

Territorial planning and the functionality of urban development in cities. The case of Oaxaca, Mexico

La ordenación territorial y la funcionalidad del desarrollo urbano en las ciudades. El caso de Oaxaca, México

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Abstract

Objective: To analyze the impact of territorial planning and functionality on the urban development of the cities of Oaxaca, Mexico, during the years 2018 to 2022. Hypothesis: in the state of Oaxaca, an unbalanced urban development predominates derived from the existing urban planning and functionality, causing weaknesses and threats to its development to prevail in its cities. Methodology: the analysis is longitudinal, uses networks, SWOT analysis, Euclidean distance, and the statistical technique of simple correspondence analysis with qualitative and quantitative data. Results: The cities have a very high imbalance in their urbanization. The best positioned in functionality and urban development are the small ones, in territorial planning the metropolitan areas, the large and the small cities. Conclusion: Although they show an urban development with very high imbalances, in the analyzed cities opportunities and strengths predominate over weaknesses and threats, particularly in small and medium-sized cities.

Resumen

Objetivo: Analizar el impacto de la ordenación territorial y la funcionalidad en el desarrollo urbano de las ciudades de Oaxaca, México, durante los años 2018 a 2022. Hipótesis: en el estado de Oaxaca predomina un desarrollo urbano desequilibrante derivado de la ordenación territorial y la funcionalidad urbana existente, ocasionando que en sus ciudades prevalezcan las debilidades y amenazas en su desarrollo. Metodología: el análisis es longitudinal, utiliza las redes, el análisis FODA, la distancia euclidiana, y la técnica estadística del análisis de correspondencias simple con datos cualitativos y cuantitativos. Resultados: Las ciudades poseen un muy alto desequilibrio en su urbanización. Las mejor posicionadas en funcionalidad y desarrollo urbano son las pequeñas, en ordenación territorial las zonas metropolitanas, las grandes y las pequeñas ciudades. Conclusión: Aunque manifiestan un desarrollo urbano con desequilibrios muy altos, en las ciudades analizadas, a la inversa, predominan las oportunidades y fortalezas sobre las debilidades y amenazas, particularmente en las pequeñas y medianas ciudades.

Territorial, Functionality, Urban

Territorial, Funcionalidad, Urbano

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Introduction

A "city" is an urban area with intensive land use constructions with a high density of socially heterogeneous population and permanent settlement, mostly not dedicated to agricultural activities, where there are services, infrastructure and equipment aimed at the accumulation of capital and social welfare. In territories such as Oaxaca, where there is an outstanding bioculturality, there are "multicultural cities" (Miguel et al., 2016), i.e. collective spaces where native and other cultures coexist, which facilitate the creation of knowledge, technological innovation and artistic-cultural production based on the mixture of modern knowledge with traditional knowledge. Common elements of a city are spatial planning, urban functionality and urban development.

In this respect, spatial planning is understood as the spatial distribution resulting from the location and arrangement of facts in geographical space (Zoido, 1998) such as population, facilities, infrastructure and services, as well as the daily actions of the citizens who use and require them. The management process that derives from this is complex for any type of city, as different actions are manifested in each of them. Some of these social actions correspond to aspects of health, education; adequate housing, with information and communication technologies, the use of firewood in homes, public management, the economy, tourism, the intensity of social conflicts and the incidence of crime; climate change, inequalities, participation, or those corresponding to sustainable local development. The interaction of these actions is reflected in the centralisation, density and centrality of city networks.

Similarly, according to the Royal Spanish Academy, functionality is the quality belonging to "function", understanding by function the "task that corresponds to an institution or entity, or to its organs or persons" (Royal Spanish Academy [RAE], n.d., definition 2). In this sense, urban functionality is understood as the strategic disposition in the geographical space of public, private and family actions based on the task that corresponds to their institutions, bodies or persons in cities.

Its manifestations are reflected in the strengths, opportunities, weaknesses and threats derived from the socio-economic and environmental dynamics of the population that inhabits them.

Linked to the above, urban development is understood as the process of transformation and structural change of localities and cities to improve social welfare and capital accumulation with technically feasible, economically viable, socially acceptable and environmentally adaptable actions, and is the result of the spatial, socio-economic and environmental amalgamation resulting from the juxtaposition of spatial planning and urban functionality.

