

Evolution of urban complexes and their influence on population growth and development of the peri-urban spaces in Calimaya, State of Mexico, from 1990 to 2015

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Abstract

This paper aims to show the evolution and influence of housing production in the private sector in expanding urbanization and population growth in Calimaya, State of Mexico, from 1990 to 2015, using qualitative and quantitative techniques, taking basis information from the Secretariat of state and Municipal Urban Development, INEGI and GIS. Statistical, cartographic data, observation and analysis of the process of housing production through urban complexes in Calimaya show on the hand its tendency to spread out of control in the towns of Calimaya Díaz Gonzalez, San Andres Ocotlan and the Concepción Coatipac, on the areas suitable for agriculture that surround forming a disorderly and scattered suburban residential space, and secondly, the rapid population growth and its potential social and environmental impacts of these.

Kew words: Urban complexes, population growth and peri-urban space.

Resumen

Evolución de los conjuntos urbanos y su influencia en el crecimiento poblacional y el desarrollo de los espacios periurbanos en Calimaya, Estado de México, de 1990 a 2015

Este trabajo tiene el propósito de analizar la evolución e influencia de la producción habitacional del sector privado en la expansión de la urbanización y crecimiento de la población en Calimaya, Estado de México, de 1990 a 2015, mediante el uso de técnicas cualitativas y cuantitativas, tomando como base información de la Secretaría de Desarrollo Urbano estatal y municipal, INEGI y los SIG. Los datos estadísticos, cartográficos, la observación y análisis del proceso de producción habitacional a través de conjuntos urbanos en Calimaya muestran, por un lado, su tendencia a extenderse sin control en las localidades de Calimaya de Díaz González, San Andrés Ocotlán y la Concepción Coatipac, sobre las áreas de vocación agrícola que las circundan, conformando un espacio periurbano residencial desordenado y disperso, y por otro, el crecimiento acelerado de la población y sus posibles impactos sociales y ambientales derivados de estos.

Palabras clave: Conjuntos urbanos, crecimiento poblacional y espacios periurbanos.

INTRODUCTION

From the decade of the nineties, but mainly in the decade of 2000, consequence of the physical-functional relationship with the city of Toluca and the phenomenon of conurbation and metropolization about it, began to expand in the municipality of Calimaya new ways to use the rural space based on housing-residential production activities in the scheme of residential urban complexes, average and low income housing in open and closed urbanizations, which account for, on the one hand of new forms of appropriation of the space, and on the another of commodification of rural areas linked to new needs of urban residents.

In this sense, the residential expansion in the rural areas of the periphery of three localities of the municipality of Calimaya (Calimaya de Díaz González, San Andrés Ocotlán and La Concepción Coatipac) and the population growth is a topic of interest for urban research in Mexico, because the process of urban expansion has been studied for large and half cities as a phenomenon of these zones; however, in recent years this process is presenting in small towns and rural communities, becoming in an example of disorderly and spread hyperurbanization, which requires studies that addressed it from various perspectives in the way on founding a basis for the formulation of public policies in the field of urban development and territorial planning.

This work has the purpose of analyze the evolution of the housing production of the urban complexes, in the residential expansion; Forming periurban spaces and accelerating the growth of the population of Calimaya, considering the transformations of the rural periphery spaces, from 1990 to 2015.

Thus, based on the statistics of urban complexes authorized by the Ministry of Urban Development of the State of Mexico and the direction of Urban Development Calimaya, fieldwork, censuses and population counts and housing for the period of study, was carried out the statistical analysis and cartographic work that allowed, through the interpretation of data and maps to respond to questions about how, where and under what conditions was been produced the housing for the working population of the municipality.

THEORETICAL REFERENCES

The analysis of the processes of urbanization in developing countries has been traditionally structured around dichotomies such as rural-urban, traditional-modern, formal-informal. In this framework, the peri-urban interface is understood as the loss of “rural” values (loss of fertile land, natural landscapes, etc.) or deficit of “urban” attributes (low density, lack of access, absence of services and infrastructure, etc.) (Adell, 1999). Characterized mainly by the new rural population flows in the contest of real state activities.

These territorial manifestations of growth and expansion of the large cities, gave rise to the development of general theories about the emergence of a new system of settlement. Initially was raised the existence of a “return to the field”, subsequently conceptualized under the term *counter-urbanization* (Berry, 1976). Other authors pointed to the «re-birth” of the non-metropolitan areas (Kayser, 1990; 1993); it also used to insisted on a less concentrated distribution of the population of processes such as deconcentration and redistribution demographic, as well as the regional restructuring of the economy and the space (Champion, 1992) quoted in (Avila, 2001).

With respect to the factors that define the different theoretical approaches, Zarate mentions that among other factors that explain this structure through models of organization and function of the urban space it is the distribution in the territory of the diverse landscapes and land uses with a structure determined by a downtown, residential areas, industrial zones and the periurban space (Zarate, 1991).

Furthermore, it is considered that these processes coincide with a phase of transition from an industrial society to a post-industrial, in which rural spaces may be “favoured”, where can be observed a diffused urbanization and identify spaces *rural-urban or periurban*, insufficient assertions to apprehend the changing nature of the urban interface (Allen, 2003).

Regarding to the location of new forms of urbanization as quintas and villas around urban centres we must considered them as a phenomenon that already existed in the Roman cities and later in the Renaissance. However, it was in the course of the nineteenth century when the transformations of the urban periphery became remarkable and gave origin to the study of the periurban areas as an object of research. This was influenced by the intensive process of suburbanization in the Anglo-Saxon cities in the context of the Second Industrial Revolution, the Accessibility generat-

ed by the railway and car, the establishment of the telegraph and telephone (Capel, 1994).

However, during the first half of the twentieth century, this process was consolidated as a result of a greater decentralization of the productive activities of the city, the construction of highways and access to mortgage credit by various social classes, which generated the so-called “diffuse city” around the decades of the 50s and 60s. Subsequently, the processes that followed to this last period is characterized by the advance of various urban services and technologies outside of the city, motorway networks and a revaluation of social “natural environment” on the part of the economically affluent sector, phenomena that intensify the transformations of the periurban areas in such a way that the urbanization continues its development on the rural area, creates new concepts that account for new forms of occupying and re-organising these spaces (Puebla, 2004).

