Peri-urban development in Cholula, Mexico

Towards a socio-spatial management model

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ABSTRACT

The City of Cholula is an exemplary case of the struggle between tradition and modernity. Its strong rural and religious identity is being adapted to new forms of spatial development. From the Pre Hispanic-Colonial grid to gated communities, Cholula is facing the challenges of peri-urbanisation through involving stakeholders and the adaptation and modification of construction regulations. In this aspect, Cholula is an attractive development pole due to its strategic location inside the Metropolitan Area of Puebla-Tlaxcala. On one side, it has become a touristic, educational, and residential core due to the landscape, history, culture, universities offer, and quality of life. On the other side it represents the paradigm of development land policies that are promoting sprawl, gated communities, social exclusion, and land speculation.

The aim of this research is to analyze the stakeholders' role in spatial development, the permeability of planning regulations and how these two factors impact on the patterns of land use in Cholula. The approach for this research is phenomenological - sociological, which contains constructive tools to develop the qualitative method supported by a case study. Therefore the municipalities of San Pedro Cholula and San Andrés Cholula are taken as a case study; the first represents the traditional urban, rural and touristic core, and the second one represents the former rural core that became the façade of new urban centralities inside the metropolitan area. The spatial development of both municipalities began to change during the 1960s with the industrialization of the city of Puebla and the construction of the *Universidad de las Américas Puebla*. However, since 1990 the rural and traditional life of Cholula changed radically due to the expropriation of thousands of *ejido* land for the implementation of the Regional Development Plan Angelópolis. This was an exemplary attempt to order the urban growth of Puebla, and to create new housing and retail areas. However, through the modification of this plan and local regulations, the authorities opened the door to peri-urbanisation and land speculation.

In the course of the analysis of stakeholders and land uses, it was concluded that market pressure and the modification of planning regulations is based on stakeholders' interests that impact the spatial development in Cholula. Through the literature review, from the international and Mexican perspective, the sociological approach was selected to guide the research. For that reason a socio-spatial management model is proposed in order to guide and improve the local planning. Although a participatory approach is not the panacea to all spatial planning issues in Mexico, the socioeconomic and cultural conditions of the case study make it a plausible management model. It is a viable option to integrate different social-units among the territory, or for the case of Cholula between the traditional barrios and gated communities. It is necessary to integrate the different existing planning mechanisms in order to improve the communication channels and networking between community, private sector and local authorities.

Key words: Cholula, spatial planning, peri-urban development, local management, participatory planning

ZUSAMMENFASSUNG

Die Stadt Cholula ist beispielgebend für den Konflikt zwischen Tradition und Moderne. Die starke ländliche und religiöse Identität der Stadt wird an neue Formen der räumlichen Entwicklung angepasst. Sowohl in den historischen Zentren mit kolonialem Grundriss als auch in den Wohngebieten am Stadtrand versucht die Stadt Cholula die Herausforderungen der Suburbanisierung zu lösen, in dem sie die Bestimmungen für Bauwerke lockert und somit den Interessengruppen mehr Spielraum für Gestaltung zur Verfügung stellt. Aufgrund seiner strategisch günstigen Lage innerhalb der Metropolregion von Puebla-Tlaxcala stellt Cholula einen attraktiven Entwicklungspol dar. Einerseits wurde die Stadt aufgrund ihrer Landschaft, Geschichte, Kultur, Studienmöglichkeiten und Lebensqualität zu einem Zentrum für Tourismus, Bildung und Wohnen. Andererseits steht sie aber auch für das Paradigma einer exklusiven Bodenpolitik, die eine Verstädterung des Umlands, geschlossene Wohnanlagen und Bodenspekulation fördert.

Ziel dieser Forschungsarbeit ist es, die Rolle der Interessengruppen in der räumlichen Entwicklung sowie die Flexibilität aller Planungsregulierungen in hinsicht auf die Wohnungsgebiete zu analysieren und aufzuzeigen, wie sich diese beiden Aspekte auf die Flächennutzung in Cholula auswirken. Die Vorgehensweise ist phänomenologisch-soziologisch und enthält aufbauende Methoden, um den qualitativen Forschungsansatz mithilfe von Fallstudien zu unterstützen. Als Fallstudien wurden die Gemeinden San Pedro Cholula und San Andrés Cholula ausgewählt: San Pedro aufgrund des traditionellen urbanen, ländlichen und touristischen Zentrums; San Andrés als Beispiel für eine ehemals ländliche Siedlung, die aufgrund der massiven Urbanisierung ein neues suburbanes Zentrum in der Metropolregion darstellt. In beiden Gemeinden begann sich die räumliche Entwicklung ab 1960 zu verändern. Die Industrialisierung, die unter anderem Textilfabriken und die bekannte Volkswagen Manufaktur in die Stadt brachten, verwandelte Puebla in ein attraktives Wirtschaftszentrum. Der Bau der *Universidad de las Américas Puebla* kurbelte ebenso stark das Ausbildungsimage dieser Stadt an. Durch den großen Zufluss vieler Leute war daher die Nachfrage für Wohnungen entsprechend riesig.

Im Jahr 1990 fand ein massiver Einschnitt in das ländliche und traditionelle Leben in Cholula statt. Um notwendiges Land für die Umsetzung des „Regionalen Entwicklungsplans von Angelópolis“ zu bekommen, wurden tausende Gemeindeländer zwangsenteignet um dieses Projekt zu realisieren. Dies war ein modellhafter Ansatz, um die städtische Entwicklung voranzubringen und neue Wohngebiete sowie Einkaufsmöglichkeiten zu schaffen. Änderungen in der Planung und lokale Festlegungen führten in der Folge allerdings zu Bodenspekulation und Suburbanisierungs-Prozessen.

Das Ergebnis der Untersuchung von Interessengruppen und Landnutzung zeigt, dass der Druck des Immobilienmarktes und der Planungsregulierungen die Raumentwicklung Cholulas negativ beeinflussen. Basierend auf der Analyse internationaler und mexikanischer Literatur wurde ein soziologischer Ansatz für die Forschungsarbeit ausgewählt. Es wird ein sozialräumliches Managementmodell vorgeschlagen, das als Leitlinie für lokale Planung dienen und diese optimieren soll. Obwohl ein partizipativer Ansatz kein Allheilmittel für alle Raumplanungsprobleme Mexikos sein kann, zeigen die sozio-ökonomischen und kulturellen Gegebenheiten der Fallstudien, dass ein entsprechendes Managementmodell plausibel ist. Es handelt sich um einen praktikablen Ansatz, der die verschiedenen „sozialen Einheiten“ in einem bestimmten Gebiet einbinden oder, wie im Fall von Cholula, traditionelle Viertel und geschlossene Wohnanlagen integrieren kann. Es wird als notwendig angesehen, die verschiedenen Planungsmechanismen zu integrieren, um sowohl die Kommunikation als auch die Vernetzung zwischen Staat, Privatsektor und lokalen Behörden zu verbessern.

Schlüsselwörter: Cholula, Raumplanung, Entwicklung Stadtrandgebiete, Lokales Management, Gemaindeplannung

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ABREVIATIONS

ACRONYM	ENGLISH	*SPANISH*
CNCH	National Crusade Against Hunger	*Cruzada Nacional contra el Hambre*
CORETT	Land Tenure Regularization Commission	*Comisión para la Regularización de la Tenencia de la Tierra*
ECLAC /CEPAL	Economic Commission for Latin American and the Caribbean	*Comisión Económica para América Latina y el Caribe*
COESPO	State Population Council	*Consejo Estatal de Población*
CONAPO	National State Council	*Consejo Nacional de Población*
EUNOIA	Evaluative User-Centric Networks for Interurban Accessibility	
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	*Agencia de Cooperación Internacional Alemana*
IDB	Inter-American Development Bank	*Banco Interamericano de Desarrollo*
INAH	National Anthropology and History Institute	*Instituto Nacional de Antropología e Historia*

INEGI	National Office for Geo-Statistics	*Instituto Nacional de Estadística Geográfica e Informática*
MAP-T	Metropolitan Area of Puebla-Tlaxcala	*Zona Metropolitana de Puebla-Tlaxcala*
MSUDP-SACH	Municipal Sustainable Urban Development Program of San Andrés Cholula	*Programa Municipal de Desarrollo Urbano Sustentable de San Andrés Cholula*
MSUDP-SPCH	Municipal Sustainable Urban Development Program of San Pedro Cholula	*Programa Municipal de Desarrollo Urbano Sustentable de San Pedro Cholula*
MUDP 1995	Municipal Urban Development Program of San Pedro Cholula 1995	*Programa Municipal de Desarrollo Urbano de San Pedro Cholula*
OAS	Organisation of American States	*Organización de los Estados Americanos*
OECD	Organisation for Economic Co-operation and Development	*Organización para la Cooperación y el Desarrollo Económico*
PAN	National Action Party	*Partido Acción Nacional*
PRD	Democratic Revolutionary Party	*Partido Revolucionario Demócrata*
PRI	Institutional Revolutionary Party	*Partido Revolucionario Institucional*
RDPA	Regional Development Plan Angelópolis	*Programa de Desarrollo Regional Angelópolis*
SEGOB	Ministry for Federal Government	*Secretaría de Gobernación*
SEDATU	Ministry for Agricultural, Spatial and Urban Development	*Secretaría de Desarrollo Agrícola, Territorial y Urbano*
SEDESOL	Ministry for Social Development	*Secretaría de Desarrollo Social*
SRPUD-PSASPC	Sub-Regional Development Program for Puebla, San Andrés Cholula, San Pedro Cholula, and Cuautlancingo	*Programa Sub-Regional de Desarrollo Urbano de Puebla, San Andrés Cholula, San Pedro Cholula y Cuautlancingo*
WB	World Bank	*Banco Mundial*
GDP	Gross Domestic Product	*Producto Interno Bruto*

GLOSSARY

- *Barrio, Colonia* – neighborhood
- *Fraccionamiento* – Mexican name for gated communities and housing areas, with their own private management.
- *Ejido, Ejidatario* – former land tenure system for rural areas with an owner of the land right.
- *Plaza* – Main Square with extensive open space in Mexican cities.
- *Encomienda* – old colonial system imposed by the Spanish Crown to administrate the conquered rural territory.
- *Rancho* – agricultural land with different land uses.
- *Hacienda* – colonial tenure system that developed an agricultural-industrial production.
- *Altépetl* – Nahuatl name for the pre-Hispanic planning system that gave socio-political and spatial order to the territory.
- *Tlachihualtépetl* – Nahuatl name for the Great Pyramid of Cholula means "hand-made hill".
- *Mayordomo* – nominal representative of each barrio in Cholula, they are responsible for the organisation of the religious festivities.
- *Atlixcáytol- Quetzalcóatl* – Nahuatl names for the expropriated land reserve in former ejido land.
- *Cacique* – in former times were the indigenous nobility that maintained their properties and status Nowadays it is normally used for principal families or owners of large estates.

A mis raíces:
David, el abuelo inmortal
Gilda, el árbol de la vida
Teo, el pensador telúrico

Among material resources, the greatest, unquestionably, is the land. Study how a society uses its land, and you can come to pretty reliable conclusions as to what its future will be.

E.F. Schumacher "Small is beautiful, economics as if people mattered"

Image 2 View from the Remedios Sanctuary to the City of Cholula. Source: author (2010)

I INTRODUCTION

1.1 URBAN GROWTH IN MEXICO

Since the exponential population growth in the 20th Century, Indovina (1990) refers that former Institutionalised City Planning – based on compacity, density, mixture of land uses, among others – is giving way to neoliberal economy[1], informal development, and urban practices that extended metropolises into *diffuse cities*. But, how is it possible that our cities exceed their urban capacity? In which moment did the periphery become an anarchic area that surpassed the management and planning? These questions are nowadays in the mind of international community of planners and it is of interest to this research to analyse the relationships between land and stakeholders and how these interactions impact the urbanisation process.

In regions of the world, like Latin America, the urbanisation process moved from the traditional Pre European and colonial urbanism, to highly dispersed and massive metropolises. This transformation in urban practices was the result of population movements from rural to urban areas in the 20th Century, among other socioeconomic changes. Since 1950 a new planning concern in many countries in the region, like Mexico, tried to create development plans, policies and academic research that made guidelines for containing the urban growth. Nevertheless, the historical miscommunication of different stakeholders and land policies is reflected between the valuation of land uses and the implementation of plans. In this aspect, Mexico is an exemplary case in socio-spatial transformation, especially after the liberalisation of free-market land in 1992. The traditional check-board grid and compact urban planning is giving place to land policies, regulations, and informal development that promote urban growth outside the cores. Named physically as **urban sprawl,** it is related to a high consumption of land with different population densities and needs.

[1] The Neoliberalism is based on the traditional Liberalism that promotes the elimination of supervisions and regulations. The "neo" is defined as "*An approach to economics and social studies in which control of economic factors is shifted from the public sector to the private sector*" (Investopedia, 2015). Some of the main features of this system are based on reducing government's role through: free-based market, cutting public economic support, deregulation, privatisation, and promoting the "individual responsibility" instead of community wealth (Martínez & García, 1996)

An urban boundary like the **peri-urban area**, by definition is interconnected to the urbanisation limits and the mixture of land uses in former rural land. Looking at these trends in urban growth, it seems that Mexican society is not completely aware of the environmental damage and socio-spatial problem that is taking place due to land consumption. On one hand, spatial development is using natural resources without any focus on sustainability. The outcomes of such actions are dispersed low-density cities, minor green and public spaces, and exclusive urban development. On the other hand, the neoliberal economic trends, real estate demand, and land speculation are transforming the rural world and agricultural land uses into urban ones.

These conditions are establishing new socio-spatial paradigms in how people understand, accept, and develop the territory, like:

1. There is no development if there is no urbanisation.
2. Land is limitless.
3. Urban areas have better quality of life than rural areas.
4. Developing social housing is no longer the Government´s responsibility.

The two first visions are jeopardizing the sustainability of the land in Mexico. Due to the pursuit of a *better urban life*, the idealization of the cities is overflowing the capacity of metropolitan management by the Government in order to provide goods and services, especially in the peri-urban and marginal areas.

Here lies the importance of analysing urban change processes in Mexican peri-urban areas as a result of socio-spatial transformations by population, and new urban structures where rural land had given physical space to metropolitan expansion. In this regard, the **Mexican peri-urban areas have become an interesting commercial space for different stakeholders with various roles and interests**. This trend demonstrates the big demand on developable land with potential urban land uses, which generally generates models that segregate and expel the population.

Due to the previous statements, the Mexican peri-urban area is the objective target area for this investigation. It is considered the research problem to be structural with several local implications, among which can be highlight the following:

- *Miscommunication in planning and management* – This results in brief, short-term planning.
- *Lack of mechanisms and partnerships between stakeholders.*
- *Uncontrolled growth of urban sprawl*
- *Violation of construction and land use regulations.*
- *Lack of control, evaluation, and feedback instruments* – The deficiency of monitoring strategies.
- *Exclusive development through gated communities.*
- *Lack of infrastructure and services to the poorest areas* – many of the public investments goes to the well developed areas, or to the most profitable real estate sectors, rather than vulnerable or marginal areas.
- *Expensive provision of goods, services, and infrastructure to peri-urban areas*
- *Environmental impact over rural and natural areas* – unsustainable changes in land uses.

Adding this structural view, another problem and effect of peri-urbanisation is the previously mentioned urban sprawl, which can be considered as a *conflicting pattern between plans and implementations*. This is the research's goal in studying the processes and stakeholders that promote sprawl in peri-urban areas, because those factors contribute to the waste of land which is by no means sustainable.

This research considers not only the land use patterns of sprawl; it also reviews the opportunities and strategies to improve spatial planning, especially when the peri-urban areas are already consolidated. The analysis will help to achieve better planning strategies in countries with similar backgrounds to Mexico in terms of socioeconomic, land policies, and spatial planning conditions.

With the above mentioned points, three main areas are used as delimitation for this investigation (adapted from López-Tamayo (1995) :

a. *The Urbanisation* – The effects of urbanisation over the peri-urban areas
b. *The Policies* – The contradictions between planning and management
c. *The Stakeholders* – The different roles among stakeholders in spatial development.

In order to understand these research delimitations, it is crucial to make a brief overview of the origin of the problem: peri-urbanisation of Mexican cities, a process that is generating new models of spatial development.

1.2 PERI-URBANISATION IN MEXICO

The peri-urbanisation process is one of the most important factors in the development of contemporary cities. Aguilar (2006) affirms that this is one of the most significant urban processes, characterized by the speed and type of urban transformation. In the last decades, the peripheral areas have shown a faster transformation than other areas of many cities.

For the case of Mexico, it is fundamental to consider two facts that triggered urbanisation outside urban cores:

- *Industrialisation period, the exponential population growth and centralisation of the country (1940-1990)* – In 1940 the cities played an important role in industrialisation as a consequence of the centralization of economic activities. During this decade and the 1950s, the urban population changed from 42. 6% to 58. 7% in 1970 (INEGI, 2010).
- *Land policy change in 1992 (Reform to Article 27 of Mexican Constitution)* – Liberalisation of *ejidos* to free-market land. Since this land policy change, the percentage of urban population moved from 71.3% in 1990 to 76.8% in 2010 with an annual population growth of 1.8% (INEGI, 2010).

With a total of 112 336 538 inhabitants, the last National Census 2010 counted 78% of urban population, which shows a decrease of rural population to 21%. Urban population is distributed in 55 metropolitan areas representing a total of 51.5 million inhabitants (INEGI, 2005). Most of the population is primarily located within the boundaries of Mexico City with 22 million inhabitants, and its nearest cities such as Puebla, Querétaro, Pachuca, Toluca, and Cuernavaca. In this context,

the population movements of these metropolises are creating a *Metropolitan Network Region* which boosts the expansion of the congested capital city.

As a result of the new metropolitan situation, the demand on developable territory changed the perception of land uses. Paul García (2006) emphasizes that the national metropolises have always been divided, segregated into fragmented regions. The result splits the extended peri-urban areas into two scales of urban development; both presented with low density level and high land consumption:

- *Massive urbanisation development* – Middle- and upper class residential areas (gated communities), massive social housing, commercial and industrial areas.
- *Informal/Individual urbanisation development* – Many of the informal houses are constructed by the invasion or modification of rural plots.

Informal settlements in peri-urban areas started in 1970 and 1980, and the urbanisation trend on private development began mainly during the nineties, when spatial processes had been marked by rapid and massive land use. In this matter, Rodríguez (2005) adds to new factors like the privatisation of space, goods, and services; and the proliferation of suburban models with various densities and land uses.

Polarization to sub-urban cores is part of metropolisation and decentralisation process of big urban areas like Mexico City, and also be seen in the case of the City of Puebla; a destination for middle-class population, due to the quality of life and pole of economic growth. Puebla's metropolitan area is 100-120 km from the Mexican capital city and is the fourth biggest city in the country. Its strategic localization developed a strong industrial sector during 1960 and 1970, and as a consequence, became a population magnet outside the cores, defining the Metropolitan Area of Puebla-Tlaxcala during 1980. This administrative territory was limited in 1990 with an incorporated area of 2,392 km2 and with more than 2,700,000 inhabitants (INEGI, 2010).

During this period, and important land policy – Article 27 from Mexican Constitution – changed and transformed radically the rural areas in all the country: through the liberalisation of the *ejidos* to free-market land, a land tenure system based on the Agrarian Reform that controlled the land tenure for farmers and peasants. In 1992, the *ejido* tenure system changed to regularisation and privatisation that opened the door to land speculation and massive housing development.

Inside these merging socio-spatial changes in the Metropolitan Area of Puebla-Tlaxcala, an ancestral city with peri-urban area takes its place as our case study: the City of Cholula.

1.3 CASE STUDY: CHOLULA, THE PERI-URBAN TERRITORY

Cholula – the oldest living city in America, with more than 3,000 years of settlements history – remained as a secondary city when Puebla was founded for the Spanish population in the 16th Century. Cholula and its surrounding areas have an important millenarian tradition with rural and religious values. As an important touristic, educational, and trade core; the region of Cholula is historically divided in several municipalities, being San Andrés Cholula and San Pedro Cholula the main urban and rural cores. For the purposes of this research it refers to the main urban cores as the

City of Cholula, formed by the two municipalities of San Pedro Cholula and San Andrés Cholula. For the land use occupation pattern analysis, the municipalities will be name separately.

This work is focused on the last 20 years of urban growth 1995-2015 and Cholula is chosen as a case study due to four remarkable features that make Cholula an attractive space for peri-urban and rural studies:

a. The **religious-indigenous socio-spatial organisation** of the barrios, a unique feature of Cholula's identity in the region (Ashwell, 1999).
b. The conflict between **tradition and modernity** that drives a **decontextualisation** problem (Glockner, 2015).
c. Its peri-urban development as a middle-size city, having Cholula a **dynamic urban growth** (Hernández-Flores, et al., 2009)
d. The population movements that attracts new incomers and expels locals, generating an aggressive **gentrification** process (Schumacher M. , 2012)

These four features are providing as well some lessons regarding spatial development and socioeconomic conflicts that may be useful to cities with similar characteristics. The processes of peri-urbanisation, gentrification, or social exclusion are not exclusive to the case study; on the contrary, they are global phenomena in urban and rural areas with struggles between traditional life-style and new forms of living and consuming.

A good example of this struggle was set during the liberalisation of free-market land in 1992. The quiet traditional rural facade of Cholula changed radically when its municipalities were added as a suburban area for spatial development through the Regional Development Plan Angelópolis RDPA[2]. During this period, the Government of the State of Puebla expropriated 1082 hectares of rural land which was part of the municipalities of Puebla, San Andrés Cholula, Cuautlancingo, and San Pedro Cholula. With the implementation of this plan, the peri-urban growth ended in an exclusion urban policy for rural inhabitants instead of an inclusion policy for new incomers and local residents.

Table 1 Population growth. Source: INEGI (2010)

MUNICIPALITY	1990	2010
San Andrés Cholula	37 788	100 439
San Pedro Cholula	78 177	120 459

This plan was originally created as a "developable land reserve" to manage urban growth outside Puebla's boundaries. Since the creation of the Plan, it was modified at least five or six times in terms of land uses. The original proposal had larger extensions of green areas and prioritised social housing, but through the years, it was developed as a residential, recreational, services and retail core, currently known as Angelópolis district. This plan was a paradigm in spatial planning that subsequently transformed Cholula's population growth, observed in Table 1.

Due to demographics and economic growth the municipalities of San Pedro Cholula and San Andrés Cholula are exemplary cases of peri-urban growth. The rural world and historical localities are

[2] *Programa de Desarrollo Regional Angelópolis*

being absorbed by urban masses, like the Metropolitan Area of Puebla-Tlaxcala. Nevertheless, Cholula had never been an isolated settlement. On the contrary one of **its greatest assets is the mixture of land uses, socioeconomic, educational, and cultural activities**. These special characteristics are nowadays in danger due to the trends of socio-spatial exclusion and gentrification. Furthermore, the millenarian rural-religious tradition, the cultural exchange is losing presence due to two current conditions in San Pedro and San Andrés Cholula:

- *Land speculation and housing demand* is promoting displacement by pushing farmers and local population to sell their properties to the best buyer.
- *Aggressive touristic and urban development policies* that are focusing on profit from tourism and housing taxation.

Considering this socio-spatial context, the spatial development of the case study – inside the Metropolitan Area of Puebla-Tlaxcala – seems to be anarchic and spontaneous rather than well planned. On one hand the municipality of **San Pedro Cholula** represents the historical tradition and the former urban population. This municipality is part of Puebla's cultural heritage, with colonial architecture, a traditional trade market, and an important rural economy. On the other hand, the municipality of **San Andrés Cholula** represents the population's movements into rural-urban, the new peri-urban facade with an educational core with different private and public universities.

Further, both municipalities share an iconic landscape which is one of the famous images of central Mexico: the majestic volcanoes, the *Popocatépetl* and *Iztaccíhuatl* dominate the view over the Valley of Puebla, and the crown on the landscape is the Great-Pyramid with the Remedios Sanctuary on the top. Inside this landscape, three elements of Mexican tradition are represented: **religion, rural identity, and mix-urban culture**.

Based on this background, Cholula reflects the merging of rural localities into urban sprawl. The case study is recognizable in the metropolitan area where many socio-spatial manifestations are interlinked: *gated communities, social housing, informal housing, and suburban localities in the former rural land*; clear cases that reveal the contradiction between developments plans, zoning policies, and current land use. These physical manifestations are the result of stakeholders' actions in speculation, privatisation and violation of construction regulations.

Cholula is an **archetypal example of how ancestral middle-cities try to adapt into a free-market economy contex**t. Even its rural-urban grid is in danger; Cholula is also a good paradigm of cultural identity and how mixture of land uses is possible in planning. The juxtaposition of socioeconomic activities made Cholula a fine place to live and with better quality of life than other places in Mexico.

This is one of the expected contributions of this research: **to revalue Cholula's rural-urban identity and state how spatial development without a participatory approach, damages it.** This is the main focus for this thesis.

1.3 RESEARCH SUBJECT, QUESTIONS AND OBJECTIVES

Based on the aims of this research, the thesis is divided into three phases that corresponds to theoretical discussion, analysis of the case study and the final proposal of a socio-spatial management:

a. *Theoretical discussion: urbanisation process, peri-urban development and agents of change*
   - Review of terminology and definitions for urbanisation process over peri-urban areas.
   - Urbanisation and agents of change.
   - Overview of spatial planning with a participatory approach.

b. *Analysis of policies, stakeholders and land use pattern in Cholula*
   - Overview of national and local spatial planning framework
   - Analysis of spatial development and land use pattern in Cholula
   - Analysis of stakeholders' roles and relationships in peri-urban development

c. *Presentation of a socio-spatial management model with general statements and recommendations*

1.3.1 RESEARCH OBJECTIVES

The research objectives were established through the discussions about paradigms on peri-urbanisation. The objectives are focused on stakeholders and policies impacts over the territory. Three main objectives were delimited:

1. To evaluate how planning regulations, land policies and peri-urbanisation are affecting Cholula's spatial development.
2. To identify stakeholders involved in land use changes in Cholula.
3. To demonstrate how current planning regulations and stakeholders are causing urban sprawl and which type of strategies will be useful for a better socio-spatial development

1.3.2 RESEARCH QUESTIONS

Stakeholders, policies and land are intrinsically related in how the territory is being developed. Based on this relationship, the research questions were elaborated through five main topics of interest for this research: urbanisation, stakeholders, land policies, land use, spatial planning.

1. How is **urbanisation** causing urban sprawl over Cholula?
2. How are **land and stakeholders** related in spatial development?
3. What are the Mexican and local **policies and regulations** for spatial planning?
4. Which is the **pattern** of land use occupation and key stakeholders in Cholula's spatial development?
5. What are the **strategies** to improve spatial planning?

1.3.3 HYPOTHESIS

The following proposition was created in order to demonstrate the current research:

The present spatial development in Cholula is formed as a result of modification and adaptation of planning regulations through involved stakeholders**. Due to this condition, spatial planning with a participatory approach will be more inclusive, more manageable, and will use land use resources more adequately to improve local management in Cholula.**

1.4 OVERVIEW OF RESEARCH PROCESS AND STRUCTURE OF THE THESIS

The urbanisation process has been widely studied in Mexico and Latin America by international authors like Scott, Butterworth, Chance, Gormsen, Ribbeck, Castells; and national researchers like Unikel, G.Garza, Bazant, Steingart, Greene-Castillo, Maya-Pérez, Eibenschutz, Iracheta, among others. Many of the academic discussion focus on the industrialisation of the 20th Century and the neoliberal economic trends in the last 30 years. As it was described, peri-urban areas became key development instruments for housing and services demand. This circumstance is leading new studies on peri-urban development, rural/urban dichotomies, new ruralities, and sub-centralities features like the work made by Aguilar (2006), Muxí (2009) and Torres-Mazuera (2012).

In the local context, the Metropolitan Area of Puebla-Tlaxcala has been recently studied, especially since the implementation of the RDPA in the nineties and the impact of peri-urban development among its boundaries. Although most of Puebla´s research is focused on historical urban growth and architectural patrimony, the work of Melé (1994), Velez-Pliego (1994), and Flores-González (1993) are fundamental for spatial development studies, which influence current reports of Iracheta (2008, 2009) and OECD (2013) regarding the Metropolitan Area of Puebla-Tlaxcala. Other important urban studies concerning Puebla´s expansion were the ones made by the group of German academics like Gormsen and Ribbeck (1981, 1994) during the nineties and eighties. Further German researches made by Borsdorf, Bäh, Jürgen, Janoschka (2002, 2006) gave continuity to urban morphology investigations. Their works are one of a kind in Latin American cities studies made in the German language.

Regarding Cholula´s territory, most of the research is on based sociological, anthropological, and archaeological areas, with extraordinary studies made by McCafferty (1996,2001, 2007, 2008), Kubler (1993, 1985), Bonfil (1988), Castillo-Palma (2001), and Ashwell (1999, 2015) that helped this research to understand the complex socio-spatial relations of Cholula. Contemporary research and publications by academics from BUAP, Colegio de Postgraduados Campus Puebla and Universidad Iberoamericana Puebla are pioneers in Cholula´s peri-urban studies. In this aspect, the doctoral thesis of Gutiérrez y Reyes (2004), Pérez-Abiti (2011), Arceo (2011) and Tlapa-Almonte (2011) were very useful to appreciate history, urbanisation, and environmental conservation in the region. It is important to remark that this research is inspired by the doctoral thesis of López-Tamayo (1995) his work is one of the best examples of peri-urban development analysis over *ejidos* in Puebla and Cholula. To complement the recent investigations and the work of López-Tamayo, this research expects to contribute to:

- Communicate with different stakeholders the importance of Cholula inside the MAP-T, not only because of its touristic and economic activities.
- Revaluate the rural identity and local knowledge of Cholula, as a conservation key and community asset.
- Demonstrate the significance of integrating a participatory approach in local management, being Cholula an urban laboratory with many opportunities and possibilities.

To achieve these three contributions, two main theoretical and contextual processes are presented through a sociological-geographical point of view with qualitative and quantitative features:

1. **Process of urbanisation and spatial planning theoretical aspects**
    a. Review of theory though bibliographical sources
2. **Process of Peri-Urbanisation** in Cholula
    a. Review of urban growth in the MAP-T and Cholula. Through geographical and statistical information from INEGI, CONAPO, and municipalities of San Andrés Cholula and San Pedro Cholula
    b. Review of spatial development background and urban theory though bibliographical sources

The research considers as well the analysis of the objects of study, following a sociological and geographical point of view:

1. **Stakeholders** ➔ different stakeholders involved in the urbanisation process measured by semi-structured interviews with a representative group of each level
2. **Planning Regulations** ➔ review of different public policies in the national, regional and local level, through official information.
3. **Pattern of Land use occupation** ➔ analysis of land occupation in the last 20 years in both municipalities. This analysis was made through geographical and statistical data of INEGI

The thesis is structured through a sequence of chapters and divided into three main blocks: *the theoretical approach, the national and regional planning framework, and the case study analysis with the proposal*:

- *Theoretical approach and state of the art*

The *first chapter* is the introduction to the research objectives and aims. The *second chapter* is divided in two parts; part A describes the theoretical definitions of urbanisation, peri-urbanisation, patterns of peri-urban development, and agents of change. Part B describes a general overview of spatial planning with a participatory approach.

The *third chapter* resumes the conceptual framework and the *fourth chapter* gives the introduction to the applied methodology. In Table 2 it is represented the methodological approach and the chosen method supported by a case study. With this base it was possible to develop a descriptive, explanatory and analytical investigation.

Table 2 Methodology approach. Source: author

APPROACH	STUDY	METHOD	TOOLS	CASE STUDY	RESULT
Epistemological Sociological	-Analytical -Descriptive -Illustrative -Explanatory -Explorative -Proactive	Qualitative	-Individual´s experience -Semi-structured interviews -Participant´s observation -PRA Tools	Object of analysis	-Pattern of Land use -Socio-spatial management model -Generalizable results
		Quantitative	Geo, socioeconomic data and official land uses		

- *National and regional planning framework*

The *fifth chapter* begins with the second part of the research through the explanation of Mexican planning policies background and framework; this chapter gives a general idea of the National context regarding spatial development. The *sixth chapter* is the introduction to the local case study, with the description of the metropolitan context of Puebla and the general aims of the Regional Development Plan Angelópolis.

- *Case study framework, analysis and proposal*

The *seventh chapter* represents the third part of this thesis, exploring the background and importance of spatial development in Cholula, its morphology among other socioeconomic, historical, and cultural features. This chapter describes as well the local planning framework in San Andrés and San Pedro Cholula. The *eighth chapter* analyses the case study with the pattern of land use and stakeholders' roles. Finally, the *ninth chapter* leads to the closing statements, strategies and a proposed model for local management.

In order to have a better understanding of the research process and chapters' development, in the Figure 1 is represented a general overview of the theoretical, and practical phases. Having described the first approach to the national context and the case study, in the next chapter, it is developed the state of the art related to urbanisation theories, agents of change and spatial planning to contextualize the object of study.

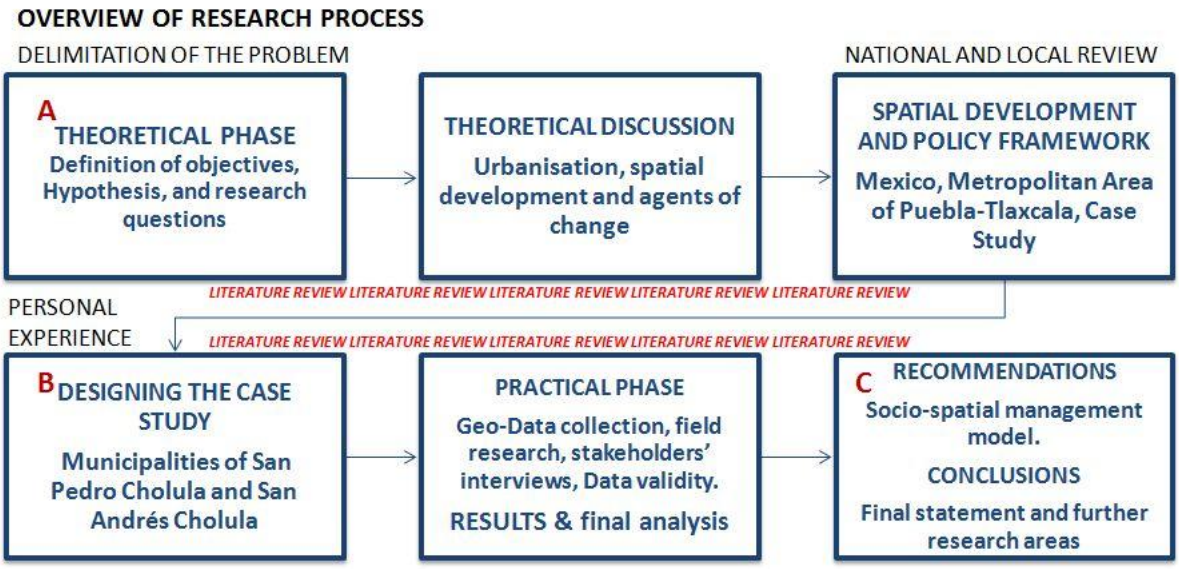


Figure 1 Overview of the thesis and research process. Source: author

Image 3 former rural land in Almoloya de Juárez, Mexico. Source: Archivo Familia Schumacher

II THEORETICAL ASPECTS: LAND, URBANISATION AND PLANNING

2.1 INTRODUCTION

According to FAO-UNEP (1999), land is not only a producer and provider resource, it has some basic functions as physical space for human settlements, industry, and recreation. With the goal of maintaining those provisions and productions, many land conflicts have occurred since the establishment of agriculture. The strong relationship between land and humanity is in a constant evolution and co-dependence. This relationship is visualized through the urbanisation phenomenon; which has been developed since the foundation of the first urban settlements in human history. Urbanisation always responded to different *zeitgeist* and contexts, being a definitive process in the conception of the urban life by the citizens.

This chapter refers to the state of the art related to urbanisation processes and stakeholders as agents of urban change. The first part of this chapter consists of a review of the different urbanisation theories over the last two hundred years; the general definition of the stakeholders as agents of change in those theories is developed. It is significant to understand that changes of population needs over time are responsible for how we approach spatial development. The second part of this chapter describes two elements that are inter-connected: **land and planning.** These two variables have a big significance in urban and rural development, mainly where the transformation of socioeconomic activities impact directly on the urbanisation process; leading to a general overview on spatial planning characteristics and participatory instruments.

PART A: URBANISATION AND AGENTS OF CHANGE

2.2 OVERVIEW ON URBANISATION THEORIES

With the industrialisation phenomenon during the 19th Century, the big urban areas of the western world became so centralised in politics and economic activities that the working and middle social classes expected to have a better quality of life inside and outside the cities. These were part of the first socioeconomic observations made by Marx & Engels (1848, p. 17) as one of the main causes of urbanisation; both thinkers stated *how "the bourgeoisie has subjected the country to the rule of the towns. It has created enormous cities, has greatly increased the urban population as compared with the rural."*

The different capitals' movements defined the urbanisation trends, which agreed that this process is delimited by population growth concentrated in urban areas or through demographics' transition from rural to urban (WHO, 2013). As a sociological reference, John Reeds (2011) named some historical reasons for urban expansion in countries like the UK, USA or Canada, like the pursuit of a rural nostalgia for the past which stretches the boundaries of the city beyond agricultural fields. As a consequence, the population is moved into individualism, car dependence, and single house property. Nowadays, in America or Asia, the scale surpasses the conurbation areas, changing the metropolitan areas into regional cities, megacities or *hyper-cities* (*ibidem, p.9)*

One of the consequences of the industrialisation period during the nineteenth century in European cities was the migration of rural population to the cities. On a structural level, a decisive factor of the decomposition of rural society was the contradiction between population growth, the decrease in mortality and the permanence of unproductive forms on land tenure (Castells, 1977). An effect of urban expansion through rural exodus was the increasing levels of pollution and public health issues. In the search of a better health policy, city planners such as Haussmann led the urban renovation of the City of Paris; in the UK the urban renovation was led by Sir Raymond Unwin who developed the planning of *The Garden City* – based on Ebenezer Howard's utopian ideas – his work was a big influence on the development of the *Local Zoning* in the United States after the First World War.

The local zoning was used as a template for the creation of new urban and suburban districts, instead of containing and controlling the existing areas (Wickersham, 2006), which contributed to the consumption of rural land for housing and commercial purposes. This form of spatial development resulted in a *Suburban Nation* or suburbanisation process (Duany, Plater-Zybeck, & Speck, 2000) without mixed, concentrated land uses; classified by Harris (1999) into residential, industrial working class suburbs and unincorporated areas.

One of the main features of suburbanisation that differs from the 19th Century model was the economic and social segregation, where Blakeley & Snyder (1999) argue the trend of gated communities propitiated the privatisation of public spaces and the exclusion zoning on density codes. Wickersman (2006) states that density codes affect the land use change over the periphery, where low-density and residential zoning experience had overpriced the cost of developable land, mainly due to the infrastructure and services provision. Wickersman agrees that these disparities between old and new urban settlements reinforced the patterns of community segregation.

During the 1950s and 1960s, researchers like Lehner (1970) analyzed the relationship between the urban growth of the cities and transportation development through the measurement of traffic distances in working and residential areas. This condition that extended in many forms the physical size of the cities obeys as well to socioeconomic changes that contribute to urban expansion. For this period Font (2004) recognises the following stages of urban transformations:

a. **Changes in urban growth,** population increased in land far from the central core
b. **Decentralisation of industrial and commercial activities,** spatial development located into periphery
c. **Population mobility,** changes of residential areas to the urban fringe
d. **Flows of goods and population,** need for more infrastructure connections
e. **Fragmentation of the environment and natural reserves**
f. **New centralities,** development of new urban areas

During the subsequent years, urban sociologists and economists began to study the city not only as a structural object but also as a living element with many social, political, and ideological contexts. The theoretical viewpoint was named as a C*ritical Urban Theory*, described by Brenner et al. (2012) in the work of Castells, Lefebvre, Marcuse, and Harvey. Another pioneer in urban studies was Jane Jacobs (1961); she studied social negative impacts on the exclusion of suburban development which causes *"borders that divide up cities into pieces"*. The thin line that divides urban from rural land segregates communities, neighbourhoods, and economic activities at local level.

In addition, there is an evident difference between developed and undeveloped countries. McGee (1971, pp. 19-20) states that the phases of industrialisation, urbanisation, and changes in the social structure should be measured by variables as: "*technologies of birth and death control, and the socio-cultural system of the society undergoing transition…thus rational birth control became part of the urban, middle class way of life"*.

Undoubtedly, urban areas are reaching bigger scales, such as the *regional city* (Marchand & Charland, 1992), where the urban structure and the distribution of population are not completely heterogenic. The influences of these major regional urban areas grow beyond the cores, municipalities, districts and even country boundaries. The growing scale and land use is shown in five different components (Duany, Plater-Zybeck, & Speck, 2000): *housing subdivisions (or clusters), shopping centres, office parks, civic institutions and roadways*.

The resulting structure of urbanisation over the territory became known as *Mega Regions*, *Global Cities* or *Metapolis,* defined by contemporary theorists as François Ascher (2011) and Saskia Sassen (2001) who named that the urbanisation structure generates *hyper-text societies* with a clear spatial economy: new mobility systems, new technologies, system production and knowledge, new collective and individual interest, etc. These new elements mobilised the cities though networks that transform the urban places into "*sites of power"* (Allen, 1999).

Regarding those new production and mobility systems, Rem Koolhaas (1995) argues that the mobility and extension of the metropolis presents a good opportunity to re-evaluate the periphery;

to break the dependency on central cores and to rethink new services, especially when the urbanisation takes place outside the former urban settlements – through sprawl –.The vision of Koolhaas concurs with the 21st Century trend of transforming urban areas into more "human cities", with affordable housing, sustainable activities, mobility through public transportation, democratisation of public space, etc. Jan Gehl (2010, p. 3) retakes the postures of the 1960s, which planned to recover social space, with the distinctiveness that nowadays

> *"The market forces and related architectural trends have gradually shifted focus from the interrelations and common space of the city to individual buildings, which in the process have become increasingly more isolated, introverted and dismissive".*

Along with the movement of recovering territorial social space, Lefebvre (1974) postulates that space is built by individuals and their context. A clear example of Lefebvre's statements on spatial development are the "*grey zones or gray spaces*", linked to people and places' dichotomy between "*lightness of legality/approval/safety, and the darkness of eviction/destruction/death*" (Yiftachel, 2012). The morphology of these peri-urban and urban areas is creating different social relations that are getting divided and separated from other social groups and urban forms. This tendency in a globalised world is unifying the conditions of socio-spatial exclusion.

2.3 CONTEXTUALIZING PERI-URBANISATION

Since the Industrial Revolution in the 19th Century, the shape and size of the cities around the world changed drastically the needs and habits of the population. The conception of the rural world became diffused between the romantic ideals of a country life-style and the decrease of the agricultural activities. The industrialisation of the economy introduced the urban to new social classes like the working class and the *bourgeoisie*. These new groups displaced the farmers' needs through infrastructure, urban goods, working and housing areas.

Within this context, people became more attracted to urban life than to rural life, due to the goods, services, transportation, work and in general a better quality of life inside the urban areas, in comparison to the country side. These changes in society made the urban peripheries "*the most common type of living and working situation in the world in the 21st Century"* (Ravetz, Fertner, & Nielsen, 2013, p. 13). Nevertheless, the idealisation of the rural world in an industrialised economy created a new landscape structure, like the *garden-cities* and the phenomenon of the second residences or summer residences in many countries of Europe.

Besides the rural nostalgia, the attraction towards the urban life-style generated another type of socio-urban change: the formation of diverse spatial systems beyond the rural territory, understood as **peri-urbanisation**. This process observed between urban borders and rural areas became of interest for land developers and informal settlers. Its main features are described by Webster & Muller (2004, p. 282) as the following:

1. *Economic structure* – Transformation from agricultural activities to mass-production
2. *Employment structure* – Transformation from agriculture to mass-production
3. *Population growth* – Transformation of city's size and population´s numbers
4. *Spatial development* - Transformation land values

Those characteristics habitually create chaotic patterns and a "*monumental public agenda" (ibidem),* which normally exceeds the management capability of authorities and planners. Peri-urbanisation has many different traditions and forms, starting from the imminent transformation of existing settlements from a rural to an urban structure (UNFPA, 2007); however, this statement does not mean that new urban localities in the peri-urban areas lose all their rural features. On the contrary, these rural features inside urban manifestations are taken into consideration for this research to understand peri-urban growth that prevails in several Mexican cities.

It is noteworthy that the literature related to the topic is quite vast and varies depending on the research époque, the author's region or sector. The research is based on the European planning tradition and the United States' urbanisation experience as the theoretical background to comprehend the Latin American phenomenon of peri-urbanisation, being Europe and the United States the biggest extern influence on Latin American morphologies.

2.3.1 MORPHOLOGY OF PERI-URBAN GROWTH

2.3.1.1 THE RURAL-URBAN FRINGE

Throughout the years, spatial development has a particular impact in the city and countryside. In most literature and studies, the collective thinking uses two concepts in order to define two contradictory and juxtaposed ideas: *urban* and *rural.* The evolution of both terms changes from the original notion of countryside-city, for example, to one with more than one characteristic like urban areas, according to the UN (2012, pp. 2.81.- 2.88)*:*

> *"…classification by size of locality can usefully supplement the rural-urban dichotomy or even replace it where the major concern is with characteristics related only to density along the continuum from the most sparsely settled areas to the most densely built-up localities."*

In the same report, the UN recognizes that there are so many differences by country; their experts establish the locality size as a **unit** for the delimitation of city-countryside. This delimitation appears to be more familiar to density, scale and land use data, changing from one region to another, rather conventional landscape. In this aspect, the UN (*ibidem)* differentiates

> *"the traditional distinction between urban and rural areas within a country has been based on the assumption that urban areas, no matter how they are defined, provide a different way of life and usually a higher standard of living than are found in rural areas. In many industrialized countries, this distinction has become blurred and the principal difference between urban and rural areas in terms of the circumstances of living tends to be a matter of the degree of concentration of population".*

A rural area has many interpretations and definitions, such as "*regions with low population density and large amounts of undeveloped land*" (National Geographic, 2015)*;* which can be delimitated with statistic indicators like the population size, density, and economic activities.

In the report for the FAO "Guidelines on social analysis for rural area development planning", Conyers (1993) established guidelines for rural planning. In this document she uses indistinctly the terms rural area and rural development. Conyers observes as well that planning is more defined by social characteristics and agricultural economy than delimitated zones. For either case the fact remains when the terms territory or region are used to differ one place to another; because in this

case the region "*may be defined as any place that is bounded to some degree by barriers to perception*" (Goffman I. , 1959, p. 106). So, the delimitation can have different definitions of scales, individuals, territory.

