Agricultura, Sociedad y Desarrollo

TYPIFICATION OF SHORT MARKETING CIRCUITS FOR LOCAL, HEALTHY AND SPECIALTY AGRIFOODS IN THE SIERRA NEVADA POBLANA

Reyna Concepcion **Xochipa-Morante**[1*], José Luis **Carmona-Silva**[1], Jose Roberto Xochipa-Morante[2], José Arturo **Méndez-Espinoza**[2], Diana Hernández-Rivera[3], José Sergio **Escobedo-Garrido**[2], Antonio **Macías-López**[2], Oliver **Taype-Landeo**[4]

[1]El Colegio de Tlaxcala, A.C (COLTLAX). Av. Melchor Ocampo No. 28, San Pablo Apetatitlán, Tlaxcala, México, 90600.
[2]Colegio de Posgraduados Campus Puebla. Boulevard Forjadores de Puebla No. 205, Santiago Momoxpan, San Pedro Cholula, Puebla, México. 72760.
[3]Universidad Autónoma de Coahuila (UAdeC). Blvd. V. Carranza s/n, Col. República Oriente, Saltillo, Coahuila, México. 25280.
[4]Universidad Nacional Autónoma de Tayacaja Daniel Hernández Morillo. Jr. Bolognesi No. 418, Tayacaja, Huancavelica, Perú. 02605.
*Corresponding author: reynaxochipamorante@gmail.com

Citation: Xochipa-Morante RC, Carmona-Silva JL, Xochipa-Morante JR, Méndez-Espinoza JA, Hernández-Rivera D, Escobedo-Garrido JS, Macías-López A, Taype-Landeo, O. 2026. Typification of short marketing circuits for local, healthy and specialty agrifoods in the Sierra Nevada Poblana. Agricultura, Sociedad y Desarrollo https://doi.org/10.22231/asyd.v23i2.1787

ASyD(23): 249-269

Editor in Chief:
Dr. Benito Ramírez Valverde

Received: June 23, 2025.
Approved: August 4, 2025.

Estimated publication date:
March 25, 2026.

ABSTRACT

In response to the globalized agrifood model, characterized by long distribution chains and industrialized products, short marketing circuits (SMCs) emerge as Alternative Food Networks (AFNs) that offer territorial proximity strategies to strengthen sustainable agrifood systems. In the Sierra Nevada Poblana, the configuration of SMCs through direct sales and reduced intermediation of local, healthy and specialty agrifoods, such as blue corn and berries, becomes relevant. The objective was to analyze the profile of producers, the structure and functioning of these circuits, to propose a typology that recognizes their complexity and impacts. A mixed methodology was used, including Participatory Action Research, community workshops, direct observation and surveys, with 165 producers in Ozolco, Tianguizolco and Buenavista, during 2024. The results show that the SMCs distribute fresh and minimally processed products, of artisanal and semi-industrial elaboration, with a prominent participation of women, young people, indigenous people, returned migrants, and peasant families. Direct channels with minimum intermediation were identified (urban markets, specialty niches, wholesale buyers, and consumers), and alternative schemes on the farm, for home delivery, traditional kitchens, agritourism, digital platforms, and barter. The functioning is supported by strategies of local and regional sales, with differentiated community organization. A typology of SMCs was proposed: urban artisanal, health specialty, and expanding commercial, statistically validated with 98.5% of explained variance and Cronbach Alpha > 0.91. In conclusion, the SMCs strengthen the presence of family agriculture producers in the market, contributing to multiple dimensions of sustainable development, and confirmed as expressions of AFNs which require differentiated policies to become consolidated.

Key words: Alternative Food Networks, family agriculture, multidimensional proximity, territorial resistance.

INTRODUCTION

Short Marketing Circuits (SMCs) emerge as expressions of Alternative Food Networks (AFNs) in response to the globalized agrifood model, dominated

by transnational companies that control production, commercialization and consumption. This process has altered diets and weakened traditional agriculture, excluding many Family Production Units (FPUs) (León, 2021; Villatoro *et al*., 2023). In the face of this, the SMCs function as mechanisms of territorial resistance and productive and commercial reconfiguration through multidimensional proximity: geographic, social, cultural and symbolic. In addition, they articulate with international frameworks such as the Sustainable Development Goals (SDGs) (United Nations, ONU, 2018) and national policies, offering alternatives in response to industrial chains, as is the case of the white corn dough-tortilla industry or the business production of berries.

In the Sierra Nevada Poblana, a territory with particular geographic and sociocultural characteristics, agrifoods with high biocultural and commercial value, such as blue corn and berries, configure expressions of AFNs focused on local, healthy and specialty products. They are driven by indigenous communities, which, through local innovation processes, seek to be incorporated to specialized urban markets and to contribute to territorial sustainable development (Silva-Flores, 2024). This dynamic strengthens family agriculture, reduces their exclusion from sales circuits, and helps to counteract adverse socioeconomic conditions.

Under this context, communities such as San Miguel Tianguizolco, with high poverty indexes (87.5% with 61.3% in extreme poverty), San Diego Buenavista (61.3% in poverty, 11.8% in extreme poverty), and San Mateo Ozolco, Calpan (35.9% in poverty) (Consejo Nacional de Evaluación de la Política de Desarrollo Social, CONEVAL, 2020), have experienced intensifying processes of forced migration and marginalization, thereby fostering the search for commercial alternatives that preserve local agroecological practices and knowledge.

The benefits of SMCs in urban zones of Latin America have been widely documented, as well as the theoretical discussion about AFNs; however, their empirical comparison is still recent (Catrip-Pintor *et al*., 2020). In Sierra Nevada Poblana, the background shows experiences based on traditional and introduced crops. In Ozolco, returned migrants from the United States (US) have taken advantage of attributes of native blue corn grown in agroecological systems and their content of anthocyanins, organizing themselves into cooperatives and enterprises (Xochipa-Morante, 2021). In Tianguizolco, a tradition of "comaleras" prevails, who are women that elaborate and sell pre-Hispanic snacks for urban markets, sustained by knowledge of nixtamal and ancestral techniques (Méndez-Espinoza *et al*., 2024). In Buenavista, production of berries is promoted by migrant experience and practices towards agroecology. However, it has become consolidated as a profitable crop that reconfigures the local economy, positioning Huejotzingo as the second place in the state production for raspberry (383 ton) and blackberry (103 ton) (Servicio de Información Agroalimentaria y Pesquera, SIAP, 2024).

Despite the limitations imposed by the market structure with strong presence of large chains and self-service stores, the three cases show the expectation of being incorporated into specialty markets that value the local, the reduction of transgenics, agrichemicals, industrial inputs, contaminant packaging, intensive transport, and production with ethnic identity (Xochipa-Morante *et al*., 2021). The hypothesis suggests that SMCs function as territorial AFNs that allow producers from FPUs in indigenous communities of the Sierra Nevada Poblana, to become incorporated into the market through strategies of multidimensional proximity, generating income and contributing to territorial sustainability, in alignment with normative frameworks and SDGs.

The objective was to analyze the profile of agrifood producers of blue corn and berries in FPUs from communities under adverse socioeconomic conditions, in the Sierra Nevada Poblana (Ozolco, Tianguizolco and Buenavista), characterizing the structure and functioning of their SMCs to propose a typology that recognizes their territorial complexity and sustainable impacts, and formulating recommendations to broaden these experiences as expressions of AFNs.

