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Artículos Científicos

La expansión urbana dispersa y su relación con las dinámicas inmobiliarias en Tlajomulco de Zúñiga, Jalisco

The Dispersed Urban Expansion and Its Relationship with Real Estate Dynamics in Tlajomulco de Zúñiga, Jalisco

Expansão urbana dispersa e sua relação com a dinâmica imobiliária em Tlajomulco de Zúñiga, Jalisco

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Resumen

La presente investigación tiene como finalidad exponer un análisis exploratorio sobre la relación entre la expansión urbana dispersa iniciada en 1990 y consolidada en el año 2015 en el municipio metropolitano y periférico de Tlajomulco de Zúñiga, Jalisco, y las acciones de los desarrolladores inmobiliarios, en específico la construcción de conjuntos residenciales que reestructuraron socioespacialmente el municipio. La estrategia metodológica comprende la realización de tres fases de análisis, donde se utilizan métodos y técnicas tanto cuantitativas (estadísticas y cartográficas) como cualitativas (entrevistas). Los fraccionamientos asentados en la porción sureste del municipio de Tlajomulco de Zúñiga fueron impulsados por los actores inmobiliarios con la intención de aprovechar el precio del suelo; al final, sin embargo,

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generaron espacios alejados en tiempo y distancia de los centros administrativos y de servicios. Además, configuraron formas irregulares de fraccionamientos con trazos urbanos internos largos que exacerban el círculo virtuoso de desvalorización del suelo y la vivienda, lo que ha generado dificultad para dotar de servicios de transporte y agua y provocado esquemas de segregación y exclusión social.

Palabras clave: dispersión urbana, Tlajomulco de Zúñiga, valor de la vivienda.

Abstract

The purpose of this research is to present an exploratory analysis on the relationship between the dispersed urban expansion started in 1990 and consolidated in 2015 in the metropolitan and peripheral municipality of Tlajomulco de Zúñiga, Jalisco, and the actions of real estate developers, specifically the construction of residential complexes that restructured the municipality socio-spatially. The methodological strategy includes the performance of three phases of analysis, where both quantitative (statistical and cartographic) and qualitative (interviews) methods and techniques are used. The subdivisions settled in the southeastern portion of Tlajomulco de Zúñiga were promoted by real estate actors with the intention of taking advantage of the land price; in the end, however, they generated spaces that were far away in time and distance from administrative and service centers. In addition, they configured irregular forms of subdivisions with long internal urban lines that exacerbate the virtuous circle of devaluation of land and housing, which has made it difficult to provide transport and water services and caused patterns of segregation and social exclusion.

Keywords: urban dispersion, Tlajomulco de Zúñiga, housing value.

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Resumo

O objetivo desta pesquisa é apresentar uma análise exploratória sobre a relação entre a expansão urbana dispersa iniciada em 1990 e consolidada em 2015 no município metropolitano e periférico de Tlajomulco de Zúñiga, Jalisco, e as ações das incorporadoras imobiliárias, especificamente a construção de conjuntos residenciais que reestruturaram o município socioespacialmente. A estratégia metodológica inclui a realização de três fases de análise, onde são utilizados métodos e técnicas quantitativas (estatísticas e cartográficas) e qualitativas (entrevistas). Os loteamentos implantados na parte sudeste do município de Tlajomulco de Zúñiga foram promovidos por agentes imobiliários com o intuito de aproveitar o preço do terreno; No final, porém, geraram espaços distantes no tempo e distantes dos centros administrativos e de serviços. Além disso, configuraram formas irregulares de loteamentos com longas linhas urbanas internas que exacerbam o círculo virtuoso de desvalorização do solo e da habitação, que dificultou a prestação de serviços de transporte e água e gerou padrões de segregação e exclusão social.

Palavras-chave: dispersão urbana, Tlajomulco de Zúñiga, valor habitacional.

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Introduction

In the peripheries of the cities of Latin America, processes of dispersed expansion of human settlements have been undertaken where low-income inhabitants predominate and where the economic dynamics of the land and housing market become the foundation and promoter of the urban transformation of the contemporary cities (Alegría and González, 2016; Colmenares, 2015; Fitch, 2016; Monkkonen and Comandon, 2016). In this regard, some studies in Mexico have made comparisons between cities or metropolitan areas on urban dispersion[1] presented (Secretariat of Social Development [Sedesol], 2011).

In most studies, the real estate actor defines how and where to build on urban land, under the corresponding institutional regulations, and does so based on profitability

[1] En los estudios de análisis comparativos de dispersión urbana entre ciudades se identifica al área metropolitana de Guadalajara con mayor crecimiento de su superficie respecto a su población (en superficie creció 3.82 veces y en población 1.98 veces). El municipio de Tlajomulco de Zúñiga forma parte relevante de su expansión física, sobre todo en el periodo 2000-2010 (Instituto Nacional de Estadística y Geografía [Inegi], 1990, 2000, 2010).

projections on the type of final demand they hope to generate with their real estate developments according to the principle of "best and greatest use"[2] (Colmenares, 2015; Eckert, 1990; Erba, 2013; Smolka, 1981;). In addition to the predictions on the willingness to pay of final consumers, which are not simple, the production time of real estate, the ability to pay of the final applicants, the levels and distribution of income, the inflation and credit policy.

For this reason, it is of great interest to expose the relationship between dispersed urban expansion and the actions of real estate developers, the construction of residential complexes, which socially restructured the municipality of Tlajomulco de Zúñiga (Jalisco) in the last 15 years. Above all because of the concentration of the low-income population that is far from the economic center, which reinforces the existence of social problems, especially for social settlements with lack of accessibility, quality urban services and facilities, as well as the related social disintegration to the disadvantages of physical isolation (Bazant, 2009; Colmenares, 2015; Monkkonen y Comandon, 2016; Sabatini y Sierralta, 2006).