In the Anglo-Saxon countries, the periurban has been formed as the place of residence of the wealthy classes, where its configuration is significantly conditioned by the model of the city-garden with certain patterns of planning (Garay, 2001). For the Latin American countries the periurban areas is mainly residential, where territorial differentiation is expressed in terms of the forms of ownership and use of space, in which coexist at the same time neighbourhoods of high-income population bordering on marginal areas, where coexist informal activities with agricultural practices, configuring the advance of urbanization along the output shafts of the cities by diffused settlements, which affects both agricultural areas of high and low productive value, spaces that can present environmental and social issues (Puebla, 2004; Ávila, 2009).

In Mexico, Aguilar (2001) considers that in the peripheries residential areas have experimented profound changes relating to the construction of single-family housing complexes targeted at various levels of society, as well as the major infrastructure works such as airports or main communication routes which facilitate the development of productive activities, which as a whole attract the location of all kinds of uses of land.

In this transformation, of the periurban areas and in a context of the formation of new centralities, arises the massive construction of dwellings with features such as the perimeter fence and control of their access, under the concepts of security, exclusivity and contact with nature, whose objective is to provide a better quality of life for its residents, whose denomination depends on their characteristics and location; *ghettos of luxury* or *fortified enclaves* in Brazil; *gated community* in North America; *closed*

fractionations or developments, which varies according to the locations (Cabral, 2001; Martín, 2006).

In this framework, the study of the periurban area considers the approach of a complex territory that expresses a state of interface between two apparently well differentiated areas: the field and the city, of difficult delimitation and conceptual definition. In regard to the subject of research, a territory problematic, in a situation of transition, in permanent transformation or with expectations of being transformed that the passage of time, extends, reallocating, heterogeneous in the uses of the land, appointed in different ways: the urban periphery, the rural-urban, the “diffuse city”, the border field-city, the “scattered city”, territories of border, the urban edge/periurban area, the outline of the city, exurbs, etc., space that is defined by the uncertainty is not field, or town (Barsky, 2005).

On the other hand, the incorporation of the private sector in housing production driven by public institutions in the first decade of the twentieth century was a determining factor in the development of periurban space. Understood the housing production as the process related to the planning, promotion, construction and housing for the distribution of the spaces including its physical environment surrounding next in the territory. Duhau (2008) named to this sector as *the new producers of living space*.

URBANIZATION AND HOUSING POLICY

The changes in the housing policy of Mexico until his current situation leads us to the second half of the 1990s as a result of the changes in the economic policy of the country. Where disappear the urban housing solutions (lots with services, foot of house, surface-ground and of housing among others) and of rural housing for the most vulnerable groups of the lowest income, the transformation of the national and state agencies of housing of the last decades have experienced substantive changes in the financing and production of social housing, as well as by the accelerated growth of the development companies who have taken almost in its entirety the process of production of housing.

The change of government agencies, financial promoters generated by two processes: the first relates to the reordering and concentration of demand in the *formal sector of workers* with an income of 3 to 10 times the minimum wage equivalent to about 25-30 % of the demand for urban housing and the second is the transfer of the functions of incorporation of the soil to urban uses, urbanization and production, promotion and sale of housing to the private real estate developers. With this, the housing market

of social interest that was guided by the demand and needs through the state has been transformed, to another where are the bidders who determine it with the complacency of the government (Iracheta and Pedrotti, 2013).

Thus, the conception of the role of the State in the housing policy at the national level change of benefactor to regulator and facilitator of business. the changes in public policies have involved a less intervention in the field of territorial planning and production of housing, on central issues such as: the location of the urban complexes, the housing solutions for the poorest sectors, the construction and maintenance of housing, among others (Puebla, 2004).

In this sense, the direction of the housing policy has resulted in achieving the goals of mortgage lending, construction of houses, as well as develop financial strategies to expand this production. Therefore, the Mexican State has assumed the role of management-administration of mechanisms, incentives and instruments to facilitate and ensure the implementation of the initiatives and projects of private sector housing to meet the goals of financing and production of houses and mortgage lending to workers, to the detriment of the management of cities and the environmental balance.

NORMATIVE BASES OF THE URBAN COMPLEX IN THE STATE OF MEXICO

The legislation in the area of urbanization in the State of Mexico has changed according to its evolution, mainly in relation to the authorisation of the branch and fractionation of soil and the regulations of housing, which is currently concentrated in Book V of the Administrative Code of the State of Mexico (CAEM) and its rules which contain the rules in relation to the territorial management of human settlements and urban development of the centres of population and in the Financial Code of the Estado de México and municipalities. Which stresses in the urbanization process and production of housing a strong administrative and financial approach.

From the article 5.40 onwards where is defined to the urban ensemble, it lays down the procedures for the production of these (typology, general rules, rights and obligations of the developer, rights and obligations of the municipalities where are built complexes, permits and licenses, etc.), which are ruled with more detail in their respective regulation. Article 5.44 refers to infrastructure works, urbanization and urban equipment *inside the complex*, but is not present specific references on the external works that connect to the urban complex in the city or the urban centre where it is located.

Article 5.5.9 establishes the guidelines and procedures for the approval of the urban complexes, whose criteria concern the coherence with respect to the use of the ground set forth in the plan of municipal urban development, which seem to be inadequate in not considering the growth trends in the urban stain for localization in the complex within the municipality.

On the other hand, the regulation of the Book V, article 40, fraction II, establishes that for the authorization of urban sets, their dimension and density *will be a function of the availability of drinking water*; presents an inconsistency, since it considers the availability as the institutional capacity to provide the fluid and does not consider the conditions of aquifers where it extracts which can be found in crisis, as is the case of the Toluca Valley.

Later in the year 2006, was formed the State Commission on Urban Development and Housing as a technical body of inter-agency coordination, chaired by state officials, Federal Electricity Commission (CFE, in Spanish) and the respective municipalities, with substantive functions stipulated in article 5.12 of Book V of the (CAEM in Spanish), where they integrate the technical views to grant the constancy of the viability of the project of an urban complex. Procedure key in the authorization, since it contains the following opinions according to article 45 of the regulation of the Book V:

- Of existence and provision of drinking water for development.
- Of civil protection, in the safety of ground and risk.
- Environmental impact evaluation.
- Of vial Incorporation and impact.
- In the case, opinions of federal and state instances by the use of right of way.
- Certification of cadastral and registration key sequence that issue the Public Registry of Property.
- Constancy of supply capacity of electric power,
- License to Use the land.