The study covers a void of knowledge about alternative marketing schemes in marginalized indigenous territories, and it contributes to drawing attention to local systems that sustain rural families, strengthen social trust, and contribute to food security and community sustainability.

THEORETICAL FRAMEWORK

For centuries, there have been global transactions of agricultural products, although nowadays the global markets of agricultural and food products represent a new phenomenon that has a strong impact on agriculture and productivity, rather than on the cultivated surface (de León, 2018). In particular, the dominion that the transnational agrifood empire exerts stands out, represented by the concentration of a reduced group of businesses that control the way in which foods are produced, marketed and consumed. Gómez-Oliver and Granados-Sánchez (2016) mention the role of the large transnational companies in the marketing of grains and raw materials, seeds, fertilizers, and agrichemicals, which travel in facilities and transport of their own. The same authors describe the transformation of the agrifood sector, with greater vertical integration of supermarkets (Walmart and other chains), which have a large impact on consumers and on producers, who, in some cases, provide inputs and seeds with which they impact decisions of what to eat, how much, and where to produce. This hegemonic model obstructs innovation processes and limits the possibilities of sustainable development in rural territories with indigenous presence.

In this context, Villatoro *et al.* (2023) suggest that small-scale producers are excluded from commercial dynamics, since they do not have the information, technology, and production and distribution processes required by

supermarkets and food marketing businesses. Considering this, the solutions that are being explored are founded on the proximity of the actors of production and consumption, through short-distance value circuits that are based on, not only geographical but also social and institutional proximity.

These circuits are identified as AFNs, which counter the globalized agrifood production system with commercial aims, for which, large consumption of fossil fuels is needed, as well as extensive production surfaces in monocrops, intensive production, huge amounts of water, and an excessive use of agrichemicals and chemical-synthesis fertilizers (Bara *et al.*, 2023; Martínez, 2022; Rodríguez and Orozco, 2025). Instead, the SMCs are set out as alternatives that contribute to the SDGs.

In recent years, the interest in analyzing "alternative" forms of production, transformation, commercialization, and consumption of foods has been renewed, so the need to address organizational structures, such as short marketing chains, is justified (Martínez, 2022). The SMCs are defined primarily as direct-sales schemes with one or at most two intermediaries between producer and consumer (Comisión Económica para América Latina y el Caribe, CEPAL, 2014). Likewise, when buying under the SMC scheme, consumers can have access to relevant information about the origin, cultivation practices, and food safety of the products that are acquired in the market (Catrip-Pintor *et al.*, 2020). From the viewpoint of social and solidary economy, they are conceived as exchange spaces ruled by equity, reciprocity, and economic justice, revaluing community work (Xochipa *et al.*, 2024); and from the stance of responsible consumption, SMCs are valued because they link food decisions informed by health, the environment and social justice (Rodríguez-Ramírez *et al.*, 2021).

In Latin America and Mexico, SMCs strengthen geographic and social proximity, strengthen trust between actors, and value foods from a cultural, environmental and sanitary perspective. In addition, they have promoted new forms of family agriculture and, during COVID-19, they allowed trading under biosafety protocols (Paz and Infante, 2020).

In Mexico, SMCs not only contribute to improving income and preserving cultural practices, they also guarantee fresh and healthy foods in the presence of growing food insecurity, closely linked to the increase in chronic diseases derived from the consumption of ultra-processed foods, among which the ones that stand out are diabetes, obesity, high blood pressure, malnutrition, and cardiovascular illnesses (Escobar-López *et al*., 2016).

Thus, the theoretical approach of AFNs and their empirical comparison is relatively recent, with case studies predominating, to a great extent because there are still no statistical data generated by official sources, which would allow other types of methodological approaches; but mainly because theoretical elaborations around this type of network are still emerging (Catrip-Pintor *et al.*, 2020; Martínez, 2022).

Therefore, a process of emergence of market niches linked to traditional products is witnessed; and it is common to observe mixed marketing schemes in rural zones, such as *tianguis*, peasant fairs, on-farm experiences, subscriptions to baskets, as well as innovative ways among which home delivery and electronic commerce stand out, adapted according to organizational capacities and the territorial context; in addition to principles of reciprocity and social coexistence (González and López-García, 2021; Torres, 2017; Saravia, 2020).

Typologies that classify them in function of commercial agreements, marketing channels (markets, malls, travel channels, home delivery sales, or virtual channels), organizational level, financial institutions, and permanent offer of agroecological products, have also been documented (Buenaventura *et al*., 2021). These are key to guide differentiated and coherent policies with domestic national frameworks.

METHODOLOGY

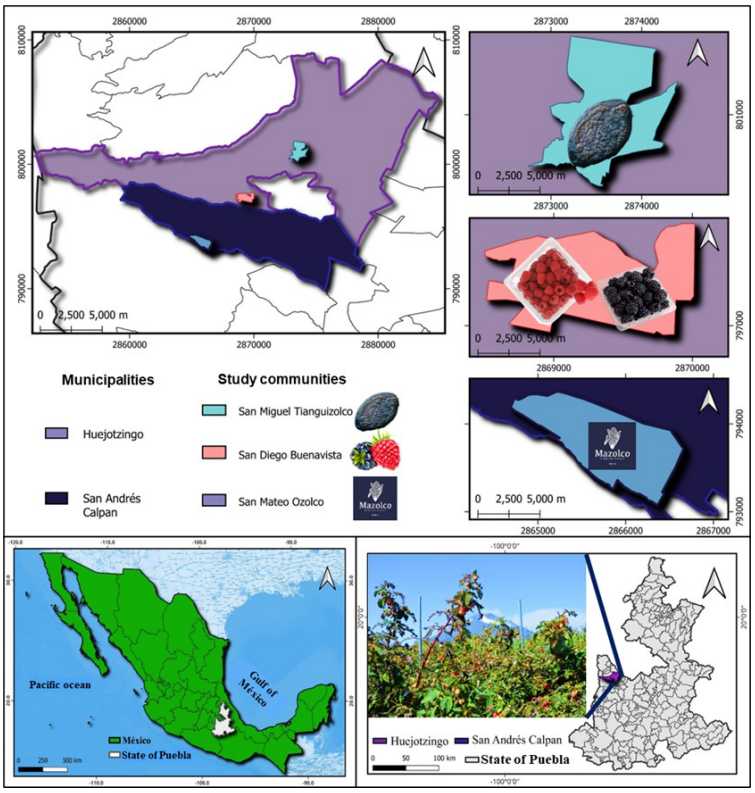
Study zone

The study was conducted between January and December 2024, in the Sierra Nevada of the state of Puebla, in three rural and indigenous communities: Ozolco (municipality of Calpan), and in Tianguizolco and Buenavista which belong to Huejotzingo (Figure 1).

The data from the National Institute of Statistics and Geography (*Instituto Nacional de Estadística y Geografía*, INEGI, 2020), the National Institute of Indigenous Languages (*Instituto Nacional de Lenguas Indígenas*, INALI, 2009), CONEVAL (2020) and the National Population Council (*Consejo Nacional de Población*, CONAPO, 2020), report that the communities present favorable conditions for producing and selling blue corn and berry agricultural products. The region located in the center-west of the state, on the foothills of the volcanoes Popocatépetl and Iztaccíhuatl (2,180-5,100 masl), shows temperate-cold climate with summer rains, where corn, bean, squash, chili pepper and various fruits (pear, berries, Mexican hawthorn, walnut, and apple) are cultivated. The population, mostly Nahua, faces marginalization and food insecurity.

