

**Measurement municipal social development in the district of Etna, Oaxaca****Medición del desarrollo social municipal en el distrito de Etna, Oaxaca**

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**Abstract**

It is highly relevant to know the impact of social development programs, specifically the funds that arise from branch 33 (FAIS and FORTAMUN) whose objectives are to provide infrastructure and strengthen the municipality, to identify possible incidences on territorial disparities. These funds are administered by the municipal authorities and to know their effect on social development, it is proposed to use the basic Municipal Development Index (IDM), since it is considered a reliable, simple and adaptable option. The purpose of this article is to propose a series of complementary indicators based on the IDM, which are adapted to the characteristics of the State and especially to the region that makes up the district of Etna, Oaxaca; in order to generate structured and real information for analysis and interpretation by all those interested in public action. This proposal is expected to be a useful management tool for municipal change towards higher levels of effectiveness and efficiency

**Resumen**

Resulta de gran relevancia conocer el impacto de los programas de desarrollo social, específicamente de los fondos que surgen del ramo 33 (FAIS y FORTAMUN) cuyos objetivos son dotar de infraestructura para fortalecer al municipio e identificar posibles incidencias sobre las disparidades territoriales. Dichos fondos son administrados por las autoridades municipales y para conocer su efecto en el desarrollo social se propone utilizar el Índice de Desarrollo Municipal básico (IDM), ya que se considera una opción confiable, sencilla y adaptable. Este artículo tiene como finalidad plantear una serie de indicadores complementarios a partir del IDM, que se adapten a las características del estado, especialmente a la región que compone el Distrito de Etna, Oaxaca, con el fin de generar información estructurada y real para su análisis e interpretación por todos aquellos interesados en la acción pública. Se espera que esta propuesta logre ser una herramienta de gestión útil para el cambio municipal hacia mayores niveles de eficacia y eficiencia.

**Territorial, Municipality, Development, Indexes****Territorio, Municipios, Desarrollo, Índices**

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## Introduction

The World Summit on Social Development held in 1992 marked the beginning of negotiations on the Copenhagen Declaration. At this summit, the founding committee was established, which held several meetings in the following years, but it was not until March 1995 that the World Summit for Social Development was held in the capital of Denmark. Representatives from 187 countries met to discuss issues related to social development and agreed to draft a declaration containing ten commitments and a program of action. This declaration represented a major international achievement in placing human beings at the center of development strategies.

The program of action determined actions at the national and international levels to fulfill the ten commitments, urging governments to measure the social impact of their microeconomic, macroeconomic and sectoral policies; at the same time, equality between women and men was included as a relevant aspect.

Of the ten commitments established, number one was to create an economic, political, social, cultural and legal environment conducive to social development. In this regard, the importance of increasing the resources allocated to social development is emphasized, as well as the criteria suggested at the national level that incorporate the review of resource allocations for public expenditure, giving priority to social development and increasing the effective and efficient use of public resources (United Nations, 1995).

Based on the above, several conceptualizations of social development have emerged, some of which will be reviewed below, and which are undoubtedly related to the definition of society from which they are based. All definitions of society have in common human beings as the center of the organization, around them different problems are solved, such as survival needs, coexistence, economic organization, democracy, in short.

The basic Municipal Development Index (IDMb) is considered as a measuring instrument that provides real values for the territorial divisions of each state, whether of a political-administrative nature or some other.

## Concept of social development

The first concept of social development is that of the author (Uribe Mallarino, 2004) who states that development can be defined as the growing tendency of a society along a *continuum*<sup>1</sup>, The extremes of which would be, on the one hand, the most advanced societies and, on the other, the most backward ones. Understanding that progress or backwardness is subject to goods, technology, productivity, accumulation and a concept further removed from what is considered survival. Therefore, we would speak of social development as the result of the improvement in collective welfare indexes such as life expectancy, infant mortality, disposable income, caloric intake or access to social services; understanding that all this would point to a longer life, greater and better enjoyment of goods, protection against natural adversities, health ailments and risks in general.

For his part (Zuluaga Monsalve, 2017) states that the correspondence between development and society is known as social development, so this is conceived as the socioeconomic change in which society is a participatory actor; development seeks to improve living conditions, quality of life for society in general and dignify the human being.