It may be noted that even when it comes to issues relevant to issue a reasoned opinion of openness and urban growth, issues such as: the consolidation of the urban stain, consistency of the project with the trends of physical and demographic growth, the location with respect to connecting roadways in an orderly manner in relation to the existing urbanization and environmental conditions, are not clear. The analysis of the location of each urban whole in Calimaya, as noted later, confirms that notwithstan-

ding the amount of reports and wages, the reality is that the urban complex authorized and built make city.

THE URBAN COMPLEX RESPONSIBLE FOR THE FORMATION OF THE RESIDENTIAL PERIURBAN IN CALIMAYA

As already mentioned, the federal policy and State housing focuses on achieving goals of production of housing and develop financial strategies to expand the production of houses. To achieve these goals, in the State of Mexico the housing production has been driven by the creation of the figure of the urban ensemble by means of which has been given the role of development and supply of housing of social interest to private companies, where the location of the urban sets and impacts (territorial, social and environmental) are less important (Iracheta and Pedrotti, 2013).

To achieve these goals the interest of developers has been the acquisition of peripheral floor, increasingly far from the centres of population due to its low cost, incurring more frequently in the purchase of common land that plans are as not scheduled for urban expansion, or if the ground gained has a different use to the housing make changes of use for the construction of urban sets.

In this context, the pattern of urbanization that has generated the production of urban sets in Calimaya, could be called as Duhau (2008), as a model of isle, to the extent that the production of urban structures is only linked to the environment and to the cities by means of some primary roads this model implies that the new inhabitants of these urban complexes to face the negative aspects such as: the isolation of its habitat, the remoteness of work, schools, health services, markets and financial services that the city offers, in addition to the trace and distribution of the urban uses of land in the interior as the functionalist logic under which they are constructed.

MATERIALS AND METHODS

Study Area

The municipality of Calimaya occupies the third place of the municipalities of the Metropolitan Area of Toluca and the fifth place in the Estado de México for its territorial extension that is of 103.4 km², is located in the south of Toluca and it is geographically located in the parallels 99° 37' 02" longitude west and in the 19° 10' 25" latitude North. It is bordered to the north by the municipalities of Toluca, Metepec, Mexicaltzingo and Chapultepec; to the east with Tianguistenco and San Antonio la Isla; to the

west with Toluca; to the south with the Tenango del Valle and Santa María Rayón (Figure 1). The territory occupies a wide inclined plane to the west is the most high part, to the 4,578 msnm, which lowers to the ground plane of the eastern part, at an altitude of 2600 msnm. The town has an average altitude of 2,680 meters above sea level.

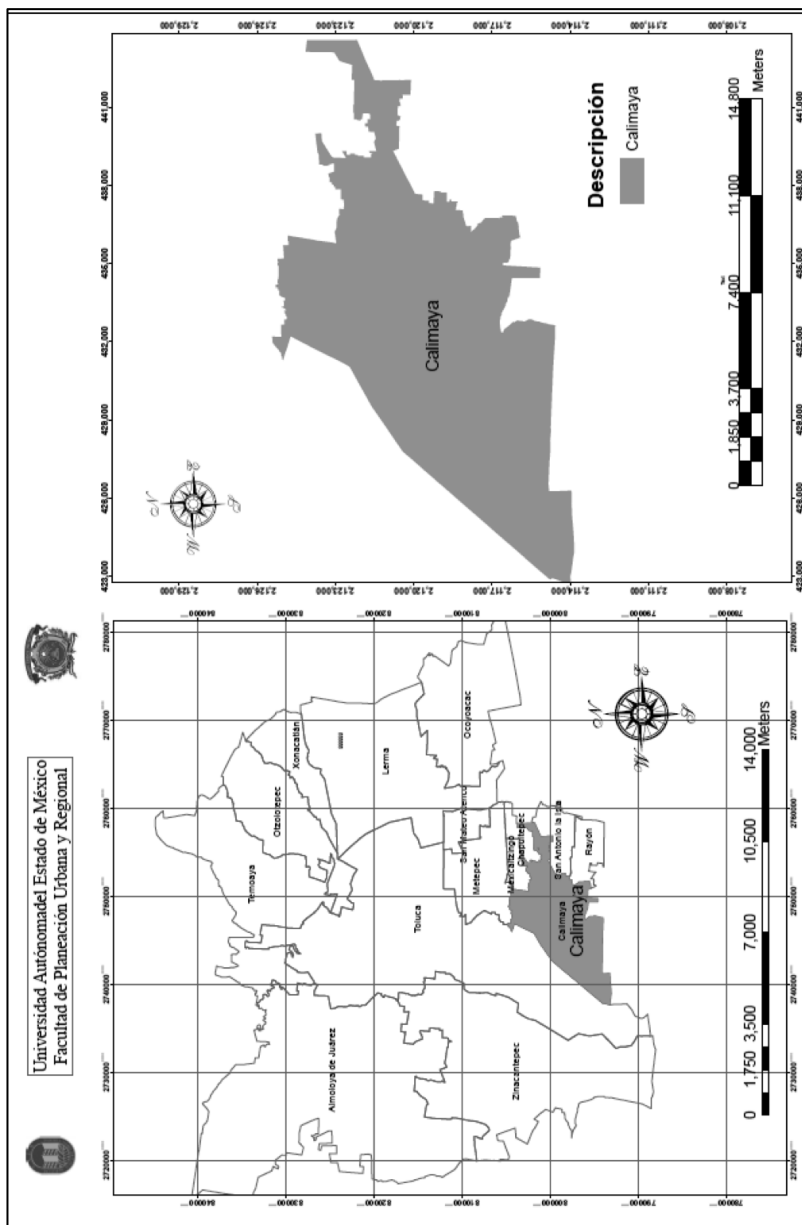
METHODOLOGY

The evolution of the urban complexes and their influence on the development of the periurban spaces in Calimaya, is approached from a qualitative research approach, whose scope is to describe the evolution of the housing production of the private sector under the figure of urban complexes and explain their influence on the development of these in the municipality, therefore it is a non-experimental research.