Urban dispersion

The concept of urban dispersion was used for the first time in the first paragraph of an article written by the sociologist William Whyte in Fortune magazine, in 1958. Among the first studies on the dispersion of the territory are those written in “United States, by the anarchic and unlimited growth of peri-urban areas generated after World War II; for the countries of Europe, the phenomenon appears from the 60s of the 20th century ”(Giampino, 2010, p. 30, cited in González, 2015, p. 40).

In a recent study on urban dispersion associated with costs in public administration, various dimensions are mentioned in the search to measure urban dispersion (Gielen, 2016). In any case, most of the authors and studies analyzed agree that the variables of density, centrality, continuity or fragmentation are referents in their definition as shown in Table 1.

[2] El principio de “mejor y mayor uso” es aquel que, siendo físicamente posible, legalmente permitido y económicamente viable, resulta en el mayor valor del bien que se está valuando. Este principio se toma en cuenta para representar estados financieros; implica un análisis de las condiciones intrínsecas del bien, las normas legales que lo afectan y los cambios económicos que impacten en dicho bien para estimar su valor (Colmenares, 2015; Eckert, 1990; Erba, 2013; Smolka, 1981).

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Tabla 1. Principales dimensiones en la medición de la dispersión urbana

Dimensión	Glaster (2001)	Ewing (2002)	Custinger *et al.* (2006)	Agencia Europea de Medio Ambiente (2006)	Muñiz (2006)	Frenkel (2008)	Torres (2008)	Patacchini (2009)	Arribas-Bel (2011)	Colannino (2011)	Kew (2013)	Jager (2014)	Paulsen (2014)	Zeng (2014)
Crecimiento														
Ocupación														
Densidad														
Continuidad y fragmentación														
Mezcla de uso														
Complejidad														
Accesibilidad														
Centralidad														
Concentración														
Proximidad														
Nuclearidad														
Social														
Espacio Libre														

Nota: Todos las fuentes que aparecen en esta tabla son citadas en Gielen (2017)

Fuente: Elaboración propia con base en Gielen (2017)

In Europe an important economic weight has been given to the concept of urban dispersion. The European Environment Agency [EEA] (2006), in its report entitled Urban sprawl in Europe. The ignored challenge [EEA] (2006), defines urban dispersion, in the context of urban expansion, as follows:

> The physical pattern of low-density expansion of large urban areas, under market conditions, mainly in the surrounding agricultural areas. Dispersion is the main advantage of urban growth and involves little control of land subdivision planning. Development is uneven, scattered and chained, with a

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> tendency to discontinuity. Jump-frogs over areas, leaving agricultural enclaves. Large cities are the opposite of compact cities, full of empty spaces that indicate inefficiencies in development and highlight the consequences of uncontrolled growth (p. 6).

In the present work, two dimensions of dispersion used by the majority of authors who have addressed the issue were taken up, namely: continuity and centrality. In addition to this, the complexity variable of the urban plan was integrated, given the irregular characteristics of the subdivisions chosen for the study.

The urban expansion of Tlajomulco de Zúñiga

The municipality's growth rate has been above the growth rate of the state of Jalisco or the Guadalajara Metropolitan Area (AMG), with rates ranging between 5.69% (from 1990 to 2000) and 12.92% (in the period 2000- 2010) (Inegi, 1990, 2000, 2010). While at the metropolitan and state level they oscillate between 1.31% and 2.12%, respectively.

In 1990, the municipal seat was the only town with more than 10,000 inhabitants, having 11,567 (16% of the municipal population). For the year 2000, other localities with equal or greater size appear (Inegi, 1990 and 2000). In 2015, the municipality of Tlajomulco de Zúñiga had a population of 549,442 people (Inegi, 2015), which corresponded to 11.2% of the inhabitants of the total AMG.

Tabla 2. Evolución del crecimiento de localidades por su tamaño poblacional en el municipio de Tlajomulco de Zúñiga, Jalisco (1990-2010)

Tamaño de Localidad	1990		2000		2010	
	Localidades	Habitantes	Localidades	Habitantes	Localidades	Habitantes
1-99 hab.	166	1661	203	3362	221	8651
100-999 hab.	16	7949	8	2624	8	5201
1000-1999 hab.	7	9672	11	16 820	16	28 732
2000-4499 hab.	4	13 806	7	22 827	7	24 721
5000-9999 hab.	3	23 773	3	18 851	9	66 780
10 000-14 999 hab.	**1**	11 567	**3**	42 958	**5**	60 492
15 000-19 999 hab.			**1**	16 177	**5**	135 114
20 000-99 999 hab.					**1**	86 935
Totales	**197**	**68 428**	**236**	**123 619**	**272**	**416 626**

Fuente: Elaboración propia con base en Inegi (1990, 2000, 2010)

Table 2 shows that in 1990 the municipality had only 15 localities with a population greater than 1000 inhabitants. By 2000, however, it already had 25 localities that reached or exceeded this figure, and finally for 2010 there is an increase of 43 localities with more than 1000 inhabitants. Several of them settled in a dispersed and fragmented way: a great challenge if you want to build a comprehensive infrastructure project aimed at generating social cohesion in the municipality.

For the year 2010, there are 11 localities with more than 10,000 inhabitants, where the sum of their population represents 67.81% of the municipality. It should be noted that, in this period, the towns of Hacienda Santa Fe and San Agustín exceeded the number of population in the municipal seat, as can be seen in table 3.