The formal and informal relationships and institutions<sup>2</sup> existing between people, build the ideals of society that determine the distribution of resources and forms of access to them, which in turn mark the conditions of life according to the possibility of satisfying the needs of the individual, first in material form through housing, clothing, food, education, recreation and health. On a second level, the immaterial aspects such as coexistence, protection, security, solidarity, organization, participation, love, respect, among others.

<sup>1</sup> Concept used in various branches of knowledge, which expresses the variation of a living being, object or scientific, social or psychological process through a progressive transformation in a given time.

<sup>2</sup> These institutions are understood as the conventions and norms of a group in a specific space.

In relation to the above, Jorge Villalón *apud* (Zuluaga Monsalve, 2017) considers that social policies are determined by the current economic model, and each of them must be approached from three indispensable aspects in their formulation. First, the productive apparatus, which is related to the generation of resources and their distribution; second, the social structure, which refers to overcoming unfair living conditions and the development of human potential, the fair distribution of opportunities for the entire population. He argues that social development must have a broader concept that transcends the economic and linear, conceiving it beyond consumerism, productionism and the satisfaction of basic needs.

The definition of (Alaminos & López, 2009), with which this analysis is aligned, defines social development as the achievement of economic, social and ecological balance where inequalities are understood as imbalances, whose response is human rights. In other words, it considers that the charter of human rights should be the basis for social development proposals.

It is logical that at the international level and especially at the national level, some relevant aspects of social development such as health, education, public safety and employment should be considered; by addressing these issues, an improvement in the indicators of social problems such as poverty, inequality, exclusion, isolation and vulnerability of the most vulnerable groups is expected. At an aggregate level, it could be argued that these are the objectives of public interventions in the area of social development.

Therefore, governments promote social development through institutions and agencies, with the function of implementing social protection policies and programs to generate inclusion, considering in the design of interventions (policies) those beneficiaries who are part of vulnerable groups or who live in marginalized or marginalized conditions. Simply put, with what has been pointed out so far, the complexity inherent to the definition of social development is evident, which acquires new degrees of difficulty when trying to evaluate or measure this social development. Given that social development is a complex process, there are various proposals for its measurement.

### *Development indexes*

The *Human Development Index* (HDI), which emerged in 1990 in a report presented at the UNDP, identifies the situation of a country in terms of the basic human development of its population by means of a composite index. The HDI is made up of three fundamental elements that determine the development of a society, all of which have the same relative weight, thus avoiding the undervaluation of any of the elements.

To calculate the HDI, the following indicators are considered: life expectancy, education and GDP per capita; the value resulting from this formula responds to a progression of low - medium - high, taking as a reference the following values: high HDI greater than or equal to 0.8, medium HDI between 0.5 and 0.8 and low HDI less than 0.5. However, one of the limitations attributed to this index is the change in the methodological criteria that is carried out year after year, making inter-temporal comparisons difficult to elaborate, obtaining less accuracy on the progress or setback in terms of human development. On the other hand, being a very general index, it presents certain limitations to identify particularities of the cases.

Another index is the *Gender-Related Human Development Index*, which takes up the three dimensions of the HDI, but also considers and quantifies social and economic inequalities between men and women, making it sensitive to gender inequalities. This term was introduced in the Human Development Report in 1995 together with the Gender Empowerment Measure (GEM).

In the same vein, the *Human Poverty Index* (HPI) emerged in 1996, when the UNDP made its first attempt to measure poverty in order to introduce a new quantitative perspective in development studies. Subsequently, the Capability Poverty Index (CPI) emerged, this index measured human development through three basic dimensions, including the insufficiency of available income to acquire the value of the food basket and to make the necessary expenditures in health and education, even dedicating the total income of households only for these purposes. (CONEVAL, n.d.)

For the first time in 1997, the UNDP proposes the HPI, which has an inverse relationship to the HDI, since it focuses mainly on deprivations such as survival, health and education<sup>3</sup>, knowledge<sup>4</sup> and a decent standard of living<sup>5</sup>. This is why, while a high HDI score implies high development, high HPI values imply a situation of greater poverty. There are two variants of this index, the HPI1 applicable in developing countries, and the HPI2 which is aimed at the study of poverty situations in developed countries.

The *Genuine Progress Index* (GPI) originated as an alternative to GDP as an indicator of social welfare. It was created by a group of researchers in California in the 1970s, and its main difference from GDP is that it distinguishes between economic activities that produce benefits and those that cause harm. This implies a different perspective, as it does not conceive of all activities as generators of common benefit.

