

DOI: 10.5281/zenodo.12426398

BEYOND THE MEZCAL BOOM: A MULTIDIMENSIONAL ASSESSMENT OF THE MUNICIPAL DEVELOPMENT OF SANTIAGO MATATLÁN USING THE IDMB

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Received: 16/10/2025
Accepted: 12/01/2026

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ABSTRACT

Santiago Matatlán, known as the "Mezcal Capital of the World," faces a contradiction: while its economy strengthens with mezcal productivity, social and environmental gaps that limit local development persist. This study aims to answer why an economically dynamic municipality maintains deficiencies in health, drinking water, and institutional management. The Basic Municipal Development Index (BMI) was applied to evaluate the 2015–2022 period in four dimensions: social, economic, environmental, and institutional. The mixed methodology, where 15 indicators were normalized using min–max with data from INEGI and CONEVAL, and 30 semi-structured interviews were conducted with key stakeholders, seeking analytical density, triangulation, and conceptual representativeness. The results show a BMI of 0.525, classified as "medium-low." The most critical gaps correspond to health (0.360) and drinking water (0.355), while the economic dimension reached 0.621 thanks to the mezcal boom. The analysis shows that this growth does not guarantee collective well-being: water governance is weak, local institutions lack resources, and women face invisible barriers in decision-making. It concludes that territorial development requires strengthening institutional capacities and investing in health and water to foster a more equitable and sustainable model.

KEYWORDS: local management, governance, development, municipality, indicators

1 INTRODUCTION

Managing municipal development has become, today, one of the most challenging frameworks of territorial planning, particularly in rural areas where economic expansion, driven by dynamic sectors such as the mezcal industry in municipalities such as Santiago Matatlán, Oaxaca, does not necessarily translate into improvements in collective well-being. In this municipality, the rise of mezcal worldwide has boosted the local economy and strengthened the territorial identity; However, critical gaps persist in drinking water, health, and institutional capacity that challenge conventional indicators focused almost exclusively on production volume. From this perspective, it is necessary to move towards comprehensive and sustainable metrics that integrate equity and resilience.

Over the past few decades, development has evolved from strictly economist paradigms to multidimensional approaches that intertwine social, economic, environmental, and institutional dimensions. In this framework, the municipal government assumes a strategic role, even when in territories such as Matatlán there are structural conditions that hinder the effectiveness of public policies aimed at the common good. The general objective is to analyze the main structural lags faced by the municipality of Santiago Matatlán, Oaxaca, through the application of the Basic Municipal Development Index (bMDI) in order to generate contextualized evidence that strengthens local public management towards a more equitable, resilient and sustainable territorial development model. In this way, it is intended not only to dimension the disconnection between economic growth and social well-being but also to make visible the urgency of policies that recognize the complexity of the territory and promote more equitable structural conditions for the entire population.

1.1 Theoretical foundation

The notion of local development has transcended economic frameworks focused on increasing GDP to embrace denser horizons, where the economic, social, environmental and institutional spheres converge. From this complex perspective, Boisier (2001) calls for privileging endogenous development models that recognize the uniqueness of each territory and strengthen its institutional framework; otherwise, growth is dispersed without roots and without a human face. In the same vein, Sen (1999) redefines progress as the expansion of substantive freedoms, placing health, education and political participation at the heart of any transformative

strategy. Nussbaum (2006).

The territorial focus of the debate is thickened by the postulates of Becattini (1991), Vázquez Barquero (2000) and Albuquerque (2004), who argue that productive processes are woven by dense sociocultural and geographical networks, what they call local production systems where identity, social capital and collective action are intertwined. This framework is crucial for Santiago Matatlán, where the mezcal economy is both a socio-productive framework and a cultural sign. Moreover, contemporary approaches insist that participatory planning Tonucci (2017) and multilevel governance (UNDP, 2020) enhance the effectiveness of public policies by incorporating the plurality of voices that inhabit the territory. Discussions on decentralization warn, however, that transferring competencies without resources or clear regulatory frameworks can aggravate disparities (Falleti, 2005; Grindle, 2007; Montero & Samuels, 2004). In contexts with indigenous normative systems, local governance opens both windows of opportunity and risks of exclusion (Burguete, 2008; Sierra, 2001; Camacho-Vera, Durán Ferman, & Vargas-Canales, 2021), a demand that calls for a critical interculturality that disputes epistemic hierarchies (Walsh, 2009).