The work was conducted in three phases:

1. 1st phase. To collect the necessary information is consulted the file of authorizations of urban complex by the Secretariat of Urban Development of the state of Mexico officially published in the gazette of the Government of the Estado de México and the direction of Urban Development of the municipality, identifying the authorizations of these complex of use for housing in the study area from 1990 to 2010. Data collected were: name and address of the urban ensemble, date of authorisation, surface, number of dwellings built, number of lots, type of urban whole. In addition it is consulted other sources of information such as: Census and counts of population of the INEGI of the period of study, Cartography of INEGI, plans for urban development of municipality, Regional Plan of Urban Development in the region in force and the utilization Toluca of Digital Map program.
2. 2nd phase. The field work was carried out by a tour in the area of study with the aid of GPS for the identification and geo reference of urban housing assemblies to verify the information obtained in the state and municipal records.
3. 3rd phase. With the initial information, the database was elaborated with which several basic statistical calculations were made that allowed to approach the analysis of the relation periurban residential expansion and population growth. Similarly, cartographic developed which allowed the identification of the location of the complexes to compare their dimension with respect to the municipal urban area, and other measurements that helped to characterize and analyze this growth both urban and population grow.

Figure 1: Calimaya municipality location



Source: Own preparation with data of INEGI 2014, Marco Geostatístico, Mapa Digital.

RESULTS

To describe the evolution of the urban complexes and their influence in the population growth and the development of the periurban spaces in Calimaya, it was considered the following:

DEMOGRAPHIC DYNAMICS IN THE MUNICIPALITY OF CALIMAYA

The growth of the population of the municipality of Calimaya is an expression of the socio-territorial transformations derived from the periurban residential expansion, mainly due to the phenomenon of population migration that changed its residence to the periurban of this municipality in the last decades.

Until 1990, the municipality showed a discrete growth of 24,906 inhabitants. From the following decade the population, as well as the periurban residential expansion, began an accelerated process of growth, for 2000 the increase was 41.3% with respect to the previous one, amounting to 35,196 inhabitants. For 2010 the population of the municipality increased to 47,033 inhabitants 33.6% more than in 1990. In the year 2015 increased to 56,574 inhabitants which represented 20.3% more than in 2010.

Likewise, the average annual growth rate of the population of Calimaya shows that the periods of greatest growth were from 1990-2000 with 3.33% and 2010-2015 from 3.76%, both above the average annual rate of the ZMT and the State of Mexico. The average annual growth rate for 2010-2015 stands out, which was 3.76% above the ZMT of 0.73% and the State of Mexico of 1.54 (Table 1).

In this way, to settle the real estate sector as an axis of development of housing of the municipality, broad sectors of the urban population were attracted by the conditions and benefits that it offered, generating offsets (migratory movements' city-field) that have impacted the population growth of the municipality.

Other conditions and intrinsic generated, which allowed the population growth are:

- The state road Toluca-Metepec-Tenango del Valle, which daily allows the transfer of goods and people to the capital of the State, either of the State itself and the region, as the southern states.
- The proximity and accessibility to the city of Toluca, Metepec and Distrito Federal which increased with the expansion of the state road Toluca-Tenango of the valley and highway Lerma-Tenango del Valle.

- The geographical conditions of the land to the north, east, south and southeast of the municipal seat, with plains and gentle slopes that facilitate the settlements.
- The supply and demand for land and housing.

Table 1: Calimaya, Toluca Metropolitan Zone and State of Mexico total population and average anual growth rate (1990-2015)

Locality	Population				AAGR		
	1990	2000	2010	2015	1990-2000	2000-2010	2010-2015
Calimaya	24 906	35 196	47 033	56 574	3.51	2.94	3.76
ZMT	1 061 065	1 471 146	1 846 116	1 914 892	3.32	2.29	0.73
Edo. México	9 802 820	13 096 686	14 995 703	16 187 608	2.93	1.36	1.54

Source: Own preparation with data from INEGI population and household census 1990, 2000, 2010 and population count 2015.

This contributes to the municipality concentrate the 0.37% of the state population, with 56 574 inhabitants and 2.95% of the ZMT in the year 2015.

URBAN EXPANSION AND PRODUCTION OF URBAN SETS IN THE MUNICIPALITY OF CALIMAYA

After reviewing the authorizations of urban sets for the metropolitan area of Toluca, developed a database and identified that between 1999 and 2010 were awarded 87 authorisations of urban sets, of which 10 correspond to the municipality of Calimaya, representing 11.49%, the posting is done until July 2010 (Table 2). It is appreciated that these have involved the construction of 10 urban sets of different scale and typology located on three of seven villages of the municipality. With regard to the distribution of the urban sets in the municipal territory, in a first analysis, verified its location in the periurban space and emphasizes the production of these in the following locations: Calimaya of Díaz González with three, San Andres Ocotlán with six and finally La Concepción Coatipac with only one.

A second analysis refers to the growth of the urban area of Calimaya generated by the construction of urban sets and its impact with respect to the pre-existing urbanized area. The growth of the urban area of the municipality of Calimaya by the construction of urban sets, has been of 383.57 hectares, equivalent to 21.41 percent of total pre-existing area and 28.16 percent of the total area of the municipality. The localities with the greatest

impact are Calimaya of Díaz González with 204.73 hectares equivalent to 14.21 percent of the surface urbanized in the municipality; San Andres Ocotlán with 146.55 hectares equivalent to 10.17 percent of the surface urbanized in the municipality and La concepción Coatipac with only 31.92 hectares, equivalent to 2.21 percent of the surface urbanized in the municipality (Table 3).

Table 2: Urban complex authorizations at Calimaya and Toluca Metropolitan Zone from 1990 to 2015

Area	Licences	
	Number	% compared to total
Municipio de Calimaya	10	11.49
Zona Metropolitana de Toluca	87	100

Source: Own preparation with statistical data of urban complexes from Secretariat of Urban Development of the State of Mexico. Available in <http://www.edomex.gob.mx/sedur/stadisticas/conjuntos-urbanos>

Table 3: Urbanized area and authorized urban complexes at Calimaya's localities from 1990 to 2015

Área	Licences		Urbanised Area	
	Number	% compared to total	Hectares	% compared to total
Calimaya de Díaz González	3	30	205.0	53.45
San Andrés Ocotlán	6	60	146.55	38.10
La Concepción Coatipac	1	10	32.0	8.34
Total del municipio	10	100	383.57	100

Source: Own preparation with statistical data of urban complexes from Secretariat of Urban Development of the State of Mexico. Available in <http://www.edomex.gob.mx/sedur/stadisticas/conjuntos-urbanos>

The impact on the town of Calimaya de Díaz González has been strong not only by the size of the sets but due to its location and the brief period in which have been developed by modifying its operation. While this is evident in the case of the municipal, the same is not true for the other two localities, because to be smaller, the impact is greater than the cause alterations in their operation, saturating the deficient structure and equipment and especially the affectation of the daily life of its inhabitants, generating clearly distinct areas between native populations and new.