The GPI is composed of 26 variables of a social, economic and environmental nature. It is calculated when domestic commercial consumption adjusted for economic inequality is adjusted by adding domestic and community labor services, public expenditures and subtracting private and defensive public expenditures, as well as the costs of environmental degradation and the devaluation of natural capital. The GEM introduces new variables that allow for a better and more realistic estimate of a territory's well-being. The importance of this index lies in knowing the country's rise and fall, taking into account the aspects that will have a future impact.

To close this review of proposals, two more indexes based mainly on the analysis of subjective variables such as life satisfaction or individual and social well-being are considered citation.

Within this group, the Happy Planet Index was created by the New Economics Foundation (NEF), based on the need to add environmental factors to the study of the development of societies and people; it assumes that without a healthy environment, complete development is not possible.

The result is achieved through a non-mathematical formula that takes into account three dimensions: life expectancy, life satisfaction (happy years of life) and the ecological footprint (relationship between quality of life and the resources obtained through the planet).

The Gross Domestic Happiness Index (GDP), whose term was proposed by the monarch of the Kingdom of Bhutan, Jigme Singye Wangchuck in 1972, as a response to criticism of the constant economic poverty affecting his country. To obtain this FIB, perception surveys are carried out, constructed with a matrix of 150 indicators that highlight nine dimensions for the study of societies: psychological well-being, health, use of time, community vitality, education, culture, environment and government (Alaminos & López, 2009).

All of the above places the discussion in a context of crossroads between approaches that reflect different models of social duty that guide priorities for efficient public management, as part of the path to achieve the long-awaited social development. To be socially developed will therefore mean optimal levels of quality of life for citizens, in terms of a peaceful, fair, free, tolerant, egalitarian and supportive environment, where there are great possibilities for each individual to satisfy his or her needs, develop his or her potential and achieve personal fulfillment. Within this framework, Amartya Sen's concept of development is enunciated:

In order to talk about the development of a society, it is necessary to analyze the lives of those who are part of it, since it is impossible to consider that there is economic success without taking into account the lives of the individuals who make up the community. Development is then the development of the people in society. For this reason it defines it concretely: Development is a process of expanding the capabilities enjoyed by individuals (London & Formichella, 2006) p. 19).

<sup>3</sup> Vulnerability to death at a relatively young age

<sup>4</sup> To be excluded from reading and communications

<sup>5</sup> General economic procurement

It is also inferred that social development is conceived as the next step after the economic development of a country; being its final objective to achieve the welfare of citizens, understanding that welfare refers to the effect of development on the individual, families and society.

In Mexico, inequality prevails due to the fact that individual opportunities are limited by gender, socioeconomic level and geographic location, as main factors; when this reality is recognized, the need to recover these differences in the measurement instruments used as a basis for intervention decision making and evaluation of the situation in state, municipal or other territorial scales, defined with political-administrative or other criteria, becomes evident.

An example of a measurement instrument was applied in 2005, when the National Council of Science and Technology (CONACYT) and the National Institute for Federalism and Municipal Development (INAFED), through the Segob-Conacyt Fund for Research and Development, selected El Colegio de la Frontera Norte, in coordination with municipal, state and federal public officials, as well as academic specialists, to develop a municipal index calculated for 2,418 Mexican municipalities.

The objective was to reflect the general tendencies of the level of development of each municipality with respect to others in the same state or the country, considering socioeconomic indicators that have been used to quantify or measure development, as well as institutional and environmental indicators, which in their convergence allowed us to obtain an overview of the level of development of the municipalities studied.

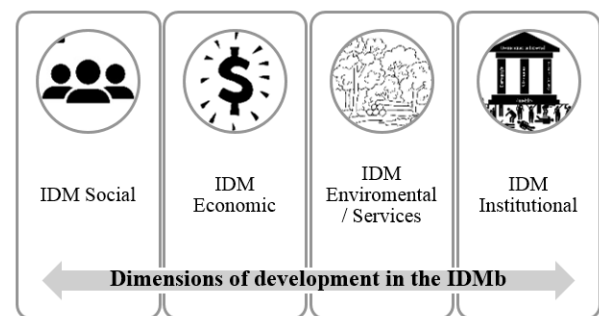
The result was the basic Municipal Development Index (IDMb) (Flamand, Martínez, & Hernández, 2007). Its conception prioritized broad applicability to allow its calculation for all Mexican municipalities and comparisons, as well as the use of information from official sources and continuous generation so that it could be replicated at different times.