Urban development in cities can be regulated, planned or balancing; or unplanned, chaotic or unbalancing. Balancing urban development is associated with sustainable local development, well-being, optimal urban health and social equity, as it facilitates the favourable development of these social dimensions. Conversely, unbalanced urban development is associated with low levels of well-being, inequality, vulnerable urban health, lack of economic activity and/or poor socio-political-environmental actions (Figure 1).

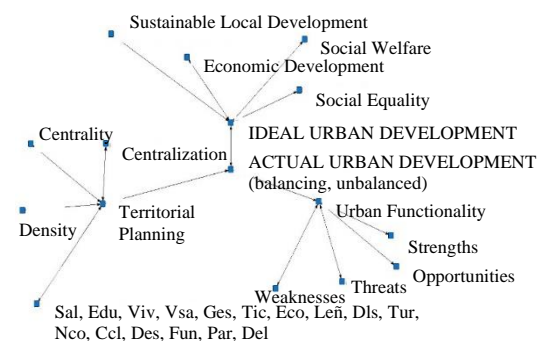


Figure 1 Theoretical model of city planning

Source: Own Elaboration

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate

Taking these dimensions in the urban sphere as a reference, the purpose of this article is to analyse the impact of spatial planning and functionality on urban development in the cities of Oaxaca, Mexico, during 2017-2022.

The hypothesis proposed is that in Oaxaca there is a predominance of unbalanced urban development derived from the existing spatial planning and urban functionality, causing weaknesses and threats to prevail in its cities.

Methodological procedure

The analysis model proposes that urban development is the result of the amalgamation of spatial planning and urban functionality (Figure 1); and its association is manifested through the correspondence of the SWOT values (strengths, weaknesses, opportunities and threats), and the centrality, centralisation and density of the networks of the real cities with respect to the ideal network, which is deduced from the optimal conditions of the real cities considered. Methodologically, urban development tends to be balanced if there is a smaller distance between the real model and the ideal model.

The Oaxacan cities analysed are classified as: small cities, those with a population of up to 15,000 inhabitants (Cuicatlán, Ixtlán and Teotitlán); medium cities between 15,000 and 50,000 inhabitants (Huatulco, Ixtepec, Loma Bonita, Matías Romero, Miahuatlán, Ocotlán, Pinotepa Nacional, Puerto escondido and Tlaxiaco). Large cities between 50,000 and 100,000 inhabitants (Huajuapán, Juchitán, and Tuxtpec). And metropolitan areas with more than 250,000 inhabitants (Metropolitan Area of Oaxaca, Metropolitan Area of Tehuantepec).

The analysis carried out has a mixed longitudinal approach, based on the qualitative perception of the analysis of articles of the problematic of the territorial context of the mentioned cities during 2018-2022, in order to know and understand the impressions (Baron and Byrne, 1998) existing in them, taking as a guide the themes of the articles, which are considered categories for the present analysis, namely: Sal: Health; Edu: Education; Viv: Housing; Vsa: Healthy housing; Ges: Public management; Tic: Housing with information and communication technologies; Eco: Economy; Leñ: Firewood; Dls: Local sustainable development; Tur: Tourism; Nco: Few conflicts; Ccl: Climate change; Des: Inequalities; Fun: Functionality; Par: Participation; and Del: Low incidence of crime.

The qualitative analysis of the articles used the hermeneutic technique. This can be defined as "the science and art of interpretation, especially of texts, to determine the meaning...of the words by which a thought has been expressed", and today "it is used in the analysis and interpretation of philosophical, historical, literary, scientific and other texts and contexts" (Virguez, 2015). The references of the qualitative analysis were selected from articles related to the cities of Oaxaca, Mexico, during the period 2017-2022 (López-Villanueva et al., 2018; Martínez et al., 2020, 2021, 2021a, 2022; Martínez-García et al., 2019; Miguel et al., 2017, 2017a, 2017b, 2019, 2019, 2021, 2021a, 2021b, 2022, 2022a; Moncada et al., 2018; Moreno et al., 2020; Pérez et al., 2019).

The quantitative conversion of the qualitative analysis is carried out through the assignment of values to the selected references of the topics of the indicated articles, based on an ordinal scale related to the SWOT analysis: strengths: 4, opportunities: 3, weaknesses: 2; threats: 1. For this purpose, symmetrical SWOT matrices of the cities were created (Table 1a and table 1b), in which in each box the SWOTs of the different categories of the analysis were indicated. Each box of the matrix contains five numbers: the first one corresponds to the ideal city, the second to small cities, the third to medium-sized cities, the fourth to large cities, and the fifth to metropolitan areas. For each city, the corresponding number and order is selected, "4" or "3" for example, and the rest are assigned the value of zero, a procedure that yields the matrix for each city.