Having defined both terms, these concepts corresponding to population evolution and urban scale have changed completely how population conceives what is urban and what is rural. Nowadays, the traditional *rural landscape* coexists with high populated urban agglomerations from other parts of the world, which generates an urban-rural split. That is why many different sub-concepts emerged inside this overlapped territory, such as the *urban fringe, rural-urban fringe, suburban fringe, urban boundaries, suburbs, metropolitan areas, satellite cities, periphery, peri-urban, etc.* The main idea of this concept was originated through the urbanisation phenomena, which resulted as the foreland in many urban processes like metropolisation or gentrification. Those and other processes have a major impact at a local, regional, and territorial level.

The conceptual effects are shown at a later stage; meanwhile it is important to name the different definitions concerning city-countryside. The first visible land problem in the city-countryside was observed by T.L. Smith in 1937 and quoted by Robin J. Pryor (1968, p. 202), Smith defined the urban fringe as "*the built-up area just outside the corporate limits of the city*" as the urban fringe. On the contrary, Wehrwein (1942, p. 217) is not so convinced about a *built-up* area, and prefers the transition between land uses. He divides the spatial planning into three types of boundaries:

- The area between arable farming and grazing.
- The zone between farms and forests.
- The suburban area lying between the built-up city and farms.

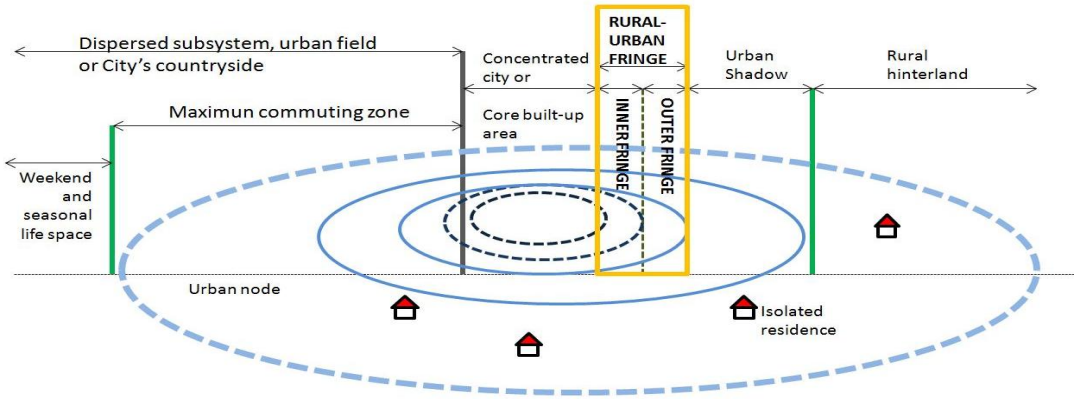


Figure 2 Regional city with the incorporation of rural areas. Source: Adapted from Bryant, Russwurm (1982)

The last area was defined by Wehrwein as a "*twilight zone-rural-urban fringe*" (*ibidem)* where this conversion zone is formed by "*urban land uses and devoted agricultural areas*". Likewise, it should be noted that during this time the rural areas were more related to agricultural activities. This condition evolved with the post-war periods and the search for more space for living and privacy (Dewey, 1948). Researchers like Zimmer and Hawley (1961) began to note the consequences of extending the housing areas through the rural zone. Other authors like Martin J.Elson (1986) state that these types of boundaries between urban agglomerations and rural areas are creating elements for emerging patterns.

Even nowadays there is still not a single definition for rural-urban fringe patterns, a well-accepted term is formulated as "*the transition zone between the city and its suburbs, and the countryside*" (Mayhew, 2009). In addition to the rural concept as rural-urban fringe there is a **mixture of land uses** in the transition area from urban to agricultural land (GEOCASES, 2005). Besides, this apparently incompatible land could blend into territory uses in the urban-rural areas (Marchand & Charland, 1992).

The last definitions are part of urban development which is not always in line with land policies or friendly to the environment. More often, the effects of land use change over the territory have long-term impacts on economy and population. Bryant, Russwurm & McLellan (1982) named the urban incorporation of the rural land as a transcendental area of our territory, divided in "*inner and outer fringe*" in form of a "*regional city*", showed in Figure 2. They claim that even sometimes the vital resources contained in these green and vast areas are undervalued. When the city is swallowing up the land, the competition for tenure, exploitation, urbanisation and speculation begins. For other authors like Webster& Muller (2004) named peri-urban areas instead of urban fringe as part of a suburbanisation practice where the rural areas have an increasingly urban nature. This definition is shared by Douglas (2006) with the vision of a rapid modification of the landscape due to human activities. Daniels (1999) preferred to name this area as "metropolitan fringe" where there is a distinction between consolidated suburbs and urban-rural boundaries

Having different meanings and perceptions of the city boundaries and the rural-urban fringe, this research chose the formal term of **peri-urban area**. Having several descriptions and personal observations, for this investigation, the peri-urban can be divided and synthesized into three main structural characteristics:

a. *Spatial* – visible growth pattern of low density and dispersed population.
b. *Functional* – **o**verlapping and changes of land use, mainly from rural to urban.
c. *Social* – migration of population to new settlements or sub-urban cores.

The spatial and functional characteristics had stabilized in the last decades without diverging from the growth pattern but becoming more dispersed. On the contrary, the traditional rural-urban migration from the 19th Century changed radically in the current century where urban population moves to the urban fringe due to gentrification, economics, "life-style", affordable housing, etc.

From the juxtaposition of city/countryside, nowadays the contemporary layouts of peri-urban development have grown into a more diffuse concept. City planners like Eduardo Terrazas (2012) claim that there is no definition between rural and urban anymore because the city no longer exists because is replaced by the region. This regional difference and definition is shared with the peri-urban observations of Ducrot, Bueno, Barban & Reydon (2010), who emphasize regional planning.

Notwithstanding, it should be noted that there are even variations in the rural/urban boundaries by localities. For example, Barsky (2005) points out the difference in countries like the UK, Canada or the United States, where the concept is more related to the *garden-city* as a housing area for middle-upper classes. Barsky defines the rural-urban fringe as a "*border territory*" and states the differences with Latin American countries. For him the Latin American periphery is related to the informal

city, an unplanned urban area with social conflict but also with contrasts with wellbeing like luxury condos or gated communities.

An interesting difference from the 20th Century urbanisation to 21th Century peri-urbanisation is the consolidation of a "*regional hybrid landscape*" (Pócsi, 2011). This contemporary difference has mainly an urban character, where big metropolises that originated from a compact city model lead to extended conurbations across the cores. As a consequence, the ecological and social impact is very high.

Regarding the development of peri-urban areas, Blais (2010)agreed that consumption of land over the rural-urban fringe has been studied and discussed during the last years. The high cost of taking all the services to the population, the long travel time to work places, the loss of farm land, illness produced by air pollution, and socioeconomic segregation are part of the consequences of extending urban settlements. Blais comments *"Cities are expensive to build but slow and even more expensive to change" (ibidem, p.4)*. In view of all the above, what is the urban morphology that is shaping a physical peri-urbanisation pattern inside and outside the cities?

2.3.2 PATTERNS OF PERI-URBAN GROWTH

The urban form is not only defined by geography or a human activity, on the contrary shaping it is a constant transformation of processes and patterns that give form to urban structures. This meaning can be understood as morphology or urban-morphology.

The scales for morphology study can go from individual plots to spatial development, especially for the observation of population movements through the urban growth and how these movements or socioeconomic transformations are affecting the size, form or density of cities, metropolitan areas, peripheries, historical centres, or even neighbourhoods.

Since the II World War, big urban transformations changed the shape and size of the cities. More migration to the main urban centres expanded the cities outside the cores and the traditional compact city changed into regional urban areas, with many scales of management and administration. For Latin American cities, the traditional urban grid broke and other forms of sub-urban centres merged inside and outside the cities, especially the morphology dictated by informal settlements and real estate markets.

To understand better the background and development of urban morphology, the work of Lewis Mumford is essential for urban studies. In the Spanish language, the work of Joan Busquets and Manuel de Solá-Morales are important as well; nonetheless this research is not focused on explaining the form of the traditional city; on the contrary, it will try to introduce the reader to one of the most problematic management patterns inside peri-urban and urban areas: urban sprawl.

2.3.2.1 URBAN SPRAWL

The configurations of metropolitan areas do not have a single growth model. It is as diverse as its social, economic and urban factors. But one can trace a constant pattern, especially when uncontrolled land use and unplanned land expansion is presented through urban sprawl.

During the 20th Century, most of the explosive growth in world cities generated the spread out of urban areas through the countryside. Having already defined the relationship between rural and urban areas, the peri-urbanisation impact through sprawl is described by C. Soule (2006, p. 3) as:

> *"Low density, auto-dependent land development taking place on the edges of urban centres…away from current denser development nodes, to transform open, undeveloped land, into single-family residential subdivisions, commercial office parks and diffuse retail uses."*

Even though there are accepted definitions like the last one, authors like Franz; Meier & Schröck (2006) point out that it not so easy to establish one single sprawl definition. In fact, the authors named different difficulties in the statement of sprawl:

- The term is used in both scientific and political discussions.
- It is used with different perspectives.
- The term is so open that it leaves space for different interpretations.
- Characteristics and consequences of sprawl are commonly confused.
- Sprawl is so similar to suburbanisation or suburban development it is difficult to differentiate.
- No clear consensus for its measurement due to the variety in definitions.
- Sprawl could define a situation as well as a process, so it can get confused.

The origin of the term is quoted by Wassmer (2002) as a negative definition for land consumption by Earle Draper in 1937 and William White in 1958. Although the primary influence of sprawl through the *garden-city* was an influence provided by the UK, in the United States the urban sprawl is contemplated as a process and consequence of suburbanisation with many detractors and defenders. Till the decade of 1990, urban sprawl stopped being a characteristic of United States urban problem and began to be accepted in other regions of the world such as the Mediterranean countries, Asia, or Latin America.

Other definitions for sprawl are established by Castells (1977) who affirms that sprawl is a functional and structural phenomenon in rural and urban areas; it has as well consequences in urbanisation through new socioeconomic activities, which destabilizes the traditional culture. From the same period, Brueckner & Fansler (1983) named one characteristic of urban sprawl as "*vigorous spatial expansion of urban areas."*

A similar definition is presented by Ralph Willmer (2006), who adds the "*segregated land use".* The spatial expansion of the metropolises responds to different population demands and processes like housing, land speculation, metropolisation, urban polarisation and sprawl. With regards to this last term, as her personal definition Pamela Blais (2010, p. 86) defines sprawl as *"an inefficient land-use pattern with the wasteful and non-productive resources".* For her, it is possible for suburbanisation or urban decentralisation to exist without sprawl, but it also depends on the land use cost. These land uses are related to the elevated expenses of public services' provision, obesity related to car transportation, loss of agricultural land, and all the illnesses related to air pollution that make the sprawl a public problem. Urbanists like Duany, Speck & Lydon (2010, p. xii) support climatologists

and environmentalists that link sprawling with climate change and other groups that relate this urban phenomena with dependence on oil, bad quality of water and epidemic diabetes and obesity.

As a pattern Galster et al. (2001) define sprawl as the combination of eight distinct factors of measurement: **density, continuity, concentration, clustering, centrality, nuclearity, mixed uses, and proximity.** These factors align with contemporary examples where not only the housing and suburbs are interlinked, also the construction of retail areas, industrial and business parks, or new infrastructure.

For Oliver Gillham (2002) the description of sprawl is essentially a suburban phenomenon "*beyond city's limits*" where the low density favours dependence on cars and the unplanned pattern of land use. But this form of urbanisation can be developed outside metropolitan areas, without connections to the core city. The author quotes Reid Ewing' rules that highlight a series of urban factors:

- *Leapfrog or scattered development* – subdivision of farmland with **high land consumption.**
- *Commercial strip development* – arterial roads or infrastructure with shopping centres, gas stations, restaurants, banks, industrial parks, etc. The use of cars is primary.
- *Low Density* – **housing in peripheral or suburban complexes**
- *Large expanses of single-use development* – **through low density, the single-use is associated to segregation of land uses**.
- *Poor accessibility* – the **distance** between urban periphery and local destinations used to be quite big, as a consequence of reliance on cars. Having few alternatives to using public transportation.
- *Lack of functional open or public space* – in most housing complexes, **the open areas are taken** for parking, more houses or for the construction of more commercial buildings.

These structural alterations of sprawl development are analyzed in Indovina's paper *La Cittá Diffusa* (1990). This concept, is commonly used as a synonym for sprawl in Mediterranean and Latin American countries, where the author affirms that former structural territory of central cores, has been changing into a new urban phenomena, where the reorganisation of economic activities of population, change the organisation of land into different hierarchies:

- A **regular urban mass;** population, services and productive activities are consistent.
- A **dispersion of the urban mass** in the vast territory, which does not lead to high density levels.
- A **high connection** between different areas in the territory. Multiple connections as infrastructure provide a high degree of internal-external mobility.

On this last point, the connections can generate a "*ribbon pattern or linear city*" over the roads. As Indovina points out, this is the configuration of dispersed, disseminated, diffused, territory. Sprawl is also considered a process that segregates social classes and influences the perception of the landscape. In this case, Nuno Portas (2004) named this morphologic rupture as discontinuity and fragmentation in the concurrence between historical city and contemporary city.

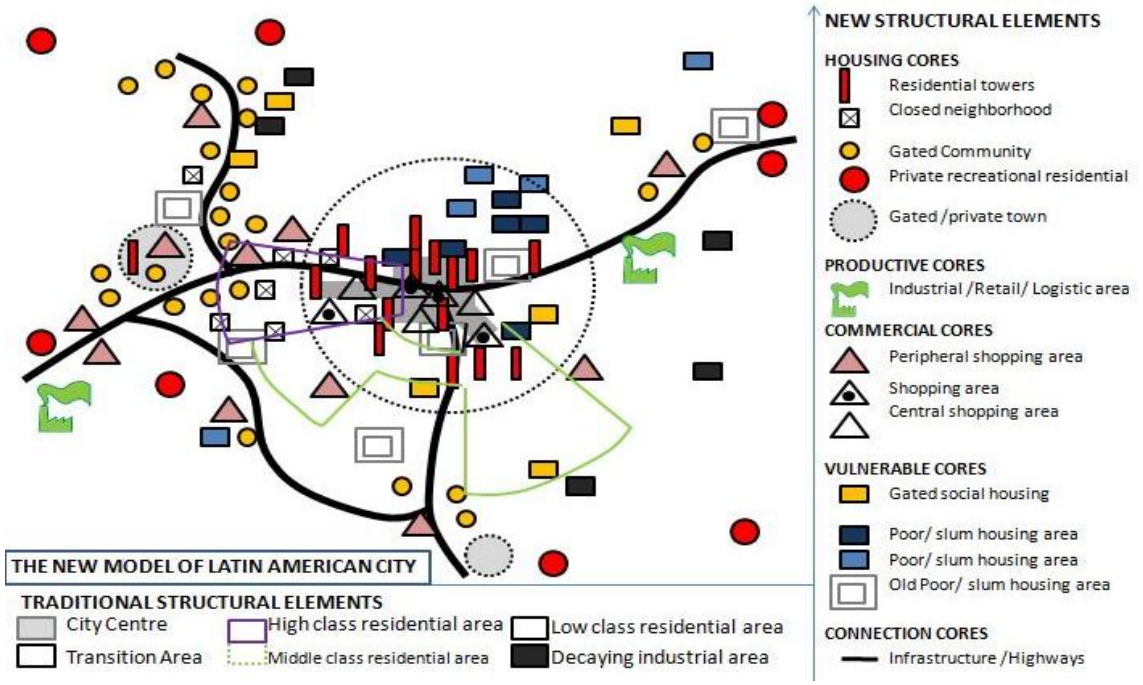


Figure 3 The new model of Latin American city. Source: adapted from Janoschka (2002)

The road-network pattern is as well based on the transportation transformations that a car-based development has created among suburbs and new working areas. According to Zahavi (1980) the relationship between urbanisation, mobility and infrastructure defines the city as a complex system "*not only delimited by a group of settlements*".

For Zahavi, mobility plays an important role that transforms the urban structure and growth. In this regard, sprawl does not contribute to improving mobility options, being the automobile the residents' necessary transportation system. Ewing & Cervero (2001, p. 87) state that one of the visible problems is that "*roads cannot be built fast enough to keep up with the travel demands induced by road building itself and by the sprawling development patterns that it spawns. Travel demand must somehow be moderated*". According to the authors, travel and urbanisation built the environment.

Inside the megacities or regional cities, the development of urban sprawl can be developed inside the city and not only through the peri-urban area (Masum, 2012). These interior urban areas are also developed through uncontrolled urban growth as a result of depopulation of core cities, where big gaps inside urban areas develop and are filled without any type of planning. This pattern is very common in Latin American countries, but more focused in the illegal or informal occupation of buildings or abandoned areas. This is the last main difference of urban sprawl that is useful to mention for our object of study.

Other differences between the United States' sprawl and Latin America's pattern are described by Lungo (2001).The first one, as was mentioned before, has a tendency on middle-class and residential occupancy with infrastructure and retail areas; and the second one is more connected to illegal land use, lack of infrastructure, or public services. The author lists some disparity facts of sprawl in Latin America like:

- **The delayed urbanisation process in most of the countries in Latin America**, where the agricultural economic model still exists.

- **The centralization and dominance of major cities**, with an attractive urban growth in the boundaries.
- **Growing of informal human settlements outside the limits of urban regulations** mainly condemned to the ostracism of authorities and private sector.

For Janoshka (2002) the illegal land occupation is not the only facade of urban sprawl in Latin American countries, the author names others like fragmentation and privatisation of the city as a consequence on the changes of population´s habits and consumption. From the same urban studies, Gormsen (1981) observed that since 1950, the influence of the suburban housing model and shopping malls of the United States, the metropolisation opens widely the urban borders, socio-spatial activities, and housing locations. Although this is still a consumer preference for suburban housing in many American countries, when a location *"with a more complete set of housing choices, compact development can hold its own on the market place*" (Ewing & Hamidi, 2015, p. 4).

To represent these preferences on socioeconomic and socio-spatial dynamics, Borsdorf, Bähr & Janoschka (2002) defined four elemental model periods in urban development: "*the colonial, the sectoral, the polarised, and the fragmented*". The last two are generating new structural elements, represented in new housing and retail cores circumventing the infrastructure, see Figure 3.

Borsdorf (2006) observes that Latin American city is changing from being a "*Kultursymbol*" to a privatised-excluded model. This case is developing sprawling models at a national, regional, and local level; in the particular case of Mexico where not only the informal urbanisation is generating sprawl. As will be seen in the next chapters, the Cities of Puebla and Cholula are facing economic and population growth. This context is creating massive social housing and residential-gated communities all over the former rural land, extending the urban areas, dispersing the population with a low-density profile that is consuming land without any type of control.

2.4 AGENTS OF URBAN CHANGE

The socioeconomic and political processes displace populations from one place to another; generate different types of needs and activities, transform landscapes, and reshape development goals of every country. Inside these transformations, citizens are completely involved with different roles and interests as stakeholders. Their interrelationship among stakeholders and the different public management levels is essential in spatial development and planning, especially when "*the boundaries between sectors became more permeable and at the same time allows for cross-sector collaboration in urban development"* (Robert Bosch Stiftung, 2013).

Such circumstances are observed by David Harvey (2013) who affirms that a radical urban change is transforming the traditional view of urban-rural and the lifestyle of the society in the pursuit of a better "*quality of urban life",* where the needs for security, entertainment, consumerism, commodity, technology; and integration into a globalised economy are jeopardizing the sustainability and capacity of the territory regardless of the environmental, social, or political cost. Those named changing needs are part of prevalent forces or processes of urban change, environmental impact, suburbanisation, gentrification, climate change and other problems

correlated to socioeconomic processes that impact a very vulnerable activity such as land use (World Bank, 2013).

Van Vliet (2002) states that if the cities are places of economic growth, they should be taken as opportunity agents of change, especially because of new forms of urban connection with many management challenges as urban liability, and governance. Using the author's concepts and the World Bank examples, Table 3 lists some of the most important processes that act as agents of urban change and had a remarkable impact on spatial development's reconfiguration all over the world. The list is classified in the different periods of urban growth and the patterns that have been produced as a result.

Table 3 Agents of change in urbanisation. Source: author

PROCESSES	IMPACTS	PATTERNS	CHALLENGES
Industrialisation	Land Use change	Urban Sprawl	Governance
Suburbanisation	Climate change	Social stratification	Community Planning
Peri-urbanisation	Public Health	Privatization of space	Sustainability
Metropolisation	Mobility	Density change	Services access
Gentrification	City Networks	Regional city	Health
Globalisation	Morphology	Informal urbanism	Mobility
	Population needs	Peri-Urban growth	Land tenure

Most of the processes have as general commonalities the impacts, patterns and challenges; in particular in the 21th Century urban areas, the land uses, climate, mobility changes or population needs are challenging the urban governance, sustainability, and land tenure. All of these processes and patterns that act as agents are driven by different scales, being the human scale the most important for this research and the origin of many urban issues.

This research focuses on Peri-urbanisation in order to recognize the different patterns of land use and challenges on spatial planning, especially with the recognition of involved stakeholders.

Within the human scale, individuals are taken as actors or stakeholders that participate with different roles or concerns in spatial development. They can be decision-makers in many socioeconomic contexts which make them imperative agents of change. The decisions, roles and interests of stakeholders that interfere in the rural and urban life are outlined by Hannerz (1980). He states that transformations depend entirely in how the individuals use the space and how they interact with the land and with other individuals. Hannerz adds that those relationship interactions are based on a "*grey zone*" of power and exchange (p.97).Complementing this posture, Low (1999) notes that interactions between stakeholders are significant "*social relations, symbols, and political economies*".

Not all agents can be stakeholders and *vice versa*, rather than defining the agents of change as processes or contexts, this research defines the agents of change – in the human scale – as population groups or individuals that take part in the conversion of different urban processes. The stakeholders may be agents of change as well but the difference is that they can have an individual or collective interest or may have the advantage of being in a decision-making position.

According to the World Bank (2001), stakeholders are agents of change that can drive positive or negative changes through the accomplishment of tasks or goals. Schmeer (1999) defines the stakeholders as actors that can be individual persons or organisations. The author groups them into "*international/donors, national political, public, labour, private/commercial for profit, non-profit, civil society and users/consumers*". Those definitions are associated with policy makers, and can be understood as part of a planning process in spatial and urban development. For example, the ODI (2009) proposes that a stakeholder is a person that "*has something to gain or lose through the outcomes of a planning process or project*". This point is also shared by Mathur et al. (2008) who state that it is crucial to recognize the affected actors by projects or plans and that they should be considered as key stakeholders.

The Latin American perception of stakeholders is linked with the terms "social actor" or "urban actor". Pírez (1995) identifies them as decision-makers and implementers that influence the local reality. Additionally, Pírez recognizes the significance of stakeholders at a local level and depending on the group they represent, their influence on the policies, the management, the planning or the projects. This research takes the definition of Mathur and Pírez, as individuals or collectives that represent, decide, and are affected by socioeconomic and cultural issues.

As individuals, Brenner et al. (2012) quote the importance on an "*actor-network-theory*" or ANT, developed by Latour, Callon, and Law. This theoretical approach suggests "*assemblage-based*" studies where *"networks are understood to be working alliances of multifarious composition"*. The stakeholders-network is useful to understand the complex socio-spatial development process when the globalisation is creating more scattered and separated socioeconomic groups.

PART B: SPATIAL PLANNING, A PARTICIPATORY APPROACH

2.5 LAND FEATURES

Land - source of life - is not only the physical composition of Earth's surface and besides, many organisations and UN´s agencies agree that land is also:

> "A*n important factor in the formation of social and cultural identity …It is also an enormous political resource, defining power relations between and among individuals, families and communities under established systems of governance."* (IFAD, 2013).

This definition explains in some way the consequences on population growth and socioeconomic needs; where land is becoming a "*scarce resource increasingly affected by the competition of mutually exclusive uses"* (Engel & Pickardt, 2011). In the last decades, the big demand on developable land – mostly in the peri-urban borders – has increased every year through urban growth of the mega-cities. Meanwhile the rural areas are losing ground because of population movements, gentrification, land grabbing, degradation, and other matters related to the satisfaction of human needs like food, health, work, and shelter.

Why is land so valuable? Why are there so many stories of land conflicts, land exploitation, and fights for land rights and tenure? It is clear that land is a food, living, and growth supplier and in the

satisfaction of those supplies; the association between mankind and land has always been co-dependent. Land as a primary element has "*particular and extraordinary features*", best explained by Kivell (1993, pp. 13,14) as important patterns to understand land development:

a. *Fixed supply* – No one can create more land; however a bigger land use can increase the effective supply and the amount available locally.
b. *No cost of supply* – Land can be considered as a "gift of nature" with no cost of creation
c. *Unique/irreplaceable* – Each plot of land is unique in terms of size, configuration, physical characteristics and location
d. *Immobile* – Land is permanent and cannot be moved
e. *Permanence* – Land is permanent, it may be altered or damaged and it may be subject to the law of diminishing returns, but in the urban context it is generally indestructible.

As the author states, land is an **irreplaceable, permanent element** and one of the main reasons why society mistakenly believes it is an inexhaustible resource. The Agenda 21 (UN , 1992) shares the same vision and defines land as a "*finite resource, while the natural resources it supports can vary over time and according to management conditions and uses*". Conversely, the historical cohabitation of humanity and territory, made the first human settlements to define the classification of land uses and tenure as a way to control future production systems.

With the historical improvement of those production systems, the different densities and growing patterns reveal a higher demand for urban land; however, there is also a big need for extended agricultural fields to meet the demand on food supply. More than that, E.F. Schumacher (1973) suggests that "*civilised man has despoiled most of the lands on which he has lived for*". The dialectic between those human needs create bigger conflicts on the tenure of agricultural land, size, shape or urban areas.

According to contemporary statistics, more than 53% of the world's population lives in urban agglomerations (World Bank, 2013). So, it is undeniable that our society is an urban society, integrated by housing areas, infrastructure networks, working areas, etc.

A negative evidence is the gap between poor and rich people that keeps increasing; besides housing, education, and health are becoming pauperized, scattered and turn into privilege rights. In the search for those rights, land outside and inside the cities is getting more expensive and more inaccessible, making it a play-ground for land speculators and other stakeholders that have an individual economic or political interest.

Within the last paragraph observations, it is essential to debate about land as a vital element for humanity, where different society components give shape, identity and socioeconomic value to a piece of ground. These components were originated in the perception of "what is rural?" and "what is urban?" are given by the different stakeholders' interests that affect intrinsically/extrinsically the land use development.

In this matter, the planning practice plays an important role as an agent of change in spatial development.

2.6 SPATIAL PLANNING OVERVIEW

The nature of land through spatial development is well defined by Mumford (1961), who states that **movement and settlement** are one of the main activities of human life. Those two actions precede basic needs such as breeding, shelter, security, food in the first rural communities.

The evolution of basic human needs developed the first transformation of the territory, generating different land uses that have always correlated with the foundation of settlements. Throughout human history, the advancement of different needs shaped and changed the morphology of the cities and their rural areas, always having in mind the ideal space for citizen living, production, or class distinction.

According to historical heritage, such as the ancient cultures, the Renaissance in Europe or the public use of space in pre-Hispanic America, planning practice was not formally established in many countries till the 19th Century; when the industrialisation of urban areas expanded their size and capacity to receive new working migrants.

Nonetheless, the massive urban growth in the 20th Century surpassed industrial planning, generating another human issue: **the need for developable land.** On one hand this need is associated to the growth of informal settlements, economic districts, food security, and suburban areas. On the other hand the need for developable land is connected to the protection of the environment, the rural areas, nature, shelter, food security, among others. Nowadays, both are threatened by aggressive economic and neoliberal policies that allow land speculation.

The above reasons include many different specialist areas that lead to a general spatial planning. From economics, nature, agriculture, water, services, health to architecture, and urban development, spatial planning "*aspires to be an interdisciplinary and cross-cutting coordinator of sectoral policies and decisions with spatial impacts, including those concerned with the environment, infrastructure and regional economic promotion"* (Reimer, Getimis, & Blotevogel, 2014).

Being an interdisciplinary practice, experts like Dühr, Colomb & Nadin (2010) describe that spatial planning includes "*diversity as an asset"* as a cultural fundamental value that will lead to respectful urban land management. While this description is located in the European context as part of the "Territorial Cohesion Principles", it can be applied to other planning concepts across the world. The following section describes the general definition for spatial planning and which concepts and instruments better suit the Mexican context.

2.6.1 TERMINOLOGY & DEFINITION

The definition for spatial planning has different connotations according to scope in many countries. Additionally the development visions may change depending on the current urban, rural, or economic issues of each territory.

First of all, the term "spatial" is defined as "*relating to space and the relationship of objects within it*" (Merriam-Webster, 2014). Those object relationships consider a wide range of vital and non-vital subjects with elements that interact in different scales and contexts (Lefebvre, 1974). This approach is the base to planning, developing and regulating every activity related to land or to the territory.

The word "plan" is defined by the same Merriam-Webster dictionary as "*a set of actions that have been thought of as a way to do or achieve something*", this definition complement the term "planning" as the *"establishment of goals, policies, and procedures for a social or economic unit"* (*ibidem*). The description made by Bruton & Nicholson (1987) differentiates between the *"general activity of planning or policy making"* and the "*physical planning"*. The authors clarify the first distinction as a procedure and the second as a physical design, meaning that planners should be concerned with this linkage between socioeconomic, cultural, historical issues in the urban and rural areas; as well with the linkage between housing, education, services, work, recreation, etc.

According to each cultural root, the spatial planning term, may have other synonyms and significances like: town & regional planning (UK), *Raumplanung* (Germany), *Aménagement du territoire (France), ordenamiento territorial* (Mexico, Peru), *planificación territorial* (Spain), among others. Other related terms that can be used as a synonym or variant is the land use planning, however in Spanish the word *land* can be translated, used, and related with different meanings as: *tierra, suelo, territorio*; however in Spanish there are some meaning differences between *tierra* (land), *suelo* (soil) and *territorio* (territory).

For the purposes of this research the term spatial planning is used to cover the elements of *ordenamiento territorial* in Mexico: *planeación*, *uso de suelo, territorio.*

Formal definitions are established by the UN (2008). For this international organisation spatial planning is "*usually concerned with identifying long- or medium-term objectives and strategies for territories and coordinating sectoral policies such as transport, agriculture and environment"* (p.5). This global scope focuses on countries in transition and is included in the Agenda 21, which remarks that *"it is desirable to plan and manage all uses in an integrated manner"* (p.10.3).

Other organisations like the OECD (2011) recognizes that spatial planning has two dimensions: "*functional and administrative",* which determine the different planning scales at national *"policy tool"*, regional *"shape development"* and local level *"land use regulation"* for every country. Besides the functional features, spatial planning can be as well multidimensional (Chigbu, 2013), due to the complexity of their resources like climate, population, territory, socioeconomic factors, etc.

2.7 SPATIAL PLANNING PRINCIPLES & OBJECTIVES

At a global regional level – in the case of the European Union – spatial planning is covered in the Territorial Cohesion Principles (Böhme, Eser, Gaskell, & Gustedt, 2008), recognizing the land's fragility and the need to design a European regional policy. The authors of this document define the Territorial Cohesion with five principles:

> "*recognize the territorial diversity, identify potentials in relation to integrated development strategies, acknowledge the territorial context, ensure fair access to infrastructure and services, and refine governance processes*."(p.3)

These principles are included in several European countries, like in Germany, where Turowsky (2002) indicates that spatial planning "*refers quite broadly to the various actions taken within a particular territory with the purpose of affecting or influencing the spatial development of the community, of industry and*

commerce, and of natural, built and social environment." Moreover, from the German perspective, planning principles are guided by "*sustainable regional development which will bring the social and economic demands made on an area into line with its ecological functions and result in a stable order which will be well-balanced on a large scale"* (Federal Regional Planning Act, 1997).

It is clear that each planning law system is concerned about the conflicts and impacts beyond the land, and recognizes the individual and cultural matters of each region. The planning responds to different land processes that include a wide range of interests. For many of the American countries' context, authors like Thomas (2001, p. 1.0) stipulates that spatial and land use planning are processes *"by which land is allocated between competing and sometimes conflicting uses in order to secure the rational and orderly development of land in an environmentally sound manner to ensure the creation of sustainable human settlements".*

Nowadays, one of the most common spatial and management conflict processes is the land and market liberalisation, where urban and peri-urban areas do not necessarily respond to a rational use of space. This is the case of many emerging economies, like in Latin America, where the "*land occupation responds to the basis of social need rather than legal procedure"* (Alvarez & Siembieda, 1997). This is a clear statement about how many human settlements are occupied and transform beyond the planning offices. This statement evidenced how the urban morphology of the cities is changing from the *"traditional monocentric structure of radial development towards a polycentric model*" (Carmona, 2000) meaning that spatial development is guided by multifunctional land uses and socioeconomic activities.

With reference to the above mentioned Territorial Cohesion Principles and the spatial planning principles established by UN (2008), five main objectives can be summarized on planning:

a. *Respect* – the nature of land.
b. *Protect* – vulnerable land uses and development through sustainable practices.
c. *Integrate* – spatial development with a community vision.
d. *Manage* – land policies, regulations, monitoring and control.
e. *Construct* – equitable, fair and just development.

Due to the multidimensional complexity of each land system, the general principles of spatial planning can be used for the Mexican context. For the National land policies, the multifunctional land uses are part of the current land development reality, however is not always taken into consideration. Within the protection of the vulnerable territory, the integration and management strategies should be reinforce in order to fulfill the development challenges in Mexico.

2.7.1 CHALLENGES

It is evident that the contemporary planners, urbanists, environmentalists, and other professions seek to integrate the variety of social groups in the conformation of rural and urban space, especially when the current requirement needs on developable land, food security, or housing. In the pursuit and achievement of those social needs, spatial planning has many global challenges; the UN (2008) states the most important:

a. *Globalisation* – trends of neo-liberal economy, influence of transnational companies, rapid growth of technology and communication.
b. *Sustainable development* – conscious management of natural resources, energy supply, environment, housing, etc.
c. *Regional integration.*
d. *Demographic change* – due to high population concentration in urban areas.

These global visions have a bigger impact in the different developing countries. According to the UNECE (2003) studies; the UN adds a list of regional challenges like: achieve a better variety of *densities and mix land uses, i*mprove *urban regeneration* in dense urban areas*, r*egeneration of housing estates*, i*mprove *community participation* for planning and interaction in public spaces*,* maintain the *cultural diversity* and recreational opportunities, improve *water and sewerage services,* and maximize efficiency and improvement of *public transportation*

According to the above list, the regional challenges will lead to a better spatial planning policy. It is needed to protect and regulate the land uses based on guidelines to make future generations more aware on the need to conserve it. This is one of the most important challenges in regions such as Latin America and the Caribbean, where the urbanisation rate rose from 64% in 1980 to 79% in 2010 (IDB, 2015).

The reality of the continent phases rapid urban growth, climate change, and planning policies that collide with the urban reality. This shows the experience on Lefebvre´s reflections that the city is being constructed and adapted by the citizens, through formal and informal urbanisation and is not necessarily congruent with what is legalized on paper.

So, in terms of the Inter-American Development Bank, urbanisation is a major challenge in Latin America with other issues related to environmental degradation, inequality and poverty, violence and insecurity, and public finances (*ibidem*).

This general perception is shared by Montes Lira (2001); he agrees that a major problem in spatial planning is the lack of management and the time lag between the implementation of plans and urban reality. The global and regional situation changes every day, where the big metropolises should pursue more equitable and fair cities with integrated policies and planning mechanisms (Casado Cañeque, 2014).

Another useful mechanism concerning environmental impact on planning challenges is the "*Strategic environmental assessment"* (Brackhahn & Kärkkäinen, 2001)*".* This method, based on the European context, tries to associate the positive and negative planning effects and "*contributes to more systematic synthesis of local or regional environmental challenges".* The geo-data instrument is a key indicator that is being developed in various contexts to monitor the achievements of objectives related to the environment and spatial planning. For this case, the information provided by international organisations like the European Spatial Planning Observation Network (ESPON) is of great help, or for the Mexican context, the geographical information from INEGI.

2.7.2 GUIDELINES TO PARTICIPATORY PLANNING & MANAGEMENT

Spatial planning covers a wide range of disciplines and ranges from territorial via regional to the local level. It was fundamental for this research to consider the regional and local scale as indispensable structures for planning, management, implementation, and monitoring. This spatial scale includes as well the urban and rural interrelationship, being the best mechanism to integrate local development visions.

There are several planning theories with different methods and scopes that integrate a wide range of local instruments. Masum (2012) lists some of the most important theories:

a. *Rational Comprehensive Planning* – The interest group is defined by planning expertise, studied by Fainstein and Larsen.
b. *Incremental Planning* – Gradually changing through decision-making, proposed by Charles E. Lindblom.
c. *Advocacy Planning* – Integration of social needs and values into planning, proposed by Paul Davidoff.
d. *Collaborative Planning* – A social group is delegated with the engagement, and responsibility to implement plans and citizen's decision-making; widely use in Germany.
e. *Participatory Planning* – Organisation actions by different social groups to plan and implement projects, widely used by international and local organisations.

These five theoretical approaches demonstrate the importance of the roles of urbanists as facilitators, negotiators, and planners. It is a fact that nowadays it is more important to involve the different stakeholders in the decision-making process; in this case the Collaborative Planning and Participatory Planning are useful theories to put in practice, with many important achievements in local communities all around the world.

This research recognizes the importance of community work; thus Participatory Planning method is chosen to complement with its instruments the regional and local planning because participation is as well an "*accessible engagement*" (Goffman E. , 1963) . Another main important aspect of this method is that people are not only integrated in the process, they are able to *"co-design and co-produce their own local environment, on the basis of daily and future activities, at different scales"* (Horelli, 2012). Nunes Silva (2012) accepts this quality as an imperative break between the traditional planning, or the "*normative planning"* and the new proposals for the urban planning practice.

For better community integration into those planning practices, Kretzmann and McKnight (1993) consider two different and important paths with solutions, defined in Table 4.

Table 4 Participatory Planning's paths. Source: adapted from Kretzman & McKight (1993)

PATHS TO FOLLOW	SOLUTIONS
1.Community's needs, deficiencies and problems	Capacity-Focused development
2.Community's capacities and assets	Asset-Based, internally focused, relationship driven

The first path corresponds to a traditional analysis of the spatial problem, and the second path has a positive look at the community's assets which will lead to an integral planning inside the communities. Various useful instruments or tools regarding the aforementioned patterns complement the guidelines on spatial planning and pursue the global, regional and local objectives. This research chose the tools and instruments from the *Deutsche Gesellschaft für Internationales Zuzammenarbeit* GIZ (2012), as an exemplary guide that fits into the national and local context, adding the already named community assets.

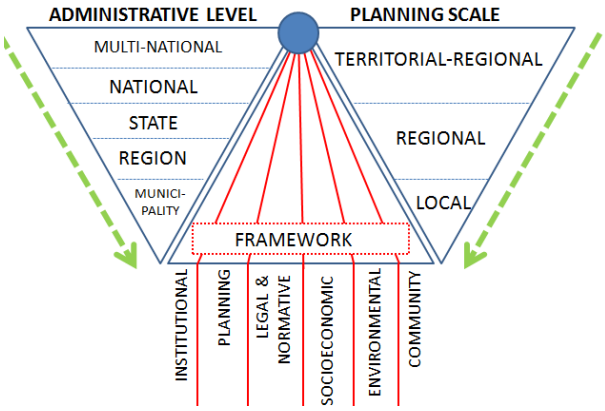


Figure 4 Planning relationship. Source: author (2015)

2.7.3 INSTRUMENTS & TOOLS

To guide an integrated spatial development, different levels of management, planning, legislation, implementation and administration are required. The base for a holistic approach is for one side the multi-national or multi-regional level, such as the cases of the European Union or metropolitan conurbations between Mexico and the United States. For the other side, the national level is elementary in guiding a wide development vision, followed by State, Region and the municipality sector. The administration should go hand in hand with the planning scales, from territorial to local, being the municipalities' vision the most important level where the different frameworks should interact.

As shown in Figure 4, the frameworks of each country are interconnected with the administrative levels and the planning scales. Through this figure, this research understands how each framework is a fundamental spatial instrument, because without having solid mechanisms, the implementation and control of spatial development at local management will not be sustainable or suitable.

Institutions, master plans, policies, economic activities, environmental issues and community approach are essential framework mechanisms that lead spatial planning. In this case, the TERRA Laboratory (European Communities, 2000) considers that administration, planning and frameworks are part of "*territorial entities*" with different "*features and their own evolution rather than following a predetermined linear process*". So, it is not worth losing sight of the local administration's role in maintaining long-term objectives, horizontal cooperation, and strategic planning in order to achieve development results.

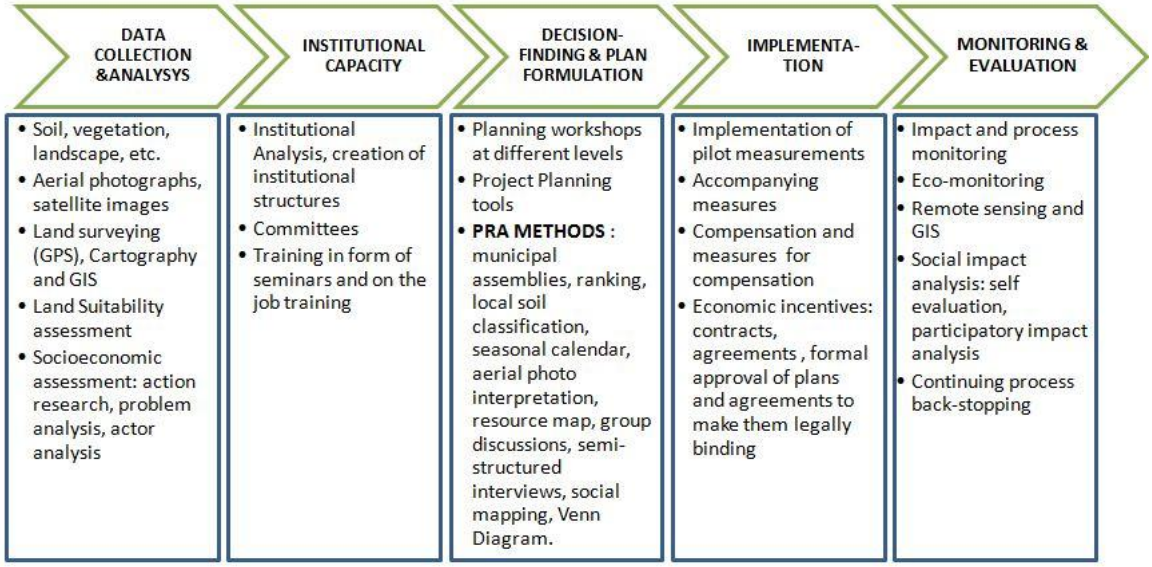


Figure 5 tools for land use planning, Source: Land Use Planning Concept, Tools and Applications, GIZ (2012)

2.7.3.1 BASIC TECHNICAL PLANNING TOOLS

International organisations like the GIZ (2012) agree that in planning development it is fundamental to consider planning as an "*iterative process*" that will lead to better learning. The act of repeating several processes will include different participants and approaches to the main targets or goals. The repetition and evaluation is necessary to understand better the population's needs the stakeholders' interest and the missing information or participants that may be excluded during the first approaches.

In Figure 5, the GIZ enlists useful planning instruments when combined with technical cooperation improve goals, tasks, and accountability in planning. The German agency prefers to list elements instead of steps, because the last ones are more related to a "*linear process*", rather than the learning process cycle or loop that is expected. Each element of the Figure 5 is listed with different useful instruments for planning and implementation, where the GIZ makes some observations (*ibidem, p.*123):

- The different dimensions on planning suggest an interdisciplinary approach.
- The interdisciplinary approach may not fulfil the conditions in many countries where different adaptations should be part of the planning context.
- The uses of instruments result in a "*mix of methods*".
- PRA-tools: participatory observation, semi-structured interviews, sketches, role plays, SWOT, trend analyses, interpretation and zoning of aerial maps, mapping, and modelling.
- The uses of GIS, cartography, remote sensing, 3d models, among others help to improve the decision-making and the communication problem between the different stakeholders.
- The participatory method is useful to create a "*transparent planning process*" where all the stakeholders can be included.

2.7.3.2 PARTICIPATORY PLANNING TOOLS

To complement the Participatory Planning Tools or PRA-tools, it is useful to map out the community assets (see Figure 6), based on the techniques of Kretzmann and McKnight (1993). The authors suggest mapping the *"gifts and skills"* of individuals, families, associations, builders, etc. With these tools, it would be easier to recognize the community´s capacity and project prospects.

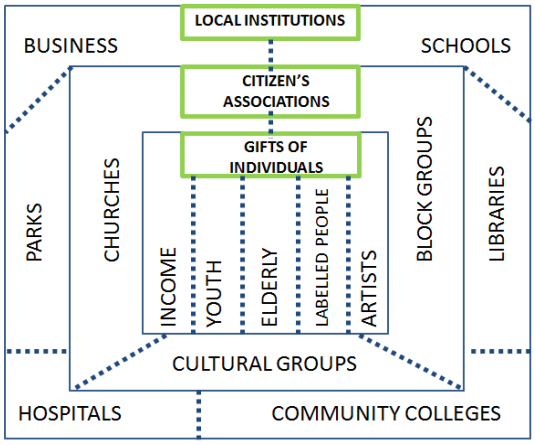


Figure 6 Community Assets Map. Source: adapted from Kretzmann & McKnight 1993

Mapping the social interactions between institutions, organisations, and citizens through this technique – or others like a Venn diagram – help to establish the individual interrelationships to approach a stakeholders' consensus. These methods go hand in hand with the analysis of stakeholders complemented by the "*actor- network-theory*" (Brenner, Madden, & Wachsmuth, 2012).

The mapping tools have as well different scopes and techniques that complement the planner's and facilitator's work. The scope of the project may change the type of information that is expected from the different social groups, or can define the stakeholders groups. To complement the mapping, there are other important instruments to consider inside peoples' issues and needs. Based on the Manual for Participatory LUP Facilitators, other PRA tools outlined by Augenstein & Fohlmeister (2013) are:

- *SWOT Analysis* – Strengths, Weakness, Opportunities and Threats/ Limitations
- *Transect walks and diagrams* – to identify key features of land uses through walking with stakeholders
- *Visioning* – group work to visualize future planning
- *Venn Diagram* – mapping tool to analyse and identify key institutions or stakeholders
- *Ranking* – to identify priorities for decision-making

It is essential to mention when Participatory Planning instruments are used, and when it is recommendable to take the typology of participation, for which Chatty, Bass and Fleig (2003) list seven types:

a. *Passive Participation* – people are being told what is going to happen or has happened. People's voices are not always listened to.
b. *Participation in information giving* – people participate through surveys; do not have the opportunity to influence.
c. *Participation by consultation* – people are consulted by external agents; they can modify the project by people's answers but it is not mandatory.
d. *Participation by material benefits*[3] – people participate through working help in order to receive economic incentives, food, or materials.