The three communities are located at between 2,200 and 2,600 masl, on hills with some slope, with fertile soils of volcanic ash. Tianguizolco and Ozolco plant blue corn on a greater surface; Buenavista produces berries in small plots, but in expansion. The total population in Buenavista is 835 inhabitants, Tianguizolco has 2,618 and Ozolco 2,890. For their part, the indigenous Náhuatl-speaking population, ranges between 25-85%; in Buenavista, there is 7.3%, in Tianguizolco 27%, and in Ozolco 80%. The population is men (48.0%) and women (52.0%), with a young population between 15 and 29 years old (26.7%).

Poverty reaches between 60-100% of the inhabitants, with different levels of food insecurity. It continues to show important movements of international



Source: prepared by the authors based on the Geography Information System, using the QGIS software.
Figure 1. Geographic location of the study zone.

migration according to INEGI (2020), CONAPO (2020), INALI (2009) and CONEVAL (2020).

Agricultural potential represents an opportunity to improve their quality of life, stemming from the local scope.

Methodological procedure

The territorial-participatory approach was used under the methodology of Participatory Action Research (PAR), during the study period, which was considered to be coherent with the AFN analysis. Mixed tools (quantitative-qualitative) were integrated, with the aim of integrally approaching the social, economic, cultural and organizational dimensions of the SMCs in the communities selected.

Methods and techniques

The following methods and techniques were systematically implemented in the three communities of study:

-A participatory mapping of distribution channels was elaborated through community workshops, to identify actors, functions and relationships for distribution, which allowed building the territorial structure of the SMCs as AFNs.
-A territorial typification of SMCs was carried out with the objective of classifying them according to their structure, functioning and expressions of multidimensional proximity, considering the particularities of each community.
-Field visits were carried out, using participant observation, to document productive practices, commercial relationships, and sociocultural dynamics, in the marketing processes.
-Community workshops were carried out as spaces for participatory dialogue, to reflect on the marketing strategies, access to differentiated markets, and valuation of biocultural products.
-Semi-structured surveys were applied to agrifood producers, to obtain quantitative information organized into two blocks of variables: i) economic characteristics of survey respondents such as, age, sex, education, Náhuatl-speaker, marital status, labor used, productive activity, and type; and ii) commercial characteristics such as product sold, symbolic differentiation, product presentation, price, frequency and destination of sales, commercial channel (on-farm sales, *tianguis*, markets, specialty stores, home delivery, tourism routes, fairs, online, among others), institutional support and organization.

Sample size and sampling

Based on the local census of agricultural producers validated by key informants, a study framework was established integrated by 1,000 farmers in San Miguel Tianguizolco, 800 in San Mateo Ozolco, and 90 in San Diego Buenavista. From this universe, a simple randomized probabilistic sampling with maximum variance (0.25) was applied, obtaining theoretical samples of 88, 86 and 47 producers, respectively.
The main inclusion criterion was that productive units could participate in more than two links of the value chain (production, transformation, distribution, and marketing) of the agrifood studied: blue corn in Tianguizolco and Ozolco, and berries in Buenavista. In Tianguizolco and Buenavista, the producers surveyed fulfilled this criterion, while in Ozolco, it was detected that many of the units selected did not participate in all the links, so only 30 effective questionnaires were validated. In total, 165 valid questionnaires were obtained for the analysis.
Stratified sampling was not applied because of territorial and productive heterogeneity; therefore, the decision was made to use an independent simple randomized sampling in each community, guaranteeing the same probability of selection for all the farmers and avoiding bias.

Information analysis

The quantitative information was analyzed through descriptive and multivariate statistics of inferential reach, and the qualitative with thematic content analysis. The methodological triangulation allowed building a typology of SMCs and assessing their impact on sustainable development. In addition, a two-dimensional Multiple Correspondence Analysis (MCA) was conducted, to explore and visualize relationships between categorical variables: communities, sex, marital status, language, education, labor, type of production, product marketed, symbolic differentiation, frequency and conditions of sales, presentation of the product, sales destination, commercial channel, institutional support, and organization. The results allowed us to assess the coherence of the variables of the typology proposed, showing the dimensions to propose differentiated strategies, which strengthen the SMCs coherent with the SDGs.

RESULTS

Characteristics of men and women producers in SMCs

The results show that the blue corn and berry SMCs in the Sierra Nevada Poblana build AFNs. These circuits function based on agricultural and food producers, whose characteristics respond to particularities of each production territory. Of the total people surveyed (165), most are women (75%), 31% are young people under 40 years old, 32% indigenous population, 36% returned migrants, and peasant families are made up of 4 to 6 members, through shared leadership (marriages or free unions), have basic education and accumulated experience in production-sales (Table 1).

Table 1. Socioeconomic characteristics of producers per community.

Variable	Tianguizolco (n= 88)	Ozolco (n=30)	Buenavista (n=47)
Age (range, years)	31-76	29-64	25-64
Indigenous language (speaker)	27%	80%	9%
Education (predominant)	Primary (39%) Secondary (42%)	Secondary (47%) High School (23%) Higher Education (10%)	Primary (45%) Secondary (49%)
Migratory experience (main destinations)	Average: New York and California	Average: California and Philadelphia	Low: New York, California, Los Ángeles, Central Zone
Seniority in production and sales (average years)	13	10	8

Source: prepared by the authors with field information (2024).

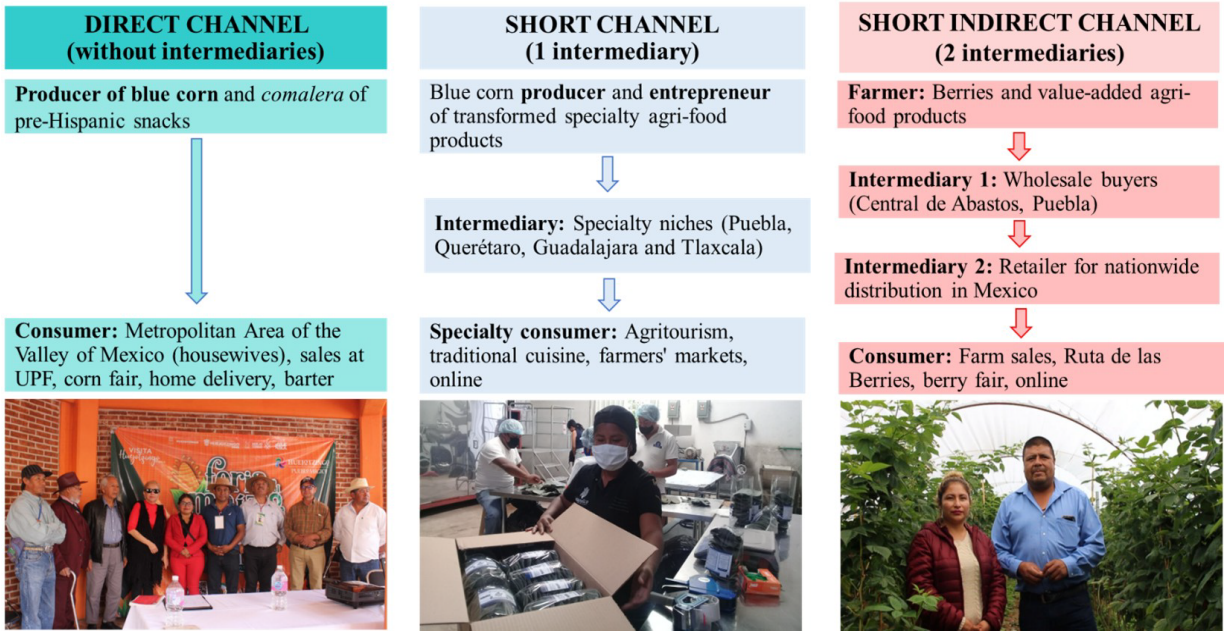
San Miguel Tianguizolco has greater female participation (95%), represents the oldest population (52.6±10.9 years, average), with up to 45 years of commercial experience. The community identity is intrinsically linked with ancestral trade, reflected in the historical significance of its name, "tianguis viejo" (old market).