Categories	Dls	Sal	Viv	Vsa	Edu	Eco	Tur	Ges
Dls	42333	42333	42322	42322	43333	42333	43444	42222
Sal	42333	4200	4230	4230	43333	42333	40300	42200
Viv	42322	4200	40000	0	40000	40000	00000	00000
Vsa	42322	4230	40000	42000	0	40000	00000	00000
Edu	43333	43333	40000	40000	40000	0	43000	40000
Eco	42333	42333	40000	40000	00000	43000	0	40303
Tur	43444	40300	00000	00000	40000	40000	40303	0
Ges	42222	42000	00000	40000	40000	40000	40300	40000
Tic	42322	40322	00000	40022	40000	40000	40300	40000
Leñ	42211	40200	00000	00000	00000	40000	40200	40000
Nco	44211	44300	00000	40000	00000	40000	44300	44000
Ccl	01111	00000	00000	00000	00000	00000	10000	00000
Des	01211	00200	00000	00000	00000	00000	00100	00000
Fun	42344	40340	40000	40000	40000	40000	40200	40000
Par	44322	40300	40000	40000	40000	40000	40200	40000
Cul	44444	44444	40000	40000	40000	40330	40444	40004
Del	44322	40000	0	0	0	40000	40000	40000

Table 1a Matrix of the dimensions of the cities

Source: Own Elaboration

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy

Categories	Tic	Leñ	Nco	Ccl	Des	Fun	Par	Cul	Del	
Dls	42333	40322	40200	44300	00000	00200	40340	40300	44444	44322
Sal	42333	00000	00000	00000	00000	00000	40000	40000	40000	0
Viv	42322	00022	00000	40000	00000	00000	40000	40000	40000	0
Vsa	42322	40000	00000	00000	00000	00000	40000	40000	40000	0
Edu	43333	40000	40000	40000	00000	00000	40000	40000	40330	40000
Eco	42333	40300	40200	44300	00100	00100	40200	40200	40444	40000
Tur	43444	40000	40000	44000	00000	00000	40000	40000	40000	40000
Ges	42222	40000	40000	44000	00000	00000	40000	40000	40000	40000
Tic	42322	0	40000	40000	00000	00000	40000	40000	40000	40000
Leñ	42211	40000	0	40000	00000	00000	40000	40000	40000	0
Nco	44311	40000	40000	0	00000	00000	40000	40000	0	0
Ccl	01111	00000	00000	00000	0	00000	0	40000	0	0
Des	01211	00000	00000	00000	00000	0	0	0	0	0
Fun	42344	40000	40000	40000	0	0	0	0	40000	0
Par	43222	40000	40000	40000	40000	0	0	0	40000	40000
Cul	44444	40000	40000	0	0	0	40000	40000	0	40000
Del	44322	40000	0	0	0	0	40000	40000	0	0

Table 1b Matrix of the dimensions of the cities

Source: Own Elaboration

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy.

With the corresponding matrices, the indicators of centralisation, centrality and density of the networks are obtained using the UCINET 6 for Windows, version 6.572. In this case, the centralisation index (CEN) shows the level of hierarchy or dominance of an element over all the elements of the network. The centrality index (CON) refers to the concentration of actions at each central location. Network density (COH) is a measure of cohesion that refers to the number of interactions in the set of possible relationships in the network" (Miguel et al., 2022).

To test the hypothesis, the existing connection between the values of the city networks is detected by calculating the Euclidean distance between the real cities and the indicators of the ideal city, according to the following procedure:

1. The ranking and obtaining of SWOT values (SWOTs) was performed by reference: strengths: 4, opportunities: 3, weaknesses: 2, threats: 1. The urban functionality index (FUN) results from the average of the SWOTs derived from the references of the categories, dimensions and type of city:

$$FUN = \text{average (VFs)} \quad (1)$$

2. Obtaining the network by city type, with the values of its centrality (CON), centralisation (CEN) and density (COH) indicators.