These complexities emerge with alternative metrics: the Human Development Index (UNDP, 2010), multidimensional poverty (Alkire and Santos, 2010) and the Basic Municipal Development Index (bMDI) promoted by INAFED (2004), which articulates social, economic, environmental and institutional dimensions through min-max standardization. Even so, authors such as Villalobos and Rojas (2021) and Raworth (2017) point out that conventional indicators continue to ignore ecological, cultural and planetary boundary factors, an urgency embodied in the political ecology of development (Gudynas, 2011; Escobar, 2008) and environmental justice (Martínez-Alier, 2002; Temper *et al.*, 2015). Expanding collective work also implies redesigning the relationships between companies, community, and the environment, as Boscán (2021) points out, indicating that changing environments offer various opportunities for rewintering. On the other hand, the notion of shared value (Porter & Kramer, 2011) invites us to transcend ornamental social responsibility, while Ostrom (1990) demonstrates that the cooperative management of common goods can be sustainable if clear and legitimate rules are supported. Putnam (1993) adds that social capital such as trust and business networks are necessary for robust institutional development, a condition underlined by Sachs (2015)

when linking sustainability, inclusion and human dignity.

The mezcal dynamism of Santiago Matatlán demands comprehensive, participatory, and culturally relevant diagnoses. The WDR, contextualized with participatory tools and intercultural sensitivity, offers a baseline to track lags and design policies that articulate territorial justice, gender equity, and socio-ecological sustainability.

2 METHODOLOGY

A mixed methodology was developed to identify and broadly understand the structural lags that are still present and that affect sustainable development in the municipality of Santiago Matatlán, Oaxaca. The methodological design was carried out in five phases that complement each other, combining review of secondary sources, and qualitative tools, as well as the use of proxy indicators.

Phase One: Index Construction and Indicator Identification

In this first phase, the Basic Municipal Development Index (bMDI) was designed, from the INAFED approach. Four main dimensions were raised: social, economic, environmental and institutional. In the case of the institutional dimension, due to the fact that the municipality is governed by Indigenous Regulatory Systems (that is, uses and customs), and since official data do not exist, a Proxy methodology was developed, using indirect variables. The final indicators were: educational lag and population without access to health (social dimension); economic participation rate and (economic) employment rate; drinking water and drainage coverage (environmental); and finally, community participation and internal

transparency as approximations of the institutional dimension. All were chosen based on their local relevance, that there is reliable data that really helps to capture the territorial reality.

Phase Two: Secondary Data Collection and Validation

Data from the municipality were gathered from official sources such as the 2020 Population and Housing Census of INEGI, CONEVAL reports on poverty and the ENOE 2023 was also used. For the data of the institutional dimension, as mentioned before, there was no comparable information, so direct observation was made in the community and interviews with key people in order to have even a qualitative idea. Then the minimum and maximum ranges were defined that served to normalize the data, but they were not taken from anywhere, but from other Oaxacan municipalities with similar characteristics. That helped make the comparison make more sense, even if it wasn't perfect.

Phase 3. Secondary Data Collection and Validation

The information from Santiago Matatlán was collected from official records: the 2020 Population and Housing Census of INEGI, the multidimensional poverty reports of CONEVAL and the National Survey of Occupation and Employment (ENOE 2023). In the institutional dimension, where the indicators do not apply due to the governance scheme under Indigenous Normative Systems, empirical evidence was used in situ through qualitative methods such as direct observation and interviews. To standardize the data, minimum-maximum thresholds were set.