San Mateo Ozolco presents a balanced profile by gender (53% women), younger population (39.9±9.0 years), high presence of Náhuatl speakers (80%), and returned migrants who have developed rural, gastronomic and tourism businesses with native blue corn. "Amigos de Ozolco" stands out with 21 years of experience as community organizational reference.

San Diego Buenavista shows intermediate age (48.9±8.9 years), balanced gender (51% women), 9% Náhuatl speakers, ruled by customs and traditions; it stands out for the agricultural vocation for berries, which was started 24 years ago by Encarnación Carrillo, producer who introduced raspberry and blackberry cuttings to the community.

Structure of marketing channels

Three differentiated structures were identified by number of intermediaries, territorial reach and social agrifood (Figure 2).



Source: prepared by the authors with field information 2024.
Figure 2. Structure of the SMCs, based on the distribution and marketing channels.

1. **Direct channel:** it connects to *comaleras* from Tianguizolco, who cultivate and process the grain that has undergone the *nixtamal* process in *tlacoyos* filled with different ingredients (bean, fava bean, pork rind, and cottage cheese), tortillas (blue and nopal), *sopes*, *gorditas*, *tlaxcales*, *paneques*, among other snacks of pre-Hispanic origin, with urban markets from Mexico City (Central de Abasto, La Merced, Tepito, Cárcel, Álvaro Obregón, Cabeza de Juárez and Santa Martha Acatitla) and the State of Mexico (Valle de Chalco, Ecatepec, Chimalhuacán and Ciudad Nezahualcóyotl) (90%).
2. **Short channel:** it involves producers-transformers from Ozolco, specialized intermediaries and consumers with valuation for healthy foods. Agrifoods with high added value (*tostadas*, *totopos*, *nachos*, *pinole*, flours, *churros*, ice-cream, beer, cookies, and traditional dishes), are distributed in specialty niches (50%): health, organic and gourmet stores in urban zones of the state of Puebla (San Pedro and San Andrés Cholula, Angelópolis, Valsequillo, Atlixco and Chipilo), select restaurants from CDMX (Condesa, Roma, Polanco, Zona Rosa and Chapultepec), Querétaro, Guadalajara, Tlaxcala, and local stores in Calpan and San Nicolás de los Ranchos.
3. **Indirect short channel:** farmers from Buenavista, who distribute fresh and seasonal raspberries and blackberries through two intermediaries: wholesale buyers (Central de Abasto, Puebla) and retailers towards national markets (65%).

In the channels identified, complementary forms of marketing are detected: community tourism with peasant fairs (20%), on-farm experiences (10%), home delivery (5%), digital trade (5%), and barter (5%).

Functioning of the SMCs

Functioning offers an important diversification of SMCs. In Tianguizolco, a traditional-artisanal circuit functions, where the ancestral technique of elaborating foods with blue corn in small spaces is conserved, with family utensils, and traditional clay stoves, using the comal to cook it. The production is mainly intended for sale in urban markets, with weekly movements. Making tortillas, *gorditas*, and other foods is done mostly by the family, who keep the traditional measure of selling by the dozen. The frequency of marketing is weekly (80%), with an average of 10 to 20 dozen per journey and prices that range between MXN 60 and 120 per dozen. The organization is family and neighborhood-based, without access to formal financing, so they depend on their own resources and local solidarity networks.

In Ozolco, the indigenous cooperative organization has consolidated a semi-industrial process with its own bottling and packaging, trading on average 13 boxes with 16 bags of 250 g, at prices of 22 to 36 pesos per bag. The sales are weekly

(57%), biweekly (27%) and monthly (7%), and they have access to institutional support and programs for productive financing (63% of production units).

In Buenavista, the group of producers faces a process of agroecological transition. The sales are weekly (100%) and they are sold in boxes with 12 domes of 170 g, with ranges between 38 and 200 boxes, at a price of 400 pesos per box. The community organization in the making has limited access to financing (43% of producers).

In the three cases, it is possible to point out the importance of communication between members of the groups, the incorporation of local and traditional knowledge, to take advantage of their local, material and human resources.

Territorial typology of agrifood SMCs

The integral analysis allows suggesting a typology of three patterns of territorial differentiation by sociodemographic differentiation, organizational level, and the destination of production towards differentiated markets. The origin of the groups is contrasting, but they share the purpose of promoting local productive activities, which generate employment and income.

In Tianguizolco, peasant producers with strong female participation incorporate their knowledge in the artisanal elaboration of *tortillas*, *gorditas* and blue *tamales*, processed at home and sold directly in city markets. It makes up the "Urban Artisanal Circuit", characterized by its family structure, artisanal production, and direct sales channel. The producers use traditional technologies, preserve their cultural identity, and allocate their products to popular urban markets. Their main strategy is personal sale and occasional barter, which contributes complementary income to the household.

In Ozolco, returned migrants show a strong community commitment, driving rural businesses that offer marketing alternatives of local blue corn, without depending on the municipal township, through healthy and functional products. They constitute a "Health Specialty Circuit", made up of consolidated businesses with indigenous identity, semi-industrial technification level, and oriented towards specialized urban niches with a preference for healthy and locally sourced foods. Their symbolic differentiation is based on the use of Náhuatl, brand design, and added value of the products. Economic relationships are sustained on cooperation, equitable distribution of benefits and the articulation with solidary marketing networks.

In Buenavista, berries, which were introduced more than two decades ago, are being cultivated by families that have incorporated technology and adequate technical management, obtaining high-quality fruits with good presentation, and with growing acceptance in Puebla and CDMX. The production integrates principles of equity, reciprocity, fair trade and environmental care. This case corresponds to the "Expanding Commercial Circuit", characterized by its

orientation towards the market and transition towards agroecological practices. The organization is family-based, with shared leadership, basic infrastructure, and occasional support from day laborers. The main sales destinations are regional wholesale buyers and markets, with growth in fairs, community tourism, and on-farm experiences. It is distinguished by its potential for profitability and the pursuit of environmental and social sustainability.

Statistical validation of the typology

The MCA sustains the typology proposed, explaining 98.5% of the total variance, through two clearly differentiated dimensions. Dimension 1 (53.2% variance), associated to productive-economic factors: community (origin) (0.996), type of production (0.996), agrifood (0.996), sales destination (0.996), channel (0.996), symbolic differentiation (0.996), sales frequency (0.973), and product presentation (0.907), evidencing that these are the main elements which give structure to these circuits, reflecting the relevance of the local strategies in the territorial economic dynamics. To a lesser extent, but with relevant demographic characteristics, sex (0.005) and marital status (0.006), allow identifying differential dynamics when it comes to productive participation and economic decision making, particularly in these rural contexts where gender roles influence the organization and management of work; and the resources, workforce (0.007), institutional support (0.005), and organization (0.005), reflect the collective articulation there is between producers, factor that impacts the efficiency and permanence of the circuits. Regarding Dimension 2 (45.3% variance), educational, cultural and temporal variables are incorporated: schooling (0.130), presentation (0.142), native language (0.020), and sales frequency (0.575), which show the influence of sociocultural conditions of sustainability and continuity of productive practices.