[3] This is a common practice in countries like Mexico, where the participatory planning is normally used for electoral purposes. When the election period is over, the representatives abandon the promises made to locals.

e. *Functional participation* – people participate through working groups to reach some project objectives.
f. *Interactive participation* – people work with other groups and facilitators in the analytic process, the groups can have local decisions.
g. *Self-Mobilisation* – people participate through collective action in the analysis, planning, decision-making, and implementation process.

From passive to self-mobilisation, there is a wide range of actions and organisation between authorities, facilitators, planners and citizens. The key aspect is the identification of different stakeholders and their needs and interests.

In the same participatory approach, Jan Gehl (2010) proposes some planning principles that are crucial to work with the "*human dimension*" through assemble rather disperse population:

a. Locate city's function.
b. Integrate those functions to improve social fabric at district levels.
c. Good urban design that invite people to use it.
d. Open up boundaries between buildings and public space to bring life inside and outside.
e. Plan and work to improve quality of space through inviting people to stay longer.

For Gehl, these principles work in different planning scales: large scale (quarters, functions, traffic facilities), middle scale (urban design), and small scale (human landscape). These three scales give a holistic spatial treatment that promotes active community participation, supported by how the people use the public space.

Based on these principles, the individual and the collective space are important elements for urban land governance, complemented by Sociocracy principles.

2.8 URBAN LAND GOVERNANCE: SOCIOCRACY PRINCIPLES

"Governance is the effective interface between the state and the individual", in these words Robert Dixon-Gough (2015, p. 7) describes the importance of this subject in every aspects of civilisation. The author states that the evolution of urban governance structures influences directly the *"changing process of evolving boundaries, territories, political changes, the consequential divisions between urban and rural areas, and urban sub-divisions".*

The practice of good urban governance in every country leads to the protection of land rights and tenure security, through applying fundamental principles like *"transparency, accountability, rule of law, equity, participation, and effectiveness*" (UN, 2015). These principles are in fact part of a process, defined by UN Habitat (2012) as *"decision-making that engages various actors with different priorities to ensure that rules are made and reinforced, development is realized, and services delivered… in a city-system".*

Through the field research and stakeholders' interviews of this thesis, it was observed a severe lack of congruent and transparent urban governance practice. On one hand, as Magel & Wehrmann (2002) imply, the centralisation of land programs diminish the management capacities and the *"absence of a clear distinction of responsibilities"* of the different administrative levels, ministers, local authorities, and in general with society. On the other hand, the lack of transparency on real estate

and urban development projects at local scale is creating a deep trust gap between authorities and local population.

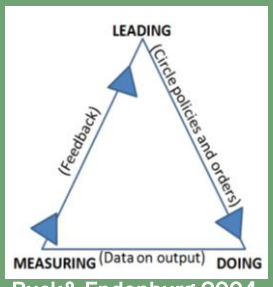
To get a better understanding on urban governance, the Sociocracy guidelines give clear principles and procedures to approach the stakeholders to a better local and spatial management. According to Buck & Vilines (2007) in Sociocracy, the "*consent and collaboration*" play an important role in building a "*strong governance structure*".

Buck & Endenburg (2012) describe Sociocracy as a *"decision-making and governance structure that allows an organisation to manage itself as an organic whole"*. With this method, it is possible to integrate different group circles with the next administration level, by *Leading-Doing-Measuring*. Sociocracy is a vast system with many structural applications, the term and principles of Sociocracy 3.0 are selected from the definitions of Bockelbrink & Priest (2015) as an easier and friendlier method to implement in communities and small organisations.

To keep in mind the principles between the traditional Urban Governance and Sociocracy 3.0, in the Table 5 it is enlisted the features of each process. For the proposed model, urban governance principles are present in every loop, at regional level, for the municipal and local level, Sociocracy guidelines are selected to conduct the local and municipal management.

URBAN GOVERNANCE (UN HABITAT)	AREA	SOCIOCRACY 3.0 (B.Bockelbrink & J.Priest)
Civil engagement and citizenship	DECISION-MAKING	Empiricism (knowledge)
Sustainability		Consent
Equity		Equivalence
Transparency and accountability	GOVERNANCE	Accountability
Security		Transparency
Subsidiary		Continuous Improvement
Efficiency		Effectiveness

Sociocracy Circle functions:



Buck& Endenburg 2004

Table 5 principles of Urban Governance and Sociocracy 3.0, Source: UN Habitat, Bockelbrink & Priest (2015), Buck & Endenburg (2004)

2.9 CONCLUSIONS: PLANNING STRATEGIES TO KEEP IN MIND

The formal interest in urban theories began with the industrialisation period in the 19th Century, where different needs from the population transformed the rural and urban world. Those needs triggered several urbanisation processes that changed the morphology and development of the cities.

The theory of democratic city growth was not developed until the 1950s and 1960s; the stated principles remain valid nowadays due to the scale of globalisation that surpasses the size and limits of the big metropolises around the world. In this process, citizens perform as stakeholders and agents of change; their impact in spatial planning makes them primordial elements in the configuration of the social fabric in rural and urban areas.

Changes in the territory can be seen mainly in the urban landscape's ambiguous inequality, lost in diffuse urban localities, scattered rural communities, and kilometres of closed and walled housing areas. Those features are a basic view in the United States' suburbia rather than the informal

urbanisation of Latin America. A common point that both regions are facing is the inability of interaction and spatial-relationship: the class ghettos, the gated communities are part of a harsh social reality that divides physically and socially the socioeconomic groups.

This ambiguous reality is generating as well a wasted consumption of land that is in no way sustainable. Spatial planning strategies are basic in having sustainable development of the territory, but its management is the key for congruent land development, especially in a world where most of the population live in urban areas.

As depicted in this chapter, it is essential to have a wider-challenges-vision, so it will be easier to have local plans implementation and solutions, adapted to many cultural, identity, economic, and social factors. This is one of the main reasons for this research to choose a participatory approach through PRA tools, community assets and sociocracy; because the new forms of urbanisations are creating an uncertain reality with many territorial tones.

Wider vision through local implementation is comprehended in spatial strategies that are useful to integrate different policies related to the land and environment as well as helping to communicate the different government levels and giving a better approach to the community. This vision is stated by the UN (2008, p. 22) which describes that every spatial strategy should be:

> *"Comprehensive in its ability to consider all important aspects of development: it should be "spatial" in the sense that its primary role and value is in coordinating the territorial impacts of spatial development, and strategic in the sense that it identifies the general location of development at the level of the settlement or sub-region."*

It is a fact that there is a global concern about the sustainability for the satisfaction of human needs, especially when it involves natural resources and developable land. The global concern makes a "big picture" of the current situation, however it is fundamental to plan, regulate, and implement at a regional and local level. This vision is well accepted in the European countries, named as a "*Strategic Regional Planning*" (Academy for Spatial Research and Planning, 2011) stipulating the need for goals or guiding principles which emerge from the local challenges. The generalization of those goals will create the planning and implementation instruments.

Depending on local vision, a strategic plan should consider different management and development tasks that include diverse administration levels. One of the most important strategies is community & spatial integration. Novak (2003) reinforces those strategies as the "*variety of creative initiatives indicating the different ways in which people forge partnerships to create a better urban environment and, as a result, a better life for themselves and their communities"* through the named participative urbanism or hand-made urbanism.

Another opinion that shares the community governance model is made by Holger Magel (2009) ***"Jede Entwicklung beginnt bei den Gemeinde"****;* meaning that nowadays, it is not possible to consider the socioeconomic or spatial development without a strategic integration of the social fabric.

Image 4 View of San Andrés Cholula from UDLAP in the decade of 1960. The agricultural plots are nowadays urbanized, Source: Archivo UDLAP. Sala de Archivos y Colecciones Especiales, Dirección de Bibliotecas

III CONCEPTUAL FRAMEWORK

3.1 INTRODUCTION

This chapter delimitates the conceptual position of the research through the theoretical discussion supported in Chapters II. What follows is a description of the research's position and context, in terms of the vision of the phenomena as well as the conceptual approaches.

3.2 CONTEXT: URBANISATION AND MARKET FORCES

The irresponsible and unsustainable land development has been in the mind of concerned people and planners since the decade of 1950. The post-industrialisation practices on urban sprawl and peri-urbanisation led the issues on land preservation onto a global scale. The reflection and observation of the problem is the origin for this research, where the analysed cases, voices and literature demonstrate that the rise of neo-liberalism practices guides the power of real state and private sector over administration, planning, and decision-making. Therefore, the market forces act as strong agents of change over urban morphology.

The study on the impact of market forces and neo-liberal policies over land development is widely studied at a national and regional level by López-Tamayo (1995). His knowledge on planning policies and practices is taken as a reference for the description of this chapter:

> *"…through the rise and consolidation of the capitalist society, the urban land use is transformed into the product and way for capital production".*[4]

At an international level, this statement is found in the affirmations of Harvey (2008), who finds that urban land use is the product that gives profit and connection between capitalism and urbanisation. The sociologist believes that the world is so influenced by liberal and neo-liberal

[4] Personal translation from the Spanish version

practices that nowadays the rights of a *"private property and the profit rate trump all other notions of rights one can think"*. This vision influences the planning practice as an instrument of capital accumulation (Harvey, 1984).

López-Tamayo's and Harvey's statements are analyzed in this research from the conceptualisation of two realities: *the theoretical conceptual approach* and *the spatial conceptual approach;* the first corresponding to the criticism of new ways of urban and spatial development and the second corresponding to the practical construction of urban space. Both perspectives are studied and based on an epistemological and sociological point of view. Furthermore, López-Tamayo (1995) agrees that the conceptualisation is not exempt from an urban dialect relationship that demonstrates the contradictions between theory and practice; a two-way style to analyse the urban reality (pg.8).

3.2.1 CONCEPTUAL APPROACH: CRITICAL URBAN THEORY

This theoretical conceptualisation is based on the sociological and urban theories of the mid 20th Century. As described in Chapter II, thinkers, planners, sociologists, activists, and researches influenced by "The right to the City" chose a socio-spatial position concerned about new dominant forms of construction of space and the interrelationship among citizens.

According to this approach, the interaction between economic forces and citizens' activities marked the trends of spatial development. This trend was studied long ago in the work of Marx and later in the postulates of the Frankfurt school and the urban sociologists of the 1960's; it was re-examined and contextualized in the 21st Century by Neil Brenner, Peter Marcuse, Margit Mayer and others through the Critical Urban Theory (CUT). This theory re-considers ideas from "The Right to the City" from Henry Lefebvre, critical theories from Herbert Marcuse, and the new socioeconomic paradigms on social behaviour and appropriation over urban space.

In contrast to other socioeconomic trends, Brenner (2012) states that CUT discard the "*market-oriented forms of urban knowledge*". It tries to push against technocratic and neoliberal development tendencies and it is "critical" because it attempts to have an "*evaluative attitude towards reality, a questioning rather than an acceptance of the world as it is"*. (Marcuse, 2012). Through those questionings, the theory searches the possibilities of change inside an urban context. At this point, this research founds the bases for a critical analysis of the object of study, using the ideals and criticism of the mid XX Century socio-urban aspirations within the contextualization of the current Century.

Another significant approach of the CUT is the consideration of urban space as a changeable, permeable element; the CUT seeks other types of urban development whilst Brenner (2012. P.14) considers that a *"democratic, socially just, and sustainable form*" is possible. In this manner, the author named four propositions of a critical theory, analyzed through different authors; those propositions are linked between them as shown in Figure 7 below and listed as:

- *Critical theory is theory* – need of *"theoretical arguments regarding the nature of urban process under capitalism"* as well as to reject the theory as serviceable, rather than practical (defined by Frankfurt School and Marcuse).
- *Critical theory is reflexive* – questions concerning traditional forms of knowledge, critical perspective against the contradictions of capitalism (defined by Frankfurt School)

- *Critical theory entails a critique of instrumental reason* – rejection of market-driven, technocratic policies and forces that support the existing individualistic and unsustainable forms of urban development (defined by Frankfurt School and Habermas).
- *Critical theory emphasizes the disjuncture between the actual and the possible* – search for "*emancipator possibilities forms of urbanism"* against the dominant elements linked to capitalism or suppressed (defined by Frankfurt School, Horkheimer and Marcuse).

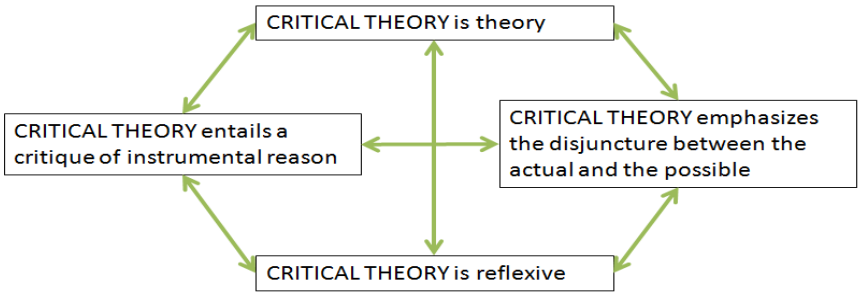


Figure 7 CUT relationship, Source: What is a Critical Urban Theory? Brenner (2012)

This theory does not pretend to be the panacea of planning and urban issues, nonetheless it intends to "*have mediations to the real of practice" (ibidem, p.15)* as well to have big-picture strategy of the different actors involved in the process of spatial development. Inside this process, Rankin (2012) states that committed planning with a critical theory help to consider and identify "*other possibilities for more just and sustainable social forms".*

The CUT analyses the processes that conform the "urban fabric", not as a general form with individual subjects, but as an element with different possibilities, uses, networks, patterns, origins, transformations, etc. Through the analysis it is possible to question the weaknesses and strengthens of the current system, the theory and practice become one as potential strategies that will lead to a "***radical urban practice;*** named by Marcuse (2012) and based on the social change that is possible inside the streets (Lefebvre 1974). Besides those postulates, Marcuse proposes a critical planning with three steps:

a. *Expose* (analyzing the root of the problem)
b. *Propose* (working with involved stakeholders to obtain favourable results)
c. *Politicize* (Taking action, supporting and organisation).

With these three steps, the researcher emphasizes that the critical theory supports the right to the city, and embraces the community causes where "*action for people, not for profit, is the rule".* This vision is supported as well by Harvey (2008) when he adds that there is a neglected human right in the "*freedom to make and remake ourselves and our cities".*

3.2.2 SPATIAL CONCEPTUAL APPROACH: CONSTRUCTION OF URBAN SPACE

This second conceptualisation is linked to the discussion between theory and practice, especially in how urban space is constructed. Following the CUT statements, Schmid (2012, p. 52) describes that "*space is the result of production processes that take place in time. This basic presupposition leads to a dynamic conception of urban space as being constantly produced and reproduced".*

This argument supports the theory of production of space, led by Lefebvre (1974) who affirmed that different agents of change participate in the transformation, domination, and control of urbanisation. The spatial conformation may be driven not only by processes, but by actions of individuals with particular interests (López-Tamayo, 2010). Being processes or actions, spatial development depends mainly on the context, where Foucault (1967) refers to the former spatial construction that was based on a "*hierarchical ensemble of spaces*" like urban and rural, religious and natural; but from the 1960's and onward, the construction of centralities represents a juxtaposed reality with ambiguous places containing poor and riches, near and close, compact and disperse. The philosopher (*ibidem)* argues that the history of space goes from emplacement, to extension and from extension to connection networks and appropriation.

Foucault's reasoning leads Schmid's (2012) argument who considers, the urban cores are becoming a type of "product" due to their "*simultaneous role as places of consumption and as consumable places".* This observation is linked to the appropriation of the space, where the observations of Lefebvre and other authors refers on one hand to the elite and dominant classes that define and decide about the nature and purpose of those spaces. On the other hand, Schmid adds that the new urban forms are more linked to "*displacement and exclusion"*, which develops peri-urban forms through dispersion, sprawl, and stratification, among others. For this case, the postulates of urbanists and sociologist critics consider that spatial development turned into political power practices through land use revalorisation and urban management (Soto Badillo, 2004). These actions are where the market forces hold influence over public policies and personal interest of stakeholders in the construction of space. One of the results of those practices is that the territorial physical integration is becoming developed through peri-urban fringes with *poli-functional and poli-central* urban cores (López-Tamayo, 2004).

3.3 CONCLUSIONS

The learning from both conceptual approaches gave the guidelines for the observation of the study phenomena: a human, social, and material vision. Through the CUT it is possible to comprehend the peri-urbanisation processes in the case-study, allowing the research being more epistemological with a wide vision of socioeconomic and planning issues to define the object study. Through these theories, urban theory and practice consider not only the economic trends, as well the wide society and environmental spectrum. As Brenner, Madden & Wachsmuth (2012) say: "*there is a need for collaborative, open-minded spirit to prevail in urban studies"* and this is plausible through the CUT and Lefebvre's teachings.

Both conceptualisations of CUT and Lefebvre fit in this research vision of socio-spatial management, proposing a local approach for spatial development, presented in the last chapter of the thesis.

Image 5 View of UDLAP recently constructed with a general rural landscape of Cholula. Source: Decanato de Artes y Humanidades , UDLAP

V METHODOLOGY

4.1 INTRODUCTION AND OBJECT OF ANALYSIS

Through this chapter the research method proposed for the object analysis of this investigation is described: The **stakeholders'** role in land development inside the peri-urban area, the permeability of **planning regulations** and how these two objects impact on the development of the **patterns of land use in Cholula**.

Therefore, Cholula is taken as a case study with rural-urban features which are able to recognize the magnitude of processes like peri-urbanisation through spatial planning. As it was described in previous chapters, the concept of spatial planning is more comprehensible at a territorial level, or as Allen, Massey & Pryke (1999) say, region or territory is "*an open, interconnected space with many co-dependent qualities*". This concept is used for the analysis of the research object inside the case study and through spatial planning.

The approach for this research is phenomenological – sociological, which contains constructive tools to develop a **descriptive, illustrative, explanatory, analytical study, with a qualitative method supported by a case study**. To understand better the expected methods it is significant to review some methodological concepts.

4.2 RESEARCH APPROACH

Phenomenology as part of Philosophy is defined as "*an approach that concentrates on the study of consciousness and the objects of direct experience*" (Oxford University Press, 2014) . This definition can be applied as part of a research process in social sciences as the study of "*our experience- how we experience*" (Smith, 2013). Being the investigation centered on subjectivity, it is considered phenomenological because it allows unstructured methods of research and data collection, as well as

trying to recognize the social reality from the perspective of population (Gray, 2009). This type of inductive study allows us to discover by personal experience, exploration and cultural matters the *internal logic of the subject* (*ibidem*, p.23). However, this research is also sociological because it tries to discover the "*relationship between culture and behaviour through observation, interviewing and studying sites*" (Tesch, 1994). This approach relays more into individual characteristics and fits quite well into a qualitative method, defined by the SAGE Encyclopaedia (2008) as *"composite of philosophy, concepts, data-gathering procedures, and statistical methods that provides perhaps the most thoroughly elaborated basis for the systematic examination of human subjectivity"*

Within this definition, the qualitative method allows more diversity and participant's observation, and as Boeije (2010, p. 6) states, it is based on the assumption that *individuals have an active role in the construction of social reality*. Most researchers agree with this holistic postulation, amongst different features in comparison to quantitative research; authors like Hancock (2001) named some of the main characteristics of the proposed method:

a. Qualitative research is related to *individuals' experiences*, points of view, perceptions, generating a primary subjective data.
b. Qualitative research is *descriptive,* especially in the portrayal of social phenomena.
c. Qualitative research *in inductive,* when the data is used to develop theory.
d. The data is collected through *encounters and observation.*
e. Qualitative data is *time consuming*, it needs small samples.

Expecting more interaction with the informants or stakeholders, the qualitative feature "*allows researchers to get at the inner experience of participants, to determine how meanings are formed through and in culture, and to discover rather than test variables."* (Corbin & Strauss, 2008, p. 13). This statement is supported by Flick (2011, p. 12)who agrees the qualitative method is important for the understanding of social relations in a "*more pluralized world with new social contexts and perspectives".*

The result of qualitative data through this holistic induction, as Merriam (2009) expressed, allows the researcher to have more reflexivity and variety of approaches in how people interpret their experiences. Following the theoretical descriptions of the method, our research unit – Cholula – is considered with important qualitative features, outlined in the Figure 8.
The qualitative method is chosen, supported by quantitative geo-statistical information because it guides the present research to find the relationship between the different objects of analysis. Additionally it is helpful to have a deeper understanding or "*big picture*" of the patterns of land use in Cholula and the stakeholders involved.

4.2.1 DESIGNING THE CASE STUDY

The complementary chosen method of this qualitative investigation is the case study or case-based research. This method is described by Gerring (2007) as a "*form of cross-level interference"* and defined by Seawright & Collier (2010) as a "*research in which the centre of attention is the close analysis of one or few cases";* understanding the term "case" as "*unit of analysis […] cases are political, social, institutional, or individual entities or phenomena about which information is collected and inferences are made".* The livelihood and day-to-day experience approach the researchers applied into the unit analysis,

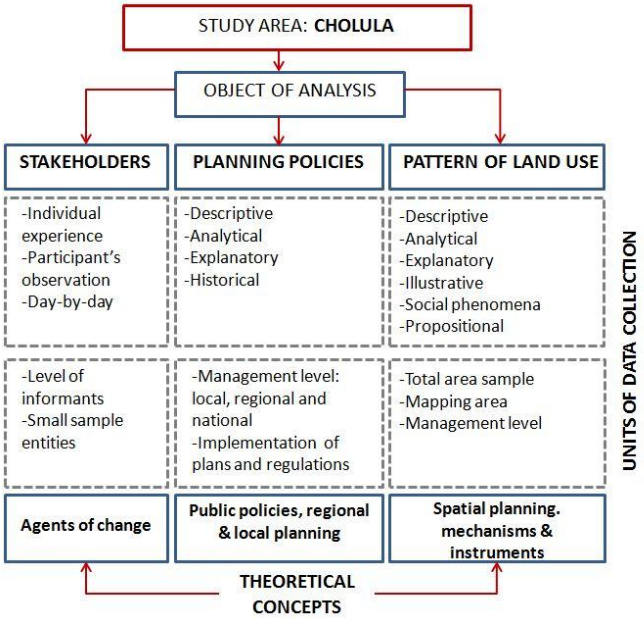


Figure 9 Case study qualitative features, elaborated by the author

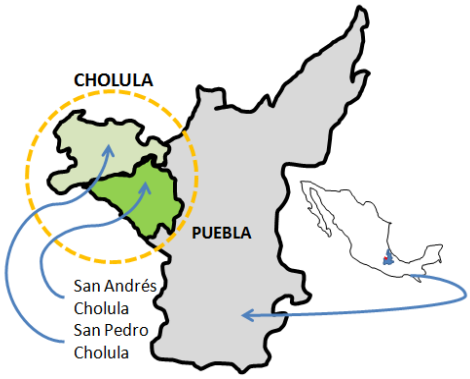


Figure 8 Case study location. Source: INEGI 2013

expecting more interaction and knowledge among the individuals. However, it is important to define which the purpose of the research is, because as Punch (2005) adds, the method normally is divided into types of situations and may change the results.

The case study is important, complex, and unique that is worthy of study. For doing this, it needs two ways: *conceptualizing and developing propositions.* According this investigation, the aim of the methodology is finding results that can be generalized and applied not only to the case study.

As it was described in ChapterI, the City of Cholula is taken as a case study because it is an attractive space for urban research, and it has as well some remarkable features like:

a. *Socio-spatial organisation*
    - Religious-indigenous organisation
b. *Peri-urban development*
    - Consequences of urbanisation of *ejidos*
    - Decontextualisation and gentrification of rural space
c. *Spatial planning and land use policies*
    - Implementation of the Regional Development Plan Angelópolis
    - Modification and violation of land use and construction regulations

These three main features can be of interest to other middle-cities in Latin America and other parts of the world that share same socio-urban issues regarding peri-urbanisation, decontextualisation of historical cities, abandonment of agricultural activities, development of massive gated communities, and privatisation of services. Besides, middle-cities with a rural past like Cholula are converted into *techno-cities* (Fishman, 1987); meaning that suburbs and secondary cities become extensions of the metropolises, losing ground, identity, and even name. For example, Cholula is nowadays named part of the Metropolitan Area of Puebla-Tlaxcala MAP-T[5].

[5] *Zona Metropolitana Puebla-Tlaxcala*

To complement the case study, it is important to outline the territorial definition for Cholula, located in the heart of the country (see Figure 9). The case-study's region has been named and divided into different towns, municipalities, and regions:

a. *Cholula de Rivadavia* – Cholula's main historical city
b. *Historical Region of Cholula* – Municipalities of Calpan, Coronango, Cuautlancingo, Juan C.Bonilla, Ocoyucan, San Andrés Cholula, San Gregorio Atzompa, San Jerónimo Tecuanipa, San Miguel Xoxtla, San Pedro Cholula, San Nicolás de los Ranchos, Santa Isabel Cholula, Tlaltenango
c. "*Las 3 Cholulas*" – San Andrés, San Pedro and Santa Isabel Cholula
d. *Land Reserve Atlixcáyotl-Quetzalcóatl* – Municipalities of Puebla, San Andrés Cholula, San Pedro Cholula, and Cuautlancingo
e. *Metropolitan Area of Puebla-Tlaxcala* – 27 municipalities including San Andrés and San Pedro Cholula
f. *Region VII* – 39 municipalities including San Andrés, San Pedro and Santa Isabel Cholula

For the purposes of this research, it is considered that there are two towns of Cholula which are taken for the case study: **the municipalities of San Andrés Cholula and San Pedro Cholula**. Both towns are neighbouring municipalities that represent some socioeconomic aspects from the State of Puebla; the cultural and rural heritage of the ancient Cholula and the metropolitan façade of Puebla. As listed previously, other towns are also part of the rural-urban transition; however San Andrés and San Pedro are more closely linked to identity and rural-urban historical values. Both towns have similar and different geographical characteristics, especially due to their historical context, but separately urban developed mainly since 1990. Some of these features are described in the Table 6 and in further chapters:

Table 6 Cholula's primary data (INEGI 2010)

MUN.	OFFICIAL DISTRICTS	TOTAL AREA	POP.	URBAN AREA	RURAL AREA	NUMBER OF HOUSES
SAN ANDRÉS CHOLULA	-San Antonio Cacalotepec -San Bernardino Tlaxcalancingo -San Francisco Acatepec -Santa María Tonantzintla -San Luis Tehuiloyocan -San Rafael Comac -San Andrés -Land Reserve Atlixcáyotl	61 km2	100,439	**62%**	**32%**	25,371
SAN PEDRO CHOLULA	-Acuexcomac -Santa Bárbara Almoloyan -San Diego Cuachayotla -San Cosme Tezintla -San Francisco Coapan -Santiago Momoxpan -San Cristobal Tepontla -Rafael Ávila Camacho -San Agustín Calvario -San Sebastián Tepalcaltepec -San Juan Tlautla -San Matías Cocoyotla -Zacapechpan -Cholula de Rivadavia -Land Reserve Quetzalcóatl	51.03 km2	129,459	**61%**	**38%**	29,205

There are many features of Cholula that make it very unique for analysis. Based on the socio-cultural statement, in spite of Cholula being an urban area, it has a strong rural identity. This feature contrasts with other towns of the Metropolitan Area of Puebla-Tlaxcala. The transition between rural-urban areas generates some semi-urban localities, and more than that, it is the place for isolated communities. New residents of the City of Puebla are establishing themselves mainly in San Andrés Cholula in the gated communities, and in some cases displacing the original inhabitants. Besides this urban transition, both towns – San Pedro and San Andrés – are well known as educational, housing, recreation, retail, and touristic areas.

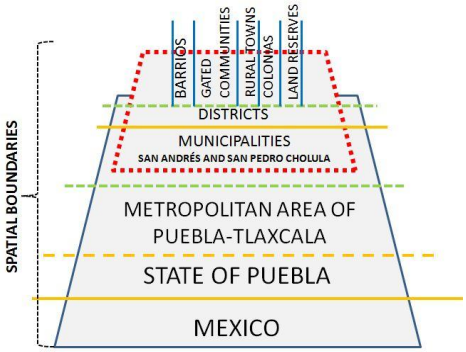


Figure 10 Spatial sub-division, elaborated by the author

As it is showed in Figure 10, the geographical and administrative position of Cholula inside the State of Puebla, and inside the country as a minor locality, is quite clear. However, there is an important break point in this hierarchy pyramid between the regional and local level.

The administrative boundaries between the land perspective of the MAP-T, the towns and the local level represent a secondary hierarchy of the territory due to the lack of supervision of the planning regulations. For one side this condition makes an administrative problem, for the other side at local level, the stratification of social groups segregates the visions of Cholula as a unit. In both conditions, the stakeholders play an important role as spatial developers.

The stakeholders create new territorial boundaries that contribute to the processes of peri-urbanisation. As it was stated in Chapter I, Cholula may not survive the vertiginous advance of urban growth and the economic interest of stakeholders. Many other characteristics of this metropolitan situation are named in further chapters; however it is important to address the design of the case study, which implies *description and reconstruction* (Flick, 2011, p. 134). Equally once more Punch (2005) considers the case study more as a "*strategy than a method",* that appreciates deeply the nature of social phenomena. This is one of the reasons why this method is more suitable for the development of the subject and useful for further research in comparative analysis.

Having identified the importance of Cholula, a number of socio-urban characteristics are selected, based on Punch's observations of the case-based method. The characteristics to delimitate the case study design are shown in the Table 7.

Table 7 Ccomparison between case study characteristics. Source: elaborated by the author, adapted from Punch (2005)

CASE-BASED CHARACTERISTICS	CHOLULA'S CASE STUDY CHARACTERISTICS
1. **Case studies have limits**	Towns of San Andrés and San Pedro
2. **Determine the study area**	City of Cholula (pattern of land use)
3. **Research questions define the object of analysis**	Who are the stakeholders? What are the planning regulations? What is the pattern of land use?
4. **Flexible in research and data collection methods**	Mixed methods: qualitative, stakeholder´s analysis, knowledge cartography

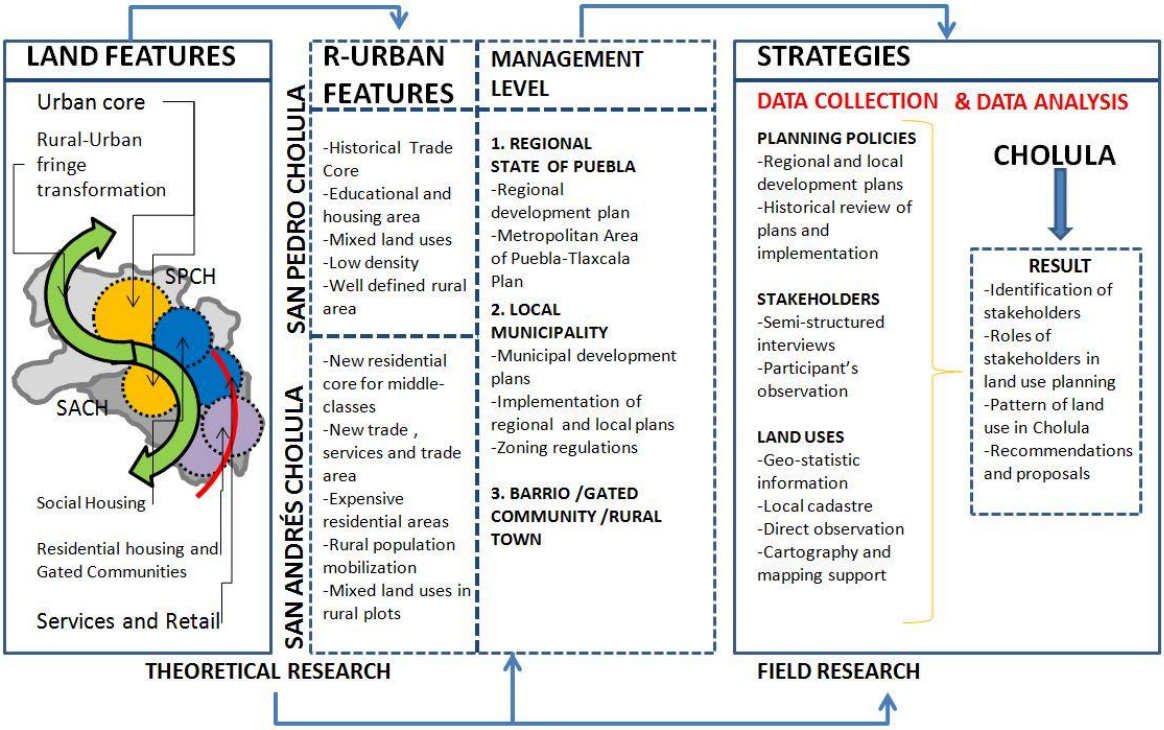


Figure 11 Case study features and data strategies- Source: author

Cholula's current metropolitan situation can be considered a general case for Mexican and other Latin American cities; the intrinsic features of the case study make acceptable limitations, as Byrne (2009) states "*generalizing is not the same as universalizing*". This investigation tries to see "*in its completeness, looking at it in many angles*" (Thomas G. , 2011) for the development of the case study without compromising the implicit boundaries of the research questions.

4.3 STRATEGIES FOR DATA COLLECTION & AND DATA ANALYSIS

An empirical data geo-statistic and one-to-one interviews were conducted to analyze the different points of view of stakeholders, as well as the participant observation on the field. The interviews were semi-structured with pre-defined topics that consider the objects of this study.

For the methodology's development, three different stages were considered, according to the case study characteristics. The different stages shape the data collection and data analysis strategy, which can be resumed in the Figure 11.

4.3.1 PRIMARY DATA

During the field research stage, the data collection strategy included "*multiple sources of data, or sources of evidence*" selected by Yin (2012) in different examples as: direct observations, interviews, archival records, documents, participant's observation, or physical artefacts. Taking the author's source's list and the case study features on Figure 10, the different planning policies, regulations and other documents in the different management levels are subtly related to the implementation and involvement of the different stakeholders. That relationship is addressed in the Figure 11 for the definition of the levels of data, management and stakeholders/informants.

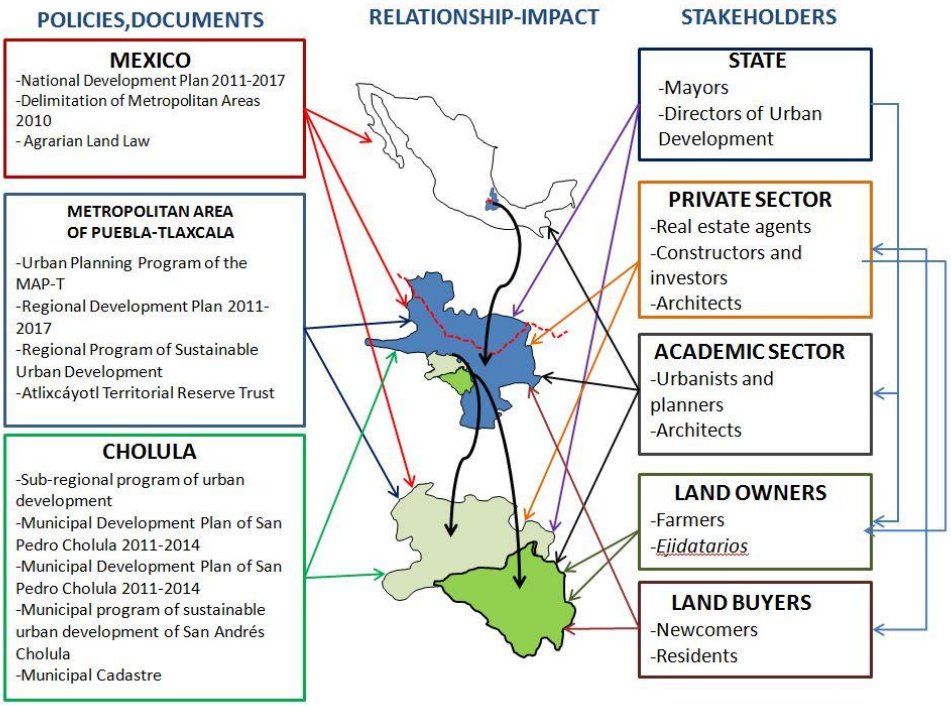


Figure 12 Definition of policies and stakeholders for data collection. Source: author

The most important documents of policies and regulations are at regional and local levels. Their importance lies in the different governmental periods and the changes in land use that constantly shape the metropolitan facade. The interpretation of the different development programs and plans is supported by the geo-statistics of the National Office for Geo-Statistics[6] INEGI, which has most of the statistical, geographical, and demographical information related to population and urban growth.

Having established a general review of the documents, as it is shown in Figure 12; the selected stakeholders play an important role in the implementation and changes in land use regulations, explained in Chapter VIII. It is a fact that stakeholders' backgrounds are diverse; in order to select the key informants it was necessary to consider the needs and benefits of each sector.

Different semi-structured interviews were applied to record the key informants based on the Figure 12. To accompany the results of the interviews, the participant's observation in the field was applied through household surveys and purposive sampling.

Before choosing the final number of the selected informants it was necessary to define the type of information expected from the stakeholders' interviews. Based on the research questions of Chapter I some keywords were selected to generate the model questions and define the key informants: **planning, communication, instruments of implementation, integration.**

The result for getting information for the keywords is explained in the Table 7. This table was useful in defining the scope and limits of semi-structured interviews as well the type of data that was needed from the informants. The key words were needed to formulate the questions and keep the interview focus. These words were useful for guiding the informant through the interest topics of

[6] *INEGI Instituto Nacional de Estadística, Geografía e Informática*

the interview. For example, from the academic group it was more important to get knowledge and expertise and from the authorities group it was more important to obtain scopes and communication, but both of these informants interviews were as well needed to obtain planning strategies, described in Table 8.

Table 8 Informants' key words. Source: author

FOCUS GROUPS	INTERVIEW'S KEY WORDS	KEYWORDS TO ACHIEVE
Experts /Academics	*Expertise, knowledge, opinion, vision*	Planning strategies
Locals	*History, changes, integration, communication*	Opportunities, communication between stakeholders
Government	*Scopes, instruments, communication*	Planning instruments, communication
Private Sector	*Vision, contribution, communication*	Integration

Having defined the focus groups and the interview's lines, the list of key informants was defined. In the Table 9 the level of key informants or stakeholders were defined that were considered for the primary data. The semi-structured interview (see Appendix A) was the most suitable method for listening and recording the different opinions of the stakeholders involved in land use planning. It was divided into three levels – **national (M), regional (P) and local (CH)** – and categorized into:

a. *Academic/Experts (1)* – members of universities, institutes and consulting groups.
b. *Community (2) NGO's (2.1)* – neighbours of Cholula, leaders and members of NGO's.
c. *Authorities (3)* – members and former members of the Government, local majors.
d. *Promoters (4)* – Real estate owners, architects and planners

Table 9 Stakeholders' list. Source: author

No.	INFORMANT'S AREA	INFORMANT'S CATEGORIES	LEVEL	NUMBER OF INFORMANTS
1	Consultant expert in Spatial Planning	EXPERT	M	2
2	Representative of National NGO	NGO	M	1
3	Sub-minister of Spatial and Urban Planning	AUTHORITY	P	1
4	Director of Spatial Planning	AUTHORITY	P	1
5	Institute of Municipal Planning	AUTHORITY	P	2
6	Consultant expert in Spatial Planning	EXPERT	P	1
7	Academic expert in Spatial Planning	ACADEMIC	P	3
8	Real Estate developer	PROMOTER	P	1
9	Local Majors	AUTHORITIES	CH	2
10	Director of Urban Planning	AUTHORITIES	CH	1
11	Local Planner	AUTHORITIES	CH	1
12	Local architects	PROMOTER	CH	2
13	Constructor and Real Estate promoter	PROMOTER	CH	1
14	Community leaders	COMMUNITY	CH	4
15	Residents in San Pedro Cholula: *(1) downtown, (1) gated community, (1) urban area, (1) rural area*	COMMUNITY	CH	4
16	Residents in San Andrés Cholula: (1) downtown, (1) gated community, (1) urban area, (1) rural area	COMMUNITY	CH	4
17	Local NGO	NGO	CH	2
18	Local Representative	COMMUNITY	CH	1
				TOTAL: 34

The stakeholders of the last table are more numerous at local level, thus the impact on land use planning is more evident at a minor scale and it is for the interest of this research to consider in detail socio-spatial changes of Cholula.

Having the list of interviewees and the key information for the semi-structured interviews, the final question was selected. For every informant a printed version of the interview – both Spanish and English – was produced with the type code and category as a reference, as well as an authorization letter for filming and recording. The complete interview format and the authorization are in the Appendix section of this dissertation.

All the questions were included as standard for the interviews, however during the dialogues; some other questions were formulated or omitted, depending on the answers of the informants. This was the primary data collection and this research did not apply general surveys to a bigger sampling because most of the socioeconomic and geographical information is already given by INEGI. For this case study, it is more important to state the voices of the main stakeholders than consider general surveys, because the informants' visions and needs constantly impact on the development of the urban sprawl all over the territory.

4.3.2 SECONDARY DATA

Having documented the planning regulations and delimited the key informants, the last step for the design of the method was the analysis of the data reflected in the land use pattern of the case study. This final analysis is supported by the different cartography at regional and local level, also provided by INEGI and the Ministry of Rural Development, Sustainability and Land Planning of Puebla[7].

Some of the official information that is available to consult is: Metropolitan Area of Puebla Tlaxcala (Metropolitan area 34, SEDESOL 2010), Angelópolis Region Map (COTEIGEP, SCT), Geo-socioeconomic data of Puebla (INEGI), Municipal land uses of San Pedro Cholula (Local Cadastre), Municipal land uses of San Andrés Cholula (Local Cadastre), among others.

Most of the geo-statistic information of the INEGI and other offices is very complete and reliable; but the purpose of this research is not to repeat what has already been done. More than describing the historical changes on the land uses in Cholula, this method tries to delve deeper into the relationship between the land use development and stakeholders. For this reason, the analysis is supported by some of the mapping methods of Knowledge Cartography (Quaggiotto, 2008) or Cartography of Knowledge (Pascale, 2011) that are considered as a better way to narrate the results of the data analysis. This system is defined as "t*he art, craft, science and engineering of different genres of maps to describe intellectual landscapes – answering the question how we can create knowledge maps*" (Okada, Buckingham, & Sherborne, 2008). The official cartography of Cholula and the MAP-T were complemented by some of the techniques of this method in order to better analyzing the findings.

For getting improved results, the objective of this method in the current research is to generate visual information related to land use planning, which is the best way to appreciate the social and urban growing pattern in Cholula.

[7] *Secretaría de Desarrollo Rural, Sustentabilidad y Ordenamiento Territorial*

4.3.3 DATA RELIABILITY AND VALIDITY

During the field research experience, the information obtained from key informants, official documents and field research and the results were observed through interpretive approach. The strategies of *"focusing on the subject to analysis and objectives of the research qualitative method"* (Masum, 2009) helped to understand the phenomena with a critical vision on reliability and validity information.

Due to the characteristics of the chosen method *"being qualitative in nature and originally raw and unorganized"* (Chigbu, 2013) it was very practical to have three main subjects of study to manage the data: The pattern of land use, policies and regulations, and stakeholders. Having these three elements it was easier to elaborate scale categories for each one, as it is showed in figure 13. Within this it was complementary to organize the information obtained from the informant's interview, geo-data statistics and literature review.

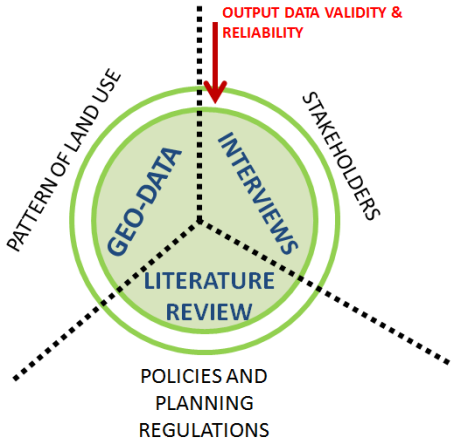


Figure 13 Triangulation process for data validity and reliability. Source: author

In addition to the obtained information from the key-informants, another useful tool that helped to analyse the stakeholder's relationship was mapping the Community Assets method by Kretzmann and McKnight (1993).

In order to bring together the output data, it was triangulated to resume and average out the results. During the field research process it was important to check the local geo-data against other official sources like the INEGI due to the difference between some geo-statistical information of the municipalities. It was also necessary to re-check the mapping information with the current land use by aerial and satellite images and walking inspection because the land uses and constructions is transforming very fast.

Through the interviews with key-informants it was extremely useful verifying local data with them, as they were a primary information source. They also helped to identify other missing issues that may be considered for this research. Most of the interviews were recorded by a camera and notes were taken as well to review the most important aspects of each meeting. Parallel to the listed informants, other interviews and meetings were made with people that were suggested by the informants in order to listen and learn from other important voices.

All the interviews were authorized and signed, the base for the key questions and authorizations are in the Appendix of this thesis, as well as the formal documents to obtain official information. The obtained information remains as confidential.

Another important element for data validity was the photographs made in the area. The visual archive was a key element in comparing the official land uses with the mapping of the current pattern of land use in the case study.

4.3.4 METHOLOGICAL CHALLENGES

The biggest methodological challenge was the access to some official information, due to the lack of a transparency process generated by each municipality, and the accessibility of it. The municipal plans were very useful to obtain the basic data, but due to legal locks and bureaucratic procedures, it was difficult to find secondary geo-data. In particular, regarding land uses.

Although there is a National transparency law for public information access, the procedure to obtain that information is not easy. Most of the official information in Puebla depends on the type of public institution that is taking care of it. For the data collection of this research, it was easier to find public information from National institutions, rather than local. During the research process it was necessary to complement the official maps from INEGI geo-database through satellite images and printed maps. For example, the map of gated communities and housing development was constructed through geo-data because there is no digital information at a municipal level, or not available to public access, neither at regional.

Another research challenge was the interviews. In general terms, most of the stakeholders were able to talk and give their opinions, but contacting owners or representatives from construction or real estate companies was difficult. Most of them are not interested in giving interviews regarding their business and relations with politicians.

