. The long chain involves an increase of $1.89 Mexican pesos in the retail price of maize, rising from $6.12 to $8.10 Mexican pesos per kg (significantly higher, $p<0.001$, when applying the *Student's t*-test, df=98).

The local price of maize is relevant because input costs are the primary criterion for setting prices of products or by-products derived from maize by transformer actors, accounting for 51% (Figure 6). The second criterion is expected profit. This latter criterion is more complex as it includes production costs plus an expectation of the profit margin to be achieved (Nahuel and Padilla 2017).

Understanding consumption patterns was relevant as it was found that the main daily forms of maize consumption are as tortillas and pozol, the latter being a beverage

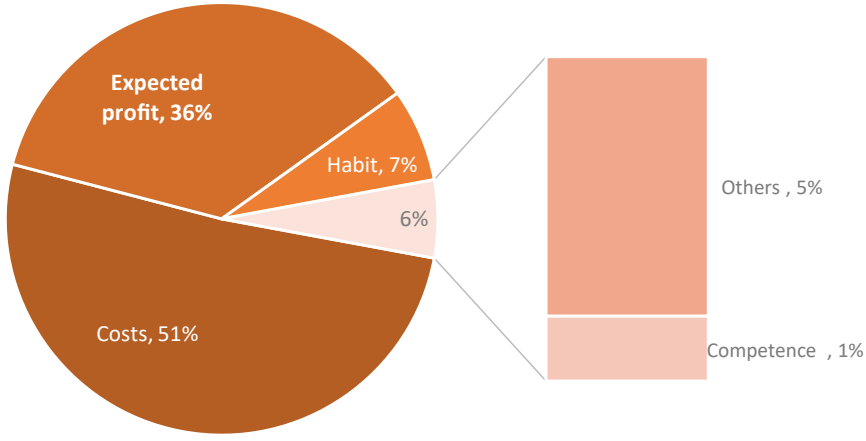

Figure 6. Criteria for price determination in local products derived from maize in La Frailesca. Source: Authors' elaboration based on the study sample.

Table 5. Profitability and distribution of economic benefits among primary maize producers and maize transformers.

Variable	Producers		Local marketing transformers					
	Maize (t)		Tortilla (kg)		Pozol (450 ml)		Tamales (unit)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Unit production cost (per ton)	$2,481.82	230.40	$ 5.33	0.86	$4.57	0.76	$3.70	0.82
Sales price (per ton)	$4,273.37	277.02	$11.54	1.12	$10.26	1.06	$6.95	0.75
Benefit cost ratio (Sig. $p<0.001$)	1.73^{c}	0.14	2.20^{ab}	0.25	2.27^{a}	0.23	1.94^{bc}	0.30

made from maize dough and ground cocoa, among other ingredients (Ordoñez, 2017). Additionally, maize is consumed in tamales once a week or every fifteen days, and irregularly as pinole (derived from the Nahuatl word pinolli, a pre-Hispanic food made from toasted maize flour sweetened with sugar or piloncillo); or as tascalate (also known as taxcalate), a typical beverage from Chiapas made with toasted maize, cocoa beans, annatto, sugar, and cinnamon. All these ingredients are ground to create a powder, which when mixed with cold water or milk, results in a refreshing drink (Ordoñez, 2017). Finally, maize is also consumed in the form of fried or baked tortillas, called tostadas and totopos (Figure 7).

The transformation-consumption pattern, represented in Figure 5, defines a shared habit that transcends time and prevails despite modernity's new trends. This is interpreted as part of traditional food culture and is one of the aspects that characterize Mexico as one of the world's most important centers of biocultural memory (López and García, 2017).

The transformation of the mentioned products is carried out in an artisanal and semi-mechanized manner. For this purpose, utensils commonly found in households are used, such as: pots (painas), manual or electric mills, tin spoons, presses, metal griddles (comales), molds, wood-fired stoves, and to a lesser extent, gas stoves. It is confirmed that maize is a raw material with multiple uses, where nixtamalization forms the cultural basis for grain transformation for food. This process involves placing maize grains in hot water with a bit of lime, allowing it to soak for several hours. Finally, the liquid is drained, and the remaining solids are ground to obtain maize dough (Perales, 2012).