Table 1. Dimension, indicator and source of factors

Dimension	Indicator	Source
Social	Educational lag (population ≥15 years old without primary school)	Population and Housing Census 2020, INEGI - Municipal tabulations
Social	Population without access to health services	Population and Housing Census 2020, INEGI - Tabulated "Affiliation to health services"
Cost-effective	Economic participation rate	ENOE, Oaxaca Bulletin 2024-IV, INEGI
Cost-effective	Occupancy rate	ENOE, Oaxaca Bulletin 2023-IV, INEGI
Environmental	Homes with piped water	Main results CPV-2020, INEGI
Environmental	Homes with drainage	Main results CPV-2020, INEGI
Contextual	Multidimensional poverty	DataMun - CONEVAL, "Municipal Poverty 2020"
Institutional (proxy)	Frequency of assemblies, transparency, trust	Fieldwork (April 2024): semi-structured interviews and direct observation

Source: Authors. 2024

In order to ensure the validity and reliability of the indicators selected in correspondence with the operationalization table, the following justification criteria were established:

a) Theoretical and definitional coherence. Each indicator was selected in search of conceptual coherence, the factor "educational lag" was operationalized as the percentage of people over

fifteen years of age without completing primary school, according to Sen (1999), is that schooling opens or closes human capacities. On the other hand, "access to health services" was measured with the proportion of individuals without affiliation to a formal system, so that both the coverage and the quality of the local health infrastructure were evaluated.

b) Economic dimension. Here the "economic participation rate" was used, that is, how many people of working age enter the labor market, and the "employment rate", which measures the percentage of those who actually get a job; This made it possible to put on the table the high informality that predominates throughout the mezcal chain, although the data, of course, do not capture all the nuances.

c) Environmental dimension. It was decided to take "access to drinking water" and "drainage coverage" as the percentage of households that have these basic services, since such variables directly impact the quality of life and, in addition, give clues about the sustainability of water resources in the territory.

d) Institutional dimension. Since the Indigenous Normative Systems do not generate standardized records, two proxy variables were chosen: the frequency of community assemblies and the existence of internal transparency mechanisms; thus, in a perhaps somewhat rustic way, it was possible to capture the real logic of governance and accountability. Priority was given to indicators with municipal coverage and relatively complete historical series for 2015-2022 (INEGI, CONEVAL and ENOE). In the absence of hard data in the institutional dimension, the proxies emerged from fieldwork through interviews and observation, maintaining the idea of participation and transparency established in the operationalization matrix.

Phase 4. Standardization and construction of the IDMb

Once the data had been systematized, they were transformed using the Min-Max normalization method, which standardizes the values on a continuous scale from 0 to 1. This technique made it possible to integrate indicators with different units of measurement and to construct a composite index. Each dimensional subscript was obtained through the arithmetic average of its normalized indicators, while the overall bMDI was calculated as the mean of the four subindices. This procedure not only facilitated the comparison between heterogeneous dimensions, but also made it possible to identify the

areas with the greatest relative lag.

Phase 5. Integration of the qualitative component

In April 2024, a qualitative component was added to contrast the numerical findings and, well, to get deeply into the social, cultural and institutional processes that mark local development. Semi-structured interviews were conducted with thirty key actors, including authorities, mezcal producers and residents of areas with precarious services and chosen through intentional sampling by criteria, seeking diversity of experiences, gender, functions and corners of the municipality.

Phase 5. Estimation of the institutional sub-index using proxy indicators

When what is being measured, as is the case with community institutionality within Indigenous Normative Systems, no official records appear, the methodology with proxy variables is proposed. According to what Ali Hussein Samadi and Masoumeh Alipourian (2021) propose, if institutional quality is to be empirically evaluated, it is necessary to resort to indirect indicators that can represent, even partially, that dimension that is not so easily seen. This way of approaching the institutional is not an isolated occurrence; in fact, it follows the line long proposed by authors such as Ostrom (1990) and also by Dietz, Ostrom and Stern (2003), who warn that institutions are not only written rules, but are embodied in everyday practices that, if well documented, can be rigorously analyzed, even if there is no hard data.