Cronbach's Alpha coefficient (0.937 and 0.914) confirms the internal consistency and statistical reliability of the model, validating the territorial classification and differentiation of the three types of marketing schemes identified.

This analysis gives methodological support and allows for the results to be considered in the formulation of public policies for sustainable territorial development, in agreement with the SDGs and national legislation.

DISCUSSION

The findings show that the typology of SMCs proposed is configured as empirical expressions of AFNs, which function as territorial resistance mechanisms, reconfiguring the forms of production, transformation, marketing and consumption of foods. This confirms what was set out by Martínez (2022), about the ability of alternative circuits to generate territorial transformations.

Territorial differentiation of SMCs

The results demonstrate that, from the FPUs with productive and organizational capacities and specific territorial contexts, territorialized proximity strategies are deployed, which transform structural limitations into competitive advantages.

San Miguel Tianguizolco, distinguished by a marketing channel structured around trust-based networks and direct transactions between *comaleras* and housewives without intermediaries, transforms the apparent "simplicity" of traditional technology into cultural added value. This strategy reconfigures the relationships of food power, through the revaluation of ancestral knowledge and techniques: agricultural production with native seeds, nixtamal processing, handmade, and cooking with firewood, clay, stoves and smoke. The differentiation, as response to the large white corn dough-tortilla industries, shows that traditional knowledge is not a technological limitation, but rather a form of competitive innovation, capable of going against the hegemonic logic, which subordinates the diet to industrialized monopolies (Camacho *et al.,* 2022).

San Mateo Ozolco transforms its main differentiating attribute, juvenile ethnic identity, into commercial value, showing that social-ethnic proximity can successfully compete with specialized urban markets, refuting conceptions that limit indigenous producers to marginal markets (Serapio-Jerónimo *et al.,* 2018).

San Diego Buenavista combines long channels with direct on-farm proximity, fairs and community tourism, keeping its production base of family agriculture, in process of agroecological reconversion. This differentiation contrasts with the berry business systems in Michoacán and Jalisco, characterized by intensive monocrops, use of agrichemicals, high workforce demand, and dependence on the exports market (Arriaga-López *et al.,* 2023).

The territorial differences observed confirm that SMCs constitute specific expressions of the AFNs, where multidimensional proximity (productive, economic, sociodemographic, cultural and symbolic) functions as a resistance mechanism to expansionism and hierarchical control of the globalized agrifood system (Rodríguez-Ramírez *et al.,* 2021).

Contribution to territorial economic reactivation

The economic analysis of the SMCs studied shows that they generate decentralization processes of capitals that counteract the concentration trends described by Bendini (2008). Instead of depending on long industrial corn chains and productive berry business systems, the communities reactivate local economies based on trust, reciprocity and economic justice, and they revalue community work (Xochipa *et al.,* 2024). This process is framed in the principles of social and solidary economy, as suggested by Requier-Desjardins and Torres (2019), where the AFNs generate significant income and allow an equitable distribution of benefits, in contrast to conventional channels.

Urban Artisanal Circuit: it demonstrates the construction of economic systems alternative to the globalized economic model (consumerist), through the feminization of agrifood trade. The women *comaleras* generate autonomy, stability, and economic empowerment. The estimated income (10-20 dozen sold per week at MXN 60-120 per dozen) and the practice of barter constitute mechanisms of solidary economy, which retain the value in the domestic units. The persistence of bartering makes anti-market alternatives visible, which question the accumulation logic of the globalized system.

This exchange continues to be current in communities such as San Pedro Cholula (Solis *et al*., 2020) and Pátzcuaro, Michoacán (Prado and Cortez, 2016). The Corn Fair carried out in Huexotzinco A.C., functions under these principles, similar to experiences observed in San Pedro Tlaltenango, Españita in Tlaxcala (Grupo Vicente Guerrero) and San Juan Ixtenco, which also protect the diversity of native corn in the presence of transgenics.

Health specialty circuit: in San Mateo Ozolco, the community-indigenous organization generates employment and income, reducing forced migration and retaining economic value locally, through indigenous enterprises. This value retention is aligned with the study by Xochipa-Morante *et al.* (2024), where it was proven that the indigenous agro-industries generate multiplying effects in the local economy from sales in specialty markets. According to the System of Agrifood Information and Consult (*Sistema de Información Agroalimentaria y de Consulta*, SIACON, 2023), the economic value of the blue corn ranges from MXN 8,000 to 12,000 per ton, against MXN 5,000 per ton of white corn, with a difference of up to 140%, which shows its economic value that increases as value is added and it is positioned in specialty niches.

Expanding circuit: in San Diego Buenavista, the significant incomes (between one and four million pesos annually) reflect the high commercial value of berries. This profitability has driven producers to incorporating practices in agroecological transition, with the intention of competing in the national price offer. The context is favorable, since Mexico has been consolidated as the main global exporter and one of the largest global producers of berries, which have been positioned as the fruit group of greatest export from the country, even above avocado, lime and mango (SIAP, 2018). At the state level, according to SIAP (2024), blackberries attain MXN 26 mil per ton against the national average (MXN 23,000 per ton) and raspberries around MXN 27,000 per ton. In turn, the berries fair has become a real commercial boom during high season (August), reactivating the economy of the Sierra Nevada and questioning the narrative that family agriculture lacks economic viability (Arriaga-López *et al*., 2023).

Therefore, these AFNs not only suggest marketing alternatives, but also integral processes of social inclusion and community resilience, facing the hegemonic agrifood model.

Innovation in agrifood proximity

SMCs develop innovative proximity processes that ease access to the information about valuation as a result of local, healthy processes, of environmental care, and changes in the dietary habits and social justice, situation that can hardly be achieved with excessive intermediation (Rodríguez-Ramírez *et al.,* 2021).

The Urban Artisanal Circuit develops processes of sociocultural proximity that reconstruct farmland-city links, without intermediaries, providing access to foods that are culturally appropriate for popular urban families. This reconstruction of links is related to the findings by Méndez-Espinoza *et al*. (2024), where it is documented that urban populations present traits of yearning to reconnect with the peasant origin of pre-Hispanic foods recently elaborated without machinery, through the corn-*tlacoyo* chain.

For its part, the Health Specialty Circuit represents an innovation of ethnic and symbolic proximity, which articulates identity, nutritional and environmental elements, as cultural resistance to the process of global dietary homogenization. The incorporation of Náhuatl and narratives such as "made by indigenous hands", builds ethno-innovation that increases the value of ethnic knowledge. The biosafety criteria are based on the absence of preservatives, colorants, artificial additives, and the presence of anthocyanins, bioactive compounds with nutraceutical properties that develop antioxidant and anticancer activity (Ghezzi and Stein, 2021), guaranteeing superior standards of food safety and nutritional quality that contrast with the intensive globalized model, based on industrialized white corn. The environmental valuation of sustainable agricultural practices and ecological packaging (corn leaf, *totomoxtle*, brown paper) reinforce the ecosystemic commitment of the model. These attributes are displayed with the perspective of securing the loyalty of the consumer and the possibility of broadening sales schemes, through community tourism, traditional kitchens, peasant fairs, and digital platforms.