Tabla 3. Evolución del crecimiento de localidades mayores a 10,000 habitantes en el municipio de Tlajomulco de Zúñiga, Jalisco (1990- 2010)

Localidades mayores a 10 000 habitantes	1990		2000		2010	
	Habitantes	Viviendas particulares habitadas	Habitantes	Viviendas particulares habitadas	Habitantes	Viviendas particulares habitadas
Hacienda Santa Fe					*86 935*	22 821
San Agustín			14 355	3046	*30 424*	7390
Tlajomulco de Zúñiga	11 567	2115	16 177	3099	30 273	7085
San Sebastián el Grande			14 695	2861	28,138	6263
Santa Cruz del Valle			13 908	2789	26 866	5671
Lomas del Sur					19 413	5016
Fraccionamiento Real del Valle (El Paraíso)					13 949	3701
Lomas de San Agustín					11 836	2936
Fraccionamiento Villas de la Hacienda					11 078	2800
La Tijera					12 425	2796
Santa Cruz de las Flores					11 204	2669
Totales	11 567	2115	59 135	11 795	282 541	69 148

Fuente: Elaboración propia con base Inegi (1990, 2000, 2010)

The 11 localities identified with a population greater than 10,000 inhabitants tend to be distributed around the main roads of López Mateos and 8 de Julio, as can be seen in figure 1.

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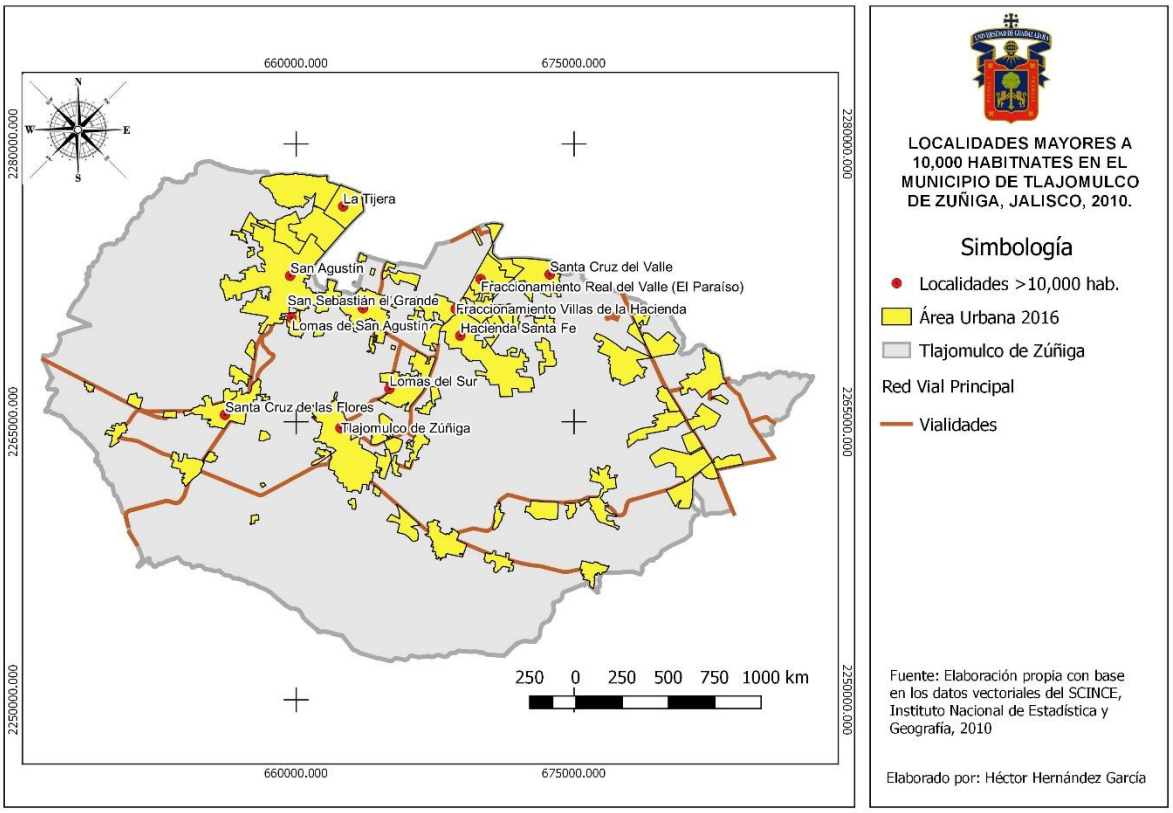
Figura 1. Localidades con más de 10 000 habitantes en el municipio de Tlajomulco de Zúñiga, Jalisco, 2010



Fuente: Elaboración propia con base en Inegi (2016)

The growth and atomized distribution of human settlements has brought with it the limited connectivity of functional spaces, the restricted accessibility to different areas within the municipality and the scarce integration into the urban structure of the city, which reinforces that there are segregated spaces that border on the exclusion, especially in the southeastern portion of the municipality, in the settlements that are arranged on the highway to Chapala.

Home values in the real estate market

In Mexico, a process of urban and population expansion was generated in the periphery under a low-density pattern with predominantly residential uses. This is due to the impulse of housing in a scenario of cheap land rental in the periphery that, combined with the income level of the inhabitants, caused a predominant growth of irregular housing subdivisions of the popular or official economic type.

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Regarding the promotion of institutional low-income housing, the Mexican State created the conditions that facilitated the operation of private companies by promoting policies for financing and purchasing housing; changes in regulatory frameworks and the founding of institutions that facilitated the entry of private capital and, in turn, the decline or fading[3] of the regulatory role of the Mexican State (Mellado, 2002).