In this sense, and since there are no official records on the accountability of government systems in municipalities that are governed by uses and customs, it was decided to put together a more localized methodological strategy. We then worked with qualitative evidence collected through semi-structured interviews with thirty key members of the municipality. In particular, the principle of "meaning saturation" developed by Hennink, Kaiser, and Marconi (2017) was considered, who distinguish between possible code saturation with 12 to 20 interviews and deep conceptual saturation, which requires between 25 and 40 cases when dealing with populations with multiple analytical dimensions. Given that the study addresses social, economic, environmental and institutional aspects in a complex territorial context, a sufficient number of interviews were established from the beginning to capture the internal variability of the municipality in terms of age, gender, occupation, access to services and community participation.

3 RESULTS

3.1 Characterization of the Municipality of Santiago Matatlán

Santiago Matatlán, known as the "Mezcal Capital of the World," is a municipality located in the Central Valleys of Oaxaca, Mexico. This municipality is located at an average altitude of 1,740 meters above sea level and covers an area of approximately 126.31 square kilometers. Its geographical location in the Tlacolula Valley allows it to have access to fertile soils, suitable for the cultivation of maguey, the base plant for the production of mezcal, which is the main

economic engine of the Santiago Matatlán region, according to the 2020 census, amounts to 10,175 inhabitants, of which 53.7% are women and 46.3% are men. The population density of the municipality is 52.34 inhabitants per square kilometer, which indicates a dispersed population in relation to its territorial extension. This geographical and demographic aspect influences the planning of public services, such as education, health, and drinking water, which must cover a population distributed in different areas of the municipality. The geographical location of the study area can be seen below, in Figure 1.

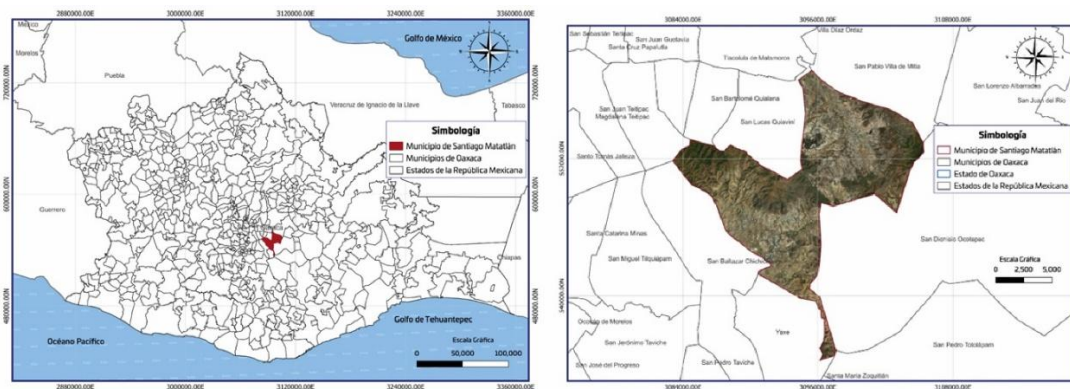


Figure 1. Geographical location of Santiago Matatlán, Oax.

Source: Authors' elaboration based on Qgis, 2024

The economic dynamics of Santiago Matatlán are almost totally intertwined with the agave-mezcal binomial; not only because of its economic weight but also because it shapes the collective identity of the territory.

Despite this boom, many of the small and medium-sized distilleries – the so-called palenques – continue to operate in informal schemes, limiting access to basic labor benefits for those who work in them. Thus, although mezcal gives life to the economy and strengthens the sense of belonging, the income generated is not distributed evenly among all families, leaving out those who occupy less visible links in the production chain (Ríos-Y Vázquez & Figueroa-Hernández, 2023).