Therefore, the basic Municipal Development Index can be described as a simple and transparent instrument that allows classifying Mexico's municipalities according to their respective levels of development. This index concentrates information on the situation of the municipalities to guide public actions aimed at local development. It is transcendental to highlight that the bMDI does not seek to grant a qualification of municipal performance, but rather to be a relative indicator of the position of each municipality with respect to the rest of the country's local entities.

### Measuring the basic Municipal Development Index (bMDI)

The bMDI can be quantified for all of the country's municipalities, this index allows each one to be placed according to the desired context; it collects information on four dimensions with equal weightings. These dimensions are: environmental, economic, institutional and social; considered fundamental to achieve an integral and sustained municipal development, therefore they were calculated to obtain the total value of the bMDI.

The development dimensions that make up the index are shown in Figure 1.



**Figure 1** Development Dimensions

Source: Own elaboration based on (Flamand, Martínez, & Hernández, 2007)

In order to better understand the bMDI, each of the dimensions will be discussed in more detail. First, the environmental or services dimension includes two indicators that show accessibility to water resources and waste management through the existence of drainage; the variables are therefore the number of dwellings with piped water and the number of dwellings with drainage out of the total number of inhabited dwellings.

It was assumed that access to water and wastewater disposal is a basic resource and a potential pollutant with serious repercussions on public health.

The economic dimension describes the municipal productive dynamics in summary form using the gross census value added per capita, as well as the level of employment as an approximation to the inclusion of the population in the labor force and as an indicator of the economic dynamism of the local productive system.

The institutional dimension includes the tax effort as an indicator of governmental financial performance and citizen participation in municipal elections as a sign of the municipality's institutional vitality and general interest in public affairs.

Finally, the social dimension includes indicators that represent the opportunities to acquire minimum knowledge with the proportion of the population with completed primary education and a health indicator with infant mortality.

The index is constructed in three major stages, which are described below:

1. Obtaining and organizing the information that feeds the basis for the calculation,
2. Calculation of the indices by development dimension (called sub-indices), 3.
3. Calculation of the bMDI, defined as the average of the four sub-indices.

The calculation of the bMDI for each municipality is based on 28 data that allow the calculation of 8 indicators, two for each of the development dimensions considered, which are subsequently integrated into four sub-indices and finally into the basic Municipal Development Index (bMDI).

According to (Vargas, 2022) the importance of the indicators lies in the information they allow to obtain, through the observation of the progress of a project and whether it has achieved a proposed objective. Table 1 below shows the data, indicators and subindices to be analyzed to obtain the bMDI.

Sub Index	Datos
Municipal-Social Development Index	Literacy
	School attendance
	Basic and post basic education
	Entitlement
	Floor different from ground
	Sanitary toilet
	Piped water
	Drainage
	Electric power
	Washing machine
Refrigerator	
Municipal-Economic Development Index	Gross census value added
	Per capita agricultural index
	Employed population
	IMSS-insured workers
Municipal Development-Environment Index	State of aquifers
	Water supply
	Drainage coverage
	Protected Natural Areas
	Deforestation
	Forest cover
	Recovery indicator
Erosion risk indicator	
Municipal-Institutional Development Index	Percentage of electoral participation
	Transparency evaluation
	Public administration employees
	Percentage of own income
	Common law crimes

**Table 1** bMDI data and subindices

Source: Own elaboration based on (Flamand, Martínez, & Hernández, 2007)

The table above shows in a structured way the data to be analyzed, then the indicators that will be measured through normalized mathematical equations, to later constitute each one of the sub-indices. Finally, the bMDI will be the result of the average of the sub-indices.

We start from the assumption that each municipality, through its management, facilitates the means to raise the welfare of the population, achieve higher levels of social development and equal opportunities; an example of management is the implementation of resources from branch 33, in its FAIS and FORTAMUN funds, these are a strategy of attention to the vulnerable population, which aims to provide the districts with adequate infrastructure and public services that improve and in turn improve living conditions.

Local governments should base their management on trying to raise the standard of living, improving the social conditions of vulnerable groups and favoring equity, until reaching community strengthening, where all inhabitants feel an important part of the community and contribute to a common goal.