The Expanding Circuit constitutes an innovation of hybrid proximity, which articulates agroecological transition schemes, with long supply chains, maintaining experiences of direct proximity.

Organizational schemes and territorial sustainability

The typology identified draws attention to organizational schemes that counteract formal contracts and "productive and commercial associations" of the concentrated model, developing territorial sustainability, based on community logics. The family-neighborhood organization in Tianguizolco represents a strategy of matriarchal resistance that maintains decisional autonomy in face of corporative institutionalization. The limitations in access to financing and infrastructure reflect exclusion from the dominant system, not organizational incompetence, evidencing the need for differentiated policies.

The community-indigenous scheme in Ozolco shows that ethnic identity and

migratory experience functions as a motor for alternative business innovation. The following 13 businesses with names in Náhuatl constitute a territorial economic ecosystem that maintains cultural identity, generating economic viability, contradicting the narrative that modernization requires cultural abandonment: Potehtli-Amigos de Ozolco (pinole), Mazolco (90% women), artisanal ice-cream Coyotitla (coyote land), corn kitchen Milli (milpa), bakery Yahuitl (blue corn), confectionary Tonalli (sun heat), brewery Ome Tepetl (two mountains), Calcentli (corn house). In addition, there are tourism and gastronomic enterprises: Corn Festival, Pulque Fair organized by youth group Yolotequitl (working with the heart), ecotourism center El Rinconcito (Bosque de Maíces), Ecotourism Villa (La Venta); and handcrafts: Cihuatequitl (working women) and Zihuame (Totomoxtle).

The organizational strategy mentioned is coherent with the results from the study by Enríquez (2022), about indigenous enterprises, which point out that businesses with names in native languages have greater permanence in the market than those with conventional names. This local organization scheme contributes to access to financing and diversified training (Comisión de Desarrollo Indígena (CDI), Slow Food, Fundación Produce Puebla A.C., Secretaría de Desarrollo Rural (SDR) Puebla, Universidad de las Américas, Hispanics in Philanthropy, and Colegio de Posgraduados). In the market, they have greater ability to negotiate fair prices and distribute income equitably throughout the blue corn value chain (Xochipa-Morante *et al*., 2021). This financial diversification is coherent with the analysis by the Food and Agriculture Organization of the United Nations (FAO) (2016) about SMCs in Latin America, where it is documented that organizations with greater diversity of sources of support present greater sustainability in the long term. This creates an integral ecosystem that broadens the territorial reach, preserving the essence of identity, consolidating a replicable model according to Rodríguez-Ramírez *et al*. (2021). A similar experience happens in Tlaxco, Tlaxcala, with Maizapan, family agroindustry that transforms blue corn into various products, combining family organizational innovations with traditional knowledge and agritourism.

The organizational consolidation scheme of Buenavista conserves family anchoring, developing broadened commercial capacities. Territorial sustainability is evidenced in the extension of berry production in Domingo Arenas and San Lorenzo Chiautzingo, being consolidated as a sustainable productive alternative in Sierra Nevada. Although their organization is still being strengthened, collective efforts such as the Grupo Rural Buenavista (which integrates more than 50% of farmers) stand out, as well as family cooperatives: Frutos Zamora, Frutillas Buenavista and Ruta de las Berries, with guided visits, on-site harvest, and the berries fair.

Multidimensional impacts and normative alignment

The results evidence that the SMCs generate impacts in five relevant dimensions, differentiating themselves from the globalized agrifood model. This integral view agrees with the analysis by ECLAC (2014), which documents multiple benefits from SMCs in Latin America, in relation to the SDGs.

I. Socioeconomic: SMCs create stable jobs, diversify incomes, and strengthen economic resilience of small-scale producers, reducing forced migration. They also promote female empowerment, indigenous inclusion, and youth rootedness, consolidating the social fabric through farmland-city trust networks. Espejo (2017) points out that participation in local markets drives the domestic economy, promotes fair trade, and strengthens solidary economy.

II. Dietary: they guarantee access to culturally appropriate foods, recover local and Mesoamerican diets, and counteract dietary homogenization and dependence on industrialized products. In addition, they contribute to community health, primarily in vulnerable sectors with child malnutrition, obesity, diabetes, cardiovascular disease and cancer. Escobar-López *et al*. (2016), underscore that families linked to AFNs present greater dietary diversity and lower incidence of child malnutrition, thanks to access to fresh and local foods.

III. Environmental: they reduce the use of agrichemicals, promote compostable packaging, and encourage short distribution routes, offering alternatives to the intensive model based on monocrops, fossil energy, and synthetic agrichemicals. Boucher and Riveros-Cañas (2017) confirm that SMCs decrease environmental costs and the dependency on fuels, compared to conventional chains.

IV. Cultural-identity: they protect the diversity of native corns, revalue ancestral knowledge and maintain traditional practices such as barter, counteracting cultural homogenization. Hellin *et al*. (2013) report that communities inserted in AFNs conserve 43% more native varieties than those integrated only to conventional markets.

V. Normative alignment: the SMCs are aligned with articles 4 and 27 in the Constitution (Diario Oficial de la Federación (DOF), 2025), the Program for Recovery of the Puebla Farmland of the Ministry of Rural Development (*Secretaría de Desarrollo Rural*, SDR) and its components "Impulso Comercial de los Maíces Nativos" (SDR, 2024b) and "Reconversión Productiva para Cultivos de Alto Valor Comercial" (SDR, 2024a). They also contribute to the SDGs: 1. Eradication of rural and indigenous poverty, 2. Combat of rural and urban hunger, 3. Health and welfare, 5. Gender equality, 6. Efficient use of water, 8. Decent work in rural SMCs, 10. Reduction of inequalities, 11. Sustainable cities and communities, 12. Responsible production and consumption, 13. Climate action, 15. Land ecosystems; 16. Social justice, and

17. Alliances. This places SMCs as instruments of integral territorial policy by articulating economic, dietary, environmental and cultural sustainability, with national and international frameworks.

CONCLUSIONS

The study contributes to a territorially differentiated typology of Short Marketing Circuits (SMCs): urban artisanal, healthy specialty, and expanding commercial. The SMCs transcend their commercial function and constitute Alternative Food Networks that operate as mechanisms of territorial resistance and multidimensional proximity, generating socioeconomic, dietary, environmental and cultural impacts, while strengthening indigenous and peasant family agriculture.

The geographic, social, cultural and symbolic proximity constitutes the central differentiating mechanism, by reassessing blue corn and berries as agrifoods of high biocultural and commercial value, promoting processes of local innovation and the inclusion of women, young people, and indigenous population, into specialized market dynamics.

The results evidence the alignment of the SMCs with national normative frameworks (constitutional articles 4 and 27), state policies to promote native corns, and productive reconversion, and with the Sustainable Development Goals, making evident their relevance as replicable models of food security, solidary economy, and community resilience.

The consolidation of the SMCs requires differentiated public policies for financing, organizational accompaniment, and institutional support, which recognize their territorial and cultural particularities. It is recommended to develop longitudinal and comparative studies that evaluate the resilience of these circuits, as a response to economic and climatic crises, as well as studies of differentiated profitability that strengthen their viability in the long term, without losing their alternative essence.