In the labor field, the data are eloquent: more than 80% of the labor force in Oaxaca is located in the informal sector, which translates into the absence of social security, irregular income, and constant uncertainty for many families who cannot even plan their spending in the short term (Ríos-Y Vázquez & Figueroa-Hernández, 2023). The educational field does not escape these tensions either: the schooling pyramid is concentrated in complete primary and secondary schools, with reduced enrolment in high school, a situation that encourages youth migrations

and a loss of human capital that, in the future, may reduce the innovative capacity of the territory.

The calculation of the bMDI in Santiago Matatlán revealed an uneven level of development between the different dimensions evaluated: social, economic, environmental and institutional. Although the economic dimension presented a favorable evaluation in terms of employment and occupation, the other dimensions showed significant shortcomings.

The findings obtained from the Basic Municipal Development Index (bMDI) show a profound disparity between the economic dynamism of Santiago Matatlán, linked to mezcal activity, and the persistent lags in social, environmental and institutional matters. Through an analysis by dimensions, contrasts are observed that allow identifying the strategic areas where local public policy requires intervention with greater urgency.

The economic dimension presents the highest value, which reflects intense labor participation, although with high levels of informality that are reflected in the interviews conducted. In contrast, the social and environmental dimensions show significant weaknesses, especially in terms of educational coverage, access to health services,

drinking water and drainage. The institutional dimension, assessed through proxy indicators derived from community practices and local testimonies, also reveals limitations in transparency, participation, and accountability, despite functional governance in community terms.

Next, the quantitative and qualitative results organized by dimension are presented, highlighting both the normalized values of the index and the local narratives that contextualize and enrich the understanding of the data. With this inclusion, the updated calculation of the bMDI for Santiago Matatlán was as follows:

Table 2. Summary of Sub-indices and values of the dimensions investigated

Subscripts	Social	Economical	Environmental	Institutional
Value	0.61	0.7175	0.2725	0.50

Source: Authors, carried out in Python 2024.

Table 2 shows the results obtained for each sub-

index that makes up the assessment of development in Santiago Matatlán, prepared using the Basic Municipal Development Index (bMDI). This index articulates four essential axes: social, economic, environmental and institutional, which were normalized on a continuous scale from 0 to 1 so that they can be compared without major distortions and then added together in a coherent way. The overall score was obtained by calculating the arithmetic average of these sub-indices, which provides a fairly comprehensive picture of the territorial state. The calculation was as follows:

$$\text{bMDI} = (0.61 [\text{Social}] + 0.7175 [\text{Economic}] + 0.2725 [\text{Environmental}] + 0.50 [\text{Institutional}]) / 4 = 0.525$$

With this indicator 0.525, the municipality is placed at a medium-low level of development; that is, a marked imbalance can be observed between the economic development generated by the mezcal industry and the persistent lags in social services.

Table 3. Dimension, Indicator, Observed Value, Normalization Formula, and Normalized Data

Dimension	Indicator	Observed value	Normalization Formula	Normalized data
Social	Educational lag	36%	$(36 - 0) / (100 - 0)$	0.36
Social	Population without access to health care	86%	$(86 - 0) / (100 - 0)$	0.86
Cost-effective	Economic participation rate	51.5%	$(51.5 - 0) / (100 - 0)$	0.515
Cost-effective	Occupancy rate	92%	$(92 - 0) / (100 - 0)$	0.92
Environmental	Homes with piped water	35.5%	$(35.5 - 0) / (100 - 0)$	0.355
Environmental	Homes with drainage	19%	$(19 - 0) / (100 - 0)$	0.19
Institutional	Combined proxy indicators	Proxy Estimation	Proxy value already normalized	0.50

Source: Authors, 2024.