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Making a constant or permanent integration between the government and the citizens.

Based on the above, the bMDI is chosen as a mechanism that allows a clearer understanding of the lines of action in which the resources of government programs are invested at the municipal level. Taking as a premise that the ultimate goal of any municipal authority is to reduce social backwardness and the social gaps it causes.

Once the results of the sub-indices and the bMDI are obtained, it will be possible to first identify the focal geographic area of attention, then the demographics of that area, the main need that is being addressed, and finally, to test the hypothesis that indicates that municipal governments have a good understanding of the needs of their inhabitants.

The main aspects of the district of ETLA, Oaxaca, which will be the area of study to be analyzed, are presented below, as well as relevant information on the 23 municipalities that make up the district, as well as their degree of marginalization and social backwardness.

**District of ETLA**

The State of Oaxaca has a political division considered the most complicated in Mexico, since it is made up of eight regions: Cañada, Costa, Istmo, Mixteca, Papaloapan, Sierra Sur, Sierra Norte and Valles Centrales; with 570 municipalities divided into 30 districts (delimited in Figure 2); the State of Oaxaca is home to a little more than 11 thousand communities.



**Figure 2** State of Oaxaca with regional and district divisions  
Source: (Wikimedia, n.d.)

In order to understand the territory under analysis, it is essential to recognize cultural diversity and take into account the struggle of the peoples to maintain their identity, in this sense, communality is a determining aspect in understanding the dynamics among Oaxacan peoples (Broca & Torres, 2022).

For this case, district 11 ETLA is examined, belonging to the Valles Centrales region; district 11 is integrated by 23 municipalities that are listed in table 2, in the first place, there is the municipal code that consists of a unique three-digit number, which allows identifying the municipality within the federal entity, then the name of each municipality; table 3 includes the municipal code, the total population; finally, it includes the degree of marginalization and degree of social backwardness, for each municipality.

The marginalization index is considered important, since it considers education, housing, income from work and population distribution, and its breakdown is state and municipal; at the same time, it is considered convenient to include the social backwardness index, which addresses indicators of education, health, basic services, housing quality and space, and household assets; its breakdown is state, municipal and by locality.

Municipality code	Name of municipality
33	Guadalupe ETLA
45	Magdalena Apasco
63	Nazareno ETLA
77	Reyes ETLA
84	San Agustín ETLA
102	San Andrés Zautla
135	San Felipe Tejalápam
150	San Francisco Telixtlahuaca
161	San Jerónimo Sosola
175	San Juan Bautista Atlatlahuca
178	San Juan Bautista Guelache
179	San Juan Bautista Jayacatlán
193	San Juan del Estado
227	San Lorenzo Cacaotepec
293	San Pablo ETLA
294	San Pablo Huitzo
426	Santa María Peñoles
483	Santiago Suchilquitongo
487	Santiago Tenango
494	Santiago Tlazoyaltepec
531	Santo Tomás Mazaltepec
539	Soledad ETLA
338	Villa de ETLA

**Table 2** Municipalities and municipal code  
Source: Own elaboration based on (INEGI, 2020).

Municipality code	Total population	Degree of marginalization	Degree of social backwardness
33	2 929	Very low	Very low
45	7 888	Very low	Very low
63	4 293	Very low	Very low
77	4 370	Under	Under
84	4 168	Very low	Very low
102	5 326	Medium	Under
135	8 231	Medium	Medium
150	13 856	Very low	Under
161	2 730	High	Medium
175	1 424	High	Medium
178	6 692	Bajo	Very low
179	1 447	Medium	Under
193	2 807	Under	Under
227	18 339	Very low	Very low
293	17 116	Very low	Very low
294	7 035	Very low	Under
426	8 967	Very low	Very high
483	10 886	Under	Under
487	1 966	Medium	Medium
494	6 300	Very high	Very high
531	2 612	Medium	Under
539	6 348	Under	Under
338	10 361	Very low	Very low

**Table 3** Municipal code, total population, degree of marginalization and degree of social backwardness of the district of Etlá

Source: Own elaboration based on CONAPO Estimates based on the (INEGI, 2020); Basic Questionnaire Tabulations, as well as the Social Gap Indicators of the (CONEVAL, 2020).