It was observed that another local limitation is the accountability of the land reserve *Atlixcáyotl-Quetzalcóatl.* This reserve is still not considered a district and its management changes to different agencies, the municipalities of San Andrés, San Pedro, and Puebla do not want to be fully responsible for it, but they do want to profit from their taxes.

4.4 CONCLUSION

Important National planners like Gustavo Garza, Jan Bazant, Roberto Eibenschutz, and Alfonso Iracheta; and research groups from the *Universidad Autónoma Metropolitana*, and Universidad *Nacional Autónoma de México* developed several studies and methods for urban fringe issues and spatial development in Mexico; however they are more focused on the case of Mexico City and their Metropolitan Area. Due to the recent metropolisation of the City of Puebla and towns like Cholula, the public and academic interests of this matter grows day by day. This research aims to complement other visions of the loss of rural land in Cholula, approaching the studies in the relationship of stakeholders in the development of the metropolitan area, as well as the socioeconomic impact all over the territory.

Beyond the qualitative characteristics of this research, the methods for the findings are mixed, mainly exploring the visions of the stakeholders and the development of urban growth through illustrative cartography. The methodology of this subject will be useful for further investigations related to Puebla's metropolisation and urban sprawl in similar cities. It will be also helpful to understand the paradigm of metropolisation and how it is possible to interpret the mapping of the land use pattern, as well as the agents of change involved in densities, uses, sprawl and population.

Image 6 Peri-urban area in the Valley of Mexico City, Source: Ricardo Gómez Garrido, authorized by the photographer

V SPATIAL DEVELOPMENT IN MEXICO: LAND REFORMS AND LEGAL FRAMEWORK

5.1 INTRODUCTION

Spatial planning in the last 30 years in Mexico responds to economic and political changes. Peña (2012) states that the new trends in planning practice had two origins: one corresponds to the fiscal crisis of the State in the 1980's that adopted a neoliberal model; the second corresponds to a legitimacy crisis of the political system that led to an uprising of new democratic movements. These facts are reflected in the combination between traditional practice, massive planning and the informal urbanisation. However, the Mexican institutions responsible for the planning have a long history in land reforms that lead for one side the rural development and the other side the peri-urban development.

This chapter is divided in three parts: the first makes the introduction to the national context in the area of spatial and urban development, divided into two parts: the first part is an overview of the period of land reform that corresponds to the agrarian reform (1920's), the regularization of the *ejidos* and the second land reform with the liberalisation of the rural land for urban development in the 1990´s. The second part refers to the legal framework for planning and the principal norms and guidelines for the regional and local authorities. At last, the third part resumes the spatial planning challenges for Mexico.

5.2 FROM THE AGRARIAN REFORM TO FREE-MARKET LAND

Mexico is marked by a strong rural history since the evolution of the first urban settlements in the Mesoamerican Region. The different societies that existed before the 15th Century had their own laws and management systems. After the conquest of Mexico in 1521 and the dissolution of former civilisations, the Spanish were the rulers for the new conquered territories. Most of the distribution of land for former conquistadors, church, and rich families was made in large estates that took place first in the form of *Encomiendas* and then into *Haciendas*.

The variety of *Haciendas* developed a productive agriculture and mining sector, especially after the Mexican Independence in 1821. The 19th Century represents the reinforcement of industrialised mining and agriculture that met the national and international demand for silver, sugar, natural fibres, sisal, meat, grains, corn and other farm products. This made big fortunes for the land owners, but at the same time it diminished the living and working conditions of the rural population, especially the workers that depended on the *Haciendas* production and most of them were deprived of their land rights.

At the beginning of the 20th Century, the instability of the political and economic situation, the bad labour conditions, the null land rights for farmers[8], among others were part of the root causes that generated the Mexican Revolution in 1910.

5.2.1 LAND JUSTICE: THE AGRARIAN REFORM BEFORE 1910

After the Mexican Revolution, during the decade of the 1920s the social stabilization of the country allowed several economic and politic reforms.

Due to the promise of land justice for the peasants and farmers the Federal Government made a big Agrarian Reform that expropriated the estates and large *Haciendas*. This expropriated land was divided and given to: farmers, peasants and indigenous communities. With this new policy, the government tried to convert the estates into public, communal and individual properties. In particular a type of communal property, the *Ejido*[9], was created, as a banner for revolutionary justice, and as a management system for agricultural production and the regulation of human settlements. The *Ejidos* sought to solve people's problems without tenure security, land rights or work as a consequence of the Colonial Period. So, the objectives of the Agrarian Reform were (Assenatto & de León, 1996):

- **To return the land to farmers** who were dispossessed by *Hacienda* owners
- **The free distribution of land to people who did not have any land ownership** through a system of communal property.
- **The creation of a new land tenure** system that would generate a higher agricultural growth.

[8] Dunn (2999) refers to the land right situation after the Mexican Revolution, quoting Fix-Fierro, and stating that in 1910 the 97% of the land was owned by 1% of the population.

[9] The term *ejido,* system largely used since former pre-Hispanic society, refers to the farm land that used to be in the boundaries of a town or community, and was used for communal activities. The term was extended after the Agrarian Reform (in the 27th Article from Mexican Constitution) for the *ejidatarios*. The given land was divided for three purposes: farm land, communal activities, and foundation of urban settlements (Assenatto & de León, 1996).

The *ejido* was institutionalised as an organisational system for land tenure and production. It was expected throughout all the 20th Century to ensure better production systems for the farmers; however it did not resolve the poverty problem and the quality of life in the rural areas. Even in the early years of the Agrarian Reform Eyler N.Simpson (1937, p. 439) affirmed that this situation generated an "agrarian crisis" and the

> *"effects of the program began to fall in production, as the problems of the organisation and control of the ejido became more complicated – in a word, as the proportions of the possible role of the ejido in the life of the nation became more patent, it was no longer possible to evade the issue…What was the ejido, anyway – one method for redistributing landholdings, a transitory political device for rectifying social injustice, or was it something more – an end in itself, a novel and insignificant type of agrarian institution and a new and important instrument of agricultural production?"*

During the 20th Century, the lack of agrarian productivity and the accelerated population growth began to marginalize the position of the rural sector. During the 1960s, half of the Mexican population lived and worked in the countryside. At the start of the millennium, Warman (2003) explains, the rural population reduced due to an irreversible urbanisation process. Currently, according to the last National Census (INEGI, 2010), urban population accounted for 78% of the total population and the rural – less than 2,500 inhabitants per locality – a decrease of 21%.

The decrease in rural population responds to different social changes, one of them is the rural-urban migration. For the case of Mexico, there are some differences between the migration period of the middle 20th Century, and the 1990-2010 rural-urban-rural migration. The first migration responds to the lack of opportunities in the agrarian sector and the pursuit of better quality of life. The second migration responds more to the abandonment of agricultural and social activities inside the rural areas; and the pursuit of better economic profit of land.

This second migration corresponds to a new social order defined by Torres-Mazuera (2012) as *ruralidad desagrarizada,* or "non-agrarian rurality" meaning that nowadays the rural population does not necessarily need to be part of the agrarian productive sector. The inhabitants of this new rurality expect to have better urban conditions inside their communities, and may not feel so connected with the rural identity or the demand for land justice of their ancestors.

The land justice demanded from the grandparents in the form of *ejidos* was supposed to benefit their descendants, although people had the land rights and tenure to exploit it, many times they did not have the instruments or resources to be economically independent, and were non productive. Therefore, decades after the Mexican Revolution the economic and living conditions of the rural population had become worse than ever. The critical conditions previously mentioned, was one of the reasons for the last modification of the Agrarian Reform in 1992.

5.2.2 LAND REFORM: THE LIBERALISATION OF FREE MARKET LAND IN 1992

The population growth of Mexican cities during the decades of 1960 to 1980 created an important urban expansion. The consequences of this urban phenomenon were that cities transgressed their boundaries beyond the urban borders, and many *ejidatarios* began to construct their own houses outside their land properties. This was the first urbanisation of the *ejidos*, illegally but responding to the needs of affordable housing for rural families and the fact that agricultural activities were

abandoned. This type of urbanisation was one of the physical manifestations of informal development in the peripheries, towns, and human settlements.

As an answer to these manifestations, during the Presidential period of 1988-1994, the Mexican President Carlos Salinas de Gortari began several economic and political reforms that responded to trends in neoliberal policies. Having the justification of the poverty and unproductively of the agrarian sector, in 1992 the Federal Government and the Congress changed Article 27 of the Mexican Constitution. This article was a legal padlock for land tenure property. Originally the article did not allow the sale of agricultural land beyond the city borders for urban uses, even if they were illegally occupied or for sale.

The *ejido* system formalised the land rights of a person, and was only possible to inherit those rights to members of their family. With the modification of the Article 27, the land right owners had a legal support of their own properties, giving also the opportunity for the government to have a controlled urban growth outside the cities. This action was expected to increase the productivity of agrarian activities and orderly urban development, as well as generate a public debate between simple privatisation and state ownership (Williams, 1999) .

On one hand this land reform created the opportunity for farmers and *ejidatarios* to own an individual property, but on the other hand it triggered the beginning of land speculation, where private investors – authorized by governments – began to buy huge extensions of farming and *ejido* land outside the urban areas. This was part of the beginning of the physical urban expansion of Mexican peripheries into major cities.

To complement the land management, the Federal Government implemented through the Agrarian Office (1996)[10] the PISO[11] program to respond to the need for developable land for urban uses through the incorporation – mainly through expropriation – of rural land and *ejidos.* The Government also created the CORETT[12] for the legal land tenure regularisation of the *ejidos.*

5.2.3 LAND DEVELOPMENT: METROPOLITAN URBAN EXPANSION

Nowadays, it is a fact that big metropolises such as Mexico City, Guadalajara and Monterrey keep attracting population from less prosperous localities. During the last decades, small cities began to decentralize economic activities and new migrant groups became residents. In this matter, Pérez Campuzano (2006) defines new forms of population displacement: from a former **rural-urban migration** to **urban-urban, metropolitan-urban** and **metropolitan-rural.** This population movement corresponds to the decentralization of Mexico City and the urban population which began to concentrate in other medium sized cities.

During 1980-1990 the industrial areas around Mexico City began to grow, provoking migration to other economic cores. The consequences of this condition were the contraction of the physical area of Mexico City and the exponential physical growth of the surrounding urban areas, creating a *Megalopolitan Region*. UN Habitat and SEDESOL (2011), establish that urban land of Mexican cities expanded by 7.4% per year in a period of three decades. Meanwhile the population grew by 1.7%

[10] *Procuraduría Agraria*
[11] *Programa de Incorporación de Suelo Social*
[12] *Comisión para la Regularización de la Tenencia de la Tierra*

and the urban population by 2.7%, in 2009 the Mexican cities occupied 0.6% of the national territory, meaning that the resulting urban spaces in the peri-urban and urban areas are dispersed, fragmented, and unsustainable for metropolitan and environmental management.

To give an idea on the impact of urbanisation over *ejido* land, Cruz-Rodriguez (2008) describes the urban expansion of Mexico City based on the work of Schteingart in 1981, 1989 and CONAPO in 1992:

- *1970-1980* – in this period 68% of Mexico City's urban growth was made over *ejido* land, and the conurbated municipalities was made over 50% of *ejidos.*
- *1980- 1990* – 28% of *ejido* land in Mexico City, 72% of *ejidos* of conurbated municipalities.
- *1990-2000* – 26.2% of *ejido* land in Mexico City and 60.5% of private property.
- *2000*-2010 – 42.4% of *ejido* land in Mexico City and 42.7% of private property.

In the last two decades the tenure changes over rural land are visible, from primary *ejido,* tenure; most of the growing areas are converted into private land. This fact coincides with the current land policies of adding with "planning and order" *ejidos* to urban land; nevertheless, the incorporation of *ejidos* to urban areas is generating a wasteful consumption of land and resources due to the high demand on housing and developable land (Schumacher M. , 2010).

5.3 LEGAL FRAMEWORK ON PLANNING POLICIES

During the former previous Presidential administration (2006-2012) the Ministry for Social Development SEDESOL was in charge of spatial planning in Mexico. This ministry worked with social programs to reduce poverty and protect vulnerable groups; it used to cover the areas of spatial, urban and rural planning.

For the current President Enrique Peña Nieto's administration (2012-2018) the spatial and urban duties were assumed by a new Ministry: the Ministry for Agrarian, Territorial, and Urban Development SEDATU.

This ministry is responsible for the different planning scales at territorial, regional, and local level. According to the updated 2015 National Planning Law, it works with other ministries and agencies like the Ministry of Environment and Natural Resources SEMARNAT, the Ministry of Agriculture SAGARPA, and the Ministry of Transport and Communications SCT.

In general terms, the legal planning framework is given by two mechanisms: **the laws and the plans/programs**[13]**.** Those mechanisms are distributed in different levels, described in Figure 14. First of all at a National level; the ministries are responsible for creating and modifying plans/programs, and enforcing the law.

Sub--ministries and agencies provide the coordination and regulation. Then, at a regional and local level, State Governments are responsible for proposing and controlling plans and regulations; and Municipalities are responsible for implementing local planning and regulations.

[13] PLANS are planning mechanisms, PROGRAMS are implementation mechanisms

Figure 14 Mexico's Spatial Planning Framework. Source: Adapted from the official charts of SEDATU (2014)

There are as well municipal institutes, citizens' organisations, and local observatories that monitor the implementation, enforcement, and administration of plans and regulations.

To understand better the planning system in Mexico it is fundamental to mention that every plan, program or regulation is based on important normative documents like *Ley de Planeación* (1983) or the National Planning Law, which has been updated several times; the last one in 2015. In general terms, the Article 2 describes the importance and responsibility of the Federal Government in planning, besides the Law provides the guidelines for the elaboration of a National Development Plan and gives responsibility to the federal institutions and administrations for the formulation of sector plans and programs (Article 17). It establishes the different plan/programs categories (Article 22) that should be aligned to the National Plan: sector, institutional, and regional.

Another basic normative document is The National Development Plan[14] (2014) which provides the framework to elaborate key programs and plans with the different governmental agencies and States. In the case of spatial planning and urban development that are not considered as key strategies in the National Plan, they are included in the National Urban Development Program. This program is supported by the Human Settlements Law (1993, updated in 2014) and is one of the bases for the Delimitation of the Metropolitan Areas of Mexico, a very important study for planning and regulation of urban settlements. These three legal mechanisms are key instruments and references for spatial planning and urban development in the country.

5.3.1. THE HUMAN SETTLEMENTS LAW (1993)[15]

The Human Settlements Law was created in 1976 and renovated in 1993 when the first symptoms of metropolitan expansion began to affect the urban management of the cities. It stipulates the policies and tools for the spatial planning and development of towns and human settlements.

[14] *Plan Nacional de Desarrollo 2014-2018*
[15] *Ley General de Asentamientos Humanos 1993*

An important axis of this law is Article 2. It defines regional development as the process of economic growth of a region, ensuring and improving the quality of life, the environment, and natural resources. For the case of urban development is defined as the planning and regulation process of the population cores.

The law sets the responsibilities of SEDATU [16] for regional planning, and for control and implementation of national urban development programs. This Ministry is responsible for planning and regulation of metropolitan zones and conurbated areas. This type of responsibilities should be shared as well by State and municipal authorities.

The law considers the different plans and programs as planning instruments for the next territorial scales:

- *Chapter IV* – The conurbated areas when two or more municipal boundaries of two or more state divisions reach a physical and demographical continuity. Should be responsibility of the state; and local government the planning, zoning and control of them.
- *Chapter V* – Regulation of population cores.
- *Chapter VI Articles 43, 45* – Land reserves for urban development and housing. Should regulate the land use and land tenure for the incorporation of them to urban uses.

In general terms, this law is one of the main references for other land and housing policies in the sector of urban development. Other important law and norms that works with this law are: the National Housing Law 1984, the *Ley de Fraccionamientos* or Residential Areas Law for Puebla elaborated in 2004, and the urban development regulations and the official local land uses.

5.3.2 THE NATIONAL URBAN DEVELOPMENT PROGRAM 2014-2018

This national program is legally supported by the Mexican Constitution, the National Planning Law, the National Housing Law, the Human Settlements Law, the National Plan; and the Sector Programs for Rural, Spatial, and Urban Development.

The most important part of this program (SEGOB , 2014) is the analysis of planning issues, which recognizes several problematic situations in spatial development like:

- The current expansion model of Mexican cities – extended metropolis, low density and peri-urban areas – generates expensive cost when the population needs public services.
- The former Housing Policies in the period 2000-2012 gave more than 159,612 Ha to develop housing land uses. Most of this agricultural soil was given to the real estate sector and the program recognizes that the transfer of the land tenure did not consider land reserves for other types of land uses like real social housing or public spaces.
- The legal framework of land uses is not clearly defined in terms of the responsibilities and duties of the real estate agents, leaving big legal gaps that leads to land speculation
- It recognizes the importance of the property tax, especially for local governments, whom are very dependent on this tax. However it is not well collected, for example, the average Mexican municipalities collect through the property tax only 0.1% of the GDP, compared

[16] *Secretaría de Desarrollo Agrario, Territorial y Urbano,* Ministry for Rural, Spatial and Urban Planning

to the OCDE countries where they collect 1% of the GDP and the USA which collects the 3%.

- The Federal Government should continue with the projects and programs related to urban mobility.

Many other strategies are considered depending on the region, the metropolitan area or the geographical situation. One of them is the Sector Program for Rural, Spatial and Urban Development (2013)[17] which more or less repeats the same urban development program, but focuses more on the rural development, and recognizes the need to improve the agricultural productivity. In the area of rural localities, the program sector promotes the urbanisation of rural localities. It means that the conditions and benefits of urbanisation should be provided to the rural world, like incentives to concentrate the people in local population centres and improve the access and quality of public services. With these actions, the level of population sprawl will be reduced, as well as the related issues.

Generally, all State's administrations and municipalities should use the National plans and programs as instruments for planning, implementation or to complement the elaboration of municipal plans.

5.3.3 DELIMITATION OF METROPOLITAN AREAS

One of the first researchers studying the metropolitan phenomenon in Mexico was Luis Unikel (1974). His work was the base for future formal delimitation of the conurbation of Mexican cities. The official definitions made by CONAPO and SEDESOL, are also based on statistics and geographic factors related to population size, physical conurbation, distance, integral function, and urban character of the municipalities (CONAPO, 2005). With the studies of 2000, 2005, and 2010, the Federal Government complemented the metropolitan physical definitions with the *Sistema Urbano Nacional* (2012).This study defines the delimitation and classification of urban settlements, considering the next urban scales:

- *Megalopolis.* Interconnected system of metropolitan areas in the centre of the country.
- *Metropolitan Areas.* Cities with more than 1 million inhabitants that may share conurbated municipalities or States, or neighboring cities with the USA.
- *Conurbation.* Localities, municipalities, States or urban cores that had physical conurbation with others between 15,000 and 49,999 inhabitants, or more.
- *Urban cores.* Cities where the urban expansion does not surpass the municipality boundaries, or do not have conurbation characteristics. A place with more than 15,000 inhabitants is considered as an urban core.
- *Urban population centre.* Localities between 2,500 and 15,000 inhabitants

This classification considers the localities because of their location; such as localities close to urban areas, localities near a road or motorway and isolated localities. As a general rule these localities with **less than 2,500 inhabitants are considered to be rural**.

Officially, the National Urban System of Mexico has 384 cities with more than 15,000 inhabitants and divided into metropolitan areas – 59 with 63.8 million inhabitants –, conurbations – 78 with

[17] *Programa Sectorial de Desarrollo Agrario, Territorial y Urbano*

5.2 million inhabitants – and urban cores – 247 with 12.2 million inhabitants –. The Federal Government usually considers only the population size of a locality for the delimitation of what is urban or what is rural; and the socioeconomic or cultural activities are taken for other sociological studies.

Other tools that help us to have a better understanding of those processes are the different indicators from the National Census, taken by CONAPO and INEGI to delimitate the characteristics of Metropolitan Areas. For example, distance to the central city, population that lives or works in the municipality, density, municipalities considered in plans and the type of municipality. This last point considers three types of physical characteristics:

> **(1)** *Central municipality* – Municipalities located in the central city, giving origin to the metropolitan area. The central city should have more than 50,000 inhabitants.
>
> **(2)** *External municipality defined by geo-statistical data* – This type of municipality may have localities that are not conurbated with the central city. This category has different conditions like distance to the central city, functional work integration, working population in non-primary activities, and average urban density.
>
> **(3)** *External municipality defined by development plans or planning policies* – This municipality is officially recognized as part of a metropolitan area through the different instruments that regulate urban development and spatial planning. This type has mainly urban characteristics with high functional integration level with the central municipality

The 59 metropolitan areas in Mexico vary in their physical regional characteristics and their municipalities' situation. The national system and definitions are a good way to help State and local governments in the area of planning. Nonetheless it does not mean it is easy to reach a congruent and sustainable urban land management, especially when places like the Metropolitan Area of Mexico City – with more than 22 million inhabitants – are surrounded by other 5 middle metropolitan areas, with different political rulers, cultural characteristics, socioeconomic activities, and geographical location.

5.4 KEY CHALLENGES IN SPATIAL PLANNING IN MEXICO

There are many problems and challenges in the area of spatial planning, this research considers 5 of the most important topics that citizens and authorities should take into consideration for a congruent spatial development: *peri-urban growth, regional and local planning, urban governance, urban land management, and participatory planning.*

These 4 topics responded to the technical and sociological observations made by UN Habitat, CEPAL, IDB, OAS, etc. Peri-urban growth is related to sustainable land uses and urban expansion, planning is related to the need for inclusive policies, urban governance is a priority area to restore confidence in the authorities; urban land management is the link with operative planning; and the participatory planning is a key element in integrating the citizens into the decision-making process and development vision for future generations.

5.4.1 PERI-URBAN GROWTH: NEW RURALITIES AND URBAN SPRAWL

Since the 1950s, millions of inhabitants migrated to urban areas for better working conditions or life opportunities. As it is described in this chapter, the bad conditions of the rural areas and the poor economy of farmers made them change their primary economic activities. Additionally, the land policy reform in the nineties, allowed thousands of agricultural hectares to be privatised, expropriated and sold, generating two situations:

- The development of massive social housing and gated communities with low density.
- The development of informal housing areas over agricultural soil.

These two facts converted the compact traditional cities in Mexico into sprawled, diffused, and extended metropolises. Rural communities are now having heterogenic social transformations that connect the population with other economic activities, not necessarily related to agriculture but still connected to the rural heritage.

People inside these rural areas coexist alongside new inhabitants and working activities; especially in the social housing and gated communities complexes. Local communities try to integrate into new urban life and get economic benefits from the new residents out of it.

This is a challenge for every local authority due to the management complexity of regulating informal and formal constructions, provision of public services and tax income. Normally many of the municipal plans or regional plans consider planning and regulations of human settlements, but do not consider other identity or social aspects that may help to coordinate better solutions to spatial development.

Another situation creating social housing and gated community complexes is the management inside and outside those areas. Due to the incapacity of the local authorities to provide security and other services to the population, the real estate companies developed massive housing areas, most them closed, even for the lower income population. The majority of them pay their own administration and security system; however this is creating a big management issue because what is happening inside those areas is not responsibility of the authorities. Ultimately, it has been creating cities inside the cities, socioeconomic circles that do not want to coexist between them.

5.4.2 REGIONAL AND LOCAL PLANNING: IMPLEMENTATION, MONITORING, AND ACCOUNTABILITY

The National Planning Law 1993 establishes the guidelines for the elaboration of national, regional, and local plans. As it was described previously in this chapter, it is essential to have a global vision of many situations to have better development objectives and goals; however, in countries like Mexico sometimes the National vision is not correlated with the local necessity.

The problem in Mexico is not the elaboration of plans, many of the guidelines are very clear and there are good examples of Mexican plans and programs with sustainable visions; the challenge is the implementation and the monitoring of local regulations.

Unfortunately, regional and local plans have become the result of the political vision of the Governor in place or the mayors, and not necessarily a common vision. Plans have another problem

related to the implementation and monitoring – continuity; it is traditional in the political panorama that when a Mayor or Governor finishes his/her administration period, the next one – if he or she is from another party – will stop all the actions, programs, or plans that the former did[18].

The individual vision of politicians and authorities are creating disorder among the spatial development and policies.

5.4.3 URBAN GOVERNANCE

Governance is the root of many social, economic, and political issues in countries like Mexico. The "flexibility" of many policies and regulations make on one hand the country very attractive for investment and individual entrepreneurship, as well as depending on the governance of the local authorities in order to access more easily affordable housing or land. But, on the other hand, the lack of commitment from authorities makes Mexico a land easier to be corrupted. Contrary to what the current President of Mexico, Enrique Peña Nieto has said about corruption as a "*cultural problem*" (El Economista, 2014), the lack of confidence from the citizens in their authorities is more related to the gaps in implementation and regulation of the laws, rather than a cultural matter.

As Healey implies (2007) urban areas have certain aspects of *place-governance,* associated to different manifestations of daily urban life. The author names some activities that guide the governance rules like economics, health, security, environment protection, welfare and the shape and growth of the cities.

Inside and outside cities, there are many challenges in the area of governance in Mexico; one of the most important being land tenure and the access to housing. Nowadays the private sector is the one that dictates the political vision, while the authorities play an important role as the executors of private interests. In this case, the Government lends responsibility to the private sector or as Magel & Wehrmann (2002) state "*good governance will be reduced to a good market ideology*".

5.4.4 URBAN LAND MANAGEMENT

Mexico is a rich country in land resources; however the National authorities' development vision is following Neo-liberal policies in exploiting those resources for the private sector and foreign investment in order to obtain better economic benefit for the country.

The problem is when capital flows and investments enter into a city, there is an inequitable distribution of capital between public/private urban projects and population needs. This condition creates several socio-spatial integration problems, where planning and management do not find a proper linkage. Iracheta (2008) emphasizes that management problems create "crisis and opportunity", for example when there is lack of communication and order between conurbated municipalities when they need to implement several plans and programs, or when there is water management issues. Moreover, the management issue began with the implementation of many plans and the lack of control over land use and construction regulations by the authorities.

[18] In Mexico there is no reelection system, the President, Governors, and Mayors must finish their work in their own elected periods.

5.4.5 PARTICIPATORY PLANNING

For reducing the gap between the different socioeconomic groups it is essential to have inclusive cities rather than exclusive ghettos. One of the actions to repair this situation is participative urbanism or community planning. Many good examples in the neighbourhoods of Mexico City exist, where the local population united against questionable urban regeneration projects and where the *Autoridad del Espacio Público* worked alongside the citizens to improve and democratise the public areas.

Through participative urbanism, local plans might have more credibility when the representative stakeholders' groups are incorporated. However here comes the challenge in this planning strategy, due to the historical populist campaigns from the politicians, where the poorest groups are used to receive food, t-shirts, hats, tortillas, or money from the parties so they will vote for their candidate. It is also common practice to take buses full of people to the political meetings, so the news-shows will talk about the full support from the population to the candidate. These practices make it more difficult to implement community planning, because people are used to thinking that this strategy is only deployed for electoral purposes.

5.5 CONCLUSIONS

The Mexican territory has a long history in land reforms and land rights, especially in the rural sector where the *ejido* was developed as a regulation figure for agricultural production and land tenure restrictions. Due to the economic, political changes and the bad living conditions of the *ejidatarios*, the Government opened the door to the free market land. On one hand the land reform helped to *ejidatarios* to own a piece that ensured them tenure security and allowed regulating urban growth over agricultural land. On the other hand the reform enabled the speculation of the peri-urban land according to the housing policies of the 20th Century. These aspects define the tendency sprawl and land development in spatial planning in Mexico of the last 20 years.

The Human Settlements Law, the National Urban Development Program, and the Delimitation of Metropolitan Areas are the three most important guidelines for the control and planning of land uses in the country. Most of these instruments should be coordinated with the local authorities and agencies. Although there is a legal framework for planning, due to the size of the country, the number of the population, and the extension of the cities; is very difficult to find a balance in spatial development and land use control between the different authority's levels and stakeholders. A clear example of this situation is the last Agrarian Reform, needed for some, exploited by others, which led to the sustainability of metropolitan growth and rural areas becoming vulnerable. In this matter, Mexico has many challenges related to urban growth and governance, management, community and local planning, where it is more than important to achieve the reconstruction of the social fabric through a complete integration of policies and actions.

Image 7 Urban landscape of Puebla with a view to Angelópolis District,
Source: Agustín López, authorized by the author

VI THE METROPOLITAN AREA OF PUEBLA-TLAXCALA: SPATIAL DEVELOPMENT AND PLANNING

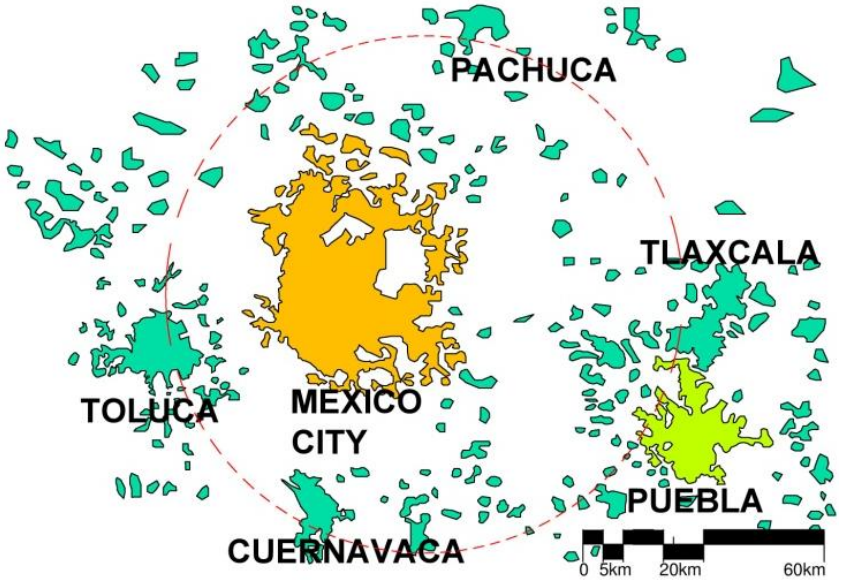
6.1 INTRODUCTION

The Metropolitan Area of Puebla-Tlaxcala MAP-T, as an administrative region is an exemplary case of urban growth after the decentralisation of socioeconomic activities of Mexico City, mainly due to its strategic location. It is important to mention that the urbanisation of the MAP-T is a complex study area and this research does not pretend to get deep into the metropolisation process of it. Therefore this chapter describes the general characteristics of the MAP-T, as the area where the case study is located. The first part introduces the general descriptions for size localities and characteristics of the MAP-T. The second part analyses the State's legal framework for regional and urban planning, in order to have a better idea of the influence on planning regulations in the administration of the MAP-T and their local municipalities.

To comprehend the importance of the MAP-T in the case study and in the central region of Mexico, it is necessary to quote the Organisation for Economic Co-operation and Development, the OECD (2013). The organisation states that the population growth of the MAP-T was 1.9% in 2013 and bigger than the average of the OECD rates for metropolitan areas, due to their strategic location in the region as an important manufacturing centre in Mexico. In addition, the organisation suggests several urban challenges for the MAP-T related to competitiveness, economy, social organisation and urban governance.

6.2. NATIONAL AND REGIONAL CONTEXT: FORMAL DEFINITIONS

Due to the expansive urban growth of the Mexican cities during the 20th Century, the urban borders were surpassed over rural land. The capital cities became not the single urban core or the only places with centralities, and the rural areas began a process of agricultural abandonment activities. This condition changed the traditional perception of the city to different urban dynamics.



Map 1 City-Network with Puebla and Tlaxcala location. Source: adapted from INEGI (2010)

The official research and reports by UN, World Bank or GIZ use different urban scales for defining a metropolis, considering many socioeconomic and demographic indicators and the traditional city features like cultural and nostalgic meanings.

Nonetheless, that does not mean the cities are merely statistics and numbers, on the contrary, the UN Habitat (2012) states that the cities are a "*remedy to global crisis*" because they are scenarios and platforms for socio-urban manifestations where local solutions can be solved. The metropolitan areas remain attractive places for migration of the population with different interests and needs compared to the traditional rural-urban migration of the 20th Century.

The particular case of the surrounding areas of Mexico City, where most of the urban population of the country is concentrated, metropolitan management is going into a regional and *megalopolitan* management. The decentralization of socioeconomic activities from the Capital of the country triggered important development for other middle-size cities. The new spatial development included the metropolisation of different urban areas around Mexico City with very complex socio-spatial relationships and administration divisions.

In this megalopolis management chaos, due to the diverse municipalities, geographical differences, population size, political parties, among others; the Metropolitan Area of Puebla-Tlaxcala MAP-T is located, with two central cities, 39 central municipalities (see Map 1 and Table 9) and 13 exterior municipalities, from these exterior ones, two are considered as part of the functional integration and ten are integrated in the local planning policies.

Due to the number of municipalities and population size, the MAP-T is considered the fourth largest metropolis in Mexico and one with the biggest urban growth in the last decades. In order to have an idea of this condition, the statistics from the period 2000-2010 show that the Metropolitan Area of Mexico City had a population growth rate of 0.9% with an average density of 16,010 (pop/km$^{2)}$ and the MAP-T had a population growth of 1.8% with a density of 7,660 (pop/km^2). Compared to Mexico City, the density in the MAP-T is lower, but the average growth is higher, a clear example of decentralisation of economic activities.

Table 10 Municipalities from the MAP-T. Source: Delimitación de Zonas Metropolitanas CONAPO (2010)

MUNICIPALITIES FROM THE STATE OF PUEBLA	MUNICIPALITIES FROM THE STATE OF TLAXCALA
1. Acajete	20. Ixtacuixtla de Mariano Matamoros
2. Amozoc	21. Mazatecochco de José María Morelos
3. Coronango	22. Tepetitla de Lardizábal
4. Cuautlancingo	23. Acuamanala de Miguel Hidalgo
5. Chiautzingo	24. Nativitas
6. Domingo Arenas	25. San Pablo del Monte
7. Huejotzingo	26. Tenancingo
8. Juan C.Bonilla	27. Teolocholco
9. Ocoyucan	28. Tetlatlahuca
10. Puebla	29. Tepeyanco
11. San Andrés Cholula	30. Papalotla de Xicoténcatl
12. San Felipe Teotlalcingo	31. Xicohtzinco
13. San Gregorio Atzompa	32. Zacatelco
14. Santa María Texmelucan	33. San Jerónimo Zacualpan
15. San Miguel Xoxtla	34. San Juan Huactzinco
16. San Pedro Cholula	35. San Lorenzo Axocomanitla
17. San Salvador el Verde	36. Santa Ana Nopalucan
18. Tepatlaxco de Hidalgo	37. Santa Apolonia Teacalco
19. Tlaltenango	38. Santa Catarina Ayometla
	39. Santa Cruz Quilehtla

The conurbation of municipalities inside metropolitan areas like the MAP-T matches on one side with the development of industrial corridors and on another side with housing development, trying to provide work and housing options to local and new residents. These socio-spatial changes generate different development poles. For the case of the MAP-T, the description and analysis of regional characteristics provide a better approach to understand the peri-urbanisation processes in the case study.

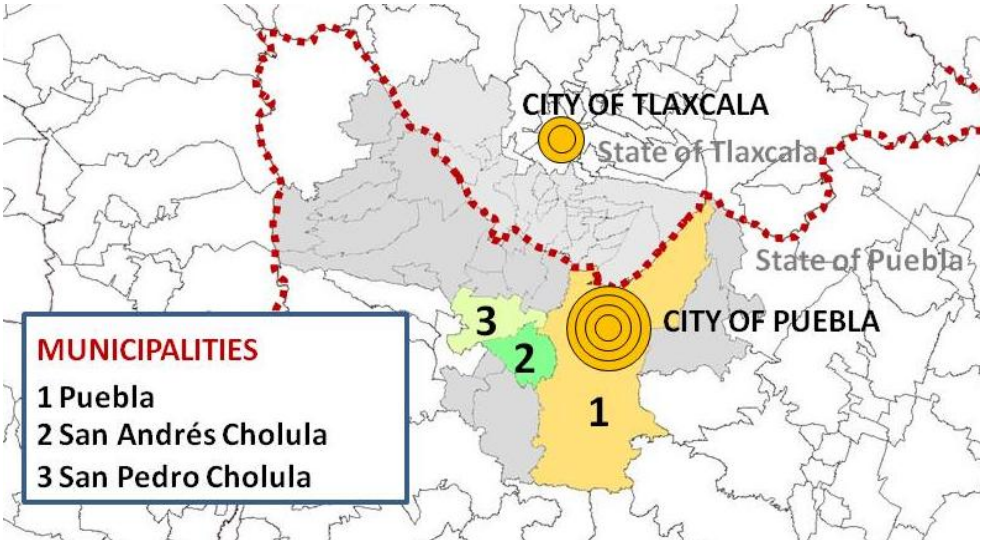
6.3 THE METROPOLITAN AREA OF PUEBLA-TLAXCALA

The MAP-T, as it is shown in Map 2, is located in centre of the country and well connected to the Mexican Capital and other States via transportation routes that lead from the Port of Veracruz to the south of the country. This metropolis is home to almost 3 million inhabitants and is 127 km away from Mexico City, separated only by the mountain system that both metropolises share through the fantastic landscape of their volcanoes.

Out of 32 Mexican States, one of them as the Capital Mexico City, the MAP-T gets its name to two different States: **the State of Puebla and the State of Tlaxcala**, as well to their equally named capital cities, **The City of Puebla and the City of Tlaxcala**[19], of which Puebla is the biggest and the main urban core inside the MAP-T

The City of Tlaxcala is a minor city with 89,795 inhabitants. It is well known due to its historical-cultural heritage, architecture, and folklore. The City of Puebla is the heart of the State as a trading, touristic, and historical city, having a strong industrial sector – especially in the automotive area – and well known as an educational centre.

[19] This research does not extend on the City of Tlaxcala, even there are socioeconomic and cultural bonds with Puebla, it does not yet share physical conurbation with the MAP-T.



Map 2 MAP-T's municipalities. Source: adapted from INEGI (2010)

Puebla is rich in culture and history, but presents as well some examples of peri-urbanisation: informal housing to massive gated communities. In fact, this is the consequence of many socioeconomic and spatial factors that lead to peri-urbanisation; influenced by legal frameworks and planning policies which emphasizes conurbation, sprawl, land speculation, and gentrification.

This This research does not intend to repeat what is already studied, but it is essential to describe briefly the origins of Puebla's urban grid, so, the reader can keep it in mind when the subsequent land use patterns are analyzed in Chapter VIII of this thesis.

The planning of the urban grid was developed with the foundation of the city in 1531; following urban design ordinances from the Spanish Crown. These ordinances were fundamental for the establishment of Spanish human settlements in America. Since then and during the Colonial period, the City of Puebla became an important trade link between the Port of Veracruz and the Capital of the Viceroyalty, Mexico City.

Puebla developed extraordinary colonial architecture, well appreciated through the urban grid in the historical district, the most important urban core in the region during centuries. With the mixture of the locally dominated pre-Hispanic cultures and the European heritage, the society of Puebla developed a particular identity that remained hermetic till the decade of the 1960's when industrial sector began to grow. After these years, the city – strongly known for its textile industry – opened to other markets, in particular when the Volkswagen Plant and the *Universidad de las Américas Puebla* were opened and the migration from people from all over Mexico and other countries like Germany, moved to Puebla.

This historical named population condition and migration is high-lightened by López-Tamayo (1995); he observes that Puebla has been a segregated city since its foundation. The first colonial city was constructed only for the Spanish population, the *mestizos,* and indigenous people were excluded to live in their own *barrios*[20]. Besides the social exclusion and the historical urban growth,

[20] This tendency on social exclusion was definitive to shape the peri-urban area in many municipalities like our case study, explained in further chapters

the author establishes two different and important urban expansions in the city during the 20th Century (p.55):

a. *First urban expansion (1930-1970)*
   - The city was 10.6 Km2 and the urban grid was compact. The first districts and new neighborhoods were constructed only outside the historical core. During the 1950′s, the urban growth was ordered, legal and with a certain spatial unity.
   - After this decade, the first informal settlements began to establish outside the city, but were isolated from the urban grid. In 1962, the construction of the Mexico City-Puebla Motorway generated the installation of industrial corridors. Volkswagen was one of the first industries to arrive five years later. This urban growth on the north incorporated the first bordering municipalities, boosting the municipal territory by 187%.
   - The SEDESOL[21]-UNAM (2008) report, distinguishes that during this period most of the industry moved from the centre urban core to the periphery, especially due to the construction of the new industrial corridors better connected with Mexico City and Veracruz.

b. *Metropolisation and spatial development (1970-1990)*
   - During this time, the industrial and real estate growth defined the first public policies in planning. This generated the first trends of urban sprawl, low density and accelerated population growth. In 1979, the city had an urban area of 59.5 Km2, which increased to 91.5 Km^2 three years later and in 1990 already to 128 km2, having more than 80% of population living in the urban area.
   - López-Tamayo found a high percentage of urban gaps in the original urban grid, followed by land occupation of the urban growth in marginal and residential housing, clear origin of free market land speculation.
   - During the 1990's it was officially recognized as a metropolitan zone with 10 municipalities from the State of Puebla and 6 from the State of Tlaxcala. For example, conurbation happened in different directions; especially urban growth tool over the *ejidos* and agricultural fields through the north, east and west (SEDESOL, UNAM, 2008).

Both periods correspond to extended peri-urbanisation processes, if the trigger was the decentralisation of Mexico City; the consolidation was the industrialisation of economic activities. This socioeconomic condition changed the urban shape of cities like Puebla, where the spatial development outside the urban core is recognised by Gormsen *et al* (1994).

The German researchers agree with Unikel, Garza, Schteingart, Eibenschutz, Bazant, Iracheta and other Mexican planners that the industrialisation made the first explosive expansion of Mexican cities during the 20th Century. Besides the rural-urban migration model that transformed cities, in the last 35 years, other forms of metropolitan urban growth were developed: massive social housing

[21] The Social Development Ministry (SEDESOL) was the responsible of the areas of spatial planning and urban development. Starting from 2011 this Ministry disappeared and changed into the Ministry of Rural, Spatial and Urban Development (SEDATU).

outside work centres, informal constructions over and within social housing, informal and formal trade-economic centres, etc.

To represent graphically those new forms on metropolitan development for Mexican cities like Puebla, Gormsen (1981) designed a model, described in the Figure 15 for Latin American cities' growth periods. His research was emphasized in Puebla as an exemplary urban growth case in the region. In this model, Gormsen divides three main periods that corresponds to López-Tamayo's analysis of metropolitan expansion.

Based on the analysis and observations of the last named researchers during the eighties and nineties, it is considered for this research the last urban expansion period for Puebla (1990-2010).

6.2.3 PERI-URBANISATION AND SPRAWL (1990-2010)

During the nineties, important regional development plans followed the National policies for the liberalisation of free markets and land development. In this period several demographic and economic changes occurred, mainly to provide solutions for economic and urban development.

In this period several demographic and economic changes occurred, mainly to provide solutions for economic and urban development. One of the Government's actions was the expropriation of thousands of hectares of agricultural land for the spatial evolution of many cities and tenure security. In this case, Puebla needed to provide land reserves to control urban growth and manage the metropolitan expansion.

For management and control needs, during these years the official recognition and delimitation of metropolitan areas was granted. In this case, the National Council Population (CONAPO) is

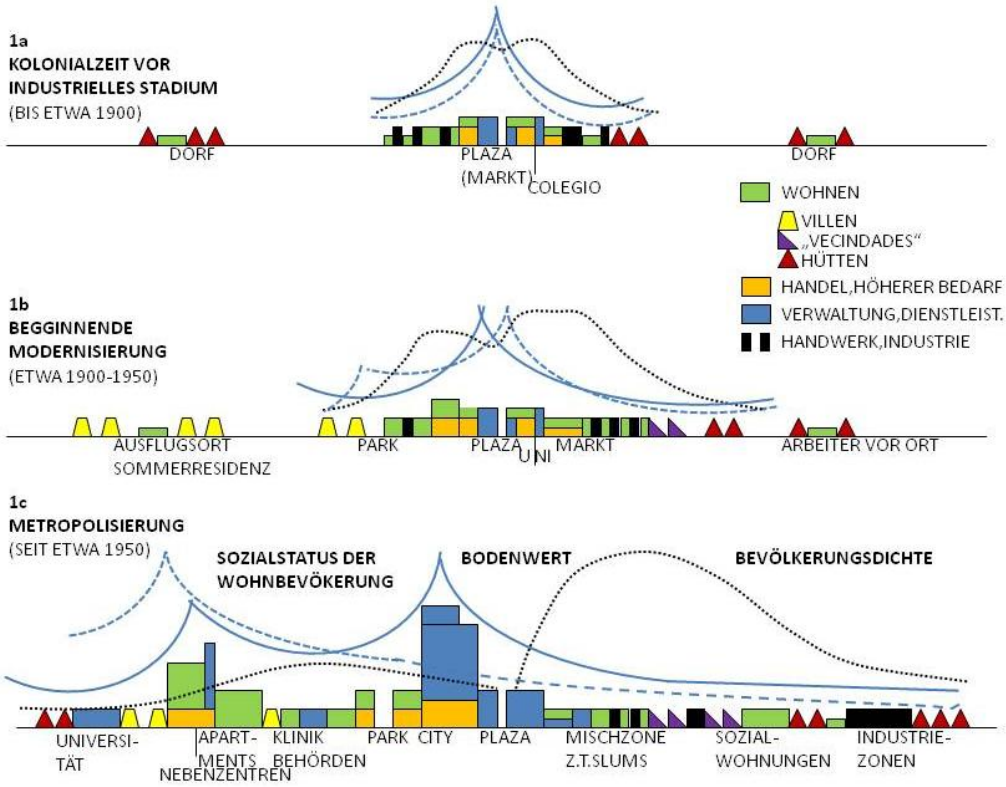


Figure 15 Latin American cities model of urban development. Source: adapted from Gormsen (1981)

responsible for delimiting the Metropolitan Area of Puebla-Tlaxcala (see Map 5). Nowadays 39.5% of inhabitants from Puebla and Tlaxcala State live in this area, being an important development core in the central part of Mexico.

The CONAPO defines the current administrative territory of the MAP-t with 39 municipalities that share physical conurbation. In order to have an idea of the exponential urban growth in the MAP-T, Table 11 and Map 3 describe the growth and development of the area, based on the National Statistics and National Census.