EVOLUTION OF THE URBAN AND PERIURBAN COMPLEXES CALIMAYA

In Calimaya, the authorization of the urban sets began in 1999 with the residential complex Rancho El Mesón, exclusive and closed, addressed to

economic strata high (Figure 2), located in soils of agricultural production of the locality of San Andres Ocotlán, close to the main highway Toluca-Calimaya. This urban whole that was seen as an isolated and different to the traditional growth urban, was the origin of the process of expansion in the periurban residential space of the municipality.

Subsequently are authorized and built two urban housing complexes in the year 2007, Villas del Campo I in the ex - rancho “Don Martín” and “La Esperanza” in the town of Calimaya of Díaz González and Residential San Andres in the town of San Andrés Ocotlán on the road Toluca-Tenango del Valle (Figure 3). From these, a race begins in the authorization and construction of urban complexes.

For the year 2009 is allowed three sets more, Villas del Campo II and Ibérica in the locality of Calimaya of Díaz González and Valle Nevado in the locality of La Concepción Coatipac (Figure 4), with the authorization of these already amounted to six urban sets, which evidenced the transformation of rural space and the changing uses of agricultural land to urban and urban reconfiguration of the municipality.

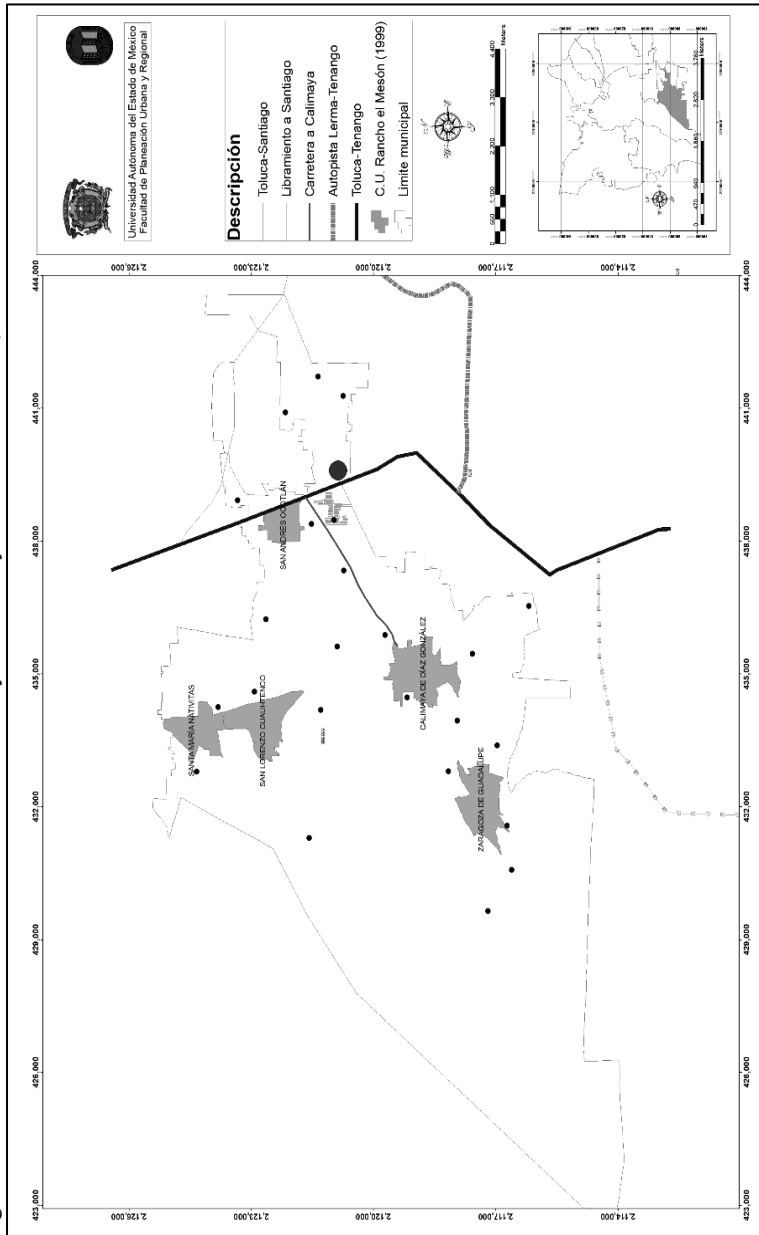
In 2010 it authorized four urban complexes: Bosque de las Fuentes, Hacienda de la Fuentes, Hacienda de las Fuentes and Lomas Urbi, all of them in the town of San Andrés Ocotlán, which were added to the existing making a total of ten urban sets authorized and built in just four years (Figure 5). These new developments have transformed the uses of agricultural land to urban and influenced the expansion of residential and shaping of the periurban space of the municipality of Calimaya, consolidating the towns of Calimaya Díaz González, San Andres Ocotlán and La Concepción Coatipac as a zone for the construction of housing for the social sectors of high income, Medium High, media and Social interest.

Within the municipality, emphasizes the production of housing through the figure of the urban ensemble closed and open, the first in the localities of Calimaya of Díaz González and San Andrés Ocotlán located in the proximity of the highway and Toluca-Tenango Toluca-Calimaya, the second on the periphery of La Concepción Coatipac, away from the highway and Toluca-La Concepción Coatipac Toluca-Tenango.

With respect to its trend is to be noted that it is in the year 2010 (Figure 6), when consolidating these localities as an area for the urban development of urban sets for high-income population, media and social interest.