The fading role of the State in housing regulation was accentuated in the 1990s,[4] when instruments such as the Housing Development and Deregulation Program, founded in October 1992, were implemented and institutions such as the National Housing Promotion Commission (Conafovi) were formed, which would change to the current National Housing Commission (Conavi), which acts as the coordinating and articulating entity of the Government's activities in the area of housing. It has even been assigned to promote, respect, protect and guarantee the right of all Mexicans to adequate housing (Conavi, s. F.).

In this scenario of economic advantages to invest in housing, real estate companies integrated complete housing projects that ranged “from the acquisition of land, its urbanization, the construction of houses, development and even, through the so-called 'bridge loans', (…) Financing to facilitate their access to the target population ”(Mellado, 2002 p. 34).

The actions of real estate developments that influenced the process of expansion of the urban area were reflected in the construction of large conglomerates of social housing, once cheap land was located on the peripheries of Mexican cities (Bazant, 2009; Mellado, 2002) . "These immense complexes are characterized by the fact that they are not accompanied by the large road infrastructure works and services that are required for projects of such dimensions and the companies do not carry out urban social and ecological impact studies" (Mellado, 2002).

All these elements prompted real estate companies to look for cheap land in a peripheral municipality, such as Tlajomulco de Zúñiga, where the role of the real estate actor

[3] El término *desvanecer* tiene connotaciones económicas y filosóficas profundas y diversificadas que son mencionadas en el libro *Todo lo sólido se desvanece en el aire* de Marshall Berman y recientemente retomadas por Bauman para desarrollar su concepto de *modernidad líquida*.

[4] Se constituyeron otras instituciones como la Sociedad Hipotecaria Federal, que impulsó el desarrollo de vivienda. Además, existe el Consejo Nacional de Vivienda (Conavi) que, desde sus inicios y hasta la actualidad, continúa como órgano de consulta del ejecutivo federal e incorpora a los principales actores del sector en la toma de decisiones, pero no solo eso, sino que, de acuerdo con la Ley de Vivienda, tiene como objetivo el proponer medidas para la planeación, formulación, instrumentación, ejecución y seguimiento de la política nacional de vivienda (artículo 28).

in the management of spaces for residential construction became decisive for the urban order. According to Cruz (2008), between 2000 and 2006, the interventions of private real estate developers in the municipality of Tlajomulco de Zúñiga were the most significant: they represented 89% of the surface area developed. It can be clearly seen that the direct intervention of public housing agencies that had occurred in past decades, at the beginning of the century, gave way to private development.

Method

The methodological strategy includes carrying out three phases of analysis based on the mixed methodology of Arenas (2014, pp. 51-68) shown in table 4. Phase one corresponds to a brief outline of the conceptual framework of urban dispersion , as well as the description and sociodemographic and cartographic statistical analysis of the demographic growth of the municipality of Tlajomulco de Zúñiga with respect to its metropolis and the entity.

Phase two corresponds to the selection of the subdivisions both from the physical perspective, geometries and distances, as well as from the social dimension of qualitative cut through the value of the house and problems of services and infrastructure.

Regarding the criteria for selecting locations and subdivisions based on the concept of urban dispersion, the following were determined:

1) *Centrality:* based on the theory of central city or service center, it will be understood as the linear distance to the main or nodal center of population, services, businesses or recreation. In this case, it will be applied as the linear distance from the center of the colony to the center of the AMG or the administrative center (municipal seat), measured from the centroids.
2) *Continuity:* it is the degree to which the developable land has been built on urban densities in an uninterrupted way (Harvey and Clark, 1965). For the study, a distinction will be made between the urban continuum derived from the AMG and the areas that break with the physical continuity of the same AMG called discontinuous.
3) *Complexity of the urban plan:* it refers to the analysis of urban polygons that allows us to differentiate compact forms such as circles or squares, linear spots or complex

shapes. The simplest indicator to characterize the shape of a polygon is the radius between the perimeter and the area of a high value.

4) *Home value:* monetary value of the home at the time of purchase by the current resident of the subdivision. It is an indicator associated with the presence of dispersion but it is not the only one to determine its formation.

The qualitative analysis is supported by semi-structured interviews. "The interview can be conceptually located as a conversation with a high degree of planned intention, with a predetermined objective, on which the course of the communicative interaction is determined" (Sierra, 1998, p. 297). The interview is a process of information exchange between one person and another (s) through questions and answers that achieve communication and the joint construction of meanings regarding a topic (Janesick, 1998, cited in Hernández, Fernández, Baptista, 2010, p. 418).

Six interviews were applied, three per selected subdivision (Arvento and Agaves subdivisions) corresponding to dispersed large urban areas.

The selection of the interviewees was through the snowball technique, that is, through natural social networks, friends, relatives, personal contacts and acquaintances that helped access the actors under investigation.

Tabla 4. Fases del proceso de análisis y reflexión del estudio

Descripción	**Fase 1**	**Fase 2**	**Fase 3**
Dimensión	Teórica-conceptual y contexto	Análisis de casos concretos	Síntesis
Tema desarrollado	Esbozo del concepto de *dispersión urbana*	Dos casos de análisis	Reflexión teórico-práctica y discusiones
	Contexto de expansión física	Problemáticas identificadas	Conclusión

Fuente: Elaboración propia con base en la estrategia del proyecto de investigación Islas Residenciales. Dispersión socio-espacial Residencial en el municipio de Tlajomulco de Zúñiga, Jalisco (1990-2015).

Phase three refers to the synthetic reflection on the relationships identified between three indicators of residential dispersion (Centrality, discontinuity and urban complexity) with respect to the value of the home at the time of sale, as well as current behaviors reflected in the cadastral cartography.