Table 11 MAP-T's urban growth. Source: Adapted from CONAPO, INEGI (1990, 2000, 2010)

PERIOD	TOTAL POP.	POP.GROWTH (%)	AREA (km2)	DENSITY pop/km²	PUEBLA'S MUNICIPALITIES	TLAXCALA'S MUNICIPALITIES
1990	1 776 884	2.4	-	-	10	6
2000	2 269 995	2.6	1 338	9390	10	13
2010	2 728 790	1.8	2 392.4	7660	19	20

Compared to 1990, at the beginning of the Millennium, the population size, and density rates reached its maximum growth. During the next years from 2000 to 2010, the MAP-T faced a stabilization period. Besides the regional plans of that period for urban development, the OECD (2013) Territorial Review observed different causes that led Puebla to metropolisation:

- Family's income improvement and lower transportation costs.
- Housing policies that promote the construction of massive social housing in peri-urban areas and affordable mortgage loans.
- Occupation of informal settlements that hinders the provision of public services and growth management.
- Lack of planning between spatial development and infrastructure.
- Limited local capacity of Municipalities and obsolete planning instruments.

The last 20 years of the metropolitan growth represent a tendency in low-density-construction. This phenomenon responds to two different expansion characteristics of the MAP-T: the big real estate operations and the construction of massive housing - social and residential - and the informal urbanisation in the *colonias populares* or common neighbourhoods (Les Ateliers, 2012).

Those characteristics are the result on the National Housing policies from 2000-2010 that promoted the massive development of social and residential housing areas outside the urban cores. This residential development created other problems that the local authorities are dealing with nowadays: **taking public services to the isolated and massive housing areas, and provide services and security to the gated communities**. The construction of these residential complexes by private investors responds to a housing and security need that the population demanded. The lack of control from authorities to those housing developments is generating the abandonment and exclusion of housing properties, and is increasingly isolating gated communities from the rest of the urban cores.

The lack of control by local authorities in construction regulations is generating another situation inside the social housing units: many of the residents are transforming their family spaces. The

formal urbanisation and construction of social houses is being adapted to economic and spatial needs of people. For example, many families adapt their living rooms into commercial spaces in the front part of the houses to receive a second income; or others construct more rooms over two levels in several stages – according to family's budget. The result is that the formal social housing became informal. For the case of traditional informal urbanisation with no services or infrastructure, it is set at the east and north part of Puebla.

During 1990-2000 urban growth contributed to the establishment of new urban centralities, with Puebla as the biggest core and the heart of the MAP-T. Other municipalities merged as important urban cores that shared physical conurbations with Puebla, like San Andres and San Pedro Cholula, Coronango, Cuautlancingo, Amozoc, Juan C.Bonilla, among others.

As it is shown in the Map 3, the new conurbated municipalities doubled the physical size of the MAP-T for the period of 1990-2010. Nowadays, the first conurbated towns are almost completely urban and the new added areas still remain with agricultural activities and a rural landscape.

Regarding the urban sprawl, it is evident in all of the MAP-T the low density rate of 7,660 (pop/km$^{2)}$ that is concentrated in the conurbated municipalities; and the low housing occupation in the cores areas and historical district of Puebla.

The OECD (2013) study, adds that the MAP-T was the metropolitan area in Mexico with bigger exponential growth, even beyond the OECD countries. For the period 2010-2013, the urban growth was eight times more than the population growth.

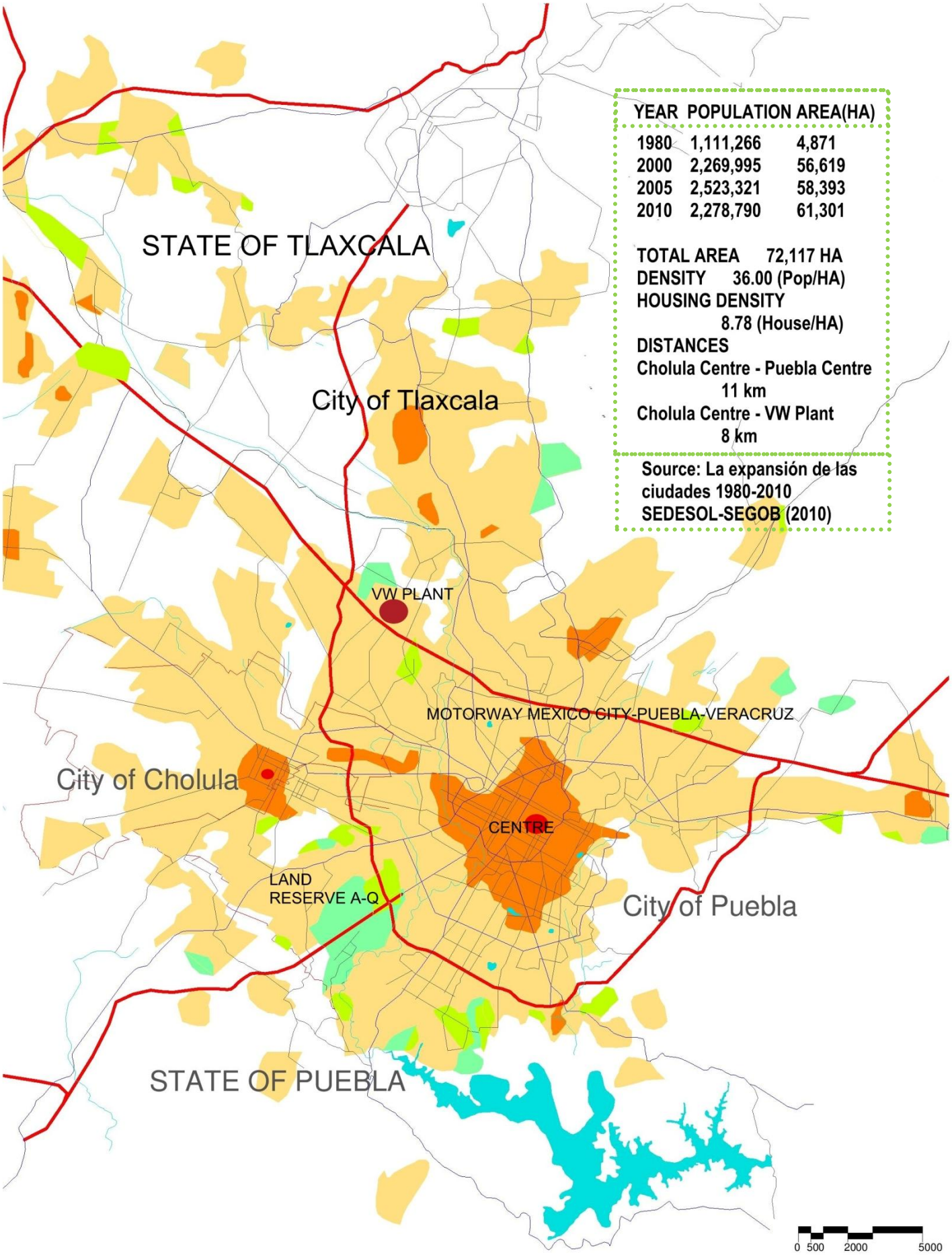
This condition matches with the urban sprawl of the area, identified by SEDESOL-UNAM in 2008. Besides the low density rates, the studies in land consumption show that there are many vacant plots and unoccupied parcels in the North-West and Centre-South part of the MAP-T. During this year, the study found 304 unoccupied plots that are not considered for other uses. This fact generates some common practices for local authorities and private sector that promotes sprawl:

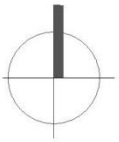
- Authorities do not provide good investment conditions inside the cities due to expensive land cost inside urbanized areas.[22]
- Private sector prefers to buy cheaper land in peri-urban and rural areas in order to develop bigger and profitable housing areas.

Complementing SEDESOl-CONAPO study, Iracheta's (2012) report "*Metrópolis en crisis. Una propuesta para la zona metropolitana Puebla – Tlaxcala"* identifies a common and accepted practice in the MAP-T: converting agricultural fields into urban ones, endangering the agricultural potential of the region, as well as environmental aspects.

The report states that population distribution in the area is random, disordered, dispersed, and unequal. The consequences of this pattern generated a lack of control of the local authorities in the land use occupation.

[22] There is as well a problem with re-densification in land uses in many neighbourhoods of Mexico City, when authorities allowed the land use change to develop skyscrapers where there is not enough water or proper infrastructure.





METROPOLITAN AREA OF PUEBLA-TLAXCALA
URBAN GROWTH AND ROAD-NETWORK
SOURCE: adapted from INEGI 2010, 2014

Main road-network | Secondary road-network | Tertiary road-network | Urban Growth 1980 | Urban Growth 2000 | Urban Growth 2005 | Urban Growth 2010

M3

Image 8 The City of Puebla from Colonia La Paz, at the bottom the new skyscrapers in San Andrés Cholula and Ocoyucan,.Source: Michelle Azofeifa, authorized by the author

Iracheta criticizes that **road infrastructure and industrial corridors are drivers of peri-urban development, planned as individual projects and not as integrated regional plans**. This critic is shared by Ribbeck's[23] observations on Puebla's development, he describes that industrial-urban corridors generate "*urban tentacles*", connected by infrastructure roads. This makes urban occupation though roads and other industrial poles and may happen with the opening of the AUDI plant in 2015, as a new industrial corridor that nowadays is speculating and developing the rural land of the municipality of San José Chiapa.

During the greater part of the 20th Century, the central public administration, and best working and housing options were located in Mexico City. However, during the decade of 1980 and 1990, several factors triggered the decentralisation of Mexico City´s socioeconomic activities like: the exponential population growth, the establishment of new industries and working options outside the Capital, improvement of network infrastructure and communications, affordable housing options, and better quality of life. Those factors gave to other surrounding secondary cities the opportunity to grow and become attractive areas to economic development. For example, the improvement of industrial and services corridors in the Metropolitan Area of Puebla-Tlaxcala is contributing to an expansive regionalisation of urban growth. Those conditions developed two situations that impact on the spatial planning in the region:

a. **Uncontrolled sprawl** over new urban localities, residential areas, urbanisation of agricultural fields to supply the developable land and exploitation by speculators.
b. Based on land use changes, the municipalities began an internal competition to gain more **profit from the property and construction taxes**.

6.4 PLANNING LEGAL FRAMEWORK IN PUEBLA

The planning system in Puebla is ruled by different administration levels, having the base in the National Policies like the National Planning Law, the National Development Plan and the National Urban Development Program. The last two are normally updated every six years with the change of the Presidential administration. Following below is a review of the main characteristics of the law and the planning policies at National level.

[23] Interview made with Prof.Dr. Eckhart Ribbeck during September 2014 in Heidelberg

6.4.1 THE STATE PLANS AND REGIONAL PROGRAMS

The current administration (2011-2017) of the State of Puebla formulated a State Development Plan[24] (2011) with different sectors, regional and local programs supported by the Sustainable Urban Development Law[25]. Many of them were made during other administrations and remain valid. In the area of spatial development, the plan recognizes the lack of planning control over human settlements. This plan defines the s*prawl as the number of new human settlements or localities in the State* and names two types of sprawl development (*ibidem* p.50):

- Localities in urban context: 4.2 million inhabitants (73.8%) with 396 set localities.
- Localities in rural context: 1.6 million inhabitants (26.2%) with 6006 set localities.

The increase in the number of rural localities gives the government a logistic problem for the public services and infrastructure allocation, in particular due to the distances between them, the local authorities having little interest in controlling the localities' sprawl over the rural areas.

Nevertheless, a similar case happens in the urban localities, where the access to public services is not enough. Through the current plan, the Government of Puebla states the problem with the urban management with the new status of localities, minor and middle cities from 2005 to 2010 (*ibidem p.51)*: 128 rural localities became urban, 266 urban localities with more than 2500 inhabitants; and 26 urban localities became minor cities or urban centres between 15000 and 50000 inhabitants

The urban growth demands more developable land, public services, and infrastructure, especially in the housing sector where the services like water and drainage are more needed in the minor and middle localities (*ibidem* p.51). More than that, the Government calculated that it would require around 5,830 Hectares of land reserve for housing development in the 14 municipalities of Puebla where 50% of the total State population is concentrated, (*ibidem* p.51*)* like Puebla, San Pedro Cholula, San Andrés Cholula, Cuautlancingo, Amozoc – in the MAP-T –. To provide actions to meet the needs of developable land and services, the Government of Puebla has several planning and implementation mechanisms like laws at State level, and at regional level through plans and sector programs.

6.4.2 HOUSING DEV. AND URBAN LAW FROM THE STATE OF PUEBLA (UPDATED 2004)[26]

This law is the main guidance for the authorisation, planning and development of housing and residential areas in Puebla. One of the most important aspects of this law is the description of the authorities' accountabilities; in this case the municipalities, for the control and implementation of this law (Article 12): control, review and authorize the land subdivision, modification, fusion, or property; verify location and the donation of 50% of the area for public equipment and green areas, validate to have proper and functional public services inside residential areas, and promote the construction of social housing.

[24] *Plan Estatal de Desarrollo 2011-2017*
[25] *Ley de Desarrollo Urbano Sustentable del Estado de Puebla, 2004*
[26] *Ley de Fraccionamientos y Acciones Urbanísticas del Estado Libre y Soberano de Puebla*

Table 12 Housing and construction development in Puebla. Source *Ley de Fraccionamientos y Acciones Urbanísticas del Estado Libre y Soberano de Puebla* (2004)

DEVELOPMENT	PROJECT	TYPE	GROUND AREA
Urban housing	Residential	Single housing, duplex, condominiums	300 m2
	Middle-income	Duplex, condominiums	200 m2
	Social housing	Single housing, duplex, housing units, condominiums	120 m2
	Social-low-income	Single housing, duplex, housing units, condominiums	90 m2
Suburban and rural housing	Residential	Rustic housing, recreational and agricultural production	1000 m2 Minimum 25 m of front facade
	Agricultural	Agricultural activities	Extended ground with more than 50 m of front
Trade and services	Mixture	Minor trade, retail, whole trade, services	According to local regulation
Industrial	Mixture		According to local regulation
Cemeteries	-	-	-

The Article 14 classifies the type of construction development and specifies the total ground area for each project, described in Table 12.The law establishes other important aspects, like the donation of the 20% of the premises to the Municipal authority, and as well it sets out the responsibilities of the developer for the construction of infrastructure and public services. It is important to mention when a housing or residential project is finished, the Article 82 declares that the developer should "give" the *fraccionamiento*[27] administration to the Municipal authority.

As soon as a housing project is in construction or is developed in several stages, the administration and maintenance corresponds to the developer, but when it is completely finished and occupied, the administration responsibility should be transferred to the local authorities. This action creates a common problem between the new inhabitants, developers and the Town Hall because many local authorities do not accept the management responsibilities, but do accept the property tax.

When the developers are responsible for the projects, they manage, give solutions and organize the community issues; but when the developers are gone, the problems of management go directly to the Municipality. The authorities sometimes do not have enough capacity to absorb the public services and maintenance areas, or to organize the community and neighbourhoods associations[28].

6.4.3 REGIONAL DEVELOPMENT PLAN ANGELÓPOLIS RDPA[29]

As mentioned in the Chapter VII, during the decade of 1990 the Mexican Government guided the country's future into a more open and competitive economy through neoliberal policies. The Government stopped having a big interference in labour and urban developing matters and the private sector became more political and with a higher economic and power influence.

The free market spirit was present in Puebla's Governors actions during the same period. The first land reserves for developable areas were set during the administration of Mariano Piña Olaya (1987-1993), having as an excuse the rapid urban growth of the City of Puebla. The regional

[27] In Mexican Spanish, the word *Fraccionamiento* normally refers to residential developments or gated communities.
[28] Interview with housing real estate developer in Cholula, June 2014
[29] *Programa de Desarrollo Regional Angelópolis*

government began the expropriation of 1,081 Hectares of *ejidos* for the creation of the **"land reserve"** *Atlixcáyotl-Quetzalcóatl* for urban development purposes.

The next Governor Manuel Bartlett (1993-1999) established a series of triggering projects to drive the economic development of the State of Puebla and the metropolitan area like industrial, trade and services corridors. One of these triggering actions was the creation of the RDPA (1994). This development plan was one of the main attempts in spatial planning that was actually implemented.

The RDPA was significant as well because it followed the urban planning trends from United States' "zoning" trough automobile mobility, big motorways, low-density development and gated communities. According to Churchill (2000), the State created the RDPA master plan through the foreign firms McKinsey & Company Inc., HKS Architects and Sasaki Associates.

For the implementation, the master plan considered the regional planning and development of thirteen municipalities: Puebla, San Pedro Cholula, San Andrés Cholula, Cuautlancingo, Huejotzingo, Juan C. Bonilla, Amozoc, Cuautinchan, Santa Clara Ocoyucan, Xoxtla, Coronango, Tlaltenango, Domingo Arenas and San Martín Texmelucan.

It was considered a total area of **1,494.30 km2** with the City of Puebla as the main urban core with a big urban growth trend to the north-west, west, and south. Some of the RDPA objectives were: to have an urban vision of environmental rescue, to obtain federal financing and self-financing projects, to complement the backlog in infrastructure and services, to generate economic investments, to mitigate the social deficiencies for marginal groups, and to update development plans and modernizing the cadastre system

When the land reserve *Atlixcáyotl-Quetzalcóatl* was created and planned for the RDPA, the original land uses were almost rural with *ejido* properties. The plan converted the agricultural land use into urban and industrial, naming the importance of creating "*mechanisms that avoid land speculation*[30]" (pg.14). Some of the ideas are shown in the Table 13 as part of the spatial planning strategies to avoid speculation, sprawl and other urban issues as part of the urban development vision.

Table 13 Spatial planning strategies, Source: RDPA 1994

GENERAL OBJECTIVES	LOCALITIES AND CONURBATED AREAS	INDIVIDUAL OBJECTIVES	LOCALITIES AND CONURBATED AREAS
Regulation of urban growth in the centre-west region	Decentralize urban growth, improving existing sub-urban cores	*Integrate a City-Network-system in the centre-west region*	Rational planning of land use through urban development
Spatial planning through population centres and current infrastructure	Improve urban development in sub-urban cores	*Integrate rural localities into the City-Network-System*	Meet housing demand for the local population
Natural equilibrium between urban and rural areas	Spatial planning in minor localities and conurbated areas with land reserves.	*Spatial planning in the centre-west through land use and infrastructure*	Benefit from current infrastructure to improve urban development
		Integrate a City-Network-system with hierarchy	Preserve and integrate historical sites into urban development
		Protect the vulnerable land uses from the urban growth, especially the ones with water issues	Stop human settlements in vulnerable areas

[30] Personal translation from the Spanish version

The objective strategies were divided in a general and individual scale, where the use of existing infrastructure and current urban localities served as a development axis for new land uses. To operate the strategies of the RDPA, an instrumental framework was created based on the regional plans and urban development regulations of those years. The plan considered three main action lines (pg.112):

- *Regulation of land use* – through spatial planning for the Centre-West region.[31]
- *Regulation of land market, housing, and public services* – through the creation of land reserves.
- *Regulation of construction and infrastructure as economic pole*.

The RDPA was one of a kind because it was a prototypical case in Mexican planning where a spatial plan was elaborated, accepted and **implemented** to manage urban growth[32]. Although the document established the mechanisms to avoid land speculation, Cabrera *et al* (2008) state that the RDPA was conceived for the economic benefit and land use profit, instead of being a plan that solves the urban growth sustainability, housing and planning problems. For example, the *Atlixcáyotl* land reserve was developed over main roads and with more profitable land uses like residential, commercial, parks, services; on the contrary to the *Quetzalcóatl* land reserve selected for social and middle-income housing.

For the delimitation of the different urban areas inside the land reserve, the RDPA named the UDUs as Urban Development Units for a better land use, administration and control. Those units changed throughout the years in terms of each State administration's demands.

In particular, the units designated to public and green areas changed through the different Plan updates, like the Metropolitan Park which in 1994 had intended 54 Hectares and in 2004 it was reduced to 24.96 hectares, the rest was designated to other uses such as the ITESM and cultural centre from the University of Puebla BUAP. Today, the official modifications gave roughly 19 hectares to the park, after a controversial land use change during Mario Marín's Governor Administration (2005-2011), who changed the plan and sector programs to transform the Metropolitan Park and the Art Park into more profitable uses.

Another important detonator project was the shopping mall Angelópolis, retail and trade area that triggered an economic boom in the region, created as well as an attraction pole to the district. With the construction of the mall, a lucrative period began with the speculation of land uses for the housing units and residential areas. This period was consolidated during the administration of Governor Rafael Moreno Valle (2011-2017), who invested in massive infrastructure and controversial urban projects all around the city.

6.4.4 SUB REGIONAL URBAN DEVELOPMENT PROGRAM FOR PUEBLA, SAN ANDRÉS CHOLULA, SAN PEDRO CHOLULA AND CUAUTLANCINGO (UDPATED 2011)[33]

The sub regional programs are supported and based on other State official documents like the State Program for Sustainable Urban Development and the Sector Program of Urban Development. Both

[31] *Programa Regional de Ordenamiento Territorial de la Zona Centro-Poniente del Estado de Puebla*
[32] Observations made by Dr. López-Tamayo (June 2014)
[33] *Programa Sub-Regional de Desarrollo Urbano de los municipios de Puebla, San Andrés Cholula, San Pedro Cholula y Cuautlancingo*

programs gave the spatial background and diagnosis for the planning and implementation of other plans, especially for the socioeconomic regions of Puebla.

For the cases of municipalities of Puebla, San Andrés and San Pedro Cholula, and Cuautlancingo; a program was created as a *complementary management and administration tool* of the Land Reserve *Atlixcáyotl-Quetzalcóatl*.

The program was an attempt to control the land use change and growth between the different municipalities that share the land reserve, commonly known as the "Angelópolis district", described in Map 4.

The plan RDPA (2011) established the authorized land uses in the district:

- *Social housing, middle-income housing, residential, services* – 427.58 Hectares.
- *Elementary schools, day-cares, mixed equipment, secondary schools, public spaces, religious temples, universities, hospitals, social centres* – 251.11 Hectares.
- *Retail, mixed commerce* – 152.03 Hectares.
- *Green areas and environmental protection* – 140.77 Hectares. This land use changed in 2011 with the modification of 8.16 Hectares of green areas to other types of development.

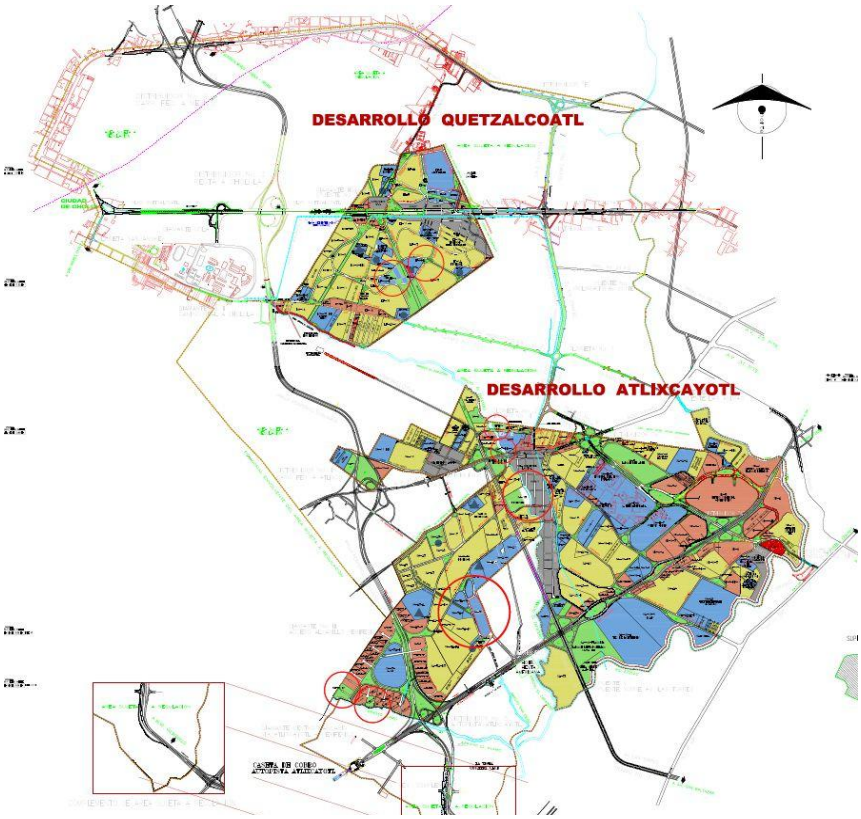
For the development of housing and other types of construction, the program defines an area relationship between the COS – Coefficient of Land Occupation – and the CUS – Coefficient of Land Use.[34] In order to understand better this relation, Table 14 shows the official indicators that every new construction should follow (p.18).

Table 14 COS and CUS indicators. Source:: Sub Regional Urban Development Program for Puebla, San Andrés, San Pedro, and Cuautlancingo 2011

	Zone type	Ground area (m2)	Free Area (m2)
COS	Urban	Up to 500	20.00
		500-2000	22.50
		2001-3500	22.00
		5501 or more	30.00
	Transition	Up to 5000	60.00
	Intensity of Land Use	**Authorized Density (Houses/Hectare)**	**Authorized Constructed Area**
CUS	Very Low 0.10	Up to 2	Up to 0.1
	Low 1.50	Up to 25	Up to 1.5
	Middle 2.00	Up to 45	Up to 2.0
	High 2.50	Up to 100	Up to 3.0

The COS and CUS indicators are useful tools for developers and investors. Playing with these numbers, they can modify the official land uses or even the density characteristics to obtain a better economic benefit and profit. To complement the indicators, the program has the official land use table as guidance for the local municipalities to authorize or deny different urban development projects.

[34] *COS Coeficiente de Ocupación del Suelo, CUS Coeficiente de Utilización del Suelo*



Map 4 Zoning of Land Reserves Atlixcáyotl and Quetzalcóatl according to 2011 modification. Source: Fideicomiso Público de la Reserva Territorial Atlixcáyotl-Quetzalcóatl, Gobierno del Estado de Puebla.

Conversely the developers and authorities find a problem in this program due to the tenure status of many of the plots that structured the former rural land. As the land reserve used to be an *ejido,* its regularization is still a "National Problem", due to many legal actions and stakeholders that are needed. The Government of Puebla created a Trust for the legal administration of the land reserve *Atlixcáyotl-Quetzalcóatl.* The Trust[35] (2005) provided an official and legal help for tenure issues and the commercialization of plots to private investors. It was responsible for the construction and maintenance roads, public services, public areas and infrastructure in general. In 2012 this trust was closed and the tenure and commercialization processes were given to the Ministry for Finance.

6.4 CONCLUSIONS: DRIVERS TO PERI-URBAN DEVELOPMENT

The territory of the City of Puebla evolved from check-board grid and centric model to a polycentric-anarchic model, due to the economic and population growth and the strategic location of the city in the centre of Mexico.

The proximity to Mexico City made Puebla an attractive urban area for investors and new incomers, developing a rich industry in the automotive sector and an educational, cultural, touristic, and residential pole.

At a regional level, the State of Puebla laws and the regional development programs, tried to put order and satisfy the population demands for housing and services.

[35] *Fideicomiso de la Reserva Territorial Atlixcáyotl Quetzalcóatl 2005-2011*

The sector programs represent challenge mechanisms for management and control of spatial development between different municipalities. In the case of the programs focused in the Angelópolis district, Cabrera *et al* (2008) state that the Government and the private sector try to obtain the maximum benefit through selective land use management. On one side, the authorities need more economic resources to supply public services and on the other, the investors and developers have the opportunity to obtain higher profit through developable land, authorized by the Government.

According to Morales García de Alba (2012), those drivers to peri-urbanisation are creating as well three collateral effects:

a. *Physical boundaries* – separation of social groups inside and outside gated communities, excluding local and working population.
b. *Private interests* – the private sector interest are getting more important than municipal.
c. *Social Exclusion* – more gaps of inequity and social injustice

Those conditions generates not only peri-urbanisation, as Schmid (2012, p. 55) affirms, visible "*processes of gentrification and displacement are no longer limited to individual neighbourhoods; rather, entire intra-urban areas and even large parts of metropolitan regions are upgraded and transformed into zones of reproduction for metropolitan elites".* Peri-urban development, exclusion, and gentrification are impacting former rural cores like the region of Cholula.

Image 9 The city of Cholula in 2014, main urban core. Source: Author (2014)

VII SOCIO-SPATIAL DEVELOPMENT IN CHOLULA

7.1 INTRODUCTION

The region of Cholula, occupied by diverse ethnic groups with their own linguistic and cultural contributions is located in the Valley of Puebla, Mexico. The region has optimal weather conditions, good land for farming and the majestic *Popocatéptl* and *Iztaccíhuatl* volcanoes on the west that rule over the rural-urban landscape. The milestone landmark between the landscapes is the sanctuary of the Great Pyramid of Cholula – *Tlachihualtépetl*[36] –, constructed by several pre-Hispanic civilisations and modified by Spanish conquistadors through a colonial church on the top. This is the most famous sky-line of the city, and introductory image for the visitor and the humanized landscape which introduces the visitor to the city.

For a better reflexion about the rural-urban fringe in Cholula, this chapter is divided into two parts: first, the historical review of the socio-spatial development in the region, and second, an analysis about the peri-urbanisation process in Cholula and its local framework. For the purposes of this analysis, some facts of Cholula´s historical development are described, because they are part of the current socio-spatial context.

7.2 OVERVIEW OF CHOLULA: HISTORICAL AND SPATIAL CONTEXT

The ancient *Chololan*[37] was one of the first urban settlements in America where different pre-Hispanic cultures established. The earliest evidence of the city that will expand around the

[36]From the Nahuatl, means "handmade hill"

[37] The origins and translation of the name Cholula, is still under discussion. A definite translation for *Tullan Chololan Tlachihualtepetl* as Cholula is known in documents from of the 16th century assumed that the name derived from the Nahuatl "*chololi*" that means "those who have fled". For Reyes (1976) a more accurate would be related to a place where the water flows. Other interpretation is given by Ashwell; she explains that *Tollan* was a generic name given to important cities during the Mesoamerican period. It means, according to the *Historia Tolteca Chichimeca* "*la ciudad donde*

ceremonial centre by the classic period (0-800 B.C.) and in vicinity of the Great Pyramid, as well as around the shore of a swampy lake, dates to the middle formative period around 500 B.C.; although evidence of settlements in the surrounding area go back to the early formative Olmec archaeological period circa 1200 B.C. (García Cook & Merino Carreón, 1989). Thirty centuries later, this city continues to be occupied by diverse groups of people. From the ancestral *Cholollan* to university town, Cholula represents a big urban laboratory for transculturation processes, because, since the first human settlements, the population of the region was never considered homogenous (Ashwell, 2014).

Like many other ancient civilizations, the land conditions in Mesoamerica[38] were ideal for agriculture, which improved the identity of the first human settlers to feel linked to the territory (Brenner A. , 1929). This was the case for the first settlers in the region of Cholula and the origin of a closer relationship with the land. Considered the first human settlement in the region, the original place for the foundation of Cholula was in the vicinity of a swampy lake with several water springs where the political borders of the present municipalities of San Andrés and San Pedro Cholula meet.

These present-day municipalities are only part of the Great *Cholollan Altépetl* during pre-Hispanic times. Cholula encompassed a vast region under central administrative and political control by the elites. The *Altépetl*[39] Cholula, as reconstructed from 16th Century documents, included over 60 tributary towns and it expanded over an area that in present time has been politically divided into 13 municipalities[40]. Nowadays three municipalities share Cholula's name: San Pedro Cholula, San Andrés Cholula, and Santa Isabel Cholula.

Many ethnic migrations settled during different periods in the region. In the current municipality of San Andrés the *Olmecas-Xicalancas* were established. Around 600-700 B.C. Cholula is conquered by groups that migrated from the southern part of the Gulf of Mexico (McCafferty & Chiykowski, Mayan migrants to Tollan Cholollan, 2008) Later in the 12th Century, around 1168, according to the *Historia Tolteca Chichimeca,* the *Toltecas-Chichimecas* conquered the *Olmecas-Xicalancas* and ruled over Cholula territory until de Spanish Conquest in 1519.

Since the beginning of the classic period, as an expanding multi-ethnic metropolis, Cholula became the focus of religious and political pilgrimages with the arrival of groups from cultures in the north, south, and southeast of Mesoamerica. Thus this pan-regional migration continues even nowadays.

The ancient Altépetl, at the time of the Conquest in 1519, had an estimated population of 30-50,000 (McCafferty, 1996) within the urbanised limits and equal number surrounding hinterland. Cholula was then administered within the socio-spatial organisation of the *Altéptl,* where land and power were assigned through political, religious and lineage hierarchies.

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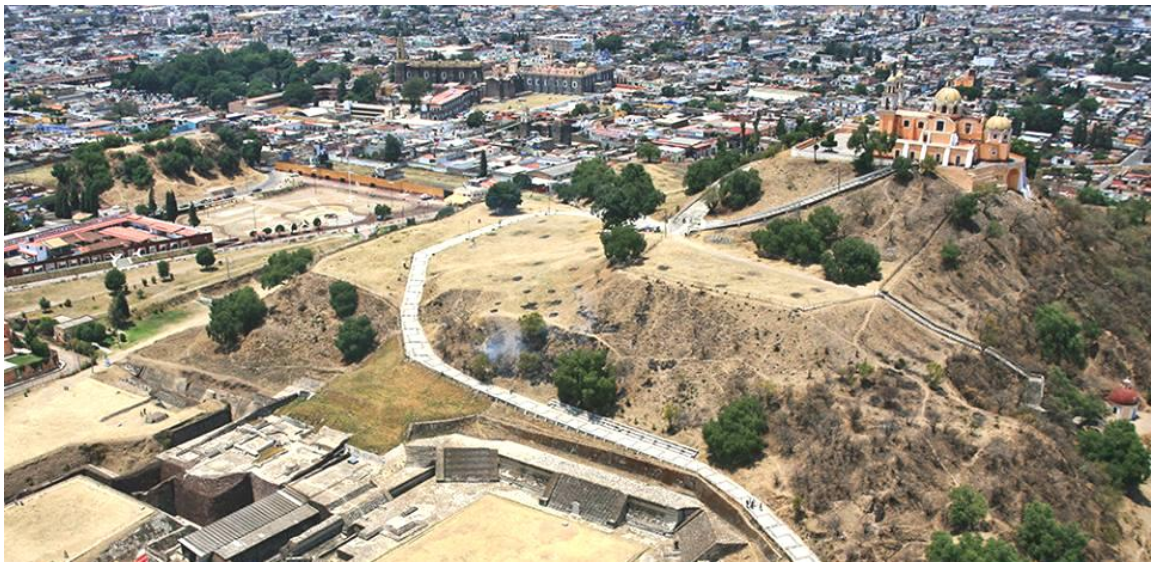
se congrega una multitud de gente, como si fueran hojas o tallos de una enorme planta de tule o tollin"; *Cholollan* means, as interpreted from various glyphs in this document:"springs place were water comes out".

[38] Mesoamerica is a cultural region defined by Paul Kichhoff that corresponds from central Mexico to Costa Rica.

[39] From the Nahuatl language "Water Mountain" (Reyes, 1976) it was a socio-spatial and political organisation of the territory in Mesoamerican cities.

[40] Important mapping documents refers to the ancient political division like "*Pueblos dependientes de Cholula en el Siglo XVI*"*from* Paul Kirhhoff and "*Región de Cholula, Mapa No. 3, Departamento de Investigaciones Arqueológicas, 1968"* from Margarita Nolasco.

Image 10 Urban context of the archaeological site in Cholula. The Remedios Sanctuary is located on the top of the covered Great Pyramid, behind it is located the historical City of Cholula. Source: Ricardo Gómez Garrido (2015), authorized by the photographer



After the arrival of the conquistadors and their indigenous allies, a massacre occurred in the city followed by the looting and destruction of temples and palaces. The mendicant Franciscan order which accompanied the conquistadors was to play, after 1526, a central role in the conversion of the natives to the Roman Catholic religion of the conquerors.

They were significant in the urban transformations which occurred when the ancient *Altépetl,* came under colonial order. The first convents and churches were constructed over ancient temples and the old names of the pre-Hispanic gods were banished or re-signified by the Indian converts when the Catholic saints native appellative were added.

The *Tlachihualtépetl*, the Great Pyramid was not abandoned as a place of worship, nor destroyed like other temples; but a church was built on the top (see Image 10). During this Colonial period, the Great Pyramid became an important socio-urban icon that represented a "*complex conglomeration of many cultural meanings"* (McCafferty, 1996)

The beginning of the Colonial period signified a drastic demographic catastrophe for the indigenous population; however, the urban core remained as an important trade city that had important economic attachments to the City of Puebla (Ruz Barro, 2008). In 1531, the oriental lands of *Cuetlaxcopan* – tributary town – were given over the Spanish Crown for the execution of the **City of Puebla**, and gradually Puebla´s geographic location as a middle-metropolis between the port of Veracruz and Mexico City, took over Cholula´s trade importance.

During the next centuries, once the customary division of land and workers were outlawed by the Crown, the concentration of lands in *Haciendas* and ranchos followed[41].

Puebla was also destined to be the place where one of the first textile industrial sectors was developed in the continent during the 18th Century. As the colonial society was consolidated and

[41] The *Haciendas* and *Ranchos* were a land administration system of big estates that the Spanish Crown established for the repartition of the conquered territory and the introduction of new agricultural techniques.

divided into a complex cast system between Europeans, natives, and Africans and the mixture among them like *criollos, mestizos, mulatos*, etc. Conversely, Castillo (2001) describes the decrease of indigenous population due to massacre, diseases, and slavery; on the contrary, the surviving indigenous nobility was respected and were authorized to receive land property and married with Spaniards and *criollos* of the same social level.

In Cholula, as in other sites of Mexico, the indigenous nobility became *caciques* of the region – not unlike is some respects the owners of *Haciendas* – since they owned big extensions of land and were able to have different types of trade activities and properties in the city.

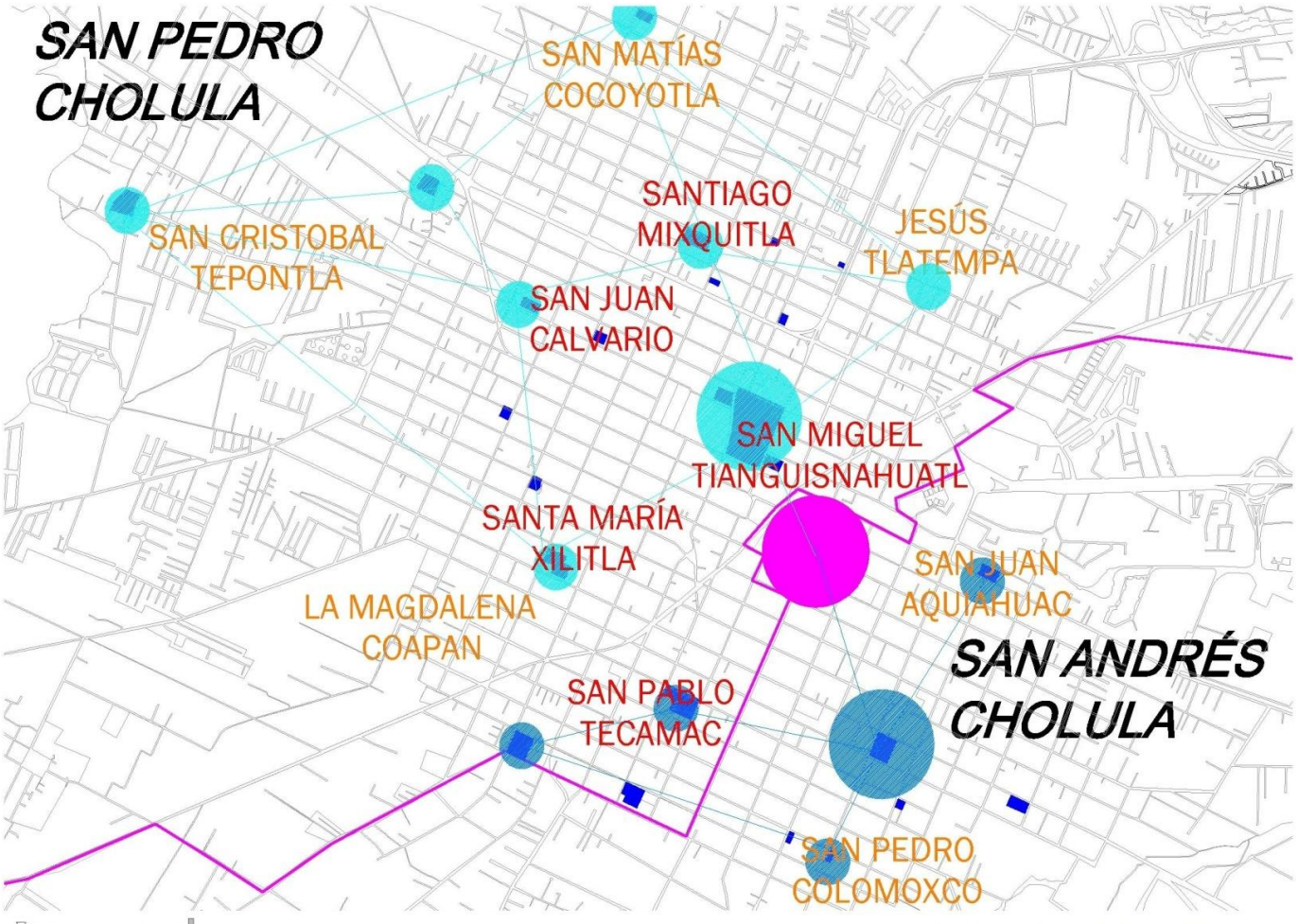
The chieftainship phenomenon is relevant for this research because, although there is no longer established a cast system in Mexico, the consequences of a colonial division are still visible through socio-spatial stratification. Despite the social division, what gives cohesion to the population as a whole, as it was during Mesoamerican times, is the current religious tradition in Cholula, which plays an important role through the Catholic temples of each *barrio*.

The religious conversion of the Mesoamerican cultures to western Catholicism have in the present merged into one big regional tradition that gives Cholula its particular identity. This transculturation process developed a socio-spatial territorial evolution, influenced by the religious tradition that impacts every aspect of the economy, family, and social life (Morales-Arizmendi, 2015).

This cultural *mestizaje* created one of Cholula´s main characteristics: the *sistema de cargos religiosos* or *mayordomías*, a socio-religious structure with pre-Hispanic roots that organize the barrio life and the catholic festivities each year (see Map 5). This system follows a circular pattern between barrios with different social hierarchies that work as an integration mechanism (*ibidem):*

- *Tiaxcas or Principales* – former *mayordomos* with a special place in the community
- *Mayordomos* – responsible for the festivities organisation, this person is the representative of the barrio and change every year. The *mayordomo* also works with other religious organisations and with *fiscales* of other towns and districts.
- *Hijos de barrio* – distinguished residents of the barrio that work actively in the festivities and local activities.

Other places in Mexico with a strong indigenous organisation share the same system, in Cholula is an essential part of its cultural manifestations. More than that, the *sistema de cargos* gives social and territorial cohesion, not always understood by new residents. Though is a nominal hierarchy, the *mayordomos* and *principales* have big influence in the community. The roots of this system have their origins in the ancestral societies that organize the social space through a religious vision that ruled the political, socioeconomic, and administrative activities.



SOURCE
IMAGES: Google Earth, INEGI 2015
CLASSIFICATION: Adapted by INEGI 2010 and historical Maps provided by Anamaría Ashwell

CHOLULA´S REGIONAL CONTEXT

M5

7.3 SOCIO-SPATIAL EVOLUTION

The great *Cholollan* territory was described by Reyes (1970) and other anthropologists as several tributary towns located since Mesoamerican times in the Valley of Puebla-Tlaxcala, represented in Map 6. With more than 750 square kilometres, the cultural region is limited to the north with the Sierra of Texmelucan. Its boundaries to the northeast are the *Tolcingo* planes where the *Malinche* volcano rises. The western borders are the rising lands towards the *Popocatépetl* and *Iztaccíhuatl* volcanoes (see Image 9) and on the east the *Cuetlaxcoapan* plains up to the Amalucan hill (Reyes, 1976). The ceremonial centre of the urban core since Mesoamerican times and up to the present is located on the right margin of the Atoyac River.

The region, due to its privileged geographic and environmental conditions, has attracted constant migrations, resulting in changing combination of people, urbanism and cultures which mix to create the idea of a distinct territory as represented by its values, its tradition, customs, and uses. This integral approach is focused to identity values from different groups of people that give a meaning to the territory, to the value of land, or as Hernández-Flores & Martínez-Corona (2011) describe:

> *"Cholula's inhabitants do not conceive land as merchandise. There is a much deeper connection with it. Land is an indispensable productive resource, but is also more than that: it is a common territory that is part of the cultural heritage received from their ancestors"*

For Cholula, this research defines the territory as a mixture between identity values that recognize the sacred role of the land and help to adapt it to different land uses, and land tenure, only separated by administrative municipalities. In this aspect, the spatial evolution of Cholula's territory is analysed in the next stages: The *Altépetl* socio-spatial organisation, the Franciscan city, the administrative division, and the conurbation period.

Each stage corresponds to different territorial processes with many urban, rural and cultural manifestations. The different stages are developed according to the different historical periods of Cholula.

7.3.1 THE *ALTÉPETL* SOCIO-SPATIAL ORGANISATION

Bernal-García (2006) states that human occupation is interrelated through socio-urban history and cosmology like the influence of the stars over topography to guide human settlements' locations. The author describes – through an ideological process – how the first people were able to choose the best place for agriculture and settle. In this case, the first inhabitants of Cholula established close to a marsh that provided water. According to Plunket, Uruñuela (1998) and McCafferty, Peurakami-Brown (2007), the first human presences in Cholula′s region are dated circa 1200 B.C.; and the first permanent settlements near what will become the urban core of the *Altépetl* date from around 2000 B.C

Settlement patterns for the Great *Cholollan* region during the formative period consisted of a mosaic of mounded sites at intervals of 5 to 10 kilometres (García Cook & Merino Carrión, 1987); and the settlements around the urban core covered an area of 2 square kilometres with monumental or religious architecture in at least three areas (McCafferty, 2001). Factors that conspired to promote Cholula to pre-eminence over other settlements since early times have to do, as McCafferty explains, with access to fertile lands and water resources but also to the symbolic worldview and

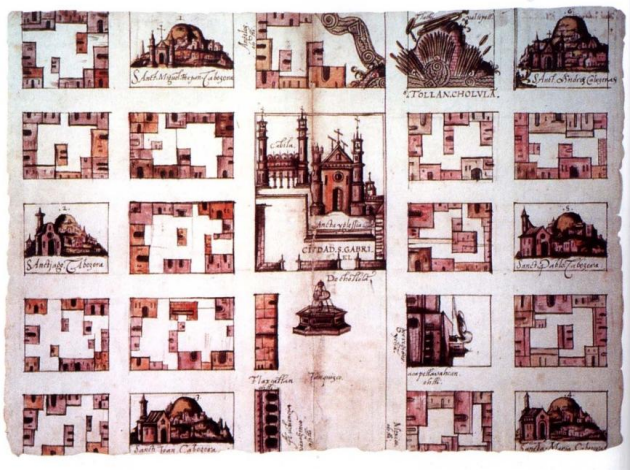


Image 11 Map of Cholula in 1581. Source: "Gabriel Rojas, descripción de Cholula 1581, 1996 edition".

cosmology of its people that contributed to making Cholula as a religious *axis mundi* for the surrounding region.