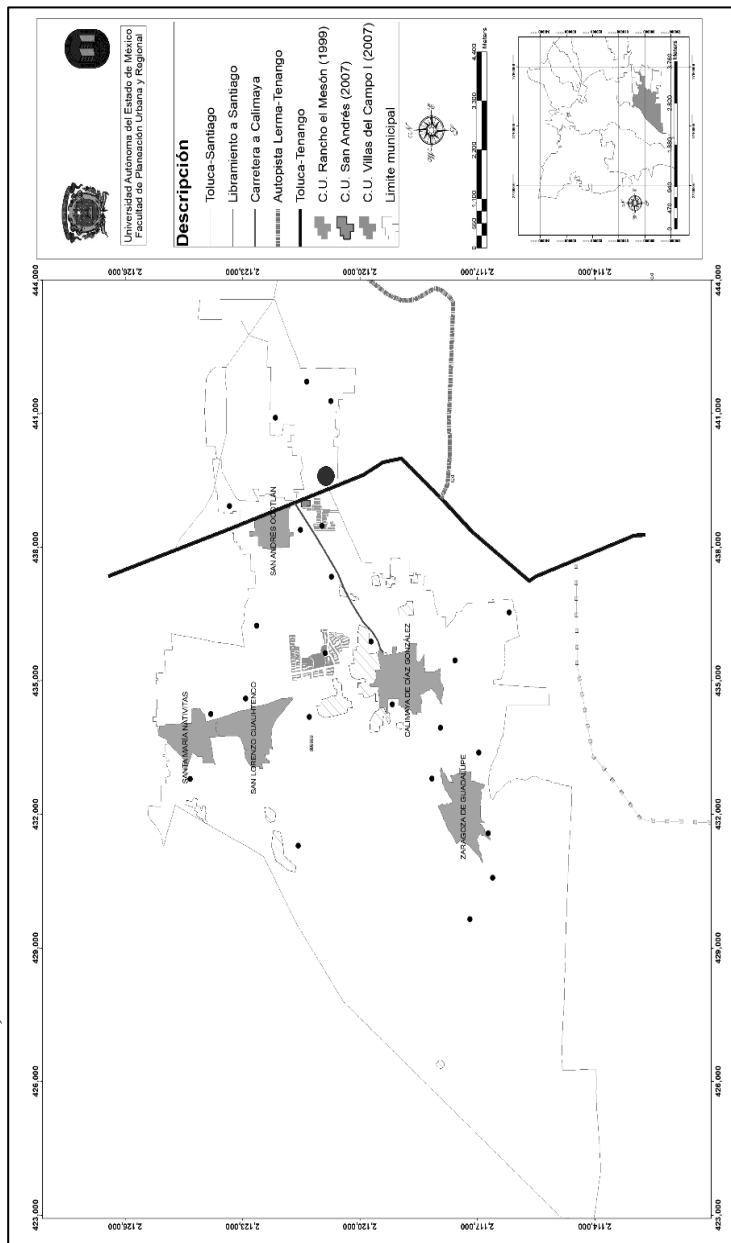
In sum, the expansion of the urban sets and the formation of the periurban space were located to the northeast of the municipal Calimaya of Díaz González, south and northeast of the town of San Andrés Ocotlán and to a lesser extent to the east of the town of La Concepción Coatipac, (Figure 6).

Figure 2: Rancho el Meson Residential at the locality of Calimaya de Diaz Gonzalez, 1999



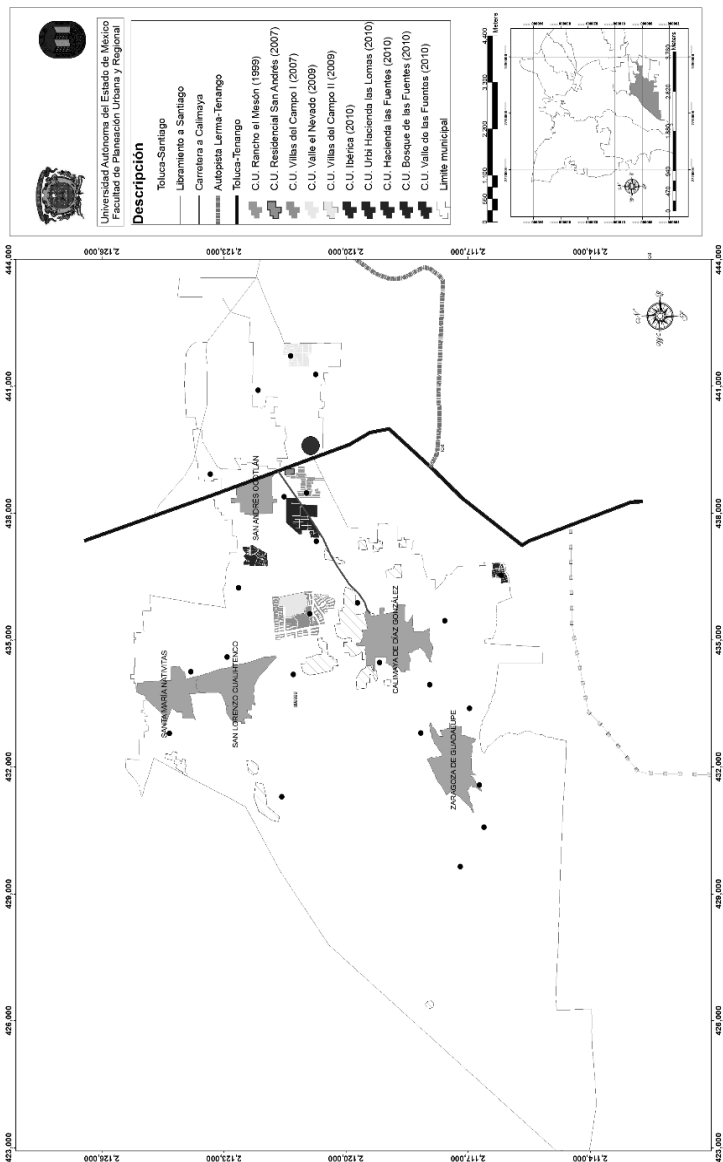
Source: Own preparation with data of INEGI 2014, Marco Geoestadístico, Mapa Digital.

Figure 3: Villas del Campo I urban complex and San Andres Residential at Calimaya de Diaz Gonzalez and San Andres localities, 2007



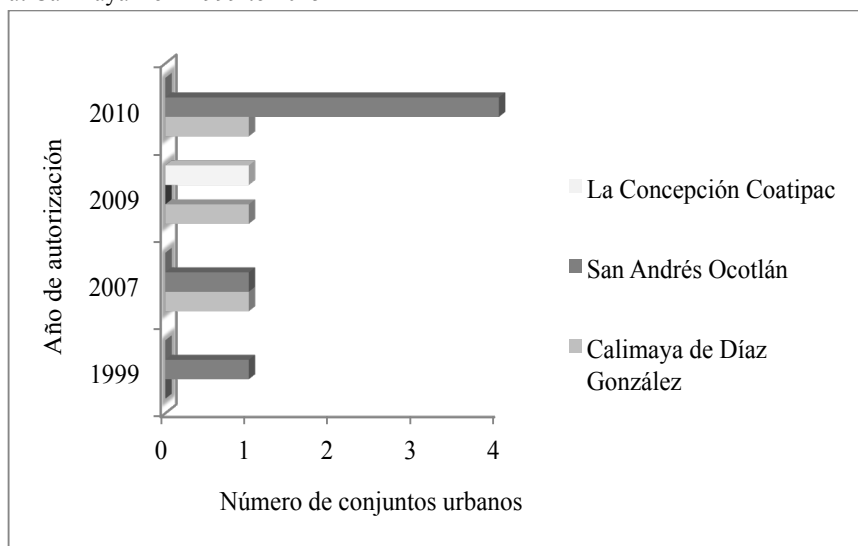
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Figure 5: Bosque de las Fuentes, Valle de las Fuentes, Hacienda de las Fuentes and Lomas Urbi urban complexes at San Andres Ocotlan and Iberica localities at the municipality of Calimaya de Diaz Gonzalez, 2010



Source: Own preparation with data of INEGI 2014, Marco Geoestadístico, Mapa Digital.