Having knowledge of the indicators and values of the district of Etlá with its 23 municipalities, taking into account its characteristics and the results of the documentary research, it is considered that the degree of effectiveness of social programs affect the reduction of deficits in public services, the generation of employment and it is expected that, consequently, it will bring an increase in the income of the population.

This is due to the fact that social policies aim to reduce or combat high levels of poverty; their main objective is to guarantee citizens access to basic goods and services that are considered part of social rights, which are contemplated in the Political Constitution of the United Mexican States. Social programs are a form of State intervention that attempts to reduce social inequalities and their attention was mainly directed to rural areas; however, in recent years there has been an increase in the population living in conditions of poverty in urban areas. Initially, policies were the responsibility of the federal government, but thanks to decentralization processes, the operation and administration of education, health and housing programs, among others, became the responsibility of state and municipal governments.

The little or almost null positive result in the reduction of social deprivation of citizens, implies a redesign of social policies that are adapted to the different areas, where labor instability, access to basic services not guaranteed, the population living below the basic survival level, flimsy housing, as well as meager incomes are recognized.

The new reality demands a renewal of the political system, creating better and new relations between the State and society, where the decision-making processes include social issues that allow improving the quality of life of the inhabitants of the districts.

### Methodological proposal

In this sense, certain determining indicators must be included in the characterization of a territory; it is essential that those who elaborate and determine the scope of social policies, through social programs and aid, have relevant information on the regions and municipalities, thus providing greater resources for the municipalities, and that these are used to carry out public works that attempt to solve the priority problems of the population.

To get into the subject, it is important to know that the definition and construction of an index takes place during three interrelated stages: first, defining the dimensions to be considered; second, choosing the values or indicators that best reflect these dimensions, taking into account the possibility of obtaining them. The second is to have efficient and reliable statistical information systems as a source and, lastly, the definition of an index to operationalize what is to be quantified, which is also comparable in time and space, interpretable and useful for decision making.

In recent years, a large number of methodologies have been developed in the search for a more accurate measurement of poverty; however, lately, unidimensional methodologies predominate, thus replacing multidimensional ones (Reyes & López, 2016).



For this study, a methodology is proposed that takes as a basis the basic Municipal Development Index (IDMb) with some adaptations that together build an overview of the standard of living, access to services, income, environmental context, citizen participation, among other data of interest about the municipalities that make up the district 11 Etna of the State of Oaxaca. Consequently, to enable the comparability of the development of each municipality, so that this instrument can be replicated in other districts and, in turn, at the regional level. The data and sources are shown in Table 4.

Dimension	Data proposal	Source
Municipal-Social Development Index	Piped water	INEGI
	Indigenous language speaker	INEGI
	Higher education	INEGI
	Entitlement	INEGI
	Drainage	INEGI
	Schooling	INEGI
	Electric power	INEGI
	Sanitary toilet	INEGI
	Computer	INEGI
	Floor different from ground	INEGI
	Medical care	SSO
	Disability	INEGI
Municipal-Economic Development Index	Population with income below 2 minimum wage	INEGI
	Percentage of population employed	INEGI
	IMSS-insured workers	INEGI
	Economic activities	INEGI
	Food poverty	INEGI
Municipal Development Index-Environment	Non-formalized activity	INEGI
	Water supply	CONAGUA
	Forest nurseries	CONAFOR
	Drainage coverage	INEGI
	Reforestation	CONAFOR
	Deforestation	CONAFOR
Municipal-Institutional Development Index	Land use and vegetation	CONAFOR
	Common law crimes	INEGI
	Municipal public safety personnel	INEGI
	Audits of the municipality	INEGI
	Electoral participation	INE
Percentage of own income	INFDMINAFED	
Assistance programs	CONEVAL	

**Table 4.** Proposed data for the bMDI

Source: Own elaboration

It is proposed to add the population speaking an indigenous language, since in 2020 Oaxaca had the highest percentage of population aged 3 years and older speaking an indigenous language with 31.2%, occupying the number one at the national level (INEGI, 2020).

The average level of schooling of the population 15 years and older is included, also the population with higher education, according to (INEGI, 2020) in Oaxaca the average level of schooling of the population 15 years and older is 8.1, which indicates that they have reached a little more than the second year of high school. It is assumed that by acquiring higher level knowledge, job opportunities and growth opportunities also increase.