The final architectural and urban form was established by the *Toltecas-Chichimecas* during the XII Century. Over the centuries the territory of the ancient Cholula "*was attracted, repelled and conquered by waves of migrants from diverse cultures of the coast and the altiplano who in turn gifted Cholula with their architecture and their humanity"* (Ashwell, 1999).

For the case of Cholula and other similar cities, the *Altépetl* as a socio-political structure delimitated the urban core and the rural areas for human settlement

Cayetano Reyes (1976) made one of the first research about the *Altépetl*, he stated that the urban layout was established surrounding the religious core. This centre represented in the ancient mythology the beginning of the "cosmic order" that drive the political and religious spatial development (Gómez-García, 2010) and staring from this point, the urban layout was developed through added quadrants and divided through the cardinal points; the author states as well that the urban core had as well peripheral settlements. In the same research focus, Florescano (2006) described the basic elements of *Altépetl's* structure were the *calpulli* or neighbourhood, a ruler of the city, a main temple, and a big plaza that were used for public celebrations and markets. Florescano quotes Lockhart when he refers to the *Altépetl* as a spatial planning mechanism with important characteristics:

- The land was divided through modular and symmetric neighbourhoods (4-10).
- The new urban modules were added to the urban core.
- Each *calpulli* must be oriented to the compass points (north, south, east, and west).
- The plaza was the heart of the daily activities.
- Each *calpulli* had one chief that was the responsible for distributing the agricultural fields and the local religious activities. The family chiefs of each *calpulli* were the beneficiaries of a communal land system that allowed them land rights exploitation.

Before the arrival of the Spanish conquistadors and their allies, the geography of the region was dominated by the rural landscape and the compact indigenous ceremonial city. This morphology and the definition of the religious territory are described in the *Historia Tolteca Chichimeca 1548*, and

the Map of Cholula 1581, described in the Image 10. Both of them were the first mapping instruments used to understand the indigenous cartography after the conquest was made. In the Image 10 the City of Cholula is depicted with the roads and the Great Pyramid; understood by Kubler (1985) as a diagram to appreciate the social organisation of the *Altépetl*.

7.3.2 THE FRANCISCAN COLONIAL CITY

After the Spanish conquest, the colonial urbanism established a superposed period of construction that began when the first evangelizers intended the recreation of the architectural and symbolic space in Augustinian terms of a "City of God". This new organisation of the ancient city followed Spanish colonial urbanism, visible in Image 10, and new catholic temples substituted pre-Hispanic ceremonial and civic buildings. Colonial documents refer that while Cholula was ruled by *Olmecas-Xicalancas* elites, ten towns under a dual leadership, presided from palaces on the Great Pyramid[42] . Torquemada records that at the time of the conquest, Cholula's ceremonial-urban centre was divided into six barrios (*calpulli)*, but various documents also mention four and even 10. The imposition of the Castilian *Cabildo* necessarily altered the ancient ceremonial and territorial organisation of the city and a colonial metropolis emerged. The assignation of the names *barrios* and *cabeceras* to the pre-Hispanic lineage of *calpulli,* transformed the complex religious and lineage elements that divided the urban space of Cholula´s *Altépetl*.

According to a dictum signed by the Viceroy Mendoza in 1542 indigenous lands were appropriated, for example, for the creation of the new administrative and urban space of colonial Cholula (Carrasco, 1971). By 1593, a descriptive letter by Juan Pineda confirmed that six *cabeceras/barrios* shaped the new *República de Indios* until 1714, when San Andrés town gains a separate *República* status and five remained under the jurisdiction of San Pedro Cholula. The five *cabeceras* were later subdivided into 10 barrios and each with its own church dedicated to a saint, fomenting a localized cultural identity that persists up to the present.

The division of the barrios helped the Franciscans and the Spanish authorities to organize the cast division and the economic and religious activities. The rest of the territory was formed by *Haciendas* and *Ranchos*. The Spaniards, *criollos* and *caciques* were the biggest owners of the land for agriculture and breeding purposes; the rest of the population was concentrated in the urban core or smaller properties according to their cast. Therefore, the region of Cholula was developed with a central urban core divided in two urbanized areas, with several tributary towns that later became districts with two central municipal authorities.

During the colonial period the *sistema de cargos* was an important evangelizing tool among the indigenous people that socially organized each barrio and villages. If the *Altépetl* and Franciscan urbanism ordered the spatial morphology, the *sistema de cargos* shaped the cultural identity of Cholula.

7.3.3 The regional administrative division

During 17th Century, the region of Cholula lost big portions of its territory that were added to other new municipalities. One of them was San Andrés Cholula, which used to be a secondary town

[42] According to *Historia Tolteca Chichimeca, t*he two leaderships were named *Aquiach* and *Tlachiach*. It refers as well the population division under *tolteca calmecactla* and 8 *calpuleque*s which indicate a distinction between the ones who inhabited the ceremonial urbanized centre and the ones who settled in the peripheral lands

and finally became independent. This administrative division was kept after the consummation of the Mexican War of Independence in 1821 when the City of Puebla divided and regulated its own territory. After that, the third period of spatial transformation began with the administrative division.

The last period remained until the latter part of 20th Century when the territory of Cholula did not increase in population size but was divided into more municipalities, having at last Santa Isabel Cholula as a rural municipality in 1985. As a summary of the historical territorial expansion and decrease of Cholula's region, Pérez-Abiti (2011) complemented the work of Sánchez-Flores and describes in the Table 15 the losses and gains of territorial area of Cholula.

Table 15 Spatial evolution of Cholula. Source: Adapted from Pérez- Abiti (2011). The years 2010 and 2014 were updated by the author.

PERIOD	HISTORICAL PERIDOD	TERRITORIAL ORGANISATION	TERRITORIAL EXTENSION	AREA (KM2)
3000 BC	Arrival of Olmecas-Xicalancas	Tribal	Boundaries with Chalco, Tepeaca, the Mixteca, Tochimilco and the volcanoes	8 033
500 AC	Arrival of the Toltecas-Chichimecas	*Altépetl*	Same, without Huejotzingo	7 258
1518-1531	Arrival of the Spaniards	Conquest, *encomiendas, corregimiento*	Same	7 258
1628-1640	The *Cédula Real* establishes the official city	City	Same, without Calpan town and San Andrés is separated from the urban core	3 000
1746	Cholula is the main urban core but is an independent town from San Andrés	*Corregimiento,* towns	Same, without San Andrés, Coronango and Santa Isabel	2 600
1786	Union of Cholula with Huejotzingo	*Intendencias,* towns	Same, without Calpan and Huejotzingo	3 475
1857	State of Puebla	Urban core	Same, without Huejotzingo	2 200
1867-1895	Municipality division	Town, district	Same, without San Nicolás Amecatla	2 100
1907	Official order	Urban core district	Without Coronango, Zacatepec, Tlautla	712
1933	Official order	Municipality	Urban core of 13 municipalities	712
1975	Official order for borders and administration	Region II – District IV	•	51,3 San Pedro 68,8 San Andrés
1994	Official order for the expropriation of *ejido* land (1,081 HA)	Region II – District IV, conurbation	Physical conurbation between San Pedro, San Andrés, Coronango, Cuautlancingo and Puebla	•
2010	Official delimitation and update of MAP-T	Metropolitan Area 34 of Mexico	39 municipalities	•
2014	Official delimitation between San Andrés Cholula and Puebla	Conurbation	8,52 km of Angelópolis district divided between them, San Andrés 4,72 km2 and Puebla 3,81 km2	111 San Pedro 61 San Andrés

The updated work of Pérez-Abiti and Sánchez-Flores indicates that Cholula's spatial development is historically composed by several cultures and political divisions, but was reduced through the different administrations, creating new municipalities and urban cores. Even nowadays it is difficult to delimitate the physical boundaries due to the contradictory official definitions and borders of the territory.

The main municipalities that surround the City of Cholula as urban core are: Santa Isabel, Cuautlancingo, Juan C.Bonilla, San Gregorio Atzompa, San Jerónimo Tecuanipan and Coronango, and all of them are members of the next official socioeconomic and geographic regions[43]:

- *Cholula Region*[44] – municipalities of Calpan, Coronango, Cuautlancingo, Juan C.Bonilla, Ocoyucan, San Andrés Cholula, San Gregorio Atzompa, San Jerónimo Tecuanipan, SanMiguel Xoxtla, San Nicolás de los Ranchos, San Pedro Cholula, Santa Isabel Cholula, Tlaltenango.
- *Socieconomic Region IV Angelópolis /San Pedro Cholula* – integrated by 27 municipalities in the west-centre area of the State with the Sub-Region of Puebla (municipalities of Amozoc, Coronango, Cuautinchán, Juan C.Bonilla, Ocoyucan, Puebla, San Andrés Cholula , San Pedro Cholula, San Miguel Xoxtla, and Tlaltenango).
- *Federal Electoral District Number 10* – with administration in San Pedro Cholula.
- *Court District Number V* – with administration in San Pedro Cholula.
- *Metropolitan Area of Puebla-Tlaxcala* – integrated by 39 municipalities.

One of the most important administrative divisions is the Socioeconomic Region IV, which is integrated in different plans like the "Sub-Regional Urban Development Program for San Andrés Cholula, San Pedro Cholula, Puebla and Cuautlancingo" as well as with the "Regional Development Plan Angelópolis" RDPA.

7.3.4 CONURBATION OF MUNICIPALITIES

The spatial planning and division match with the last period of urban expansion for Cholula with the RDPA that drove the **conurbation of municipalities** in the 1990s. As was described in the Chapter VI of this research, this plan began the expansion of Puebla's Metropolitan Area to the centre-west. With this official spatial planning action, the rural world of Cholula changed radically, losing big portions of agricultural fields, like the *ejidos* through expropriation laws. According to López-Tamayo (2010) the most affected *ejidos* and localities were: San Andrés Cholula (696 hectares), San Bernardino Tlaxcalancingo (140 hectares), Santiago Momoxpan (87,6 hectares), and La Trinidad Chautenco (147.2 hectares).

The total of expropriated land was 1,082 hectares, plus 733 hectares that were already taken by the government. The rural land and agriculture fields became of interest to many stakeholders and the green landscape, public and green areas began to reduce through the years to provide more areas for infrastructure and housing.

[43] Information from Municipal Plans of San Pedro and San Andrés
[44] According to INAH Map.3 elaborated by Margarita Nolasco in 1968

These circumstances responded to the decentralization of Mexico City's activities in the decade of 1980 and 1990, where thousands of people migrated to the minor surrounding cities like Toluca, Pachuca, Querétaro, Cuernavaca or Puebla. Starting in this period and during the next two decades the population of Cholula expanded quite fast, especially during the period 1990-2000 having 2.5%% of population growth as is laid out in Table 16.

Table 16 Population growth in Cholula and Puebla. Source: INEGI (1990, 2000, 2010)

MUNICIPALITY	1990	2000	2010	POPULATION GROWTH
San Andrés Cholula	37 788	56 066	100 439	1990- 2000 2.5% 2000-2010 5.8%
San Pedro Cholula	78 177	99 794	120 459	1990-2000 2.5% 2000-2010 1,8%
Puebla (capital)	1 057 454	1 346 916	1 539 819	1990-2000 2.5% 2000-2010 1.3%
Metropolitan Area of Puebla-Tlaxcala	1 776 884	2 269 995	2 728 790	1990-2000 2.5% 2000-2010 1.8%

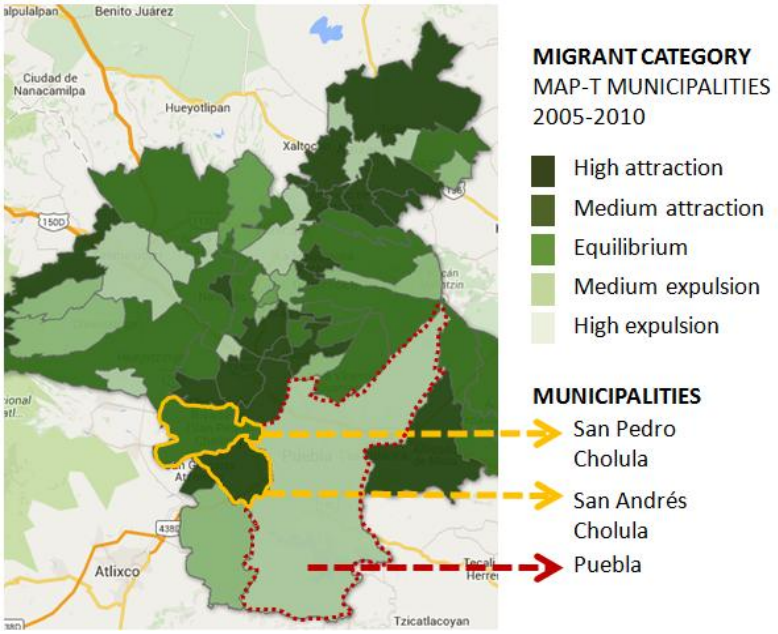
According to INEGI's Census, the municipality of San Andrés Cholula surpasses by far the population growth rates of San Pedro, Puebla and the whole MAP-T. In the last ten years the municipality has had a growth of 5.8% which matches with the spatial development of the land reserve *Atlixcáyotl-Quetzalcóatl*, or Angelópolis district, as a new economic, housing and entertainment pole. This district, located mostly in San Andrés, corresponds to the expropriated land during the nineties as part of the RDPA and the governmental measures to control the urban growth to the west.

Many factors made Cholula and Puebla attractive to new incomers and investors that promoted the migration of people and enterprises from Mexico City to Puebla. The reasons concur with the RDPA implementation, whereby the territorial reserves of San Andrés and San Pedro became developable areas. Some of the factors that helped to develop new urban centralities were:

- The **strategic location** near industrial corridors (15-30 km), the working areas (10-15 km) and the proximity with Mexico City (127 km)
- The **security** for families and students
- The **housing offer** for all family budgets
- The **education offer**, from elementary school to universities
- The **short distances** from home to working areas or to education centres
- The **cultural and recreation** variety

The security factor became more important in recent years, mainly because of the violence and insecurity that is occurring in several regions in Mexico. This factor generates an internal migration condition, and new incomers in the MAP-T are increasing the demand on housing, education, or working options.

Paradoxically Puebla is an attractive State to investors and people from other parts of the country but it is as well a labour exporter to United Sates. For example, according to CONAPO (2006) in 2005 6.1% of Puebla's total population was living in United States, being San Pedro and San Andrés municipalities with high migration rates.



Map 6 Migrant categories in the municipalities of San Pedro and San Andrés. Source: adapted from CONAPO 2010.

For one side, this is a contradiction between the investment and security opportunities for the privileged, and for the other side it represents the lack of opportunities for excluded people that come from marginal and rural areas, generating a regional gentrification.

In Map 6, it is shown how San Andrés and San Pedro are considered as well by CONAPO as attractive municipalities for migration inside the MAP-T. For the 2005-2010 periods, the Municipality of Puebla presented a high expulsion rate that matches with a middle-income population sector that changes their residence from Puebla to Cholula, mainly in the Angelópolis district where is nowadays the biggest housing offer. This case is observed as well by architects like Gallardo & Nieto[45] who claim that most of the housing and urban projects are being developed in Cholula and the neighbouring municipalities, whereas the housing projects in Puebla are almost none.

Table 17 Comparison population statistics between San Andrés, San Pedro, and Puebla. Source: adapted from National Census of 1990, 2000, 2010 and National Population Overall 2005 from INEGI

MUNICI-PALITIES	TOTAL POPULATION	BORN IN THE MUNICIPALITY	BORN OUT OF MUNICIPALITY	RESIDENTS INSIDE MUNICIPALITY	RESIDENTS IN OTHER STATE OR COUNTRY
SAN PEDRO	1990 – 78,177 2000 – 99,794 2010 – 120,459	1990 – 2000 – 87,502 2010 – 105,905	1990 – 2000 – 9,790 2010 – 12,624	1995 – 2000 – 82,949 2005 – 104,148	1995 – 2000 – 32,30 2005 – 3,133
SAN ANDRÉS	1990 – 37,788 2000 – 56,066 2010 – 100,439	1990 – 2000 – 47, 162 2010 – 81,480	1990 – 2000 – 5,855 2010 – 16,075	1990 – 2000 – 43,920 2005 – 82,847	1990 – 2000 – 2,886 2005 – 5,330
PUE.	1990 – 1,057,454 2000 – 1,346,916 2010 – 1, 539,819	1990 – 2000 – 1,092,084 2010– 1,277, 582	1990 – 2000 – 20,8012 2010 – 214,380	1990 – 2000 – 1,114,013 2005– 1,319,589	1990 – 2000 – 51,211 2005 – 42,160

[45] Interview made in July 2014 in Cholula

According to the National Census, since the conurbation period of 1990, the population is increasing very fast. In the Table 17 is shown new inhabitants born between the period of 2000-2010, especially for the case of San Andrés and San Pedro. More drastic is the number of new residents such as in San Pedro, in 2000 there were 82,949 residents and in 2005 82,847. During the same years San Andrés changed from 43,920 residents in 2005 to 82,847 residents, only in five years. This is a clear example of how Cholula's conurbation is experiencing new populations' dynamics.

In general terms, those dynamics give place to the first signs of peri-urbanisation: low density development, construction over the agricultural fields, housing sprawl, single land uses, etc. The peri-urbanisation gave way to sprawl and a diffuse definition between rural- urban boundaries, similar but different between the territory of San Andrés and San Pedro, as is explained in the following sections.

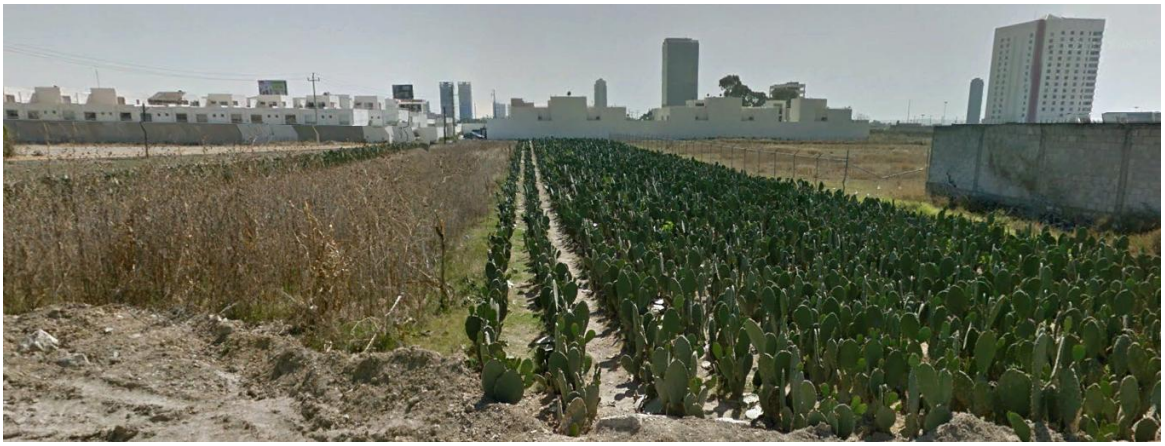


Image 12 Example of peri-urban area in San Andrés Cholula with cactus fields facing the urbanisation in Tlaxcalancingo. Source: Google Earth Street View (2015)

7.4 SAN ANDRÉS CHOLULA

In former times, San Andrés Cholula used to be a quiet rural town with a big portion of *ejido* land. But in the last 30 years, the agricultural economy and traditional way of life is facing some major urban challenges like peri-urbanisation, land speculation, and gentrification of the rural space. These challenges are visible rapid construction of gated communities and condominiums that are juxtaposed to agricultural plots, visualized in Image 12.

As a general overview, San Andrés has a territorial size of 61 km^2 and is separated by 8km from the City of Puebla. Although it shares a physical conurbation with Puebla and other municipalities, the most important division of the territory is given by its antique *barrios* having the current administrative division:

a. **1 main urban core** – San Andrés
b. ***2 barrios*** **–** San Juan Aquiahuac, San Andrés Colomoxco
c. **6 districts –** San Francisco Acatepec, San Luis Tehuiloyocan, San Antonio Cacalotepec, San Rafael Comac, San Bernardino Tlaxcalancingo,Santa María Tonatzintla

d. **1 land reserve –** Atlixcáyotl[46]

San Andrés is presenting an extensive urban sprawl over some of them, especially in districts like San Francisco Acatepec and San Bernardino Tlaxcalancingo (see Map 7).

In order to understand the territorial transformation, it is important to be familiar with three different types of periods in which the society and morphology of San Andrés changed radically:

a. *1860-1960* – San Andrés got an independent jurisdiction as a municipality in 1861. Until the decade of 1960, San Andrés remained as a 100% rural town.
b. *1960-1990* –San Andrés began its social transformation with the construction of the *Universidad de las Américas Puebla* in 1968. The founding of this private university transformed the primary economy of San Andrés, and the agricultural vocation of the land changed into the construction of student flats, restaurants, bars, infrastructure and services related to student and academic needs.
c. *1990-2010* – began when the Agrarian Reform changed in 1991 and with the modification of the Mexican Constitution in article 27.This political change matched with the RDPA implementation and the Governors of Puebla began the urban development of a big portion of rural land in San Andrés. This third period was the collision between the rural society and the massive urbanisation. One of the features that reflects the peri-urban fact is the population growth rate, according to San Andrés statistics, in the former period in 1970-1980 the rate was in 3%, but from 1995-2000 the rate was 4.8% in only 14 years (H.Ayuntamiento San Andrés Cholula, 2008).

The land use transformation from rural to urban made San Andrés a rich municipality[47], due to the construction of shopping malls, private universities, hospitals and big gated communities. The rapid urbanisation stimulated by the high percentage of taxes; incited a decades-lasting dispute over the border of the territory between San Andrés and Puebla.[48]

The urban landscape and the taxes income do not correspond to the rural reality of the different villages of San Andrés. The Angelópolis district, the new district, is quite new, well developed and most of the middle-high class live there. This automobile-housing sector contrasts with the villagers of San Bernardino Tlaxcalancingo (see Image 11). These locals only survive thanks to their agricultural activities or to commercial services.

Contrary to the first expropriation period, when many farmers were cheaply paid for their land, nowadays the rural plots in San Andrés are expensive and not so easy to sell.

This condition can be considered as an involuntary lock to protect the rural plots in the area for a limited time, because many farmers now their land value and they do not want to sell it cheap.

[46] The land reserve "Atlixcáyotl" known as "Angelópolis" is not officially enounced as a district due to its special administrative condition. However due to the big population size, even this land reserve has new big residential areas like "Lomas de Angelópolis" that could be named as well a new district of San Andrés.
[47] According to the municipality, for 2014 the general tax collection was 400 million pesos (around 20 million EUR) mainly thanks to new residential development and the territorial changes with Puebla (Velázquez, 2016)
[48] The conflict between territorial divisions is not finished. In 2014; both Mayors accepted the final division of the Angelópolis district, this decision was ratified by the State Congress but in practices is still not entirely accepted.

For example, the district of San Bernardino Tlaxcalancingo, which has a big portion of rural land but rapid process of urban sprawl, has an official cadastre cost of 170 EUR per square meter. This is an expensive cost for an agricultural field, but is so close to the main urban cores and the Angelópolis district that it is not so easy to sell. Meanwhile, farmers continue their agricultural activities till they find a buyer or better projects to sustain their agricultural activities.

To have a better idea of how taxes income influences the land uses and do not develop deeply the rural San Andrés, in the Table 18 the differences and similarities between the rural San Andrés and the Land Reserve *Atlixcáyotl* (Angelópolis District) are set out.

The Angelópolis profile is more attractive for public investment than the rural districts. The current Governor's development vision is focused on attracting more visitors and investors through visible infrastructure in the industrial corridors, touristic areas, and places like Angelópolis.

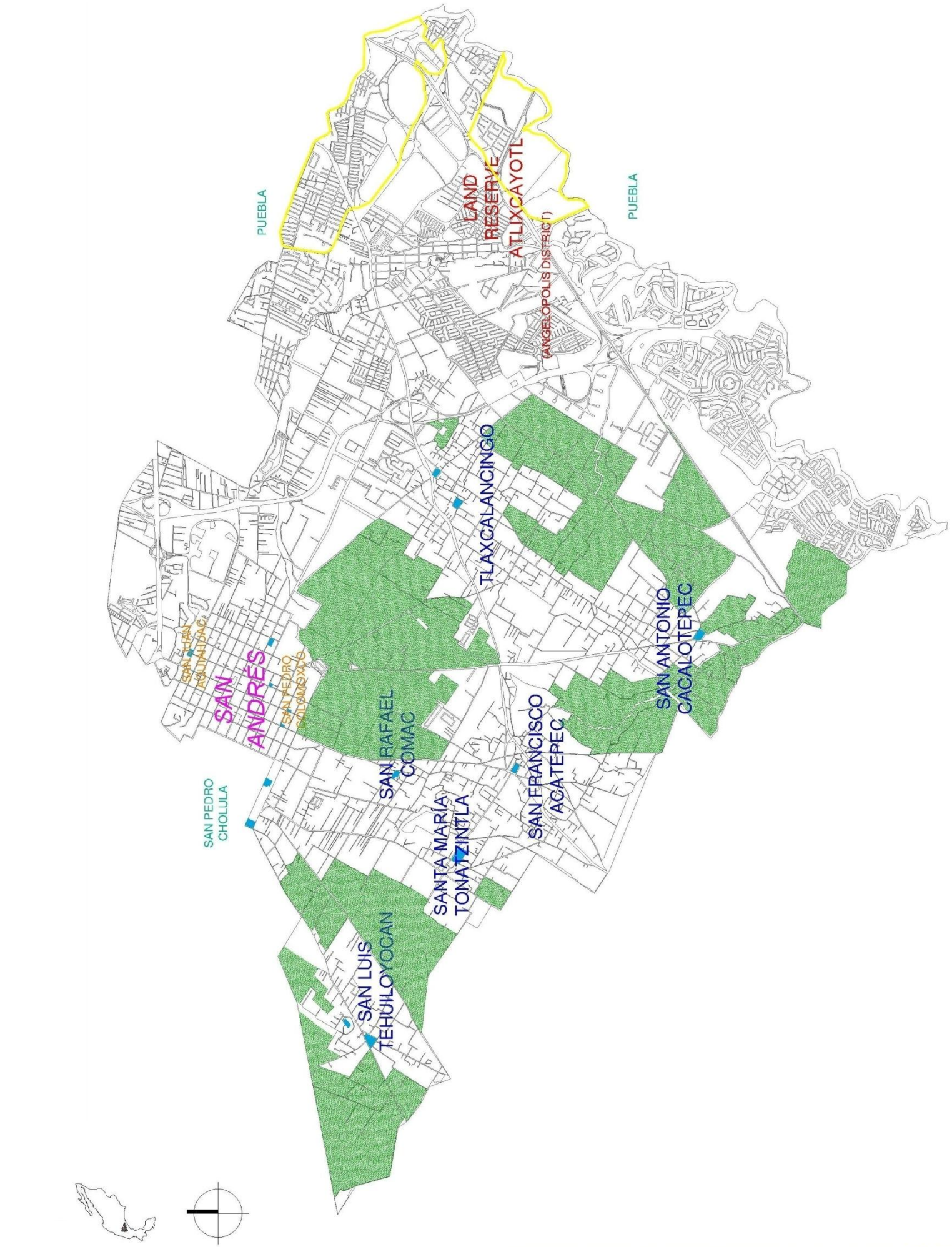
Table 18 Rural San Andrés and Angelópolis District, Source: author and official cadastre map from San Andrés

FACTORS	RURAL SAN ANDRÉS	ANGELÓPOLIS DISTRICT
CADASTRE COST (m^2)	19 – 170 EUR[49]	260 – 521 EUR
ECONOMIC ACTIVITIES	Agriculture, services, trade, education	Trade, retail, services, entertainment, education
TYPE OF DEVELOPMENT	Informal housing, small gated communities, small retail areas, rural houses	Social housing, gated communities, shopping malls, retail areas, hotels
TYPE OF DENSITY	Low and sprawled	Middle – low and sprawled
INFRASTRUCTURE	Public services, public hospital, minor streets, unpaved streets, motorway	Public services, private hospitals, underground cabling, concrete roads, parks, bikeways
FOOD POVERTY LEVEL	High, 25% of the population according CNCH	Low

For the municipality, the current local administration intends to develop real estate projects worth more than 1,000 million Mexican Pesos, around 62 million EUR. Most of these projects are basically hotels, luxury condos, shopping, and residential areas. According to the Mayor, in recent years the capital gain of the municipality increased 300% (Hernández, 2014). This leaves the rural areas in a pauper position where the rapid urban growth is more profitable for property taxation. In 2014 16.3 millions of Mexican Pesos – circa 945,571 EUR – were collected from property taxes. According to the local authorities, the municipality was working with an official land use map of 2008, but with the expansive urbanisation, the local cadastre was upgraded. For 2015 the municipality expected to increase by 80% the annual tax revenues to 51.7 million of Mexican Pesos – circa 3,000,000 EUR – (Más Noticias, 2015).

As a result, the rural-urban landscape of San Andrés shares land between huge gated communities, massive social housing, retail areas, and the most important universities in the Region, contrasted with the rural communities and *barrios* that survive the real estate giant

[49] Exchange currency 08.04.2015, 1 EUR= 16.10 Pesos MXN



CLASSIFICATION (BARRIOS AND DISTRICTS)

Districts	Barrios	Main urban core	Land Reserve	Historical temples	Rural areas	Given area to Puebla

MUNICIPALITY OF SAN ANDRÉS CHOLULA CONTEXT

SOURCE
MAP: Adapted from INEGI 2010
CLASSIFICATION: Adapted from Municipal Plans

0 500 1000 2000m

M7

Image 13 San Gabriel Convent in the historical centre of Cholula, on the bottom the Great Pyramid with the Remedios church.
Source: Google Earth Street View (2015)

7.5 SAN PEDRO CHOLULA

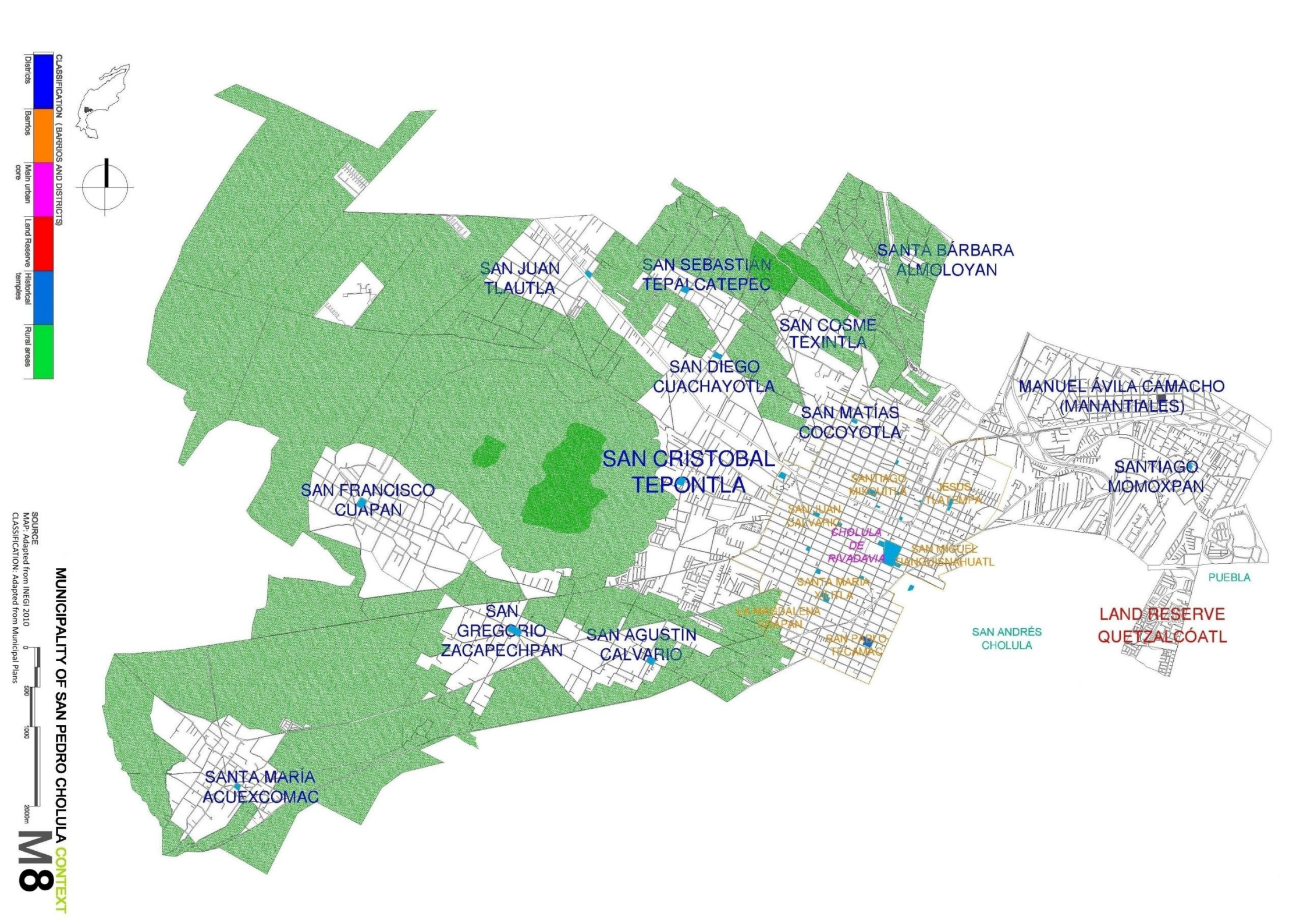
The socio-spatial differences of San Andrés Cholula are not as visible as in San Pedro, mainly because San Pedro is the historical city, the bigger urban core of the region and did not have the extensive former rural land of San Andrés. San Pedro is 51.03 km2 in size (INEGI, 2010) and is connected and conurbated with the city of Puebla. San Pedro has an administrative division in:

- **1 main urban core** – The City of Cholula or Cholula de Rivadavia.
- **9 *barrios*** – Santiago Mixquitla, Jesús Tlatempa, San Miguel Tianguisnahuatl, San Pedro Mexicaltzingo, San Pablo Tecamac, La Magdalena Coapan, Santa María Xixitla, San Juan Calvario Texpolco.
- **13 districts** – Santa Bárbara Almoloyan, San Cosme Texintla, Santa María Acuexcomac, San Cristóbal Tepontla, San Agustín Calvario, San Gregorio Zacapechpan, San Matías Cocoyotla, San Diego Cuachayotla, San Francisco Coapan, Santiago Momoxpan, Rafael Ávila Camacho, San Sebastián Tepalcatepec, San Juan Tlautla.
- **1 land reserve** – *Quetzalcóatl* or popular known as Momoxpan.

The original *barrios* are integrated by the traditional grid and most of the local population live there, represented in Map 8. Each *barrio* gives life and cultural character to the urban core, but none of them is considered inside the "*Pueblo Mágico*" [50]program, only the main historical quarter(see Image 13). Most of the districts are considered as rural, except Rafael Ávila Camacho and Santiago Momoxpan, which are mainly urban.

Other important elements of the morphology of San Pedro are the gated communities, the named "*fraccionamientos*". Contrary to San Andrés, there are many old gated communities in San Pedro; generally are they are made up of between 5-10 houses and the new ones are constructed with 10-20 houses depending on the zoning uses.

[50] The *Pueblo Mágico* federal program pursuits the cultural recognition of traditional towns in Mexico that maintains vernacular architecture, folklore, traditions, and uniqueness. This program was created in order to upgrade tourism and local economy.



MUNICIPALITY OF SAN PEDRO CHOLULA CONTEXT

M8

.Several of these closed housing areas are located in the urban core and in districts like Rafael Ávila Camacho, Santiago Momoxpan, the land Reserve *Quetzalcóatl* and San Cristobal Tepontla. The socio-cultural division can be appreciated inside them: the bigger the gated community is, the less interaction it has with the local life.

Although the gated communities in San Pedro generate socio-spatial stratification, they do not change so radically the urban-rural landscape as in San Andrés. But it is clear that the *fraccionamientos* play an important role in the urban daily life of Cholula and the MAP-T because they respond to a population need for security and privacy protection, a well exploited opportunity by real estate developers.

San Pedro was as well economically benefited by the establishment of the *Universidad de las Américas* in 1968, but in a smaller scale than in San Andrés. Until the decade of the seventies, San Pedro was completely independent from the Capital of the State, Puebla. For a better transit of the students and people working in the University in 1976 a connection road was constructed between the Puebla and Cholula named *Recta a Cholula*, this action was an urbanisation trigger that opened the door to conurbation.

The road infrastructure drove different land uses and needs related to the university. It changed the traditional urban grid of San Pedro to other urban morphologies. First it ruptured the colonial grid, and second, it was adapted to new trends in urban development.

The new infrastructure impacted as well the morphology of San Andrés in 1988, when the motorway Puebla-Atlixco was built. In a certain way, San Pedro survived the conurbation clash in a more transitional way than San Andrés, mainly because:

- San Pedro is the heart of the trade market in the region with several industries.
- It is more diversified in socioeconomic activities and is financially independent from Puebla.
- It did not depend entirely on real estate development and property taxation.
- It has well identified tourism, religious, and culture activities that reinforce the local identity.

The identity factor is one of the most important preservers of Cholula's life-style with the urban and rural ambiance; developed by the locals, adopted by new inhabitants and reinforced by students, professors, and foreigners.

In conversations with Dr. Gutiérrez y Reyes[51], it is noted that San Pedro and San Andrés share a common space but the population is moved by different motives according to the land area:

- The historical Cholula is moved by traditions, shared as well by the rural space.
- The rural Cholula is moved by an "aspirational" culture to improve their family conditions.
- The metropolitan space is moved by land speculation that responds to a consume society

[51] Interviews made on June 2014 and March 2015 in Puebla

Image 14 Degradation of streets and transformation of social housing in the land reserve Quetzalcóatl, Source: author (2014)

San Pedro has some shopping areas, residential and social housing, but unlike San Andres, they are not massive. The local authorities of San Pedro decided that investment in social housing and lower income housing represented high profit to the investor, but not high taxes for the municipality[52]. Where it is similar is in the expropriation of rural land in the nineties through which the land reserve *Quetzalcóatl* was created, which corresponds to the former rural land of the district of Santiago Momoxpan, but was smaller than the expropriated land of the *ejidos* of San Andrés.

Contrary to the *Atlixcáyotl* reserve of San Andrés, in San Pedro the land reserve Quetzalcóatl was developed with more social housing and less higher-income residential areas. Currently, this land reserve is a conflict area due to the uncontrolled changes in land uses and densities. The problem comes with the current state of many housing edifications; most of them were transformed through the years into commerce, convenience stores or more rooms for the families (see Image 14). The degradation level of houses and streets is appalling. To a certain extent, the local administration of San Pedro does not want to accept full responsibility of the management of the land reserve *Quetzalcóatl*, because through the years, the administration of this developable area was the responsibility of the State Government. Nowadays the land reserve *Quetzalcóatl* can be considered as a "grey zone" in San Pedro with many social, mobility, and administrative problems.

Despite the administrative problems in this land reserve, in 2014 the municipality was able to increase 57% of the property taxation collection, around 12.8 million Mexican Pesos (circa 792 million EUR). Although the property tax increased by 50%, the authorities offered discounts and a "participative budget" where citizens were able to choose in which area their taxes could be applied (Vértice 102, 2015). This was a different strategy to San Andrés, because San Pedro was working with a better cadastre and official land uses information and offered as well incentives to citizens to promote tax payment.

Beyond the socio-spatial and taking differences between San Andrés and San Pedro, there is another important instrument that helps to change the urban morphology of both municipalities: the municipal development plans and programs. In this case, the institutional framework of both towns is equal in planning but significantly different in the developing LOCAL policies purposes.

[52] Interview made by the researcher with former Mayor of San Pedro Cholula in June 2014

7.6 INSTITUTIONAL FRAMEWORK

The National Planning System[53] considers municipalities as responsible for the formulation and implementation of their own local plans, and they are in charge of their own spatial planning. In some cases, the jurisdiction of the State level can be part of when the plan considers a region with several municipalities or for environmental protection, infrastructure development, and social development, among others.

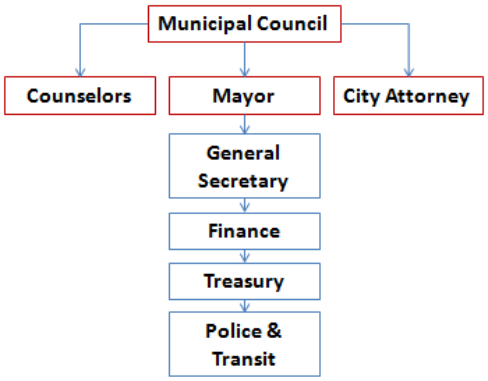


Figure 16 Organisation of the Municipal Council, Source: author

The paradigm of Mexican planning poses a problem between the existing regulation instruments and the gaps for their implementation. Most of the thousands of existing plans in the country only represent ideas on paper and are far away from meeting the real population needs. More than that, Dr. López-Tamayo[54] states the development plans became political demagogy rather than real planning instruments. This is a general affirmation and may depend on the current dominant political party, the administrative plans and programs that can be used for electoral purposes.

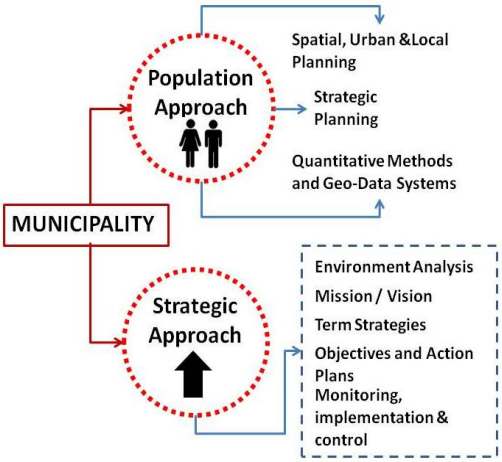


Figure 17 Methodology guidance for the elaboration of municipal plans, Source: adapted from COESPO 2014

The conflictive political interest sharpens whenever the authorities' administrations change. For instance, after each government term, the new Governor tends to detach from the predecessor's acts; restarting planning as a blank slate. The lack of continuity is intensified when the representatives account for different parties; this last point may be the general failing in Mexican planning, the lack of continuity and long-term vision.

According to the Article 46 from the *Ley Orgánica Muncipal* (2001), the Municipal Law from the State of Puebla, the local city council will be represented democratically by a mayor, counsellors and syndics (city attorney). The number of counsellors will be determined by the size of the population, normally there should be one counsellor for every 10 000 inhabitants. These administrative jobs will be selected according to the proportional votes each party gains during the local elections.

The role of the counsellors is fundamental for the Mayor's work; they have the responsibility of administering, approving or denying local programs, plans, projects, and municipal budgets, changes in land use or reforms. These decisions are taken during the *cabildo* or council sessions, which can be private or open sessions to promote citizens' participation.

[53] Explained in Chapter V
[54] Interview made by the author in Cholula, June 2014

The municipal council is organized into different categories as is shown in Figure 16. The organisation and responsibilities of the different Ministers may change, such as Urban Planning, Health, Park& Recreation and others. The number of counsellors may also change; San Pedro has 12 counsellors while San Andrés has 11.

It is essential to note that although there are directors for the different chairs and departments like urban planning, their role is basically administrative, while, on the contrary, the role of counsellors is more relevant due to their decision-making process in the public council and the commissions.

One of the duties of the Mayor is the presentation and implementation of a municipal plan, supported by the *Ley de Planeación para el Desarrollo del Estado de Puebla* (2005) the Planning Law of Puebla and the Municipal Law in the Article 104, which requires the creation of the municipal plans in the first three months of each administration, with a validity of three years and having the opportunity to change it or improve it. The law defines the municipal plans as *"instruments for community development"* which should be aligned with the Regional, State and National Plans.

To complement the municipal plan, the same Municipal Law establishes in the Article 78 the accountability of the municipality and some aspects regarding spatial planning like: elaboration of zoning, urban planning, protection of conservation areas, regularisation of land tenure, control of land uses, and update of construction regulations.

The COESPO (2011) created a methodology for the elaboration of municipal plans, suggesting always a "*population and strategic approach"* that will guide the local authorities for planning in the main areas like education, housing and infrastructure, health and vulnerable population, as it is shown in Figure 17. This approach helps to identify the demographic dynamics and the development trends.

As it was described in Chapter 6, for the Mexican Policies there is a differentiation between plans and programs: the plans are planning instruments and the programs are implementation instruments. The programs have more continuity than the plans, for the case of local level, the plans are renovated every three years, depending on the party ruler, and the programs are only updated when necessary.

Unfortunately, most of these plans are only paper statements, especially in land uses which are determined by construction regulations of each municipality; and other factors like informal housing, violations to the official land use map, and the official requests for changing it; naturally all of them contribute to peri-urban development.

7.7 MUNICIPAL URBAN DEVELOPMENT PROGRAMS

In order to comprehend these planning instruments the analysis of municipal urban development programs of San Andrés Cholula (version of 2008) and San Pedro Cholula (version of 1995 and 2010) can be used. Those periods of development plans are heirs of 1990's policies like the RDPA.

In the Annexure B of this thesis is added the general descriptions of the plans since 2008-2011 for San Pedro and San Andrés, although most of the local cadastre and urban planning programs were updated they are still working with these versions. It is probable that in 2015 new versions of the

cadastre and urban planning programs will be officially accepted. In this section the urban development programs are described.

For the case of San Andrés the authorities were given the land use map of 1995 and the urban development program of 2005. For San Pedro, the authorities were given the urban development program of 1995 and 2010.

7.7.1 MUNICIPAL SUSTAINABLE URBAN DEVELOPMENT PROGRAM OF SAN ANDRES CHOLULA MSUDP-SACH (2008)[55]

The Municipal Program for Sustainable Urban Development of San Andrés was made in 1995[56]. Its policies and strategies for spatial development were updated in 2008.

The legal framework was based on the General Law for Human Settlements, the Sustainable Urban Development Law of the State of Puebla, Cadastre Law and the *Fraccionamientos* Law, this last one regulates the construction of gated communities. This program is as well enrolled in the "Regional Urban Development Program for the Conurbated Zone of Puebla-Tlaxcala"[57].