Figure 6: Urban complexes evolution in accordance to its location and authorization at Calimaya from 1999 to 2015



Source: Own preparation with data of GACETAS of GEM, SDUEM.

With the authorization and location of the urban complexes not only reconfigured the urban structure with the formation of the periurban space, but also promotes the social segregation and residential in the territory. This situation is directly related to the scale of intervention measure through the amount of housing and the type of the same per set and location, which implied a third analysis.

While in the municipal Calimaya of Díaz González there have been three urban sets with a total of 4,144 new homes in the town of San Andrés Ocotlán there have been six urban complexes with 4,035 homes and 2,783 in the La Concepción Coatipac new dwellings distributed in just an urban whole (Table 4).

The growth of housing of greater impact for the municipality was in the year 2009 with the construction 4,675 new housing and the lower impact was in 1999 with only 388. The effect of the municipality with the construction of 10 urban complexes and the production of 10,333 houses is very strong, as in just four years occurred on 171.08 per cent of the existing housing stock in 1995 that corresponded to 6,040 homes.

Due to the supply of housing for the urban complexes, was carried out the characterization of these, based on the typology established in the Financial Code of the Estado de México and the municipalities (Article 3(XL), see Table 5).

Table 4: Evolution of housing production by location from 1990 to 2015

Locality	Urban complexes	Households				Total
		1999	2007	2009	2010	
Calimaya de Díaz González	4	0	1 313	1 892	2 060	5 265
San Andrés Ocotlán	5	388	121	0	1 776	2 285
La Concepción Coatipac	1	0	0	2 783	0	2 783
Total	10	388	1 434	4 675	3 836	10 333

Source: Own preparation with data from GACETAS of GEM, SDUEM.

Table 5: Urban complexes according to type and location from 1990 to 2015

Locality	Closed urban complex	% compared to total	Open urban complex	% compared to total
Calimaya de Díaz González	3	30	0	0
San Andrés Ocotlán	6	60	0	0
La Concepción Coatipac	0	0	1	10
Total	9	90	1	10

Source: Own preparation with data from GACETAS of GEM, SDUEM, GEM and field registers.

How can be seen in table 5, in the production of urban complexes stresses the typology of closed sets with 90 per cent in the towns of Calimaya of Díaz González and San Andrés Ocotlán, concentrating the largest number of housing for the population of resources and means, and high is only an urban whole open in the locality of La Concepción Coatipac for population of scarce resources.

It is worth mentioning that while the urban sets are closed in the vicinity or built on the shores of the main roadways and Toluca-Tenango, Toluca-Calimaya del Valle, the urban whole social interest open has been away from the urban locality and the roads Toluca-Tenango del Valle. These new ways of producing housing, promote fragmentation and socio-spatial segregation, in addition to saturate the roadways and make more complicated the lives of the new inhabitants of the urban sets, because you must move to large distances to work, go to school or to make their purchases.

In relation to its typology, according to what is established in the Financial Code of the Estado de México and the municipalities (Article 3(XL), Table 6 shows that the production of housing in the municipality is directed mostly to high social strata, medium-high and means, in such a way that the

residential and mixed-residential with 1,932 households, the mixed-media and media with 5,618 households representing the percent of total 73.07 dwellings located in the towns of Calimaya of Díaz González and San Andrés Ocotlán. The production the households of social interest was 2,788 dwellings located in the conception Coatipac at a greater distance from the municipal and urban center. In this way Calimaya is projected as a new option for this type of project.

In regard to the participation of the real estate firms in the residential expansion and construction of the periurban space, fourth part of the investigation (Figure 7), has to be GEO buildings S.A. de C.V is the real estate company that has the largest presence by the number of authorizations with projects of urban complexes closed medium-medium, followed by the company Real Estate Projects of Culiacán S.A. de C.V, with average housing and social interest. The rest of the real estate companies contributes with only an authorization of the urban complexes.

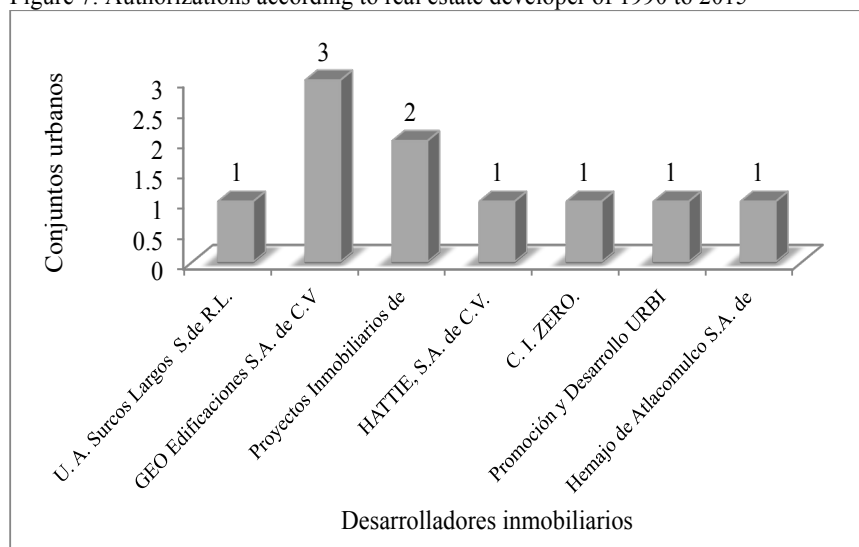
Table 6: Housing according to type and location from 1990 to 2015

Locality	Household by type				Social interest
	Residential	Mixed residential	Mixed medium	Medium	
Calimaya de Díaz González	0	93	1 220	3,952	0
San Andrés Ocotlán	388	1 451	0	446	0
La Concepción Coatipac	0	0	0	0	2 783
Total	388	1 544	1 220	4 398	2 783

Source: Own preparation with data from GACETAS of GEM, SDUEM, GEM and field registers.