Results

Characteristics of subdivisions

Of the 262 localities registered in 2010, it was determined to analyze two that had the three dimensions of dispersed growth, namely, according to the variables indicated by Muñiz (2006 and 2013), Zeng (2014) and Gielen (2016), who have addressed the issue: 1) degree of centrality, 2) urban discontinuity and 3) urban complexity, measured from the forms of urban plans.

The value of the dwelling for the period when the selected subdivisions were being developed was considered. The data collection tool was the semi-structured interview, applied to residents who referred from one interviewee to another. The developments that met the physical and actor characteristics described were the Agaves-Villa Luna-El Capulín (Agaves) and Arvento subdivisions, which correspond to the towns of El Capulín and the northern part of the town of Cajititlán. Both subdivisions were built by the company Casas Geo,[5] the largest Mexican company for the construction of low-income houses in force until 2018, when it declared bankruptcy upon assuming insolvency to continue in the business and recognize that they cannot generate more cash and raise resources to pay off their debts.

Arvento subdivision

The Arvento subdivision currently forms the northern part of the town of Cajititlán, north of Lake Chapala. Its central point is the geographic coordinates of 20 ° 26 ’45.62” north latitude and 103 ° 18 ’23.04” west longitude. Its approximate area is 116.89 hectares. Because the last Population and Housing Census dates from 2010, where specific information can be

[5] La empresa creció exponencialmente desde la década de 1990 y llegó a construir más de 655 000 casas en 52 ciudades de 16 estados. La empresa determinó que ofreció el servicio de vivienda a más de 2 400 000 personas (más de 1% de la población). El modelo de negocio de Corporativo Geo se enfocó principalmente en el nivel asequible y segmentos económicos de pagos mensuales recaudados por el Instituto del Fondo Nacional de la Vivienda para los Trabajadores (Infonavit) y el Fondo de la Vivienda del Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Fovissste).

found at the block level, as well as the basic geostatistical areas (Ageb), and given that the fractionation grew between the period 2010-2016 , there are not complete data of the population variables. However, the Inegi National Housing Inventory (2016) indicates that, of the 5165 private houses, 1349 are inhabited.

Agaves-Villa Luna-El Capulín subdivision (Agaves)

The Agaves subdivision is located in the southeast of the AMG, past the airport. Its central point is the geographic coordinates of 20 ° 28 ’17.28” north latitude and 103 ° 16 ’52.19” west longitude. Its approximate surface area is 176.32 hectares with a population of 8251 inhabitants (Inegi, 2010). According to the Inegi National Housing Inventory (2016), the dwellings that were had were 2,193 inhabited out of the 6796 private houses, that is, 4603 dwellings are found without inhabiting, according to these data.

Analysis of the dispersed urban expansion criteria

Centrality

Regarding the linear distance from the central municipality of the AMG, the Agaves subdivision is at a distance of between 20 and 25 kilometers and the Arvento subdivision at a distance of between 25 and 31 kilometers.

While the linear distance per neighborhood with respect to the central municipality to the administrative head of Tlajomulco ranges between 11 and 21 kilometers for both subdivisions as shown in figures 2 and 3.

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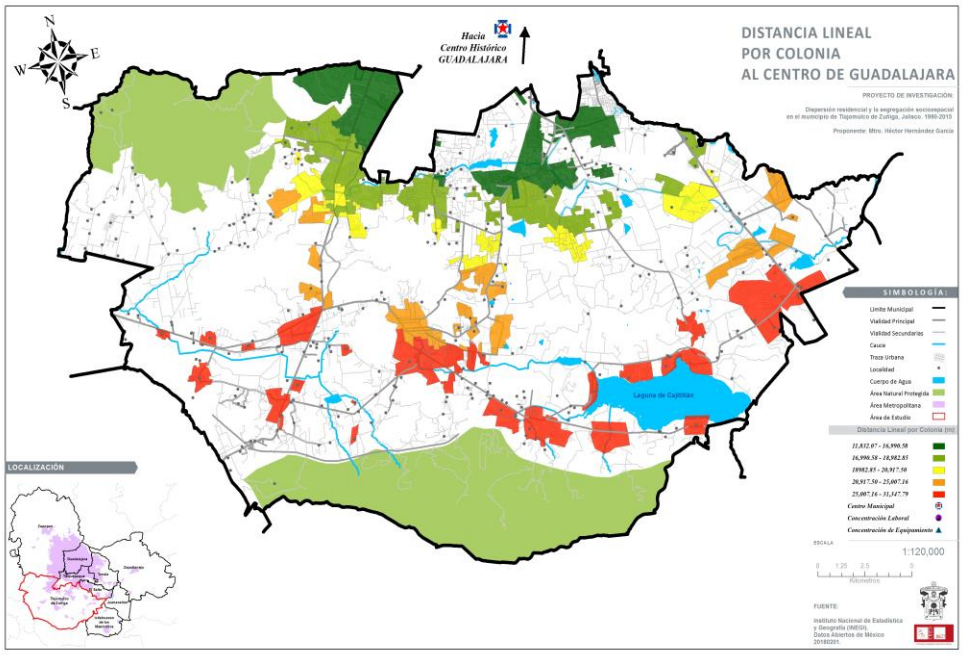
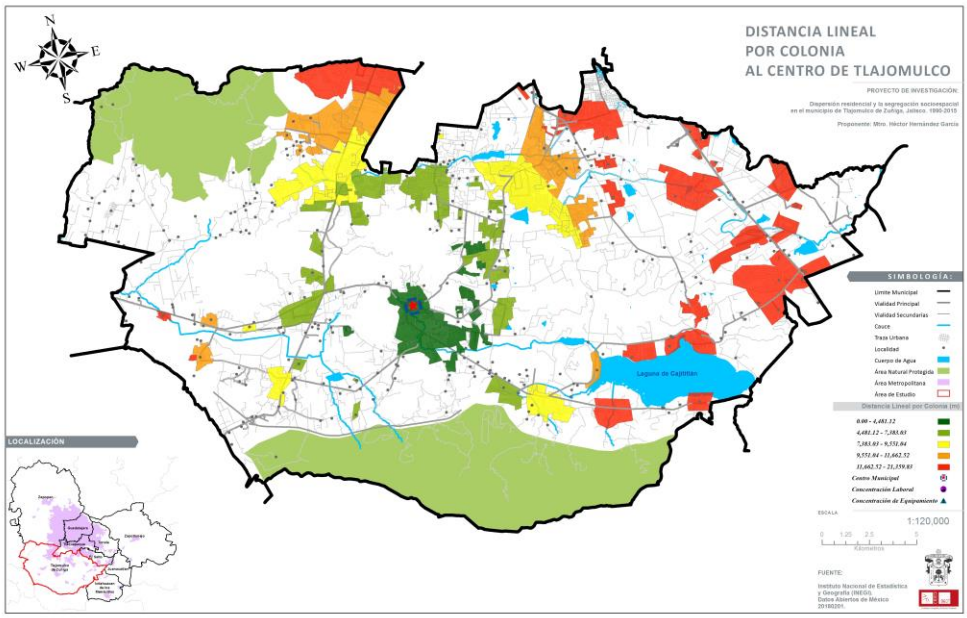
Figura 2. Distribución de los fraccionamientos respecto al AMG (variable de centralidad metropolitana)