3. The values of centrality (CON), by category (Vcat) of the cities were standardised to obtain the corresponding standardised value (Vest), and facilitate the comparison between the types of cities:

$$VestCON = 4*(Vcat)/(\text{Maximum value of the network by city type}) \quad (2)$$

In particular, the centrality index (CON) of the categories was obtained, and results from the average of the Vest:

$$CON = \text{average (Vest)} \quad (3)$$

4. From the network of each type of city, the values of centralisation (CEN) and density (COH) of the cities were obtained.
5. The spatial planning index (OTE) results from the average of the VFs of centrality (CON), centralisation (CEN) and density (COH):

$$OTE = \text{average (VestCON, VestCEN, VestCOH)} \quad (4)$$

6. The Euclidean distance between the real cities and the ideal city indicators were calculated:

$$Dij = ((OTEi - OTEcdsi)^2 + (FUNj - FUNcdsj)^2)^{1/2} \quad (5)$$

Where D, D1,2,3: Euclidean distance; OTEi: index of the territorial organisation of the ideal city; OTEcds: index of the territorial organisation of the real city; FUNi: index of the functionality of the ideal city; FUNcds: index of the functionality of the real cities; i = values of the ideal cities, j = values of the real cities (small, medium, large, metropolitan areas).

7. The results are evaluated with the scale of statistical distances of the data obtained in the cities (Table 2). It is considered that the lower the value of the distance (D), the closer the cities are to the ideal urban development, and that a value higher than 0.9 indicates that urban development is unbalanced.

8. The statistical technique of simple correspondence, which makes it possible to compare the relationships of dependence and independence of a set of categorical variables based on data from a contingency table (De la Fuente, 2011), is used to visualise the connection between the indicators analysed. The frequency of the variables is taken into account, and the comparison is made to determine the corresponding assessment.

9. For hypothesis testing it is expected that:

$$D > 0.90 \quad (6)$$

$$\Sigma(D,A) > \Sigma(F,O) \quad (7)$$

i.e., that the Euclidean distance is greater than 0.9, and that the sum of the frequencies of weaknesses (D) and threats (A) is greater than the sum of strengths (F) and opportunities (O).

Results

When analysing the networks obtained for the cities of Oaxaca, it was found that the small cities (up to 15,000 inhabitants), show a network with a high centralisation (0.838), and a low density (0.255). They are relatively isolated cities with little interaction between their dimensions and categories. The image they provide is that of a territorial mosaic with high cultural activity and social participation with low conflict. They show poorly managed urban interactions, with a large proportion of unserved and unhealthy housing, a shortage of ICTs and use of energy resources such as firewood; they are routinely threatened by social problems arising from inequality and climate change which is increasingly affecting them.

Small cities behave as multicultural systems with a predominance of indigenous peoples, territorial, sectoral and economic opportunities (the average value of their FODAS is 3, the value assigned to opportunities), with tourism, education and the infrastructure required for sustainable development standing out. In Oaxaca, these are the cities that can achieve sustainability in the medium term. The city of Ixtlán is the most central, followed by Cuicatlán (figure 2).

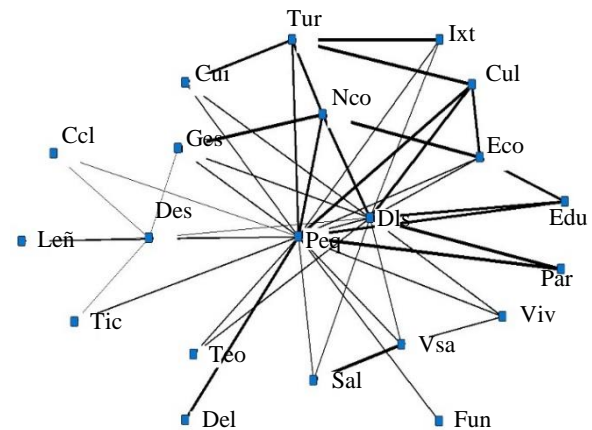


Figure 2 Small Towns Network

Source: Made with data from table 3

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy; Ixt: Ixtlán; Cui: Cuicatlán; Teo: Teotitlán; Peq: Small Towns. In darker color the strongest interactions of the network are shown

Medium-sized cities (between 15,000 and 50,000 inhabitants) form a network with high centralisation (0.794), and low density (0.294). They also show isolation with little interaction between their dimensions and categories. The image they provide is that of a territorial mosaic in consolidation. Their opportunities are their functionality, their economic dynamics, their cultural and tourist activities, with weaknesses in their urban spaces derived from deficient management, inequality, abundant unserved and unhealthy housing, with a shortage of ICTs; threatened daily by the problems derived from climate change that increasingly affect them.