ACKNOWLEDGEMENTS

The authors wish to thank SECIHTI, for the postdoctoral scholarship granted through CVU 550557; El Colegio de Tlaxcala A.C., for its valuable role as institutional host; Mr. Seth Galindo Juárez, for his support in the methodological stage; and the producers of berries and blue corn from Buenavista, Tianguizolco and Ozolco, for the information provided to develop the study.

REFERENCES

Arriaga-López FG, Castro-Valencia AM, Macías-Martínez R. 2023. Análisis de la contribución económica de la producción de berries en la Región Altos Sur del Estado de Jalisco, México. Ra Ximhai, 19(1). 43-65. https://doi.org/10.35197/rx.19.01.2023.02.fa.

Bara CR, González-Santos R, Colmenero RL, Hernández-Sandoval L, Hernández-Puente KN. 2023. Sistemas locales de producción y redes alimentarias alternativas en Amealco de Bonfil, Querétaro, México: Resistencias e interconexiones para caminar hacia la soberanía alimentaria. Debates en Sociología, (57). 244-272. https://doi.org/10.18800/debatesensociolo-

gia.202302.010.
Boucher F, Riveros-Cañas A. 2017. Dinamización económica incluyente de los territorios rurales: alternativas desde los sistemas agroalimentarios localizados y los circuitos cortos de comercialización. Estudios Latinoamericanos, nueva época, (40). 39-58. http://revistas.unam.mx/index.php/rel/article/view/61580/54241.
Buenaventura I, da Paixao R, Gómez JD. 2021. Circuitos cortos de comercialización (CCC): un enfoque desde las experiencias agroecológicas en el territorio brasilero. Cooperativismo & Desarrollo, 29(119). 1-33. https://doi.org/10.16925/2382-4220.2021.01.05.
Camacho CI, Sánchez A, Saldaña M, Carcaño E. 2022. Soberanía alimentaria y agroecología: Contribuciones desde y para la Economía Ecológica Radical. REVIBEC-Revista Iberoamericana de Economía Ecológica, 35(3). 39-56. https://redibec.org/ojs/index.php/revibec/article/view/vol35-3-3.
Catrip-Pintor AK, Hernández-Flores JA, Méndez-Espinoza JA. 2020. Tipología de Circuitos Cortos de Comercialización en mercados y tianguis periurbanos de la región de Cholula, Puebla. Estudios Sociales Revista de Alimentación Contemporánea y Desarrollo Regional, 30(56). 1-25. https://doi.org/10.24836/es.v30i56.995.
CEPAL (Comisión Económica para América Latina y el Caribe). 2014. Fomento de circuitos cortos como alternativa para la promoción de la agricultura familiar. Boletín CE-PAL/FAO/IICA. https://hdl.handle.net/11324/6041.
CONAPO (Consejo Nacional de Población). 2020. Índices de intensidad migratoria México-Estados Unidos 2020. https://www.gob.mx/conapo/documentos/indices-de-intensidad-migratoria-mexico-estados-unidos-2020.
CONEVAL (Consejo Nacional de Evaluación de la Política de Desarrollo Social). 2020. Medición de la pobreza: Indicadores de pobreza. https://www.coneval.org.mx/Medicion/Paginas/Pobreza-municipio-2010-2020.aspx.
De León G. 2018. La globalización y su influencia en la agricultura. Anuario Jurídico y Económico Escurialense, (51). 389-410. https://publicaciones.rcumariacristina.net/AJEE/article/view/326/pdf.
DOF (Diario Oficial de la Federación). 2025. Decreto por el que se reforman los artículos 4º y 27 de la Constitución Política de los Estados Unidos Mexicanos en materia de protección del maíz nativo. https://dof.gob.mx/nota_detalle.php?codigo=5752109&fecha=17/03/2025#gsc.tab=0.
Enríquez P. 2022. Nombres comerciales en kichwa en Quito: una comodificación y explotación cultural del uso de la lengua, Lexis. 46(2). 621-669. https://doi.org/10.18800/lexis.202202.006.
Escobar-López SY, Vizcarra-Bordi I, Thome-Ortiz H, Espinoza-Ortega A. 2016. Caracterización de los consumidores de alimentos orgánicos en tianguis y mercados alternativos de la zona centro de México. *In*: Mercados y desarrollo local sustentable. Renard MC. Ed. Red de Sistemas Agroalimentarios Localizados (Red SIAL-México): México, https://www.aacademica.org/humberto.thome.ortiz/39. pp: 135-154.
Espejo A. 2017. Inserción Laboral de los Jóvenes Rurales en América Latina: Un breve análisis descriptivo. Grupos de Diálogo Rural, una estrategia de incidencia. In: Serie documento Nº 225. Grupo de Trabajo Inclusión Social y Desarrollo. Programa Jóvenes Rurales, Territorios y Oportunidades: Una estrategia de diálogos de políticas. Rimisp: Santiago, Chile. https://rimisp.org/wp-content/files_mf/1502548172Inserci%C3%B3nlaboraldelosj%C3%B3venesruralesenAm%C3%A9ricaLatina.pdf
FAO (Food and Agriculture Organization of the United Nations). 2016. Circuitos cortos de comercialización: Una mirada desde el enfoque territorial, http://www.fao.org/in-action/territorios-inteligentes/articulos/colaboraciones/detalle/es/c/410218/.
Ghezzi P, Stein E. 2021. Los arándanos en el Perú. Departamento de Investigación y Economista Jefe/Sector de Instituciones para el Desarrollo. Nota técnica del BID IDB-TN-2324. http://dx.doi.org/10.18235/0003875
González M, López-García D. 2021. Principles for designing agroecology-based Local (territorial) Agri-food Systems: a critical revision. Agroecology and Sustainable Food Systems, 45(7). 1050-1082. https://doi.org/10.1080/21683565.2021.1913690.
Hellin J, Keleman A, López D, Donnet L, Flores D. 2013. La importancia de los nichos de mer-

cado: Un estudio de caso del maíz azul y del maíz para pozole en México. Revista Fitotecnia Mexicana, 36(Supl. 3-a): 315-328. http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0187-73802013000500008&lng=es&tlng=es.

INALI (Instituto Nacional de Lenguas Indígenas). 2009. Catálogo de las lenguas indígenas nacionales: Variantes lingüísticas de México con sus autodenominaciones y referencias geoestadísticas. https://site.inali.gob.mx/pdf/catalogo_lenguas_indigenas.pdf.

INEGI (Instituto Nacional de Estadística y Geografía). 2020. Censos y Conteos de Población y Vivienda (datos de 2020). Principales resultados por localidad (ITER). Estados Unidos Mexicanos. https://www.inegi.org.mx/app/descarga/ficha.html?tit=326108&ag=0&f=csv.

León M. 2021. Circuitos cortos y mercados itinerantes como alternativas sostenibles de comercialización. Instituto Interamericano de Cooperación para la Agricultura (IICA). https://blog.iica.int/blog/circuitos-cortos-mercados-itinerantes-como-alternativas-sostenibles-comercializacion.

Martínez LE. 2022. Redes alimentarias alternativas para la valorización del patrimonio alimentario: propuesta analítica a partir de un estudio de caso. Estudios Latinoamericanos, 37(50). 95-118. https://doi.org/10.22201/fcpys.24484946e.2022.50.85918

Méndez-Espinoza JA, Valencia-Bastida I, Ramírez-Juárez J, Pérez-Ramírez N, Regalado-López R, Hernández-Flores JA. 2024. Caracterización y tipificación de las unidades domésticas que participan en la cadena agroalimentaria maíz-tlacoyo. Agricultura, Sociedad y Desarrollo, 21(3). 389-401. https://doi.org/10.22231/asyd.v21i3.1624.