By the year 2021, the number of inhabitants aged six years and older who have a computer is only 23.4% of the total population of Oaxaca; likewise, the state is the second state with the second lowest percentage of population using the Internet with 56.9%, only behind Guerrero with 61.4%. These data are taken into account due to the adjustments that have been made so that the school-age population can continue their education through electronic media.

Access to medical care is also included, since they serve the population without social security; they also bring health services closer to the most vulnerable areas with difficult road access.

People with disabilities are also taken into account, since they represent approximately 20% of the total population of the state, and their importance in the economy of any region is considered.

On the other hand, the population with an income lower than 2 minimum wages, which, by the way, increased as a consequence of the pandemic, is analyzed together with the population that performs non-formalized economic activities since their salary is insufficient. In the same vein is food poverty, which according to data from the (CONEVAL, 2019) the lack of access to food went from 21.7% to 20.4% between 2008 and 2018.

Forest nurseries are also included, since currently the state of Oaxaca has a network of technified forest nurseries in charge of producing native plants depending on the region where the nursery is located. In the same vein, reforestation, land use and vegetation are added as intervening factors in the economic activities of the regions.

Finally, aspects such as municipal public security personnel, audits of the municipality and assistance programs are studied as part of the management of state and municipal authorities. The primary objective of obtaining the Municipal Development Index for the district of Etna is to measure progress in four dimensions of development: social, economic, environmental and institutional, in order to present an integral evaluation of the situation of each of these.

Due to the different nature of the variables that make up the bMDI and its four dimensions, a typical form will be used to transform variables, normalize them and achieve similar magnitudes between them using the following formula:

$$\text{Normalized variable} = \frac{(\text{Municipal value} - \text{Minimum})}{(\text{Maximum} - \text{Minimum})}$$

By applying this formula, all the data would be on a scale between zero and one, so that the bMDI and its four dimensions would be on a scale that reflects the level of achievement and, in turn, would provide a quantification of progress and setbacks. Thus, municipalities with values close to one will represent those with the highest level of development and those close to zero will correspond to a lower level of development.

Since the purpose is for the indexes and the variables themselves to have an intuitive and positive interpretation, this means that the higher the value, the better the conditions. However, in the case of the indicators that have a negative sense, a complementary operation will be applied that will invert their scale; in other words, those variables that, by their nature, show less desirable circumstances the higher the value.

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### **Conclusions**

Municipal authorities require clear, timely, accurate and reliable information on the social, economic and environmental aspects of their districts in order to make decisions.

The basic Municipal Development Index has the objective of measuring the capacity of the transfers of branch 33 in its FAIS and FORTAMUN funds to satisfy the needs of the population in a broader sense than other indexes. The premise is that economic growth improves the conditions of a community, but it is insufficient to increase its level of development through the management of municipal authorities, who listen to the requests of the inhabitants directly.

This exercise aims to promote the use of the bMDI at the municipal level to show the trends of the level of development first at the municipal, district, regional and state level, which in the future will represent in an integral way the level of development of the Oaxacan municipalities. The information obtained will be sent to the municipal authorities so that they will have a better understanding of the situation of their municipality and at the same time real data on its evolution.

According to the data proposal, it is expected to recognize the success or failure of the policies, taking into consideration the degree of complexity and interdependence of the economic, social, environmental and institutional dimensions. Few studies have been conducted to evaluate the performance of municipal governments, mainly due to the availability of information. Therefore, in the selection stage of the indicators for the proposal in the different dimensions, the availability of information was confirmed, especially with regard to the environment and services dimension, because the disaggregation of information does not reach the municipal level.

From the author's perspective, it is deduced that the application of the bMDI provides a closer approach to the real situation of the country. Once the bMDI is analyzed in the 23 municipalities that make up district 11 ETLA, Oaxaca, we expect to obtain an overview of the situation of each of the municipalities in relation to their level of development. In addition, each of the dimensions will reveal the strengths, weaknesses, opportunities and threats of each municipality.

Finally, by detecting key points of development, municipal authorities can design specific actions to combat and, if necessary, eradicate the causes of low levels of development, but this index only shows the starting point. Finally, it is important to recognize that, when obtaining bMDI values, it is only representative of a moment in time, but the final purpose of implementing the bMDI is to provide data for a given moment, but if a comparison over time is desired, certain adjustments are required that consider as a reference point the development potential of each municipality and the extent to which this potential is used.

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