Fuente: Elaboración propia con base en Inegi (2010, 2013, 2016)

Figura 3. Distribución de los fraccionamientos respecto al centro de Tlajomulco de Zúñiga (variable de centralidad-municipal)



Fuente: Elaboración propia con base en Inegi (2010, 2013, 2016)

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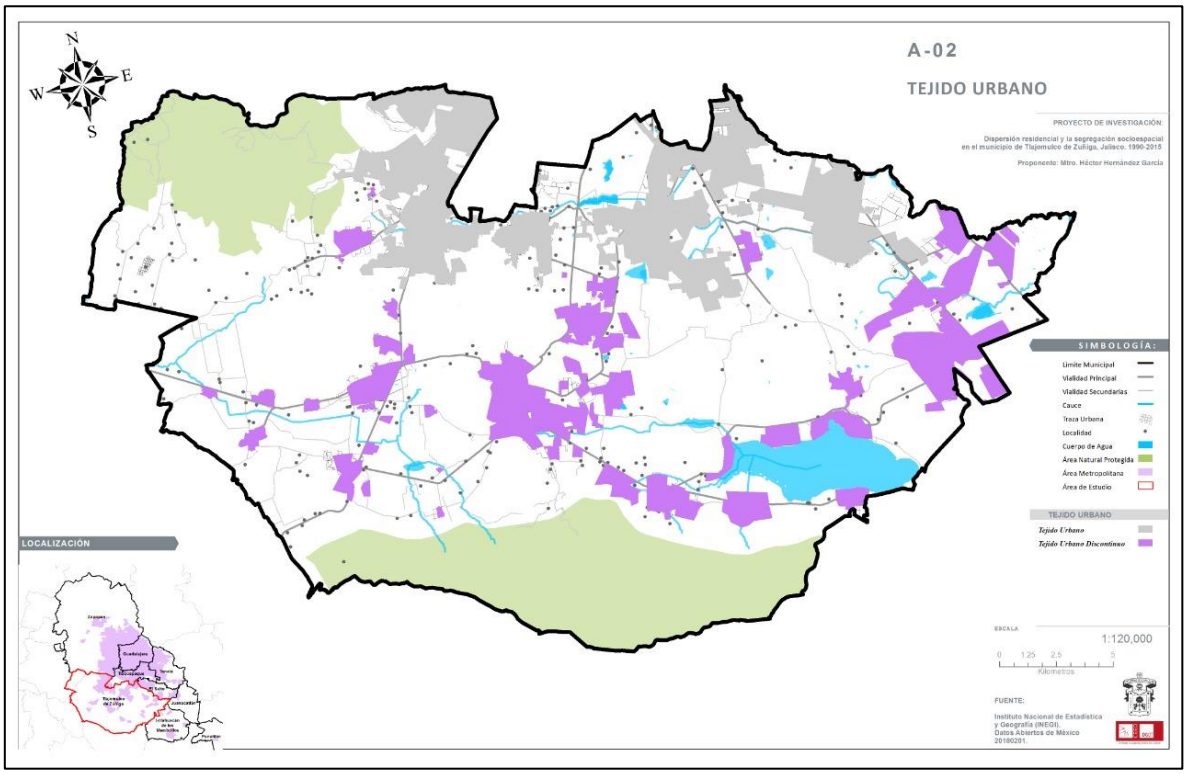
Continuity

Various authors identify discontinuity as one of the significant expansion attributes. "Frogs leap beyond underdeveloped land to leave a mosaic of developed and underdeveloped areas"; Thus, an urban landscape of isolated and low-density houses is built (Jaeger and Schwick, 2014).

At this point, the set of settlements that present interstices among themselves in a space planned for their development will be defined. Patterns will have low scores on this dimension. Bodies of water, wetlands, forests, parks, slopes or protected soils, highways, interchanges or other public reserves and facilities are not considered interruptions of continuous development patterns. It should be noted that the urban area of the municipality of Tlajomulco de Zúñiga is 15,045.93 hectares: the discontinuous urban fabric is 6,996.68 hectares and the continuous urban fabric of 8,049.25 hectares, as illustrated in figure 4.