The medium-sized cities are territorially multicultural systems in the process of consolidating their strengths through the opportunities they offer in their development and sustainability process (the average value of their FODAS is 3, a value assigned to opportunities). The cities of Huatulco, Puerto escondido, Tlaxiaco, Miahuatlán and Pinotepa Nacional stand out (figure 3).

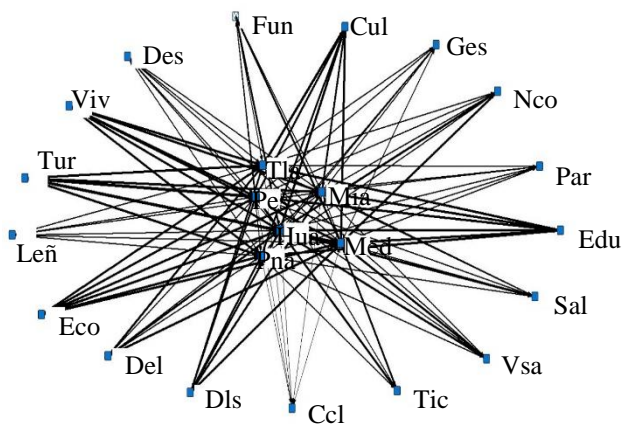


Figure 3 Network of Medium-sized cities

Source: Made with data from table 3

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy; Hua: Huatulco; Pes: Puerto Escondido; Tla: Tlaxiaco; Mia: Miahuatlán; Pna: Pinotepa Nacional; Med: Medium-sized cities. In darker color the strongest interactions of the network are shown.

The network of large cities (between 50,000 and 100,000 inhabitants) has a high centralisation (0.993), and a very low density (0.118). Despite being dominant in their territory, they show relatively little interaction with dependent localities. The image they provide is that of a territorial mosaic consolidating its strengths through the opportunities offered by its functionality, its economic dynamics, its cultural and tourist activities, with weaknesses in its urban spaces coming from poor management, inequality, abundant unserved and unhealthy housing, with a shortage of ICTs; regularly threatened by social conflicts, crime and the problems arising from climate change that increasingly affect cities.

In summary, despite their multiculturalism, population size and territorial expansion, large cities are still territorially and strategically weak systems, given that the average value of their FODAS is 2 (value assigned to weaknesses). The cities of Huajuapán, Tuxtepec and Juchitán stand out (Figure 4).

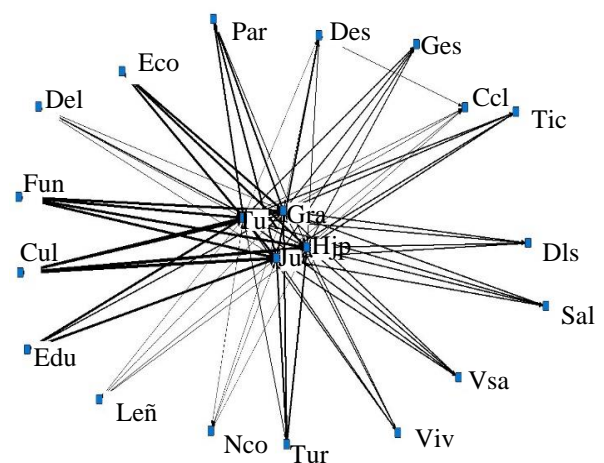


Figure 4 Big Cities Network

Source: Made with data from table 3

NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy; Gra: Big Cities; Tux: Tuxtepec; Juc: Juchitán; Hjp: Huajuapán. In darker color the strongest interactions of the network are shown.

The network of the Zm (more than 250 thousand inhabitants) is highly centralised (0.858), with a low density (0.224), i.e. it is a network that, despite being dominant in its territory, shows a centralising dominance with the dependent localities. The image they provide is that of a territorial multicultural mosaic with high functionality, economic dynamics and cultural and tourist activities, surrounded by poorly managed urban spaces, with inequality, abundant unserved and unhealthy housing, with a shortage of ICTs; regularly threatened by social conflicts and problems arising from climate change that increasingly affects them. In these cities, the problem of population mobility also stands out.