ONU (Organización de las Naciones Unidas). 2018. La Agenda 2030 y los Objetivos de Desarrollo Sostenible: Una oportunidad para América Latina y el Caribe (LC/G.2681-P/Rev.3). Santiago: CEPAL. https://repositorio.cepal.org/server/api/core/bitstreams/cb30a4de-7d87-4e79-8e7a-ad5279038718/content.

Paz RG, Infante CM. 2020. Circuitos cortos de comercialización: el juego entre lo disponible y lo posible en la agricultura familiar. Economía y Sociedad, 25(58). 1-15. https://www.scielo.sa.cr/scielo.php?script=sci_arttext&pid=S2215-34032020000200035

Prado JQ, Cortez M. 2016. Trueque, intercambio y reciprocidad: Economía solidaria en las comunidades purépecha de Michoacán. Revista Etnobiología. 14(2). 79-91. https://dialnet.unirioja.es/servlet/articulo?codigo=5633190.

Requier-Desjardins D, Torres G. 2019. Sistemas Agroalimentarios Localizados (SIAL) y circuitos cortos en América Latina. *In*: Ressources, inégalités et développement des territoires ruraux en Amérique Latine, Caraïbe et en Europe, Guibert M y Sabourin É. Coords. Fondation EU-LAC et l'Agence Française de Développement: Francia, pp: 119-131. https://www.researchgate.net/publication/342047127_Sistemas_Agroalimentarios_Localizados_SIAL_y_circuitos_cortos_en_America_Latina_in_Guibert_et_Sabourin_eds_Ressources_inegalites_et_developpement_des_territoires_ruraux_en_Amerique_Latine_dans_la_Cara

Rodríguez R, Orozco HP. 2025. REALT Occidente. Una propuesta hacia sistemas alimentarios locales. En redes alimentarias alternativas. La Jornada del campo, (213). 16. https://www.delcampo.org.mx/La-Jornada-del-Campo/?fbclid=IwY2xjawPThU9leHRuA2FlbQIxMABicmlkETFpeXNtVENYRlMxR2ZUZHhKc3J0YwZhcHBfaWQQMjIyMDM5MTc4ODIwMDg5MgABHlJTkVU5FDenU1RTj-uCbw8GGkTiuvpFVmTURmTmR2Md9e4cMF6gIEfgu76S_aem_d3I9YphonJpJ4S6CjepiCA

Rodríguez-Ramírez S, Gaona-Pineda EB, Martínez-Tapia B, Romero-Martínez M, Mundo-Rosas V, Shamah-Levy T. 2021. Inseguridad alimentaria y percepción de cambios en la alimentación en hogares mexicanos durante el confinamiento por la pandemia de Covid-19. Salud Pública de México, 63(6). 763-772. https://doi.org/10.21149/12790.

Saravia P. 2020. Circuitos cortos de comercialización alimentaria: Análisis de experiencias de la Región de Valparaíso, Chile. Psicoperspectivas, 19(2). 32-43. www.scielo.cl/scielo.php?pid=S0718-69242020000200032&script=sci_arttext.

SDR. 2024a. Componente II. Reconversión productiva para cultivos de alto valor comercial del Programa "Recuperación del Campo Poblano". https://sdr.puebla.gob.mx/media/k2/attachments/CONVOCATORIA_COMPONENTE_II_RECONVERSION.pdf.

SDR (Secretaría de Desarrollo Rural). 2024b. Componente III. Impulso Comercial de los Maíces Nativos del Programa "Recuperación del Campo Poblano". https://sdr.puebla.gob.mx/me-

dia/k2/attachments/CONVOCATORIA_COMPONENTE_III_MAICES-NATIVOS.pdf

Serapio-Jerónimo MA, García-Herrera EJ, Morales-Flores FJ, Rivera-Pineda F. 2018. Identidad étnica como elemento para fomentar el desarrollo socioeconómico en una comunidad mazahua. Agroproductividad, 11(9). 75-80. https://doi.org/10.32854/agrop.v11i9.1218.

SIACON (Sistema de Información Agroalimentaria y de Consulta). 2023. Valor de la producción nacional agropecuaria y pesquera. Gobierno de México. https://www.gob.mx/agricultura%7Cdgsiap/documentos/siacon-ng-161430.

SIAP (Servicio de Información Agroalimentaria y Pesquera). 2018. Panorama agroalimentario 2018-2024. Secretaría de Agricultura y Desarrollo Rural, https://www.gob.mx/agricultura/dgsiap/articulos/panorama-agroalimentario-2018-2024-la-herramienta-basica-de-consulta-estadistica-del-sector-agropecuario-y-pesquero?idiom=es.

SIAP (Servicio de Información Agroalimentaria y Pesquera). 2024. Producción mensual agrícola. Avance de siembras y cosechas. https://nube.agricultura.gob.mx/avance_agricola/.

Solís MK, Méndez JA, Ramírez J, Pérez N, Regalado J, Hernández JÁ. 2020. Prácticas del comercio tradicional en el mercado Cosme del Razo en San Pedro Cholula, Puebla, México. Revista de El Colegio de San Luis, 10(21). 1-28. https://doi.org/10.21696/rcsl102120201191.

Torres G. 2017. Apuntes sobre sistemas alimentarios localizados. Del distrito industrial al desarrollo territorial. Estudios Latinoamericanos, (40). 19-36. https://doi.org/10.22201/cela.24484946e.2017.40.61575.

Villatoro JG, Vidal M, Vázquez A. 2023. Evolución y tendencias de la investigación científica en circuitos cortos de comercialización: análisis bibliométrico internacional. Agricultura Sociedad y Desarrollo, 20(2). 214-236. https://doi.org/10.22231/asyd.v20i2.15.

Xochipa R, Escobedo JS, Guerrero J de D, Mora JS. 2024. Participación social comunitaria en cadenas de valor. El maíz azul en la Sierra Nevada de Puebla. Región y sociedad. 36. 1-20. https://doi.org/10.22198/rys2024/36/1882.

Xochipa-Morante RC. 2021. Pequeños productores de maíz azul y los mercados: Un enfoque de cadena de valor. Tesis de doctorado, Colegio de Postgraduados campus Puebla. México. http://193.122.196.39:8080/handle/10521/4866.

Xochipa-Morante RC, Escobedo-Garrido JS, Macías-López A, Guerrero-Rodríguez JdeD, Valadez-Ramírez M. 2021 Consumidores de productos de maíz azul en mercados de productores, Sierra Nevada, Puebla, México. Estudios Sociales, Revista de Alimentación Contemporánea y Desarrollo Regional, 31(58). 1-23. https://doi.org/10.24836/es.v31i58.1176.

Xochipa-Morante RC, Xochipa-Morante JR, Carmona-Silva JL, Macías-López A, Contreras-Hernández J, Vargas-Picado H, Rosas-Gallo A. 2024. Importancia del uso y conservación de la lengua náhuatl en San Mateo Ozolco, Calpan: Un recurso estratégico para el desarrollo comunitario. Revista Ciencia, Tecnología y Sociedad, 4(1). 60-68. https://static1.squarespace.com/static/55564587e4b0d1d3fb1eda6b/t/67239c71e7fc407cff8b593e/1730387057752/Xochipa+Rev+--+CTS2024+--+60-68.pdf.