Paredes *et al.* (2009) pointed out that when nixtamalized maize is ground, it loses its structure because the components of the grain have been modified. The resulting dough from grinding consists of fragments of the germ, residues of the pericarp, and endosperm

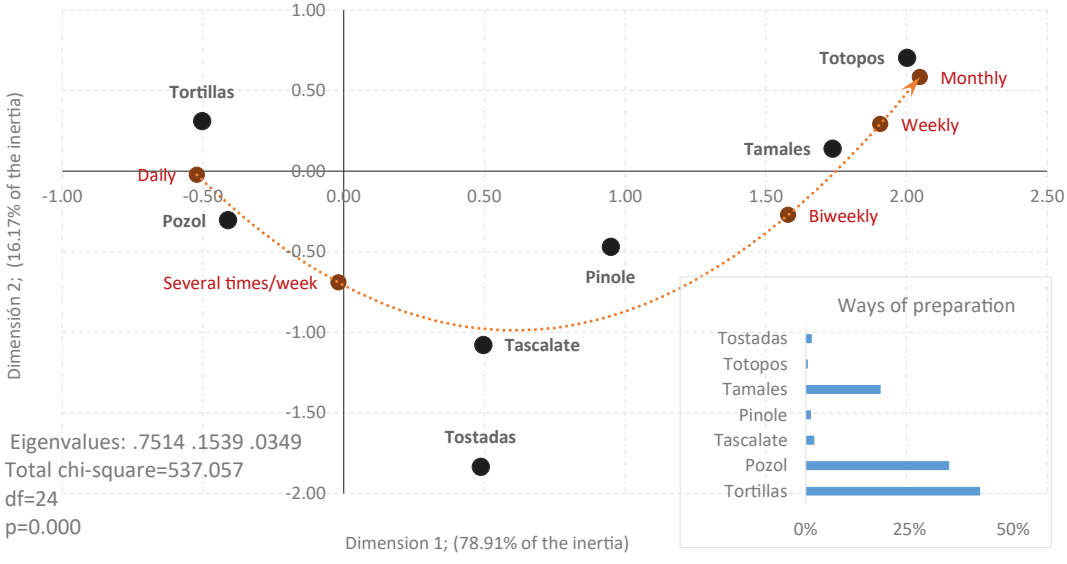

Figure 7. Traditional forms of maize food use in La Frailesca region. Relationships with the frequency consumption vector through simple correspondence factorial analysis.

held together by partially gelatinized starch, and emulsified proteins and lipids. Maize is deficient in the amino acids lysine and tryptophan; however, through this process, the availability of most essential amino acids is increased, which undoubtedly represents one of the greatest contributions of Mesoamerican biocultural memory to the world.

In this way, although the term 'chain' suggests a flow that links connections, it is actually a value aggregation flow that is far from being linear, like in a literal chain. Taking into account the above, García *et al.* (2009) compare it to a web of relationships, where actors with high organizational power and influence could dominate processes and impose their influence over the less powerful. Moreover, it implies that there are relationships in multiple directions, channels, and dimensions.

The chain approach can also provide a methodological framework for regional development management and the design of public policies (Pietrobelli and Staritz, 2017; García *et al.*, 2009). In other words, it demonstrates that such an approach is an additional tool to enable multi-actor processes, as mapping chains necessarily requires identifying and interacting with stakeholders and allows for gathering relevant information about the relationships established among them. This involves an inclusive process of citizen management that requires building awareness regarding these relationships.

CONCLUSIONS

Cultural feedback have been described, guided by consumption traditions in the Frailesca region, where the influence of multiple trends in this area is recognized. Tradition (referred to in the study as biocultural memory) and modernity are lines of thought that constantly interact for the functioning and balance of marketing channels (lightly addressed in the study). The production link is based on family labor and small-scale production systems with diverse potentials in the four municipalities studied. Transformation and consumption links are guided by local food culture and produce feedback that also impacts the productive sector.

The maize value chain in the Frailesca region is characterized by encompassing the familial and local realms, with significant sociocultural influence, where the value aggregation flow is far from linear. While not hegemonic, the sociocultural factor plays a predominant role in the maize agroecosystem value chain of Frailesca.

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