They offer opportunities in the field of health, economy and infrastructure required for sustainable development. Due to their population and territorial size, MCs behave as strategic but economically weak political-administrative territorial systems (the average value of their FODAS is 2, a value assigned to weaknesses). In these cities, their association with climate change (Ccl) and inequalities (Des) is increasingly prominent (Figure 5), indicating that the manifestation of problems derived from these aspects tends to be more and more permanent in these cities.

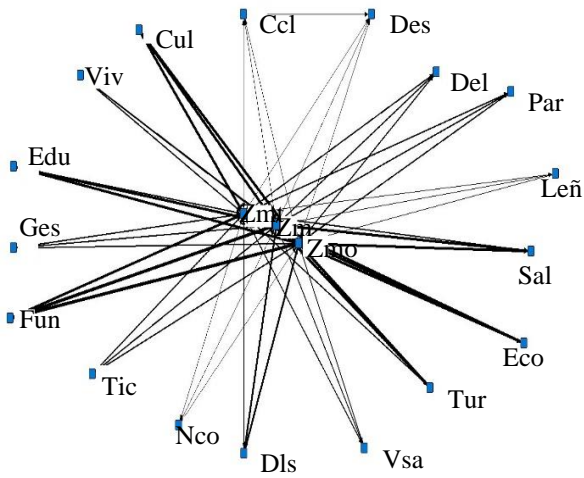


Figure 5 Metropolitan Areas Network
 Source: Made with data from table 3
 NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy; Zmo: Oaxaca Metropolitan Area; Zmt: Tehuantepec Metropolitan Area. In darker color the strongest interactions of the network are shown

Comparatively, Oaxaca's ideal city network shows that all the dimensions it contains interact with each other, with the exception of climate change (Ccl) and inequality (Des), categories that are present but isolated. It is a network of low centralisation (0.279), and high density (0.634), i.e. there is sufficient interaction between its dimensions and with the rest of the cities. In the ideal city the average FODAS is 4. The ideal Oaxacan city behaves as a territorial system of opportunities and strengths.

The image provided by the ideal city through its network of interactions is that of a multicultural territorial mosaic in which native peoples coexist with others, consolidated through its strengths, and which provides security and opportunities offered by its functionality, its economic dynamics, its cultural and tourist activities, it has urban spaces with efficient management, without inequality, serviced and healthy housing, sufficiency of ICTs; which can face social conflicts, crime and threats derived from climate change (Figure 6).

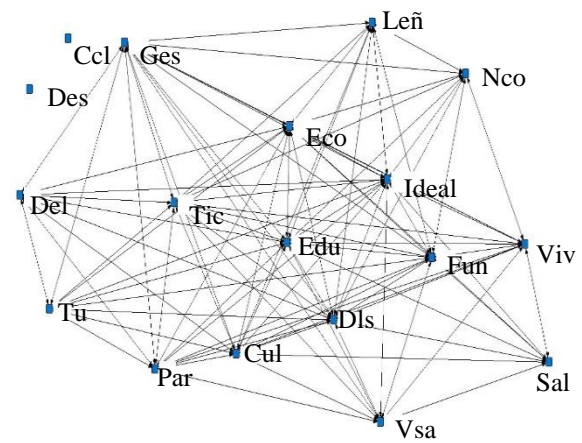
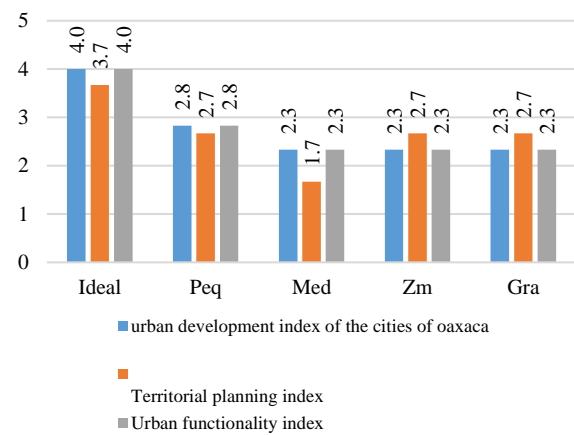


Figure 6 Network of interactions of an ideal city
 Source: Made with data from table 3
 NOTE: Sal: Health; Edu: Education; Viv: Living Place; Vsa: Healthy housing; Ges: Public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Del: Low Crime Rate; Cul: creative economy; Ideal: Ideal City. In darker color the strongest interactions of the network are shown