3.2 Social Dimension: Deficiencies in Education and Health

In the social factor, the numbers show hard lags in key variables of human development. With the calculation, the educational lag was left with a normalized value of 0.36 while access to health marked 0.86, yielding, on average, a social subindex of 0.61. this indicator has an impact on development, as Amartya Sen, 1999 puts it, as it limits people's basic freedoms. For its part, the health factor indicates a lack of medical services accompanied by problems in available infrastructure and basic supplies. This mixture of educational and health deficits underscores the urgency of designing territorial policies that are committed to greater investment in education and the expansion of health services with an intercultural and equity approach.

3.3 Economic Dimension: High Employment, but Challenges in Formalization

The economic dimension showed the best relative performances within the bMDI, within the bMDI,

with an average sub-index of 0.7175. The economic participation rate was 0.515, while employment reached 0.92, a sign that almost the entire active population works in some way. But be careful, these numbers must be read with a magnifying glass: in Santiago Matatlán employment moves, yes, although mostly in the mezcal informality. The dynamism is noticeable, however, job instability, low social security affiliation and the vulnerability faced by women producers mean that incomes remain fragile and opportunities for personal advancement fall short. All these findings point to the urgency of promoting formalization strategies, associative schemes and access to financing that strengthen productive capacities with a gender approach, otherwise, growth will continue to be lame and uneven.

3.4 Environmental Dimension: Limited access to drinking water and drainage

The performance of the environmental dimension is the lowest of the four evaluated, with an average sub-index of 0.2725, the lowest performance of the

entire table evaluated. The drinking water indicator reached 0.355, and the drainage coverage registered 0.19; both well below the state average, which has an impact on collective health, as exposure to communicable diseases is increased and the vulnerability of households is deepened. It should not be forgotten that the social cost of these shortages falls, almost always, with greater weight on women and girls who end up assuming, in daily practice, the management and transport of water. In short, investment in hydraulic systems and basic sanitation is required; otherwise, the environmental gap will continue to widen and will compromise both the sustainability of the territory and the dignity of its people.

3.5 Institutional Dimension: Community governance with transparency challenges

Under the community government governed by the indigenous Normative Systems that prevails in Santiago Matatlán, a different methodological route had to be devised to estimate the institutional sub-index, mixing proxy variables with qualitative evidence that was collected in the field. By reviewing practices such as the convening of general assemblies, the daily functioning of the committees, and the stories about the trust that people place in their authorities, an axial analysis was applied to these testimonies, and from there five proxy dimensions of institutionality emerged. Each of them was given a qualitative score according to the frequency and consistency with which they appeared in the interviews; This gave shape to an indicator that better reflects real institutional life that is not captured in official records.

The coding and values were as follows:

Table 4. Dimension, Indicator, Observed Value, Normalization Formula, and Normalized Data

Proxy Dimension	Coding Criteria	Assigned Value
Frequency of community assemblies (FAC)	Present in all testimonies	1.00
Perception of citizen participation (PPC)	Mentioned in interviews	0.50
Institutional Trust (IC)	Mentioned in interviews	0.50
Accountability Mechanisms (MR)	Detected in interviews	0.25
Access to Public Information (AIP)	Mentioned negatively in interviews	0.25
Institutional Sub-Index (SI)= FAC+PPC+CI+MR+AIP 5		0.50

Source: Authors, 2024.

For the institutional dimension, a value of 0.50 was assigned, being the average of the values assigned. This score reflects a functional governance based on community legitimacy, although limited in formal mechanisms of transparency and public availability of information. The absence of clear accountability mechanisms, and the perception of decisions made without consultation, reveal a need to strengthen channels of information, citizen participation, and budgetary surveillance. The institutional dimension is key to sustainability, as it conditions the effective implementation of public policies and the social appropriation of development processes.

4 DISCUSSION

The interpretation of the results obtained in Santiago Matatlán requires a theoretical reflection on the conceptual frameworks that support the measurement of development at the local scale. the IDMb here becomes a lens that connects people's real opportunities with a territorial view of well-being. From this perspective, the study is anchored in three theoretical axes: the human capabilities approach, the economics of territorial development and the idea of institutional sustainability. From the approach of

Amartya Sen's (1999) capabilities, development is not only economic growth or accumulation of goods but the expansion of freedoms to live the life that each person values, therefore, education and health are not simple coverages; they are core capabilities. When lags such as those detected in Matatlán persist, the full exercise of human rights is restricted, Nussbaum (2006) underlines this when he speaks of minimum thresholds of dignified life, physical integrity, reflection and control of the material and political environment.