As for control and implementation regulations, the plan stipulates the goal of decreasing the population growth from 6% to 4.8%. It also suggests:

- Control regulation in the land reserve *Atlixcáyotl- Quetzalcóatl*, promoting low and middle density housing with mixed land uses.
- Control regulation of the physical expansion of the urban sprawl.
- Reduction and restriction of the social housing offer.
- Application of improvement rural housing programs.
- Control of urban growth over the roads.

The districts of San Bernardino Tlaxcalancingo and San Antonio Cacalotepec are marked as expansive urban zones due to the motorway to the City of Atlixco, also the land reserve *Atlixcáyotl* is recognized as one of the areas with the severest urban sprawl and environmental affectations mainly because of the massive construction.

It emphasizes low-middle densities and restricts social housing. The low-middle density was considered in order to control the urban growth. It should be noted that the exponential growth of Angelópolis District, particularly in the residential sector through the construction of private condominiums, is not proposed by the program and is actually incompatible with the density and land uses.

The MSUDP-SACH considers 35.97% of San Andrés' territory as urban, the agricultural land corresponds to 36.5%, and the program comprises 55% of land use, 15% for small trade, offices and services, 6% for small industry, manufacture and hand-crafts, and 24% for road infrastructure.

[55] *Programa Municipal de Desarrollo Urbano Sustentable de San Andrés Cholula.*
[56] The Municipality argued there is not a physical copy of the document, only from the land use map.
[57] *Programa de Desarrollo Urbano para la Zona Conurbada de Puebla-Tlaxcala*

It is well defined as a primary zoning for spatial planning, dividing the municipality in six sectors, two with rural features and four with urban features:

- *Rural sector*
  - (1) Localities from San Luis Tehuiloyocan district
  - (2) Localitiesfrom San Rafael Comac, Santa María Tonantzintla, and San Francisco Acatepec
- *Urban sector*
  - (3) San Andrés' urban core
  - (4) Land Reserve *Atlixcáyotl*
  - (5) Land Reserve *Atlixcáyotl* South
  - (6) Localities from San Bernardino Tlaxcalancingo and San Antonio Cacalotepec

This classification leads to a primary zoning which contemplates the urban growth focused in middle-income and residential housing with other secondary uses. In the Table 1 the primary zoning is described, where the official land uses are:

- *Mixture* – Commercial, services, public, with 1,634,462.94 m^2
- *Housing* – Social housing, middle and residential housing, with 10,322,441,92 m^2
- *Destination* – Land destined for public infrastructure, road infrastructure, and environmental protection, with 8,446,479.83 m^2

Table 19 Primary zoning: land uses and land destination for San Andrés Cholula. Source MSUDP-SACH (2008)

	TOTAL AREA	URBAN LAND USE	URBAN GROWTH LAND RESERVES	AGRICULTURAL LAND USE	DESTINATION
M²	63,517,006.95	22,851, 875.12	9,292,511.94	23,187,361.97	8,185,257.92
%	100	35.97%	14.63%	36.51%	12.89%

The land uses of San Andrés are considered within an urban structure, complementing the traditional municipality division within four urban corridors over main roads with a mixture of land uses, located in: *Camino Real a Cholula (*retail, services, public infrastructure, and housing), *Boulevard Quetzalcoatl* (retail, authorities services, and entertainment), *Boulevard Atlixcáyotl* (retail, services, public infrastructure, and entertainment), and *Carretera Federal Puebla-Atlixco* (trade, services, public infrastructure, industry, and housing).

To complement the official land uses, the program establishes the official densities for housing developments, described in the Table 20.

Table 20 Official densities for San Andrés Cholula. Source: MSUDP-SACH (2008)

DENSITY	HOUSES /HA	POP/HA	GROUND (M²)	COS	CUS	MAX. LEVELS	MAX.HEIGHT (m)
H0							
Single family house	6	27	1000	0.4	1.0	2	5
Horizontal development			1200	0.5			6

H1							
Single family house	15	68	400	0.7	1.5	2	6
Duplex			1000	0.7	2.5	2	6
H2							
Single family house	25	113	300	0.7	1.5	2	7
Multi-Family			750	0.8	3.5	3	9
H3							
Single family house	30	135	200	0.8	1.5	3	8
Multi-Family			1500	0.8	2.5	5	14
H4							
Single family house	50	225	120	0.8	1.5	3	8
Multi-Family	25	113	1500	0.8	2.0	6	175
Multi-Family	50	225	2000	0.8	2.0	8	20
H5							
Single family house	50	225	120	0.8	2.0	3	8
Multi-Family			2500	0.7	4.0	10	28
H6							
Single family house	44	198	120	0.8	2.0	3	8
Multi-Family	60	270	4000	0.8	3.0	10	28
Multi-Family	120	540	5000	0.7	4.0	12	32
Urban Corridors	120	540	4000	0.65	5.0	25	90

Compared to San Pedro's densities, the program is more precise in describing the land uses and densities, mainly due to the housing sector. It establishes as well the importance of protecting the rural landscape of the volcanoes and the Great Pyramid, especially when a developer wants a vertical development with more than 8 levels and with H4-H6. This type of multi-family developments or condominiums should be only authorized in urban areas.

The density division satisfies the needs for urban growth in the middle-housing and residential sector in terms of trade recreation, infrastructure, and services, amongst others. The program promotes social housing with an exclusionary policy that promotes isolated housing areas. The lack of integration is evident due to the big demand for gated communities for a population segment with higher incomes.

7.7.2 MUNICIPAL URBAN DEVELOPMENT PROGRAM OF SAN PEDRO CHOLULA MUDP-SPCH (1995)[58]

Since 1995, the diagnosis of this plan establishes the existence of unused land inside the urban area of San Pedro, this land was considered suitable for urban development. Ironically, this diagnosis is repeated 20 years later and not implemented with projects through urban development programs. This was one of the main objectives of the program, especially in unused and unoccupied land with low density rates.

During this period, the rural area was 3,185 Ha, the conservation reserve was 405 Ha, and the urban area 1100 Ha. 60% of the urban land uses were concentrated in the urban core and 78.84% of the agricultural uses outside the urban core.

[58] *Programa Municipal de Desarrollo Urbano de San Pedro Cholula 1995*

The program proposes four zones of the municipality to guide the spatial planning:

- *Metropolitan growth area* – bordered by the *Periférico Ecológico*, the original outer ring in that time and located in the districts of Santiago Momoxpan, Rafael Ávila Camacho and the new land reserve. This area has the highest urban growth pressure.
- *Metropolitan impact and transition zone* – located between the *Periférico Ecológico* and the conurbated zone of Cholula, with high urban growth over main roads like federal motorway Puebla-Mexico and the *Recta a Cholula.*
- *Patrimonial urban zone* – bordered by the urban conurbation between San Andrés and San Pedro with the localities of San Matías Cocoyotla, San Diego Cuachayotla, and San Cristobal Tepontla.
- *Metropolitan rural area* – integrated by rich agricultural fields in the localities of Santa Bárbara Almoloyan, San Cosme Texintla, San Sebastián Tepalcatepec, San Francisco Coapa, Santa María Acuexcomac, San Gregorio Zacapechpan, and San Agustín Calvario. These rural districts are still considered the main agricultural areas of San Pedro.

The description of land uses like housing considered complementary land uses like retail, trade and services with established densities showed in the Table 21. The official land use regulated the density according to the type of spatial development of the municipality, and not only the housing development.

In addition, the 1995 program was starting point after the expropriation and urbanisation of the land reserves in San Andrés and San Pedro.

Table 21 Official densities for 1995. Source: Municipal Urban Development Program (1995)

DENSITY	HOUSES/HA	POP/HA	PLOT, GROUND (M^2)	COS	CUS	MAX. LEVELS
H0 (patrimonial area)	-	75	-	-	-	-
H1 (Metropolitan transition area)	16	80	400	0.5	1.0	2
H2 (Metropolitan Rural area)	13	104	650	0.5	1.0	2
H3 (Buffer area)	31	155	200	0.6	1.2	2
H4 (Urban social-housing area)	62	310	100	0.6	1.8	3
H5 (Metropolitan growth area)	90	350	90	0.85	3.4	4

7.7.3 MUNICIPAL SUSTAINABLE URBAN DEVELOPMENT PROGRAM OF SAN PEDRO CHOLULA MSUDP-SPCH (2010)[59]

This is the current authorized urban development plan for the municipality of San Pedro Cholula. In the diagnosis it recognizes the land use vocation for San Pedro: urban land use, rural land use, and conservation. During this year the rural area comprised of 3,729.27 Ha and 3,072.86 Ha for urban land use. The diagnosis recognizes the trend in urban sprawl over the territory.

The program ranks the population cores described in the Table 22 as a tool to delimitate the urban and rural cores in San Pedro; as well as the level of coverage of public facilities and public services.

[59] *Programa Regional de Desarrollo Urbano Sustentable de San Pedro Cholula 2010*

Table 22 Population hierarchy. Source: RMPSUD-SPCH 2010

POPULATION SIZE	PUBLIC FACILITIES, PUBLIC SERVICES	DISTRICTS
50,000-100,000 pop.	Medium, basic	Cholula de Rivadavia
10,000-50,000 pop.	Medium basic	Santiago Momoxpan
5,000-10,000 pop.	Basics	San Matías Cocoyotla San Gregorio Zacapechpan San Cristóbla Tepontla San Diego Cuachayotla
2,5000-5,000 pop.	Rural core	Rafael Ávila Camacho (Manantiales) San Juan Tlautla Santa María Acuexcomac San Francisco Cuapan Santa Bárbara Almoloyan
Less than 2,500 pop.	Sprawled rural locality	San Agustín Calvario San Cosme Texintla San Sebastían Tepalcatepec

The program suggests using the vacant or unused land on the city to regulate the urban growth –like in 1995 –. Instead of growing on the peri-urban areas it is strongly recommended to use the 650 Ha that exist in San Pedro's core to utilize the existing public facilities and infrastructure. Just in the central part of the City (Cholula de Rivadavia) exists more than 138 Ha of vacant land.

The official land use map, the *Carta Urbana* is the most important official instrument of this program to define, control and plan the urban growth, the urban image, and the construction regulations of the municipality. The official densities for housing development are presented in the Table 23, normally the density standards are the ones that classified and regulate the land uses, complemented with others in the *Tabla de compatibilidad de usos de suelo,* or land use compatibility.

Compared with San Andrés' densities, San Pedro's authorities do not consider vertical development, mainly because most of the urban cores are located in the historical area and the road infrastructure is not sufficient for higher densities.

Table 23 Official densities. Source: RMPSUD-SPCH 2010

DENSITY	HOUSES/HA	POP/HA	PLOT, GROUND (M^2)	COS	CUS	MAX. LEVELS
H0 (not allowed)	-	-	-	-	-	
H1 (controlled housing)	16	72	400	0.5	1	2
H2 (residential housing)	20	90	300	0.5	1	2
H3 (middle-income housing)	31	140	200	0.6	1.2	2
H4 (social housing)	45	202	120	0.6	1.8	3
H5 (low-income housing)	70	315	90	0.6	3.4	4

This program reinforces the urban facilities of Cholula, due to location and tourism activities, taking into consideration the importance of community planning for a better town and districts development.

In 2014 a new version of this program was created, with several modifications to the land use map and densities, but is not officially ratified, meanwhile the 2010 version is the valid one.

7.7.3 COMPARATIVE APPROACH BETWEEN SAN ANDRÉS AND SAN PEDRO

Despite the evident differences between the plans – such as the development of the housing sector – the plans and programs of San Andrés and San Pedro have some points in common:

a. The municipal plans and the development programs are clear in their policies; however **the violation** of official land uses, densities, and construction regulations continue.
b. The plans do not represent the real density growth.
c. The plans are focused on supporting the provision of infrastructure like sidewalks and streets pavement, construction of roads, water supply, drainage, electricity, bridges; because it provides more tangible proof that the authorities "are working".
d. The plans recognize the importance of protecting the natural areas and supporting the farmers, but do not have the big picture of Cholula's rural and cultural world in. Especially the rural population would not be able to survive by solely supporting local production and receiving money from the Government. No plan or programs contemplates the protection of the rural fields as an important identity, conservation and sustainable local factor. It is also alarmingly common that **each plan contemplates the agricultural land as "future urban development area".**
e. The municipalities are their own controllers, despite the existence of instruments to follow up the plans every three years, it ends up being a brief internal evaluation of what was done, which also works as an exposition of the projects that the following administration will most likely not continue.
f. All the diagnoses recognize the lack of control and implementation mechanisms, but no one really works to change the situation
g. Since 1995 the urban development programs recognize the vacant land as areas for spatial development inside urban cores. Currently there are some public buildings constructed in these areas, but there are no significant urban projects to stop the sprawl outside the urban core.

These seven observations coincide in how local authorities through their plans and programs valuate Cholula's land to become an important touristic, educational, services, and residential core. Most of the policies' approach is concerned with infrastructure development in order to receive more real estate investments and tourism benefits.

In the diagnosis of both programs, the lack of law implementation in the area of gated communities and social housing construction is a common factor. As a consequence of this uncontrolled urban expansion, the regional development was less homogenized and more marginalized than former years, increasing the gap between the different socioeconomic groups. This condition is supported by local policies, for one side they are focused on attracting investment for new residents and visitors to Cholula, but for the other side they expel the local population due to the lack of opportunities, especially for people from the rural sector.

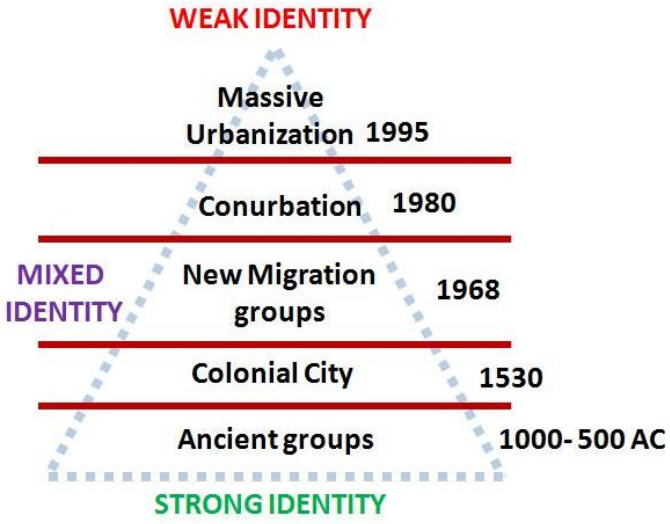


Figure 18 Cholula's socio-spatial layout. Source: author

There is definitely a lack of an integral approach for Cholula's municipal development. It is not congruent to believe that tourism and real estate are the only factors that increase the economic sector in the region. The well established historical Cholula and the new metropolitan Cholula are creating their own defense social groups, but what happens with the rural Cholula? This is the most vulnerable area of both municipalities and it seems that their future is to be completely absorbed by land speculation. All the programs identify on paper Cholula's land use vulnerability, but in practice no administration implements the necessary actions.

7.7 CONCLUSIONS

> "*Somos cholultecas los que no podemos vivir en cualquier otro lugar, los que escogimos vivir aquí con la carga histórica de esta ciudad…" Anamaría Ashwell* (2015, p. 121)

Cholula as a territory with an important urban core can be represented as an exemplary case of peri-urbanisation. More than that, Cholula is a dynamic territory that expels and attracts population, this condition develops not only peri-urbanisation, also gentrification and spatial-stratification Nevertheless, and the socio-spatial reality is creating a mixed identity through the new migration groups. For one side the geographical context gave to Cholula the historical identity, on the other side through migration it was developed three different types of socio-spatial conditions that influenced the territorial dynamics (see Figure 18):

- *The religious identity in the historical and rural Cholula* – in words of Dr. Margarita Tlapa[60] "tradition gives place to adaptation".
- *The mixed identity* – since 1968 it was resulted from the internal migration of new inhabitants, academics, and students that chose to stay in Cholula.

[60] Conversation made in March 2015 in Cholula

- *The metropolitan facade* –Resulted from neoliberal policies and real estate developers that generated a consume society that does not feel so connected or integrated to the historical and rural Cholula, but more identified with the globalisation context.

Throughout these conditions, the rural-urban population of Cholula has dramatically changed when different socioeconomic factors impacted the urban development, like the construction of roads, the expropriation of *ejidos* and the implementation of the RDPA in 1993. Since the decade of 1960, the urbanisation process between Cholula's towns and Puebla took place and created a physical conurbation. The creation of the RDPA was important development factor for San Andrés municipality because a big portion of the rural and were expropriated and sold. This fact changed the rural vocation of San Andrés and became part of the metropolitan region inside the rural-urban fringe. During this period San Pedro was also conurbated, but in a transitional way for the inhabitants.

With the municipal plans and urban development programs, San Andrés recognized the urbanisation value, while San Pedro was expectant of trade, industry and services, but both of them did not reinforce through their public policies the protection and recognition of rural areas. As a result, the peri-urban area is not well defined and presents spatial issues. The demand on developable land and housing offer gave place to the property tax incomes, differenced and consolidated between both municipalities. The property tax and water service gave as well a big territorial conflict with the locals and the authorities, well appreciated in the differences and similarities in the pattern of land use of our both municipalities.

Image 15 Landscape of peri-urban development in the Angelópolis district. Source: Agustín López (authorized by the photographer)

VIII PATTERN OF LAND USE: MORPHOLOGY AND STAKEHOLDERS OF PERI-URBAN DEVELOPMENT IN CHOLULA

8.1 INTRODUCTION

The characterization of Cholula shares its features with other Latin American cities due to the historical and rural background and its struggle to adapt the imminent land speculation and massive urbanisation. The traditional compact city, with modular grid, low density, mixed land uses, and the main urban core is transforming into metropolitan models that follows housing needs and socio-urban change. Inside those urban and rural transformation, the land uses plays an important role in spatial development, generating occupational patterns which consist on groups of people which with different stimuli and ways of using the territory.

This chapter is divided in two parts, the first one describes the spatial morphology of Cholula to understand better the territorial conformation of the urban and rural areas; and then it is analyzed through mapping the spatial structure and the current pattern of land use. The second part consist in the analysis of the stakeholders, the agents in peri-urban development and how their relationships and interests affect and impact the land uses in Cholula.

8.2 SPATIAL MORPHOLOGY OF CHOLULA

As described in Chapter VII, the spatial development of Cholula was structured by the different influences of the pre-Hispanic and Colonial societies, giving the socio-political organisation a significant role in the development of the urban and rural form. The morphology of Cholula is a historical division between different ethnic groups, between different migrants and cultural

assimilations. This division created a constant social dichotomy between rural and urban, between San Andrés and San Pedro, between locals and incomers, between *barrios* and gated communities.

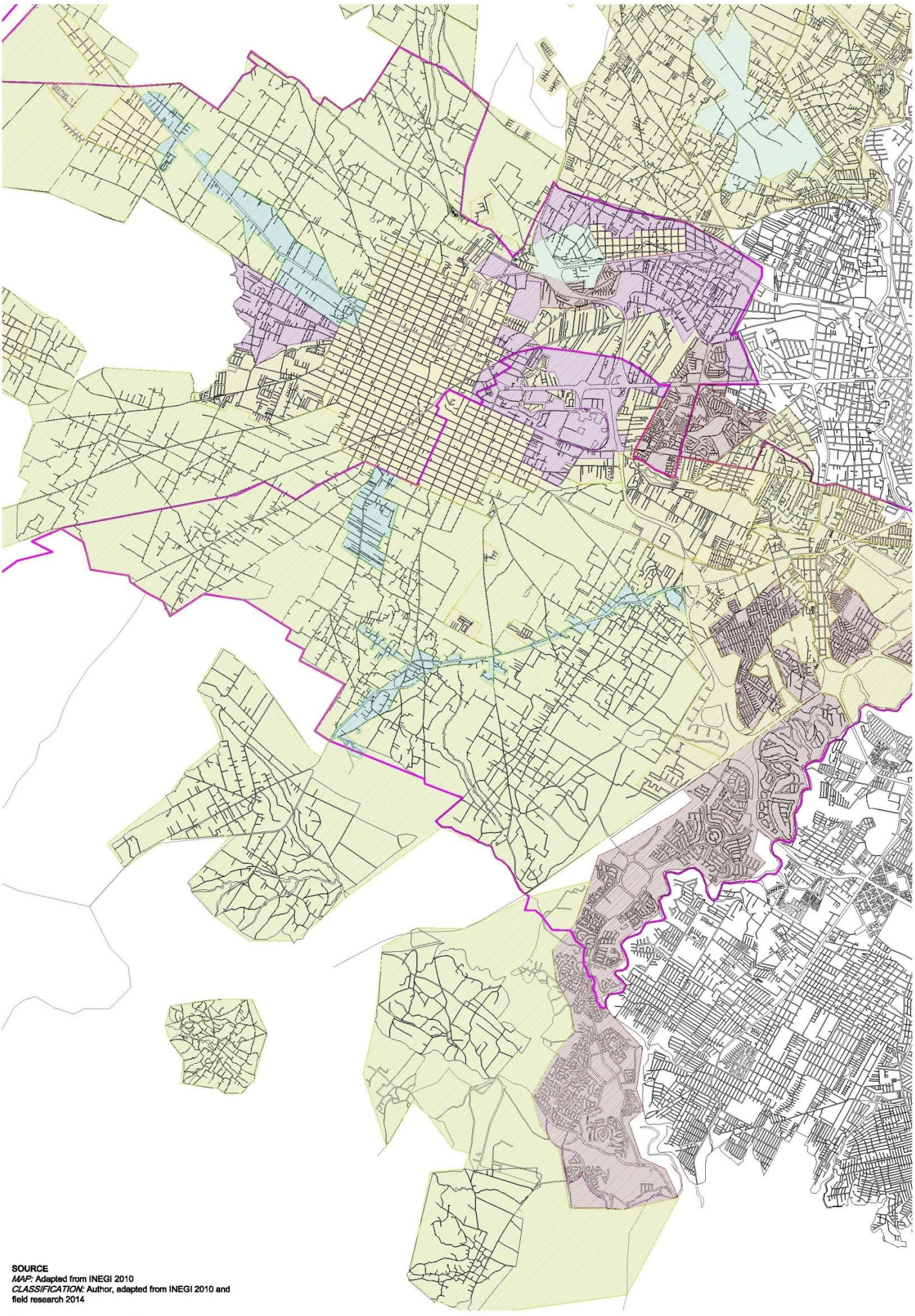
The following analysis of the pattern of land use focuses on the spatial morphology of San Andrés and San Pedro; it also takes into consideration the planning and implementation actions of the RDPA in Cholula's territory, in order to discuss and describe the relationship between planning regulations and stakeholders in the pattern of land use in Cholula.

8.2.1 SPATIAL AND URBAN STRUCTURE

For the study of Cholula's land uses, this research describes Cholula's socio-spatial and urban structure and the current spatial development of the territory; mainly since the implementation of the RDPA in 1993.

The mapping description is studied from the following categories related to spatial development and proposed by Gormsen *et al* (1994) for middle-size Mexican cities and the territorial analysis and format of Pamela Durán Díaz (2013):

a. *Urban layout and grid development* – In Map 9, the different urban grids among Cholula´s region is represented, from the regular-modular grid, to the housing sprawl, and rural localities.
b. *Socio-spatial structures* – In Map 10, a general overview of socio-spatial division is represented between the new centralities like Angelópolis district and rural Cholula. It is visible the number of religious temples that work as social interaction areas for the traditional Cholula, on the contrary it is visible as well how the shopping-malls are meeting points for new incomers.
c. *Housing and urbanisation* – In Map 11, housing development among Cholula´s region is showed focused in the alarming growth of gated communities in the last 20 years, especially in the municipalities of San Andrés Cholula, Coronango, and Cuautlancingo; these last two are becoming dormitory towns.
   This map shows how before 1995 few gated communities exist and urban growth was more homogeneous. After this year with the implementation of the RDPA, the trends on sprawl development changed the rural land uses into urban ones.
   It is visible as well how the new sub-urban cores and new centralities have private-development, car-based mobility and less interaction with the traditional urban and rural cores.
   In the map it is showed the exponential growth of "Lomas de Angelópolis", a massive gated community in the south that is surpassing the rural area of Ocoyucan.
d. *Road and mobility network* – In Map 12, the road and mobility network is represented, showing the main roads inside and outside the urban areas and how this network drives urban development. It is represented as well the mobility flows between housing, working, educational, and recreational areas.



SOURCE
MAP: Adapted from INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010 and field research 2014

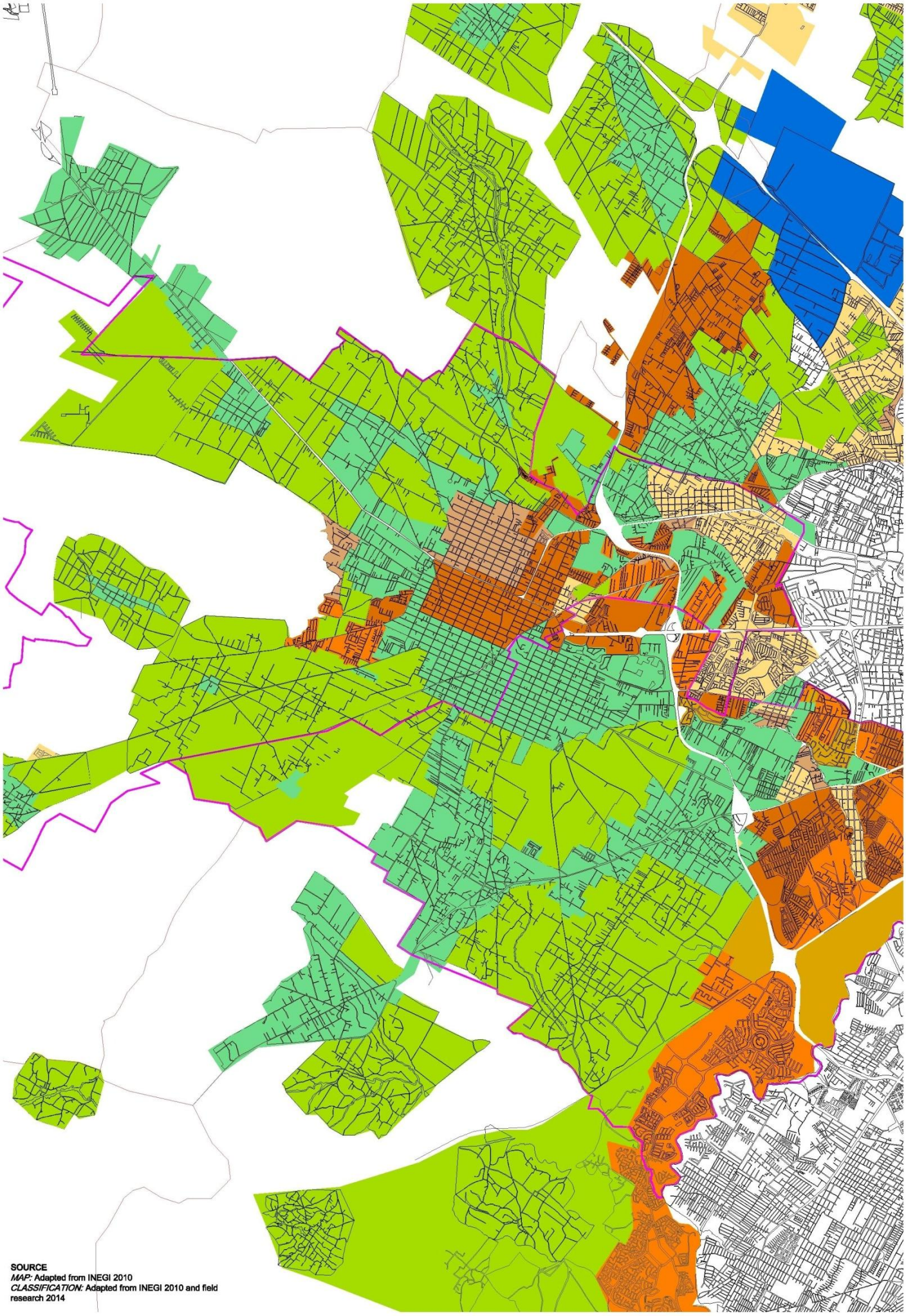
CLASSIFICATION

Massive dev. grid	Urban grid over former rural plots	Traditional reticular grid	Rural-urban grid	Urban grid over road-network	Mix- urban grid

GRID DEVELOPMENT IN CHOLULA

0 500 1000 2000m

M9



SOURCE
MAP: Adapted from INEGI 2010
CLASSIFICATION: Adapted from INEGI 2010 and field research 2014

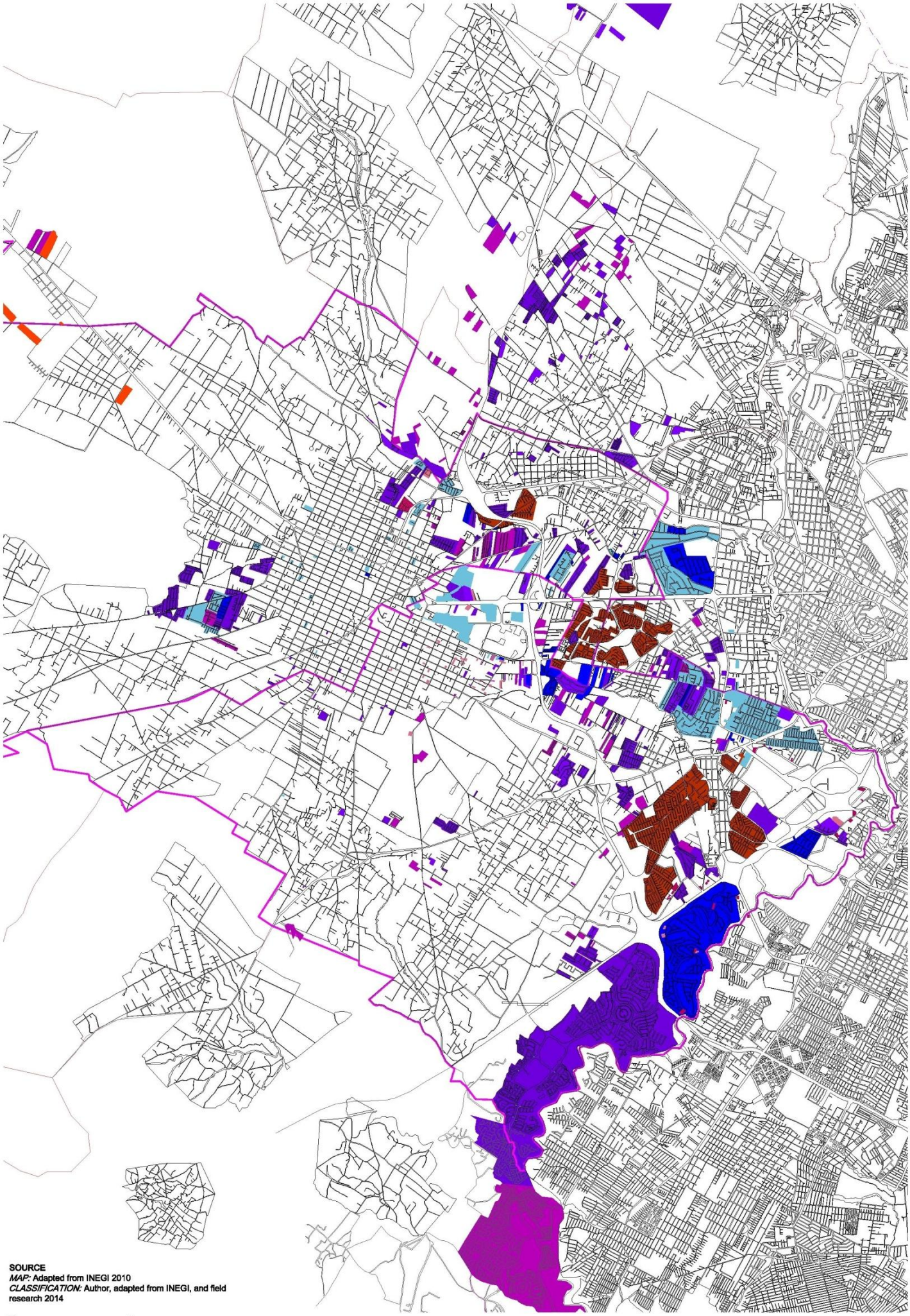
CLASSIFICATION (DIVISION BETWEEN SOCIAL GROUPS AND LAND USES)

High | Middle-High | Middle | Mix groups | Middle-low | Low | Mix-industrial

SOCIO-SPATIAL DIVISION IN CHOLULA

0 500 1000 2000m

M10



SOURCE
MAP: Adapted from INEGI 2010
CLASSIFICATION: Author, adapted from INEGI, and field research 2014

SOCIAL HOUSING
1990 Before | 1995 After | 2005

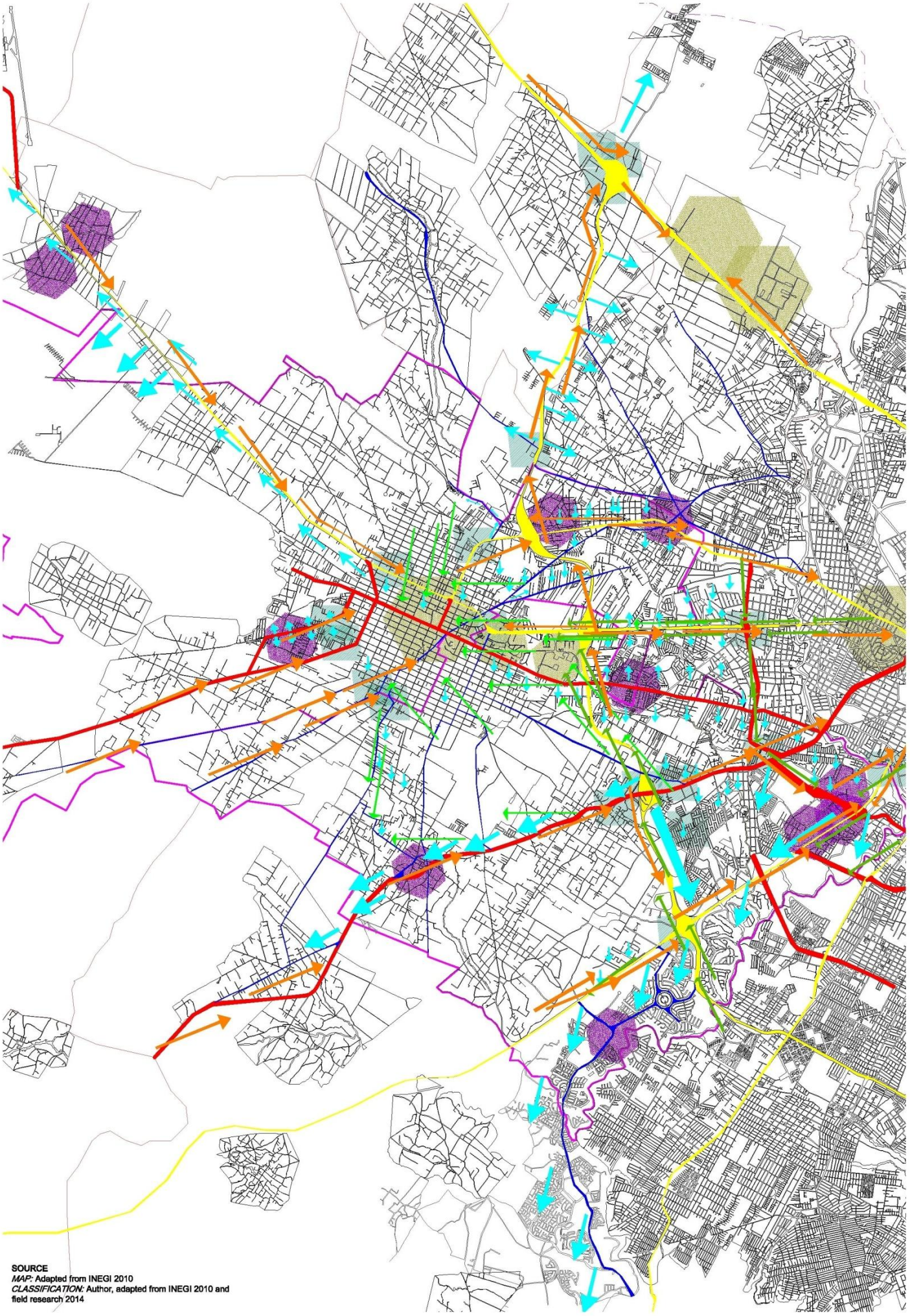
CONDOMINIUMS
1990 Before | 1995 After | 2010

GATED COMMUNITIES
1990 Before | 1995 After | 2000 | 2010 | 2015

0 500 1000 2000m

HOUSING DEVELOPMENT IN CHOLULA

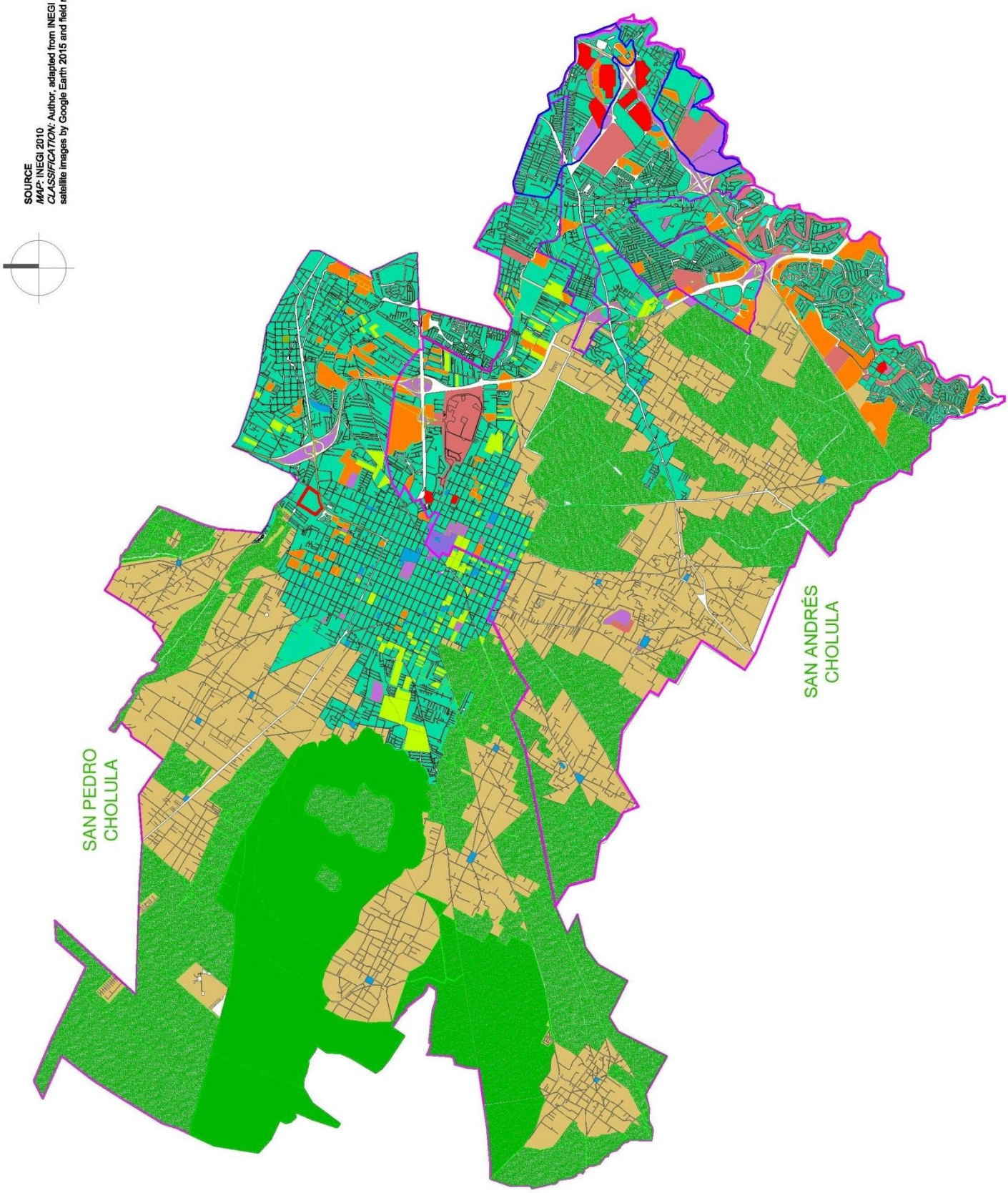
M11



ROAD AND MOBILITY NETWORK IN CHOLULA

M12

SOURCE
MAP: INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010, satellite images by Google Earth 2015 and field research



CLASSIFICATION SPATIAL AND LAND USES TRENDS

Urban	Peri-urban	Rural	Agricultural plots inside urban area	Vacant land public and private

TRADITIONAL AND NEW SOCIO-SPATIAL LOCATIONS

Archeological sites	Religious temples	Main shopping-centres	Green-plazas-recreative public areas	Green- private areas

LAND RESERVES AND LOST AREA

Quetzalcóatl Land Reserve	Altixcáyotl Land Reserve	Land given to Puebla

LAND USE AND SPATIAL DEVELOPMENT IN CHOLULA

0 500 1000 2000m

M13

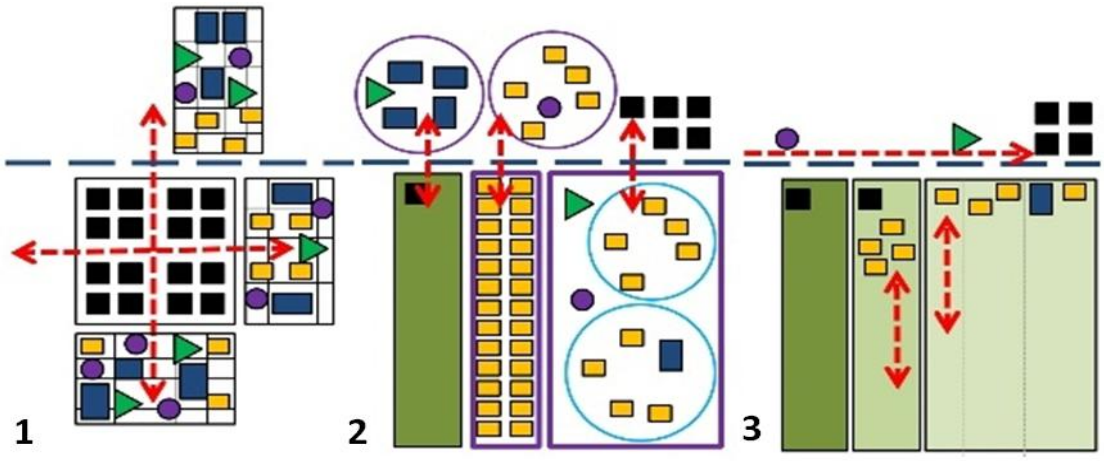


Figure 19 Spatial development model for Cholula. From the modular-grid (1), to the private-development (2) and rural (3), Source: inspired and adapted from Gormsen et al. (1994) models.

8.3 SPATIAL DEVELOPMENT MODEL AND PATTERNS OF LAND USE

Through the mapping analysis of the different morphological categories and the field research, three spatial development models were identified for Cholula, which correspond to the three socio-cultural realities of the area: **the modular-grid, to private-development and rural model** (see Figure 19 and Map M13).

The modular model corresponds to the historical growth of Cholula and the foundational city, and the other two are mainly focused on the urban growth from 1995 to 2015 when the physical conurbation with the City of Puebla was completed.

Each model may have different physical structure and socio-urban characteristics, but they share some trends in economic activities and densities. For the current research to be brought to a satisfactory analysis, first the characteristics of each model are described below, complemented by the pattern of land use of each model.

8.3.1 THE MODULAR-GRID MODEL– THE TRADITIONAL CHOLULA

The compact spatial development model corresponds to the urban cores of San Pedro and San Andrés, both of which have the traditional colonial grid. This grid or urban layout was the fusion between the "*native grids*" and *"check board plan derived from new towns of medieval Western Europe, reinforced by the Laws of the Indies in 1573 that prescribed Vitruvian rules for their layout"* (Kubler, 1993).

The regular grid was planned to be 188 x 100 meters in size for each urban square, having at the heart of the settlement a big *plaza* with the representation of the religious and political powers, meaning the Town-Hall and the Parrish, or in the case of San Pedro, the Convent of San Gabriel. Back from the Town-Hall and one urban square away exists the Market "Cosme del Razo" one of the most important trade places in the region and the heart of the trade activity in Cholula.

In general terms, the plaza and the historical district of San Pedro are surrounded by commercial, religious, entertainment, and touristic activities; as well some housing areas which are located in the parallel streets (see Image 16). While the historical model was the traditional planning system, this model is no longer used by planners or population; on the contrary the other two models with their patterns are widely used for urban growth.

The traditional historical-grid model is similar between San Andrés and San Pedro, but with some singularities for each municipality.

San Andrés urban core also has a plaza with the Parrish and the Town Hall, but contrary to San Pedro, has less trade areas, has no central market, has less housing density levels; but has more restaurants, bars, and single housing areas. Both municipalities have a big student population, because as the *Universidad de las Américas Puebla*[61] is located in San Andrés most of the student population prefer to live in its urban core.

Image 16 The historical Plaza of Cholula surrounded by the town hall, churches and commerce. Source: author (2014)

Due to the formulation of San Pedro and San Andrés' urban cores, four main characteristics of a compact model are also present: **centrality, compactness, mobility network, and mixed-land uses**. These characteristics did not change very much in the last 30 years, especially due to the focused economic activities for San Pedro – trade and tourism – and San Andrés – education, entertainment and services –.

Being a grid and modular model, San Andrés and San Pedro are very attractive for academics, students and tourists, their urban cores are one of the few places in the Metropolitan Area of Puebla-Tlaxcala where is possible to live without a car, by using bicycles or simply walking around the town. The public transportation is well connected to the City of Puebla and other areas of Cholula.

Another very important attribute of this model, which differs from other compact-historical cities in Puebla and Mexico, is the presence of rural activities inside the urban grid. Cities like Puebla were founded with well defined housing and economic activities, whereas the agricultural land was settled outside. For Cholula it was different, both San Pedro and San Andrés historically have rural plots inside the urban core and traditionally these plots are the areas that are being urbanized through time. This situation reinforces Cholula's rural identity and the presence of the rural factor in each spatial development model.

Due to the students, farmers, commerce and pedestrian activities, the historical-grid model presents different patterns of land use, described in the Table 24 and Map 14:

(1) Modular urban core, (2) Modular rural-(2) Urban core, (3) Housing core, and (4) Road-network urbanisation.

[61] Other universities like Universidad del Valle de México Campus Puebla, Tecnológico de Monterrey Campus Puebla, Universidad Anáhuac Campus Puebla, INAOE, and the BUAP are located in San Andrés Cholula; the municipality is very attractive for student life.