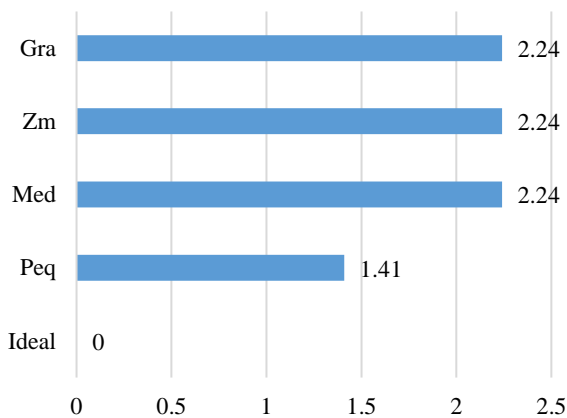
Viewed as a whole, the best positioned real Oaxacan cities in terms of urban functionality are the small ones. The furthest away from the ideal model are the metropolitan areas, large and medium-sized cities (Graphic 1). The best positioned in spatial planning are metropolitan areas, large cities and small cities. Medium-sized cities are the weakest in this respect.



Graphic 1 Urban functionality of cities
 Source: Made with data from table 3

In the case of urban development, and according to the analysis of Euclidean distances, the cities furthest away from balanced urban development are large cities, medium-sized cities and metropolitan areas (with a very high distance, 2.24 Euclidean distance). Small cities are the closest to ideal urban development in Oaxaca (Graphic 2), but still at a high distance (1.41 Euclidean distance). This indicates that all cities are immersed in unbalanced urban development (their value is greater than 0.90, according to the parameter that delimits the level of imbalance, as per equation 2 in point 2 of the article).

In summary, the best positioned towards a balanced urban development are the small cities, those with the strongest roots in the original cultures. The other cities, medium-sized, large and metropolitan areas, which are multicultural, show an unbalanced urban development. In all cases, Oaxacan cities are located at a level far from the ideal model.



Graphic 2 Euclidean distance of urban development index of the cities of Oaxaca
Source: Made with data from table 3

Complementarily, the correspondence analysis shows that the main strengths of Oaxaca's cities as a whole are their functionality, culture, tourism, participation, as well as their relatively low conflict and low crime (6). Their main threats are climate change and inequalities (2). Its most important weaknesses are health, governance and household use of firewood (3). Its outstanding opportunities are its housing, healthy housing, boosting its education, tourism and sustainable urban and local development (5), especially of small and medium-sized cities. In quantitative terms, opportunities and strengths (11) predominate over weaknesses and threats (7) in the cities analysed (Figure 7).

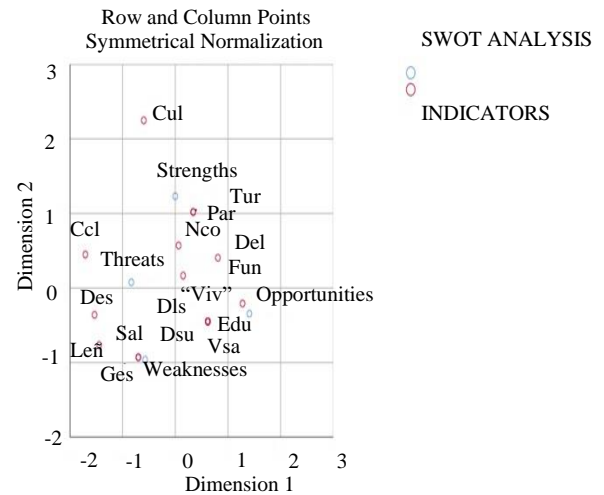


Figure 7 Swot Analysis of Cities
Source: Made with data from table 3
NOTE: Dimension 1: indicators; Dimension 2: Swot Analysis

Indicators	Ideal City	Small towns	Medium cities	Big cities	Metropolitan areas
1. Cul	4	4	4	4	4
2. Par	4	4	4	3	3
3. Nco	4	4	3	3	1
4. Del	4	4	3	3	3
5. Edu	4	3	3	3	3
6. Tur	4	3	3	4	4
7. Dsu	4	2	3	3	3
8. Dls	4	2	3	3	3
9. Viv	4	2	3	3	3
10. Vsa	4	2	3	3	3
11. Eco	4	2	3	3	3
12. Tic	4	2	3	3	3
13. Fun	4	2	3	3	4
14. Sal	4	2	2	2	3
15. Ges	4	2	2	2	3
16. Leñ	4	2	2	2	1
17. Des	0	1	2	2	1
18. Ccl	0	1	1	1	1