In the economic sphere, although the sub-index shows high values, the informality that characterizes mezcal work repeatedly cannot be ignored. Becattini (1991) when studying Italian industrial districts, development is intertwined with the social and cultural fabric of the territory; in Matatlán the mezcal chain articulates family networks and collective knowledge, however, this structure does not guarantee equity or job security. Here Coraggio's (2011) social and solidarity economy dialogues, revealing the valorization of non-capitalist jobs, but also the limits of such experiences when redistributive policies and institutional support are lacking.

On the other hand, such a low environmental

rating is evidence of a problem that the literature on sustainable development has been discussing for years. Quiroga (2001) coined "institutional sustainability" to refer to the ability to integrate the ecological as a key element and not as an ornament; in Matatlán, the lack of water and sanitation reflects not only material deficits but also a short institutional framework to plan environmental infrastructure with territorial justice. This vision is in line with ecological sustainability as a necessary condition for the reproduction of life and not as a separate chapter. With respect to the institutional aspect, the indirect variables reveal a tension between community legitimacy and the weakness of formal transparency mechanisms. Democratic governance, according to Ostrom (1990) and Avritzer (2002), conceives citizen participation not as a formality, but as an organizing principle of the debate on common goods. In short, the multidimensional view adopted by this research goes beyond unilateral visions of development by linking human capacities, territorial conditions, ecological sustainability and quality of governance; thus, the IDMb becomes not only a technical exercise, but also a critical tool to make inequalities visible, guide policies and promote fairer, more sustainable and culturally relevant development models, if progress is not made along these lines, the delays detected will continue to make their way.

5 CONCLUSIONS

The findings presented in this study allow us to affirm that the general objective of the research was fully achieved. Through the application of the Basic Municipal Development Index (bMDI), methodologically adapted to the socio-territorial specificities of Santiago Matatlán, the main structural lags that hinder the construction of a fair and sustainable development model in the municipality were clearly identified. The territorial panorama was complex because the economic dynamism linked to the mezcal boom is evident; however, this impulse does not translate into comparable improvements in services for the population. Labor informality

continues to predominate and the scarce social protection, added to precarious employment conditions especially for women producers, betrays an active economy, but at the same time exclusionary.

In the social sphere, significant challenges continue: educational lag and limited health coverage reduce human capacities and perpetuate intergenerational inequalities. For its part, the environmental dimension was left behind: serious shortages of drinking water and drainage impact public health and threaten the sustainability of the territory. The institutional dimension, estimated through proxy indicators and qualitative evidence, exhibits legitimate but weak community governance in mechanisms of transparency, accountability, and effective citizen participation.

In theoretical terms, the study is based on Sen's (1999) approach to human capabilities, recalling that indicators not only quantify material shortages, but also the possibility of exercising substantive freedoms. It also dialogues with the economics of territorial development of Becattini (1991) and with the theories on sustainable governance proposed by Ostrom (1990) and Quiroga (2001), stressing that development requires both robust productive structures and participatory and legitimate institutions.

Among the methodological contributions, the adaptation of the bMDI to a context of Indigenous Normative Systems stands out, combining official data with qualitative evidence collected in the field; this made possible a more comprehensive diagnosis adjusted to the territory. However, limitations remain: the lack of disaggregated data, especially in the institutional dimension, forced the use of qualitative approaches that, while enriching the analysis, incorporate a certain degree of subjectivity. It is suggested that future research delves into participatory methodologies, conducts longitudinal analyses and explores in greater detail the gender dimension in local production systems, otherwise it will be very difficult to grasp the real complexity of the development process.

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