Figura 4. Área urbana continua y discontinua en el municipio de Tlajomulco de Zúñiga



Fuente: Inegi (2016)

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The complexity of the urban plan

Regarding the shape indexes, the aim is to measure the complexity of the polygon that delimits the natural or forest area studied. There are numerous authors who have cut down the theories developed from ecology to the analysis of the dispersed city, according to Frenkel (2008). The most compact shapes, with a geometric sense, are those that present a smaller perimeter-area ratio, as in the case of circles or squares that indicate less dispersion.

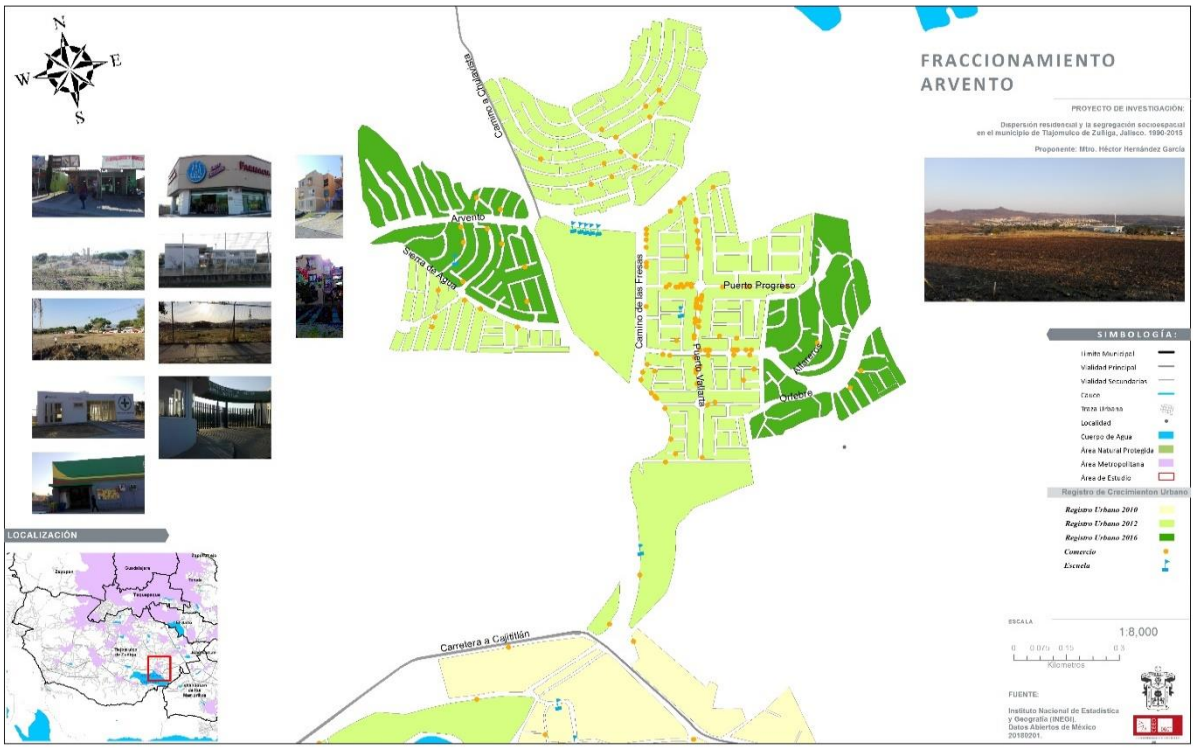
Urban spots allow us to differentiate compact shapes such as circles or squares. The smallest form only has an urban nucleus with an almost perfect rectangular shape and therefore minimal complexity. The highest value will be that of the only urban nucleus with a more tortuous polygonal shape, which represents greater complexity.

The form indicator by territorial area is the set of urban nuclei of the municipalities of the rural system that present the smallest value. In fact, it is in this area that urban areas tend to be smaller and more compact. On the contrary, the urban strip is the one with the highest value, and indicates more morphological complexity of the urban pieces in this area.

The morphology of the urban plan of the Arvento subdivision

It is an urban project planted in an irregular polygon, whose interior design obeys natural elements, such as the natural relief and the bodies of water that cross it, so that a trace of roads of the primary road system is generated with organic forms and, therefore extension, blocks and the layout and planting of buildings with irregular shapes and sinuous lines in some cases, and in others, with orthogonal tendencies (figures 5 and 7).

Figura 5. Fraccionamiento Arvento en el municipio de Tlajomulco de Zúñiga, Jalisco



Fuente: Elaboración propia con base en Inegi (2016)

The public areas and the existing urban equipment are mostly concentrated in the central part of the subdivision, where the truck station of a single truck route to the interior called "Chapala" is located (figure 6).

Figura 6. Central de camiones cercana al fraccionamiento, parte oeste. (Existe solo una ruta de camiones al interior denominada *Chapala*)

Fuente: Elaboración propia

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Figura 7. Tipo de vivienda y servicios. (Espacios destinados a vehículos automotores no utilizados o subutilizados)

Fuente: Elaboración propia

The morphology of the urban plan of the Agaves subdivision

It is an urban project planted in an elongated irregular polygon of a length of 3.48 kilometers, whose interior design obeys two logics: one of natural cut and another as a result of the layout of roads of the primary road system. The blocks, the layout and planting of the buildings have regular shapes and long lines of roads with orthogonal trends as shown in figure 8.

The public areas and the existing urban equipment are concentrated, for the most part, in the initial part. There, we can find primary and secondary schools, however, the bus stop or central is at the bottom of the subdivision, which makes it difficult for some people to function and move (figure 9).