With regard to the number of houses built by real estate developer in the study period (Figure 8), highlights GEO buildings S.A. DE C.V. for the construction of 4,955 dwellings (47.95%), followed by real estate projects of Culiacan S.A. DE C.V. with 3,093 dwellings (29.94%) and Hemajo Atlacomulco with only 121 dwellings (1.17%), constructed during the study period.

Figure 7: Authorizations according to real estate developer of 1990 to 2015



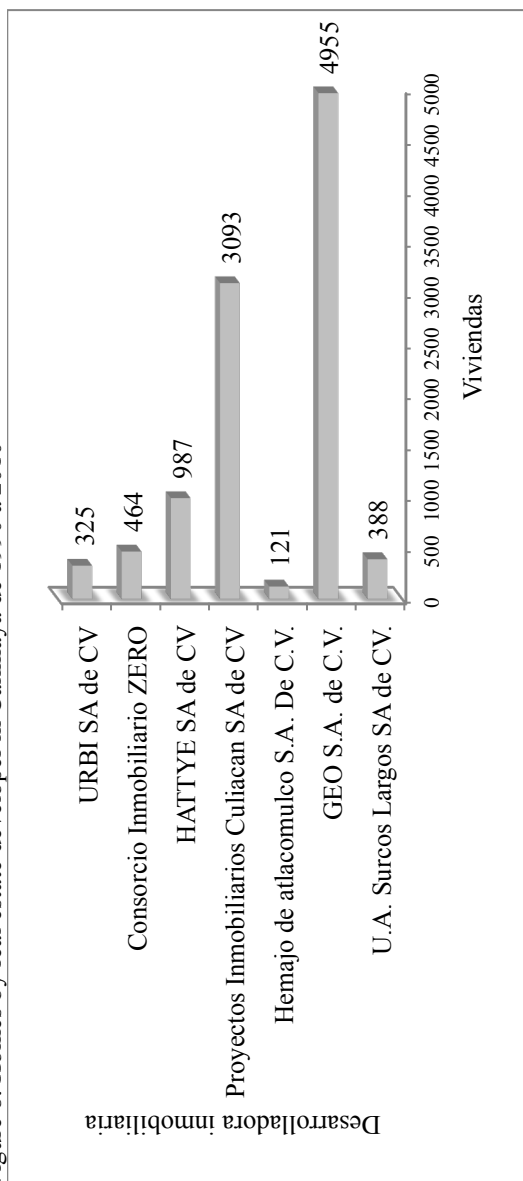
Fuente: Source: Own preparation with data of GACETAS of GEM, SDUEM.

CONCLUSIONS

The residential expansion and population increase in the municipality of Calimaya responds to several factors, including its geographical position and interconnection in the exchange of goods and people with the state capital and the south of the region, availability and low cost of urbanized land, the opening to private housing developers and the demand for housing and security, which the government responds through the housing finance policy.

This is manifested in the form of occupation and organization of the periurban space, the new housing models in the urban set modality; Closed and open, type; Residential, mixed residential and social interest. They arise and reproduce in the face of the flexibility of the planning instruments, which allowed the dispersed construction in areas not accessible to population centers. With a tendency to spread out of control in the localities of Calimaya of Díaz González and San Andrés Ocotlán, in agricultural areas of high and medium production surrounding them and where the couple expands and coexists with the mining and quarrying of stone materials, to the detriment of the quality of life of the new inhabitants of these new forms of urbanization

Figure 8: Homes by real estate developer in Calimaya de 1990 a 2010



Fuente: Source: Own preparation with data of GACETAS of GEM, SDUEM.

However, the development of urban settlements on the periphery of the municipality began in 1999 with the construction of a closed residential urban complex. From 2007 to 2010, 9 urban groups were authorized, representing an increase of 90%, located 3 in Calimaya de Díaz González in an area of 205 Has; 6 in San Andrés Ocotlán in 146.5 Has. And 1 in the Coatipac Concepción in 32 Has. Transforming 383.57 hectares of high and medium agricultural productivity, which represent 8.3% of the municipal territory.

As for the magnitude, understood as the quantity of housing produced, in 10 urban units, 10,333 houses were built, more than one hundred percent of the existing ones, disrupting the municipal functionality of both the population and the government, where Demand for services exceeds the economic benefits of taxes in the municipal government, which is unable to meet the demands of the new inhabitants. The model of private urbanization corresponds to the period of federal and state government where there was greater openness to private initiative in housing. Phenomenon that reconfigures the urban structure and promotes dispersed urban sprawl, and promotes socio-territorial segregation and pollution, to the detriment of the environment and the quality of life for all the population of the municipality and the region.

The growth of the population of the municipality as a result of the construction of residential and social housing observed a significant change, going from 24,906 inhabitants in 1990 to 56,574 inhabitants by 2015. This population requires services such as wastewater treatment, solid waste Urban, security, health and education, among others, evidencing the incapacities of the municipal public administration to attend them.

The commuting of this population causes congestion of the Toluca-Calimaya, Toluca-Tenango del Valle and Tenango del Valle-Lerma roads, incorporating pollutants of greenhouse effect to the detriment of the quality of life of the population of this zone. Of particular note are the actors who influenced these processes, of the 10 real estate developers; GEO buildings S.A. Of C.V. Participated with three closed urban complexes of mixed and medium residential type, Proyectos Inmobiliarios de Culiacán S.A. Of C.V. With two sets, one open and one closed, with medium type housing and social interest. The rest of the developers participated with a housing project.

Thus, this new model of urbanization in Calimaya is not alien to a globalized reality, which reinforces standards of coexistence and consumption directed by private capital and its interests, coupled with factors such as the

search for security, social status without identity, and Quality of life related to a healthy environment and the flexibility of state and municipal urban planning instruments. If the trend of urban and population growth persists in the municipality of Calimaya, the low density urban pattern and the loss of land with agricultural skills will increase, which will exacerbate the consumption of resources such as water and agricultural staples And the management of urban solid waste, sewage and air pollution. The foregoing shows the federal, state and municipal governments in compliance with urban regulations.

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