Table 3. Summary of city indicators
Source: Made with qualitative data from López-Villanueva et al., 2018; Martínez et al., 2020, 2021, 2021a, 2022; Martínez-García et al., 2019; Miguel et al., 2017, 2017a, 2017b, 2019, 2021, 2021a, 2021b, 2022, 2022a; Moncada et al., 2018; Moreno et al., 2020; Pérez et al., 2019
NOTE: 4: Strengths; 3: Opportunities; 2: Weaknesses; 1: Threats. Sal: Health; Edu: Education; Viv: Living place; Vsa: Healthy housing; Ges: public management; Tic: Housing with Information and Communication Technologies; Eco: Economy; Leñ: Firewood; Dls: Sustainable Local Development; Tur: Tourism; Nco: Few Conflicts; Ccl: Climate Change; Des: Inequalities; Fun: Functionality; Par: Participation; Cul: creative economy; Del: Low Crime Rate.

Discussion and conclusion

The hypothesis of this article that in Oaxaca there is a predominance of unbalanced urban development derived from the existing spatial planning and urban functionality, and that in this context in its cities, weaknesses and threats prevail in its development process, is rejected, because although all the cities manifest an urban development with very high imbalances, conversely, in the cities analysed, opportunities and strengths predominate over weaknesses and threats, particularly in their small and medium-sized cities. This contradictory behaviour of the cities, that of having an unbalanced urban development that generates strengths and opportunities, may be due to:

- a) That in cities, even with centuries of their foundation as is the case of the Metropolitan Zone of Oaxaca, the existence of their imbalances and opportunities shows an urban development in constant transformation, due to the fact that they are immersed in both internal and external territorial-demographic and economic-social-environmental growth processes, which exceed the public management of the cities, which finally contribute to the asymmetries in their internal and external interactions, for example, the high population growth, especially in metropolitan areas;
- b) That despite the existence of opportunities, these are more realised in large cities and metropolitan areas, and are not taken advantage of in most small and medium-sized cities, where they fail to be transformed into concrete possibilities, among other things because, although these cities offer opportunities for development, they do exist, For example, basic problems such as land regularisation and land tenure, in which, in addition, projects are managed by agreements derived from the uses and customs of the native peoples, which makes it difficult to manage private resources, and collective initiatives are not promoted for the projects that can be carried out. In general, in all cities there is a lack of initiatives, projects and investments from business, social collectives and governments that can turn existing opportunities into real possibilities.
- c) The development decisions that are made do not take into account the real territorial organisation of the cities, which "is based on multirationalism, and institutional actions do not manage to adapt to this behaviour: this is shown by the existing marginalisation, poverty and social backwardness. The territory of Oaxaca is organised as a mosaic of activities and micro-regions: it has a geography that not only reflects the diversity of its flora, fauna and culture, but also of the social rationalities existing within it". In this context, it is evident the lack of effectiveness and vision that its territorial planning has to be based on a "public management with centralising decisions that distort its economic, environmental and even political dynamics, without taking into account the opinion of the local population" (Miguel et al., 2022). They are not attractive for capital accumulation, except in sectors such as tourism or gentrification, especially in the historic centre of the Oaxaca City Metropolitan Area, but there is a scarcity of projects based on solidarity and collective rationalities.

d) Opportunities could be seized by planning the urban development of cities towards a more balanced process, not only to cover the bureaucratic requirements to access public resources, but to really move forward both to complete their equipment and services, and to take advantage of the cultural strength of cities as a way to ensure their economic growth. In this regard, "the creative economy can be considered as a strategy to promote inclusive and balanced development", as it considers "the cultural potential of regions and cities as a strategic axis, which has also shown to have a positive and significant effect on the reduction of social backwardness in Oaxaca". In this sense, although it is convenient to "counteract the concentration of the infrastructure of the cultural industry in large cities such as the Metropolitan Zones of Oaxaca and Tehuantepec, as this hinders the improvement of the economy in small and rural localities" (Martínez et al., 2022), it is these and the large cities where there is more openness to develop new projects, which can combine private and public initiatives for a better balance.

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