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Figura 8. Fraccionamiento Agaves en el municipio de Tlajomulco de Zúñiga, Jalisco

Fuente: Elaboración propia con base en Inegi (2016)

The urban morphology consists of an elongated plan with blocks that follow the isomorphic roads that form winding roads where 80% correspond to single-storey multi-family dwellings. Neighborhood-level businesses are incorporated in the housing corridor located on Via Láctea street (weekly daily supply).

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Figura 9. Entrada al fraccionamiento de Agaves. (Uso de automóviles particulares para dar servicio interurbano de la población que sale o entra al fraccionamiento)

Fuente: Elaboración propia

Figura 10. Casa deshabitada en la sección final del fraccionamiento, al suroeste

Fuente: Elaboración propia

Home value

The findings of information on the people interviewed in the matter of housing prices are as follows: in the Los Agaves subdivision, people were interviewed who paid 390,000 pesos for their housing, 249,000 pesos and even, after being lowered, with subsidies emanating from the federal housing policy, 189,000 pesos.

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In this subdivision, a person was identified who, given their work activities, made it possible to identify a pattern of material values and income level of its residents based on their location within the subdivision, which, as noted, presents an elongated shape of large dimensions (length of 3.5 kilometers).

The interviewee indicated that she perceives people with medium purchasing power who live near the main access road to the subdivision or exit to the highway (see figure 9), unlike residents who live in houses that are 3.5 kilometers away from the access point (see figure 10), which implies a decrease in the rental value of the property with respect to the houses near the main road.

The Arvento subdivision was promoted, by the Casas Geo company itself, from the Los Agaves subdivision as a space near the Cajititlán lagoon, where you could buy a home with 270,000 pesos or with a subsidy it could be reduced to 220,000 pesos.

Also, few parked vehicles were observed during the week and weekend, when the interviews were carried out as illustrated in figure 7, which was seconded by the interviewees, who indicated that public transport is the most used to communicate, being these of regional character (Chapala). It is worth mentioning that in both cases the problem of long travel times to their work centers, health centers and recreational and leisure activities was observed.

Discussion

The exploratory study on the causes that originated the socio-spatial dispersion in Tlajomulco de Zúñiga allows us to understand that accessibility is an indispensable variable to find the logic in the distribution of human settlements. Also, that the roads, according to their proximity or distance from the business or service center, establish a direct relationship with the value of the home. In other words, the house closest to the center tends to have a higher cost than that far from the center, even within the subdivisions this logic is maintained. Hence, a reason to explore the formation of social segregation in the various subdivisions.

Similarly, some actors in the real estate market are governed by a logic of location when setting prices according to access, not only to the business center, but also to basic services and infrastructure. It is clear that, prior to the formalization of the settlements, urban planning in the municipality was not privileged, which caused an uncontrolled dispersal of the populations built in its interior.

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We consider that the strength of the study is found in the management of two complementary dimensions of analysis (quantitative and qualitative), under the premise of analyzing the relationships between processes, policies and variables of dispersed urban expansion with respect to the value of housing, which, as a whole, allows us to envision real estate and housing consumption dynamics.

Conclusions

During the period from 2000 to 2010, the Government was permissive with the real estate sector, that is, it granted many urbanization permits. In the case of Tlajomulco de Zúñiga, the population growth occurred at accelerated rates (growth rate of 12.92%), above the state and metropolitan average. The population tripled in 10 years: from 123,619 to 416,626 inhabitants.

The distribution of human settlements in the municipality was structured in two territorial logics. The first consisted of a series of urban locations with a large population concentration oriented to roads and accesses to the AMG; and the second in localities and human settlements far from the urban continuum, which, in addition, in their current state, present irregular and discontinuous forms of the urban continuum. From this last set, two remote and discontinuous subdivisions were selected: Arvento and Agaves. In these, a relationship was identified between spatial variables measured in dispersed urban expansion and the price of housing in the municipality of Tlajomulco de Zúñiga.

Regarding the centrality variable, as the distance from administrative and service centers increases, land and housing costs tend to be low. The foregoing cannot be decisive, since there are developments of great renown and promoters of medium-high socioeconomic status that present decentralization.

Regarding the discontinuity variable, it is identified that the developers are acquiring separate lands and on these they build subdivisions; in the end, they constitute a scene of dispersed human settlements. In the case of the two subdivisions analyzed, they were developed and promoted by the same company Corporativo Geo, S.A. de C.V., better known as Casas Geo. In the analysis carried out, it can be observed how there is a gap between the two subdivisions in question, which is the current object of speculation, due to the possible

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future use that may be generated, a possible project to link them. This reflects how the market and the companies themselves can gradually increase the value of undeveloped land.

Regarding the variable of the complexity of the urban plan, this is associated with the specific determination of the location of the house in the context of the subdivision, a relevant role in the geometric shape of these, the layout of the main roads, as well as the access or proximity to educational, recreational, cultural or health services. Access to basic services tends to improve living conditions and create an increase in the value of land and housing. In this sense, one of the residents interviewed refers that he observes a different pattern of people with purchasing power who live near the main access road to the subdivision or exit to the highway compared to residents who live in houses that are three kilometers away. away from the access point, which implies a decrease in the rental value of the property with respect to the homes near the main access road.

In general, it can be concluded that the subdivisions settled in the southeastern portion of the municipality of Tlajomulco, in the context of the second national metropolis, were promoted by real estate actors with the intention of taking advantage of the value of the land, but generating remote spaces in time and distance from administrative and service centers. In addition, with forms and internal urban lines that exacerbate the virtuous circle of devaluation of land and housing, with difficulty in providing transport and water services, which progressively segregates and borders on the exclusion of its inhabitants. In short, the real estate actor plays a relevant role when deciding where and how to build and to whom to sell.

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