Table 24 Modular-grid Model and patterns of land use, Source: author

PA-TTERN	DEN-SITY	LAYOUT	CONSTRUCTION TREND	SOCIOECONOMIC ACTIVITIES	OFFICIAL DENSITIES
1 Modular Urban Core	**Low-Medium**	Regular grid	Traditional façade, family buildings, single family houses, students houses, restaurants, convenient stores, hotels	Education, tourism, trade, services, industrial	-Cholula de Rivadavia (H3) urban core -San Matías Cocoyotla (H4) agricultural zone -San Andrés (mix density and uses)
2 Modular Rural-Urban Core	**Low**	Regular grid	Single family house	Agriculture	-Cholula de Rivadavia (H3) urban core -San Matías Cocoyotla (H4) agricultural zone -San Cristobal Tepontla (H1) sub-urban core - San Andrés (mix density and uses)
3 Housing Core	**Medium**	Irregular grid	Traditional architecture, contemporary architecture, single family houses, family buildings, small commercial centre, small and medium gated communities	Education, housing, services, trade, retail	-Cholula de Rivadavia (H3) urban core - San Andrés (mix density and uses)
4 Road network urbanisation	**Low-Middle**	Irregular grid, urban develop. over road network	Single family houses, family buildings, small commercial centre, small and medium gated communities	Education, housing, services, trade, retail, industrial	-Cholula de Rivadavia (H3) urban core -San Cristobal Tepontla (H1) sub-urban core, buffer zone -San Gregorio - Zacapechpan (H1) sub-urban core -Santiago Momoxpan (H2) Industrial,trade, housing -San Andrés (mix density and uses) -Santa María Tonatzintla (low density)

Image 18 Agricultural fields in the protected archeological area in San Andrés Cholula, Source: author (2014)
Image 17 Flower and agricultural fields below the Great Pyramid and the archaeological site, located in the urban core of San Andrés, Source: Gilda Schumacher (2014) authorized by the photographer

(1) Modular Urban Core Pattern

It is present in the districts of Cholula de Rivadavia (SP)[62], San Matías Cocoyotla (SP), and San Andrés (SA). The pattern is classified as mixed with middle-low density in the historical centre of San Pedro, low density in the historical centre of San Andrés. The urban core's land uses are mixed uses between housing, archaeological sites, education, services, and commerce.

The main features of this pattern are:

- Regular grid with urban squares of 188 x 100 meters in average.
- Mixed land uses: commercial, industrial, services, housing, and education in the urban core, commercial and housing in the *barrios,* housing and agriculture in the border areas.
- Low-medium density
- Traditional architecture in the historical district, mixed constructions in the *barrios* and other localities.
- Traditional trade area in the urban cores.
- Archaeological and historical sites.
- Location of hotels and restaurants.
- Location of a religious representation in each barrio.
- Presence of agricultural activities in urban plots.
- Vacant or unused plots.

The size and form of the urban grid is similar to the rural plots.

(2) Modular Rural-Urban Core pattern

This pattern represents a transitional land use between the former agricultural fields and the urban area. The most important location for this pattern is below the Great Pyramid, in the fields that are protected by the INAH where the owners are not allowed to construct on the fields. In the Images 18 and 17 these protected fields are shown. This, the same area is in conflict with the new urban project which tries to construct a modern and closed park in the protected archaeological area.

[62] SP San Pedro Cholula, SA San Andrés Cholula

Image 19 Recta a Cholula, infrastructure that developed conurbation between Cholula and Puebla and an example of road-network urbanisation
Image 20 Rural plots urbanisation over the road *Camino Real a Momoxpan* in San Pedro, Source: Google Earth (2014)

The rural plots below the Great Pyramid and the ones located in the urban core are a clear example of how the rural identity of Cholula is always present. The example of this pattern is presented in the Images 18 and 19.

The presence of this pattern is mainly visible in the districts of Cholula de Rivadavia (SP), San Matías Cocoyotla (SP), San Cristobal Tepontla (SP) and San Andrés (SA). The rural plots can still be found in the historical *barrios*, in coexistence with the urban grid. An agricultural plot can be located in front of a school, a small gated community or some local stores. It is common that many of these plots have a transitional land use change, meaning that their agricultural vocation is being abandoned or unused, the owners wait for a better business opportunity or begin to construct progressively.

The main characteristics of this pattern are:

- Regular grid with rural plots (urban squares) of 188 x 100 meters in average.
- Low density, single family house construction.
- Transitional development from agricultural to urban.
- Agricultural use or abandon of agricultural use.

This pattern serves as a green boundary between the traditional regular grid and the irregular grid, presented in the urban expansion of Cholula in the 1980's.

Despite the urban growth in San Andrés and San Pedro, according to the analysis on Map 15, it can be stated that Cholula is a "rural city". For the official definitions from INEGI Cholula (defined in Chapter V) is no longer a rural area due to the number of localities with more than 2,500 inhabitants, but according with international definitions like UN (defined in Chapter II), Cholula is still a rural place due to presence of agricultural plots inside and outside the urban core, the cultural- rural identity, the spatial distribution, and the conservation areas like the Zapotecas hill.

The rural-urban core pattern is as well the transitional area to other pattern like the rural localities-sprawl, described in the rural development model.

(3) Housing core pattern and (4) Road-network urbanisation pattern

The Housing core pattern is the transitional zone between the compact colonial Cholula and the beginnings of the physical conurbation with the City of Puebla., described in Map 16. This pattern is the consequence of the transformation of socioeconomic activities in Cholula, which made San Andrés and San Pedro attractive places to live and study in.

The demand for housing and retail areas generated two types of development: the urbanisation of rural plots and the urbanisation over infrastructure. This last one, the Road-network urbanisation (4) is considered as another pattern development. The road-network urbanisation background is described in the Chapter VII when the *Recta a Cholula* road and the Puebla-Atlixco motorway were constructed to connect Cholula with Puebla and Atlixco. Both patterns are represented in the Images 19 and 20.

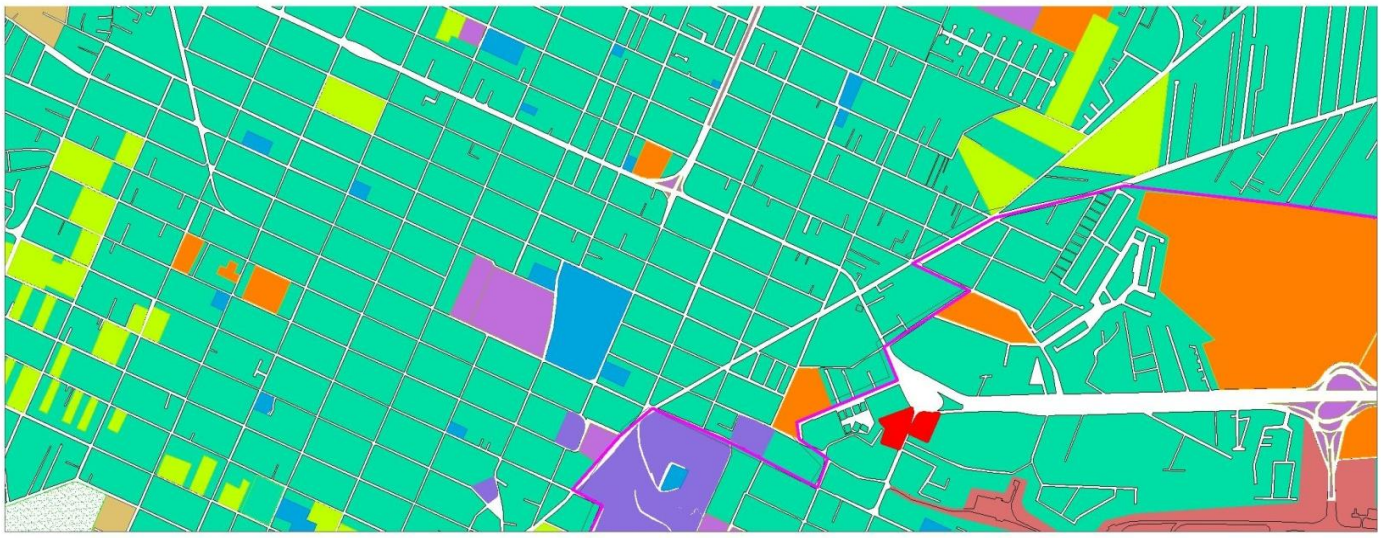
The first gated communities and housing units were developed as part of this pattern, especially in the borders of Cholula de Rivadavia (SP), San Cristobal Tepontla (SP), San Gregorio Zacapechpan (SP), Santiago Momoxpan (SP), San Andrés (SA), and Santa María Tonatzintla (SA).

The main characteristics of patterns 3 and 4 are:

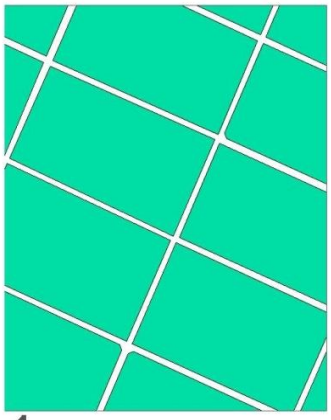
- Irregular grid over road networks.
- Individual urbanisation of rural plots.
- Low density development.
- Small gated communities and housing units.
- First small shopping centres.
- First urban symptoms of physical conurbation.
- Mixed land uses.

In both patterns the presence of the rural factor is constant and more vulnerable in the land use changes because it is the physical boundary between the rural and the metropolitan Cholula. One example of this pattern is located in the residential area of La Huerta and Zerezotla in San Cristobal Tepontla (SP) and in the *Camino Real a Momoxpan* (SP), where the proliferation of gated communities delimited the fringe between rural and urban. This area is as well a clear example of how development is made over a road. Nowadays is impossible to extend the width of the street, even to put sidewalks in because the "formal urbanisation" was never regulated.

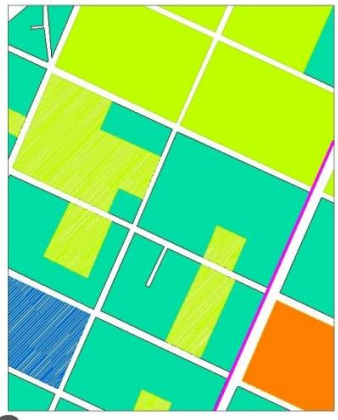
The urbanisation of rural plots is still very common, not at a massive scale as in the Angelópolis district, but in a more transitional or contrasting way. Another example is over the "Camino Real a Momoxpan" road, the agricultural fields over the road are being urbanized to construct small gated communities that go along the ground area. The next plot may still be rural productive and the next plot may have a convenience store. In this sector of the city, informal housing and formal development is repetitive.



PRESENCE OF THE MODULAR GRID IN SAN ANDRÉS AND SAN PEDRO CHOLULA HISTORICAL AREA



1 MODULAR URBAN CORE

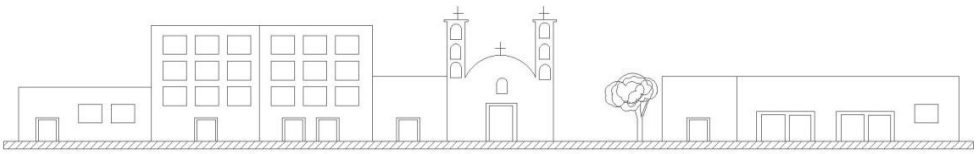


2 MODULAR RU-UR CORE

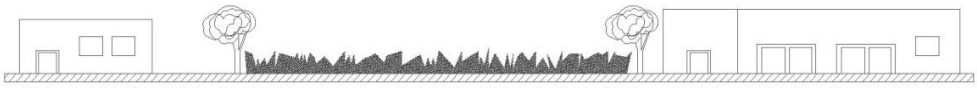
3 HOUSING CORE

4 ROAD-NETWORK GROWTH

SOURCE
MAP: INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010, satellite images by Google Earth 2015 and field research

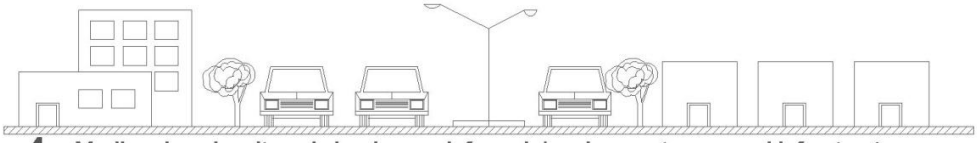


1 Medium-low density, mix land uses, historical heritage, traditional architecture, temples



2 Low density, mix land uses, historical heritage, traditional architecture,family houses

3 Medium-low density, mix land uses, small gated communities



4 Medium-low density, mix land uses, informal development over road infrastructure

CLASSIFICATION SPATIAL AND LAND USES TRENDS

Urban	Peri-urban	Rural	Agricultural plots inside urban area	Vacant land public and private

TRADITIONAL AND NEW SOCIO-SPATIAL LOCATIONS

Archeological sites	Religious temples	Main shopping-centres	Green-plazas-recreative public areas	Green- private areas

MODULAR GRID IN CHOLULA

M14

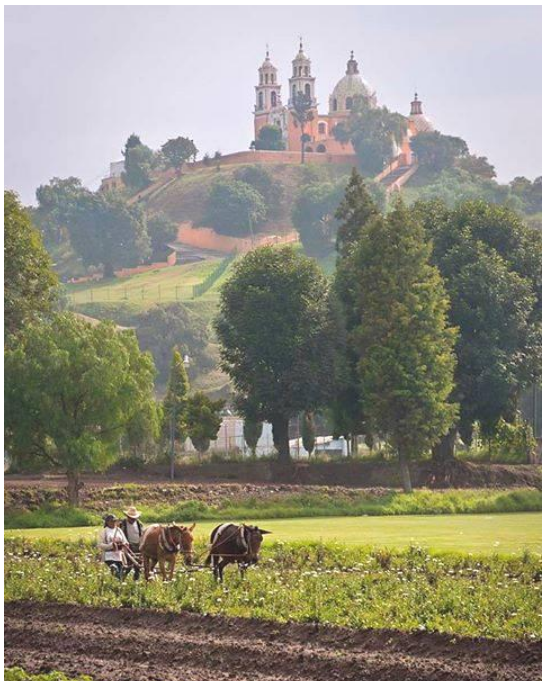


Image 21 Rural plots below the Pyramid. Source: John O`Leary (2014) authorized by the photographer.

8.3.2 THE RURAL MODEL – THE AGRARIAN CHOLULA

The rural spatial development model of Cholula corresponds to the identity, cultural and historical values of the local population (see Image 21). It represents the dialectic between the rural world and the globalisation. Cholula´s rural population is as well in constant transformation where the locals maintain their own culture or change internally to adapt to new needs (Glockner, 2015).

While the compact model remains common, the rural continues to shrink and change. Certainly for the case of Cholula there are two main factors that contribute to this condition: the lack of productivity of the agricultural sector and the economic growth of the real estate sector.

The agricultural fields are the most vulnerable land uses in Cholula. In the last two decades the rural land decreased dramatically in the municipality of San Andrés Cholula where there used to be *ejidos*. The remaining agricultural fields are former *ejidos* many of which were converted into individual properties. Although San Andrés used to be a rural town; San Pedro controls and produces most of the agricultural activities of the region. One of the most significant productions is the flower sector in San Pedro and the *nopal*[63] production in San Andrés in the district of San Bernardino Tlaxcalancingo (see Map 15).

Most of the agricultural production of both municipalities is not adequately supported by the government[64], despite the fact that there are federal programs specifically designed to provide the farmers with economic support, instruments for seeding and agricultural equipment. As stated by Torres-Manzuera (2012), a limited number of farmers and *ejidatarios* increased their productivity, achieved economic or improved their quality of life through the subsidies granted since the Mexican Revolution and the Agrarian Reform, but the promises of the Revolution did not reach the whole rural population. For the local case of rural localities in Cholula, they represent a rural culture resulted from the mixture between pre-Hispanic, colonial, and modern features (Lewis, 1959).

Cholula's rural area still maintains a certain amount of independent agricultural economy, supported by the identity and nostalgia for the rural past than the real opportunity of people in becoming successful farmers. In this case, three different patterns of land use transform the rural model, described in the Table 25 and Map 15:

(5) Rural core, (6) Rural localities sprawl, and the transitional (7) Rural-urban fringe.

[63] Cactus production
[64] Chapter IX

Table 25 Pattern of land use in the Rural Model of Cholula, Source: author

PA-TTERN	DEN-SITY	LAYOUT	CONSTRUCTION TREND	SOCIOECONO-MIC ACTIVITIES	OFFICIAL LAND USE
5 Rural Core	Low-Medium	Regular- irregular grid	Rural localities, closed to the agricultural fields	Agriculture, trade, services, animal breeding, industrial	-San Juan Tlautla (H4) agricultural zone -Santa María Acuexcomac (H3) sub-urban core and agricultural zone -San Francisco Cuapan (H1) sub-urban core and agricultural zone -San Agustín Calvario (H4) agricultural zone -San Luis Tehuiloyocan (low density) agricultural zone -Santa María Tonanzintla (low density) agricultural zone
6 Rural Localities Sprawl	Low	Irregular grid	Transitional construction of single family house	Agriculture, trade, animal breeding	-San Diego Cuachayotla (H3) sub-urban centre, agricultural zone -San Sebastían Tepalcatepec (H3-H5) sub-urban core -San Cosme Texintla (H3) upgrade urban growth area -Santa Bárbara Almoloyan (H4-H3) sub-urban core, agricultural zone -San Rafael Comac (low density) agricultural zone
7 Rural-Urban Fringe	Low	Irregular grid	Informal construction over agricultural plots	Trade, housing, services, agriculture, animal breeding, industrial	-Cholula de Rivadavia (H3) urban core -San Matías Cocoyotla (H4) agricultural zone -San Cristobal Tepontla (H1) sub-urban core -Santiago Momoxpan (H2) Industrial,trade, housing -San Andrés (mix density) -Santa María Tonanzintla (low density) -San Francisco Acatepec (low density) -San Bernardino Tlaxcalancingo (middle density) -San Antonio Cacalotepec (low density)

Image 23 Rural locality in Santa María Tonanzintla, Source: author (2014)
Image 22 Location of San Francisco Cuapan district in San Pedro, at left the Zapotecas natural reserve, Source: Google Earth, INEGI (2015)

(5) Rural core pattern

This pattern is present in some of the original rural localities, according to official definitions from CONAPO, has less than 2,499 inhabitants and concentrates most of the population in rural towns. The low density is normal with an increasing urbanisation sprawl tendency in the surrounding agricultural plots. This pattern is present in the districts of Santa María Acuexcomac (SP), San Francisco Cuapan (SP), San Agustín Calvario (SP), San Juan Tlautla (SP), and Santa María Tonanzintla (SA), examples of this pattern are showed in Images 22 and 23.

The road connections between this pattern and the urban cores are made by secondary roads for the case of San Pedro's districts and highways and main roads for the case of San Andrés's districts. As for most of the land use and growth patterns in Cholula and the Metropolitan Area of Puebla-Tlaxcala, the original town grid of this pattern is more regular but it is broken through the urban development of roads, more present in the next two patterns.

The main characteristics of this pattern are:

- Regular-irregular grid.
- Low density housing.
- Agricultural activities related to corn, beans, flowers and vegetables.
- Local animal breeding.
- Compact rural cores.
- Road connection to urban cores.
- First sprawl symptoms.
- Marginal areas.

Although San Pedro and San Andrés has several official rural districts, the ones from San Pedro are more isolated and has more agricultural production – like floriculture – unlike San Andrés' districts which tend to increase the urban sprawl and the abandonment of agricultural activities for other economic options.

Image 24 San Luis Tehuiloyocal locality with a sprawl pattern over primary roads, Source: Google Earth, INEGI (2015)

(6) Rural localities sprawl pattern

This pattern is officially recognised by SEDATU and CONAPO as an increasing growth problem. This means that rural cores are being sprawled over individual properties and *ejidos*, presented in informal development or several construction stages. The lack of control and regulation of informal housing developments creates a national problem, recognized by the Government due to their incapacity to provide full public services to those sprawled localities.

In the case of Cholula, most of the rural districts have public services and road connections to the main urban cores, but they lack good quality secondary roads which are no suitable for productive agricultural work. This pattern is present in the districts of San Diego Cuachayotla (SP), San Sebastían Tepalcatepec (SP), San Cosme Texintla (SP), San Juan Tlautla (SP), Santa Bárbara Almoloyan (SP), San Luis Tehuiloyocan (SA), and San Rafael Comac (SA).

In Image 24 there is an example of this pattern and the main characteristics are:

- Increased growth of informal-transitional construction over plots.
- Low density.
- Sprawl over main and minor roads.
- Abandonment of agricultural activities to supply the demand for trade or services.
- Marginalised areas, especially the ones off secondary roads.

The sprawl development over roads is very common because for many rural families it represents an opportunity to improve the family's economy with a new business rather than depending on agricultural activities. The tendency for many of the land owners that are close to a road network is: to change informally the land use to construct their own homes parallel to the roads, construct their own family business, or sell the land to investors in housing, trade and services that are looking for a cheaper land cost.

The changes of land uses from agricultural to trade or services opens the door to the rural-urban fringe.

Image 25 Example of rural fringe with agricultural plots and gated communities in San Cristobal Tepontla, more known as "La Huerta", Source: Google Earth, INEGI (2015)

Image 26 Rural locality with a gated community and vertical development in San Bernardino Tlaxcalancingo, Source: author (2014)

(7) The rural-urban fringe pattern

This pattern is present in the land use mixture and socio-spatial transformation of the rural areas, like in the example of illustration 8. It is and well explained by Torres-Mazuera (2012) through an "*urbanized rural reality",* an accurate description of Cholula's rural land phenomenon, in which the economic activities do not relay any more on agriculture but it still preserves its rural identity. This identity is observed as well through the religious ceremonies of the locals.

This pattern has many variations according to the socioeconomic activities of the local population; it represents as well the linkage between the rural traditional Cholula and the modern metropolitan Cholula-Puebla. The land use changes are visible in the districts of San Matías Cocoyotla (SP), San Cristobal Tepontla (SP), Santiago Momoxpan (SP), Cholula de Rivadavia (SP), San Andrés (SA), Santa María Tonantzintla (SA), San Francisco Acatepec (SA), San Bernardino Tlaxcalancingo (SA), and San Antonio Cacalotepec, (SA).

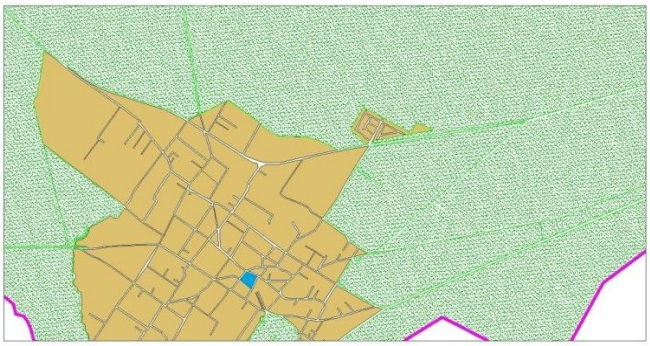
The main characteristics of this pattern are:

- Low-medium density.
- Localities sprawl and transitional integration with urban areas.
- Urban development pressure over agricultural fields.
- Urban Sprawl over main roads.
- Mixture of land uses.
- Abandonment of agricultural activities.
- Gated communities and informal urbanisation (see Images 25 and 26).

The districts of San Andrés are more reliant on the urban and economic growth of the Metropolitan Area of Puebla-Tlaxcala, especially San Bernardino Tlaxcalancingo and San Andrés which are closer to the Angelópolis district. This location increases the land use costs and the real estate speculation.

As a result, a new rural exodus is taking place; by the heirs of agricultural plots abandon the countryside in the hope of being included into the urban life.

PRESENCE OF THE RURAL MODEL IN SAN ANDRÉS AND SAN PEDRO CHOLULA

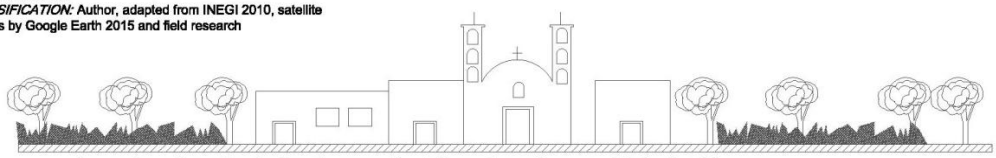


5 RURAL CORE

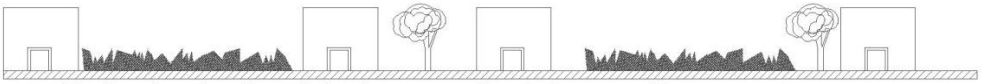
6 RURAL LOCALITIES SPRAWL

7 RURAL-URBAN FRINGE

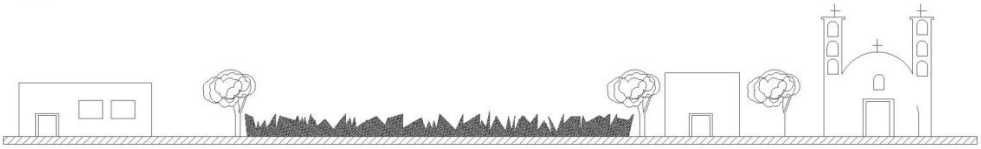
SOURCE
MAP: INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010, satellite images by Google Earth 2015 and field research



5 Low density, single land uses, traditional costumes, historical towns



6 Medium-low density, mix land uses, small gated communities



7 Low density, mix land uses, informal and formal development, trade area

CLASSIFICATION SPATIAL AND LAND USES TRENDS

Urban	Peri-urban	Rural	Agricultural plots inside urban area	Vacant land public and private

TRADITIONAL AND NEW SOCIO-SPATIAL LOCATIONS

Archeological sites	Religious temples	Main shopping-centres	Green-plazas-recreative public areas	Green- private areas

RURAL MODEL IN CHOLULA

M15

8.3.3 THE PRIVATE DEVELOPMENT MODEL – THE MODERN CHOLULA

To recall briefly what was described in Chapters VI, many factors influenced the economic growth of Puebla like the decentralization of socioeconomic activities of Mexico City and the industrialization of Puebla. These factors were reflected in the urban expansion of the city boundaries and the advent of globalisation to create a compact, calm, rural, and student town such as Cholula.

Urban growth has been enhanced by new private-development model, where the physical conurbation of many municipalities created a bigger management problem for the provision of services, education, infrastructure, housing, health, etc. This coincides with two periods of conurbation: first, during the 1980's and 1990's construction of main roads to connect Puebla and Cholula, and second, through the expropriation of *ejidos* and the implementation of the RDPA in the 1990's in the municipalities of San Pedro Cholula, San Andrés Cholula, Puebla, and Cuautlancingo.

This model is defined as private-development because the population embraces globalisation's standards of modernity: neo-liberal economy, modern buildings, market-based activities, networks, individual property, gentrification, and social stratification. Despite the standards, the rural and historical Cholula was and is "assaulted" by new urban ways that transform drastically the social-spatial interactions. The metropolitan model presents two different patterns of land use development:

(8) Sub-urban core and the (9) New centralities, described in Table 26 and Map 16.

Table 26 Patterns of land use in the Private-development Model of Cholula, Source: author

PATTERN	DENSITY	LAYOUT	CONSTRUCTION TREND	SOCIOECONOMIC ACTIVITIES	OFFICIAL LAND USE 2010
8 Sub-urban core	Medium-low	Irregular grid	Housing units, small gated communities, small shopping areas, small family/offices buildings	Education, services, trade, retail, industrial	-Cholula de Rivadavia (H3) urban core -Santiago Momoxpan (H2) Industrial,trade, housing -Manuel Ávila Camacho (H4) mix land use - San Andrés (mix density and uses)
9 New centralities	Medium-high	Irregular grid	Vertical construction of luxury condominiums, big shopping malls, gated communities, massive construction of trade and retail centres	Education, services, trade, retail, entertainment, residence	-Land Reserve Quetzalcóatl (H5) mix uses, trade, services, -Land Reserve Atlixcáyotl mix uses, trade, services

Image 28 Land reserve Quetzalcóatl, zone of Momoxpan with modified social housing, Source: author (2014)
Image 27 Gated communities and social housing in the Land reserve Quetzalcóatl, Source: Google Earth, INEGI (2015)

(8) The sub-urban core

This pattern corresponds to the first period of physical conurbation with Puebla when the urban growth was developed through road infrastructure. The construction of new housing and trade areas is visible in the municipality of San Pedro through the Recta a Cholula road that connects with Puebla, as well through the Boulevard Forjadores and the Federal Highway to Huejotzingo. In the case of San Andrés, the Via Atlixcáyotl connects to the Motorway to Atlixco and is intersected by the ring road Periférico Ecológico that crosses a big part of the MAP-T.

The pattern is present in the districts of Cholula de Rivadavia (SP), Santiago Momoxpan (SP), Manuel Ávila Camacho (known as Manantiales, SP), the Land Reserve Quetzalcóatl (SP), and San Andrés (SA). In both municipalities many new housing areas were developed, as well as many schools for primary and secondary education which were built to complement the educational offer of Cholula.

The main characteristics of this pattern are (see Map 16):

- Irregular grid, breaking with the orthogonal-colonial layout.
- Medium-low density development.
- Services and education activities.
- Road-network urban development.
- Urban sprawl over roads.
- Mixture of land uses.
- Medium gated communities and big social housing areas (see Images 27 and 28).

It is interesting to note that this pattern has no rural presence like the others; this is where the urban model is consolidated, and no trace of agricultural uses is visible.

The sub-urban core is the linkage to the metropolitan development when the RDPA was implemented in the 1990's. Through the creation of the land reserves of Quetzalcóatl (SP) and Atlixáyotl (SA) a new pattern was developed through new forms of urban centrality.

Image 30 General view of the gated community "Lomas de Angelópolis", Source: author (2014)

Image 29 Development of "Lomas de Angelópolis", a new private centrality, Source: Google Earth, INEGI (2015)

(9) New centralities

The new centralities are paradigms of regional cities, metropolitan areas, hyper-text societies, meaning that modernity does not depend on the classical local values but more on a global development vision. It represents as well the social change of the traditional population's activities, leaving behind the historical quarters of the cities and creating new meeting social cores.

This pattern of land use corresponds mainly to the new district of Angelópolis where a collision occurred between the rural land uses and the massive urbanisation of San Andrés, with a minor impact in San Pedro. One of these examples is the massive gated community "Lomas de Angelópolis", a new private urban area as shown in Images 29 and 30.

Castells (2001) named this pattern as *"urbanización salvaje"* meaning that the land occupation is presented through explosive demographics, urban sprawl, illegal occupation of rural areas and land speculation. In line with these urban manifestations, the pattern has the following characteristics:

- Land development through the RDPA.
- Gentrification of rural areas.
- Speculation of *ejido* land.
- Stratified land use for housing, trade, retail, entertainment, and services.
- Massive housing development for social housing and middle-income housing.
- Changing of densities and land uses according to the construction permissions and not through the urban development regulations.
- No land use and densities control over lower income housing.
- Low-medium density through gated communities, high density through luxury condominiums.

As a new centrality, the Angelópolis district is the "object of desire" for many new incomers, because it is the modern part of Puebla, has many attractive areas for families, has a big housing offer, and many entertainment, cultural and public areas. Compared to other parts of Cholula, Angelópolis has better infrastructure such as roads, underground cabling, public services, security, hospitals, etc.

Although this pattern seems to be an urbanely integrated zone, the reality is that it lacks a good socio-spatial integration like the compact and rural models of Cholula. It is integrated for the inhabitants of the gated communities and users of shopping areas, but not for the rest of the local population that normally must need a car to get in those new places. What is curious is that this pattern still presents some surviving agricultural land uses, where the farmers know the economic value of their land and they refuse to sell – or at least until someone reaches the "right" price –. This is visible in some rural plots of San Bernardino Tlaxcalancingo (SA), especially those that are located near the ring road in a well located urban area of Angelópolis district.

Despite being embedded in an urban area, the rural plots still work as plantation sites. These plots correspond to the former rural identity of Cholula that coexists with the metropolitan development of Puebla. For this reason, individual rural plot is the goal for land speculators, because it is easier to modify the official land use, as well as the buying and selling price.

There is a big difference between the gated communities of Cholula and Puebla of the 1980-1990's and the 2000-2010's; the first ones were smaller, between 10-30 houses and were located in the sub-urban cores (see Map 11). The second ones were developed on a massive scale, no matter whether they are for social housing or residential.

Through the implementation of the RDPA, in the *Quetzalcóatl* land reserve more social and middle income housing was developed, thousands of properties (see Images 29 and 30). Nowadays most of the houses are completely modified, from a two-floor house; many of them have their own business in the front part, or had two extra floors built. The families of these homes prefer to earn a second income through a trade activity or to have more space for living. These construction modifications are as well tolerated by the local authorities of San Andrés and San Pedro.

In this pattern, the RDPA planned at the beginning social housing units and gated communities, including a country-club. However, due to the successful real estate transactions and the high demand for developable land, many investors continued the housing land use but focused on higher incomes. A new era of gated communities and retail areas began since 2010, developing massive gated developments with their own trade, education, and services, a new type of "city within the city". For example, the *fraccionamiento* Lomas de Angelópolis is an immense gated community developed in two municipalities – San Andrés Cholula and Santa Clara Ocoyucan – with more than 13 walled kilometres, with smaller gated residential areas inside, trade and retail areas, parks, and new vertical condominiums. The life inside this residential area is dictated by the car and aspirational life-style.

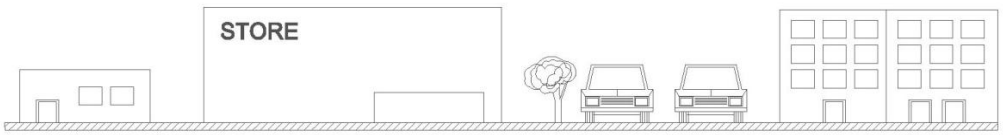
Due to the complexity and urban size, Lomas de Angelópolis is considered a second new centrality inside Angelópolis. Despite the attractiveness of these new centralities, the lack of socio-spatial integration with the rest of Cholula's context made this pattern into the global paradigm of social inequality and the gap between rich and poor.

PRESENCE OF PRIVATE-DEVELOPMENT MODEL IN SAN ANDRÉS CHOLULA

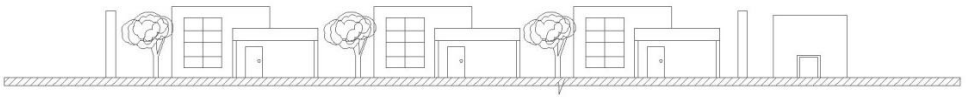
8 SUB-URBAN CORE

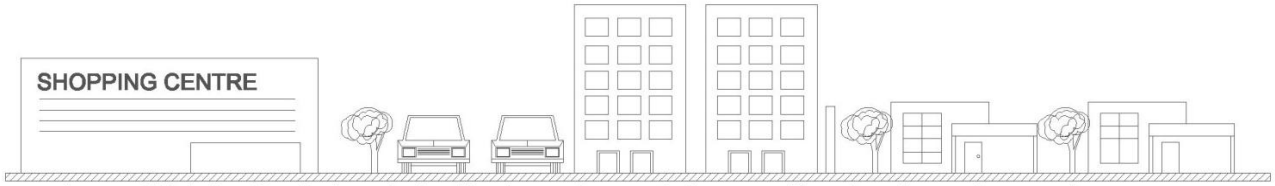
9 NEW CENTRALITIES

SOURCE
MAP: INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010, satellite images by Google Earth 2015 and field research



8 Low density, single and mixed land uses,gated communities, urbanization over rural areas, trade, education and servies





9 Low and high density, single and mixed land uses, huge gated communities, shopping centers, services, car-based mobility, big road infrastructure

CLASSIFICATION SPATIAL AND LAND USES TRENDS

Urban	Peri-urban	Rural	Agricultural plots inside urban area	Vacant land public and private

TRADITIONAL AND NEW SOCIO-SPATIAL LOCATIONS

Archeological sites	Religious temples	Main shopping-centres	Green-plazas-recreative public areas	Green- private areas

PRIVATE DEVELOPMENT MODEL IN CHOLULA

M16

Image 31 Example of land use and density change in La Vista Country-club, the residential towers were not part of the original project. Source: Google Earth (2014)

8.3.4 DEVELOPABLE LAND AND THE RDPA: THE CONFLICT OF LAND USES

The first attempt to plan the urban growth of Puebla was the RDPA; however, during the implementation and development of the plan. Urban growth got out of control. Although the plan propitiated the urbanisation of the rural land, the current violations of the official land uses by developers and local authorities overcame the power of real estate investors.

When the RDPA was implemented, the land dispossession affected farmers and *ejidatarios* when big portions of the *ejidos* were expropriated. Most of the original landowners were underpaid and the expropriated land was sold at a significantly reduced cost to private investors. Those investments are the most profitable in the last 20 years.

For example, in a massive middle-high income gated community like Lomas de Angelópolis the cost off a 200 m^2 land plot is about $7000 Mexican pesos[65] and it increases every three months. The price is controlled by investors and real estate companies, who justify the excessive prices, considering the need for security, quality of life, tertiary activities, recreation, education and green areas, all together in one big place.

This condition generates two types of population movements: the group of people from Puebla, Mexico City, Querétaro, Germany, among others move and expect to live in a developed and secure district of the MAP-T; and the former land owners who are forced to relocate outside of Cholula, where the housing prices are affordable.

There are as well modifications in the density levels of San Andrés. The original RDPA considered low-density areas for housing and medium-density for retail buildings; however, from 2009-2014, San Andrés municipality authorized the changes in densities for housing and now it is profitable to develop high-density condominiums for high-income population[66]. The changes in densities still benefits the investors and do not include the mixing of other types of housing or the mixing of land uses. A clear example is the Country-Club La Vista (See Image 31), where skyscrapers are being constructed, when the original land use was low- density for residential houses.

[65] 412EUR, December 2014

[66] The big demand on retail and gated communities of the Angelópolis district reached the neighboring municipality of Ocoyucan. Ten years ago used to a rural town with 100% agricultural areas and nowadays is having the same urban growth process as San Andrés, but more exponentially.

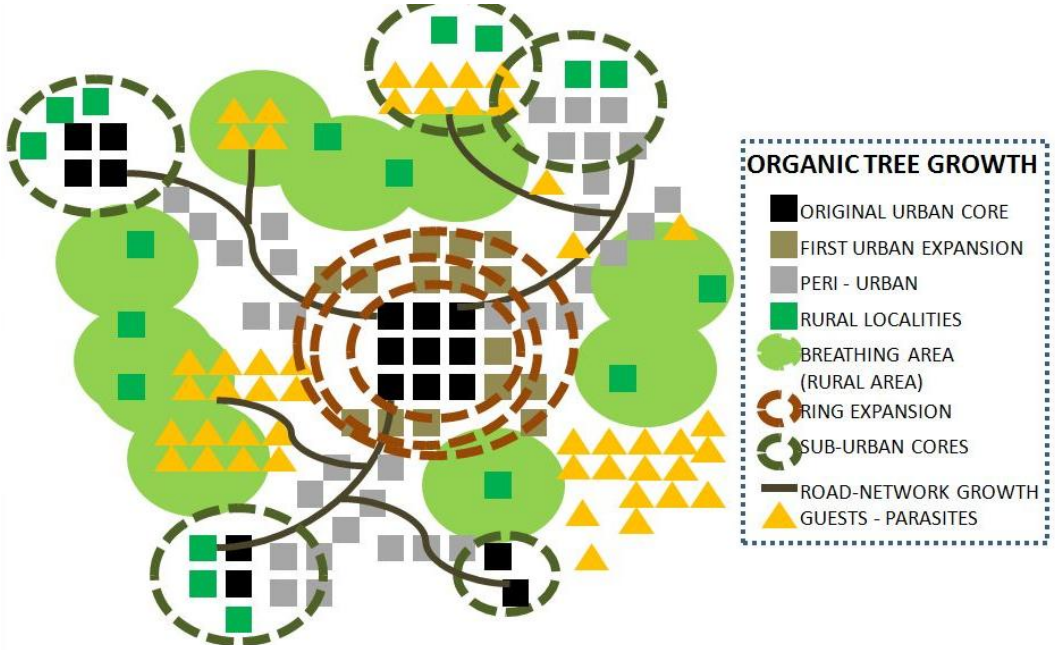


Figure 20 Organic-tree-growth models for Cholula´s region. Source: author (2015)

8.4 THE RESULTING MODEL. ORGANIC-TREE GROWTH

Spatial development in Cholula is the result of different growth models and patterns. Based on the mapping analysis and the definition of the patterns of land use, this research observed that the urban growth is being developed through an organic morphology. On one side this growth is following road-network and geographical features; on the other side it shows how sprawl is being developed in peri-urban areas.

These observations are outlined in Figure 20 as a summary of the *organic-tree growth* in Cholula, with some important elements:

- *The ring tree* – the traditional concentric urban growth that added modular grids
- *The branches* – urban growth over the road-network that connects with minor urban cores or rural localities
- *The breathing cores* – the rural areas that surround the ring and branches are important green-breathing areas that give a break to the congested metropolitan area. Especially because in the region there are few parks and green-public spaces. The ring, the branches, and the breathing areas coexist with a transitional urbanisation.
- *The guests/parasites* – the juxtaposed residential and retail areas act as guests in the organic growth that could coexist with the other three elements, but with the warning of decontextualisation. It means that massive urbanisation through social housing and gated communities do not integrate with the organic growth, generating by themselves their own spatial cells that consume breathing space and resources as parasites.

This organic-tree form is the result of several conditions such as the anarchic growth of peri-urban areas, the liberalisation of free-market land, the lack of control over regulations; and demonstrates how urbanisation is subsequent to a continuum sprawl over road-networks that include rural areas. It means as well that this pattern follows an ambiguous urban land management with different groups' interests. However this model could be useful to prognoses future urban development and population movements.

Image 32 Public forum for the defense of Cholula´s patrimony organized by the group "Cholula en Bici" in June 2014 with academics, community, and farmers. Source: author (2014)

8.5 STAKEHOLDERS' ORGANISATION

According to Álvarez (2013), many examples of local initiatives in places like Mexico City show that making alliances between stakeholders can *"promote and substantially improve the urban environment and living conditions"*.

For the case of the pattern of land use in Cholula, different stakeholder categories were selected in order to define the key informants. In addition to collecting data from each group, the mapping of Community Assets (Kretzmann & McKnight, 1993) was useful in identifying strong partnerships and one-on-one relationships.

The purpose of this mapping analysis is to define the main characteristics of each group, besides mapping procedure "*organizes a network that reveals innovative modes of spatial organisation and disseminates this information to other stakeholders*" (Weinland, 2013, p. 12) and how they can be connected in the "*community building process*" as a useful tool for Participatory Urban Planning. The base of this tool considers "*individuals, associations and institutions*" categories as an organisational framework to empower local strengths.

The four main stakeholders' groups considered for Cholula were selected throughout the most important socioeconomic areas that impact on spatial planning, like local knowledge, expertise, local administration, urban development policies, society needs, and market-based social behaviour. Based on these areas, for the purposes of this research the stakeholders were grouped into:

a. *Academics/Experts*
b. *Government*
c. *Community*
d. *Private Sector*.

As it was developed in the mapping and grouping analysis, these four groups have their own features and sub-groups. Some of them mot only belong to one groups and represent the interest of different society sectors in San Pedro and San Andrés Cholula.

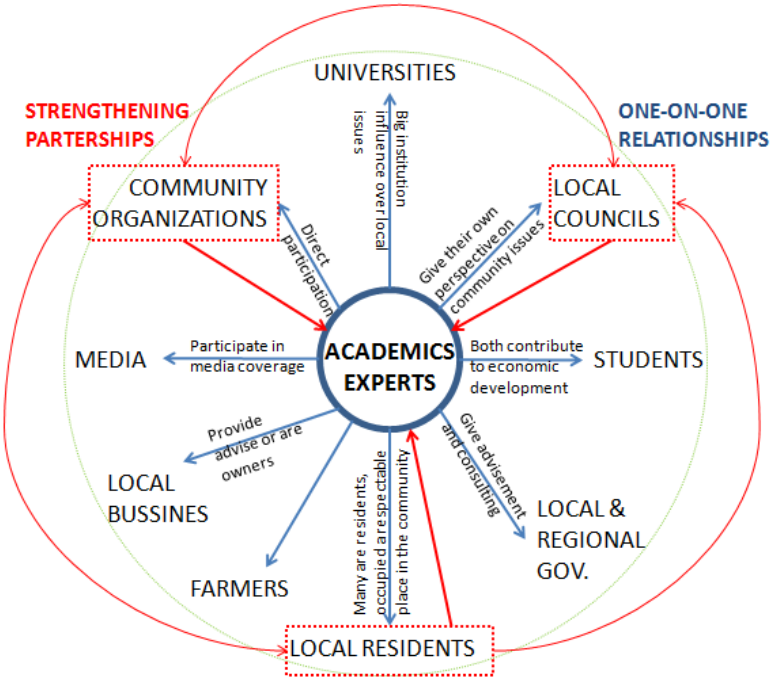


Figure 21 Academics' strategic partnerships and assets, Source: adapted from Kretzmann &McKnight (1993)

8.5.1 ACADEMICS & EXPERTS

This group is represented by people involved in academic and research activities at local, regional, and national level as is demonstrated in Figure 21. Most of them work for local universities and research institutes like the *Universidad de las Américas Puebla, Universidad Iberoamericana Puebla, Tecnológico de Monterrey Campus Puebla*, *Benemérita Universidad Autónoma de Puebla, Instituto Nacional de Astrofísica Óptica y Electrónica,* among others. Many members of these institutions work with academic groups and through consulting groups, or with governmental planning offices.

This group knows and is concerned about the historical heritage, archaeological patrimony, cultural identity, and urban growth of Cholula. Many academics used to work for the Government, so they know firsthand the problems in planning and the menace of land speculation for the rural people due to the lack of interest or knowledge from local authorities to improve the quality of life of Cholula's municipalities

The origin of this group is not only from Cholula, many academics came from Puebla, Mexico City and foreign countries; however they have a big influence on the community due to their compromise and knowledge about local issues. Many of them live and work in San Andrés or San Pedro. The academics choose Cholula as a residence and many participate in local organisations and NGOs. Sometimes they are invited to give their opinion to the local Council for important projects or decisions consultation.

The recreational, educational and research activities of this local group and the students contributes extensively to the economic development. Therefore it is important to strengthen the relationships and identity between community organisations, local council, local residents and academics; in a strategic partnership to contribute towards a better participatory planning.

Figure 22 Authorities' strategic partnerships and assets, Source: adapted from Kretzmann & McKnight (1993)

8.5.2 GOVERNMENT & LOCAL AUTHORITIES

This group is represented by local authorities (mayors, planners, counsellors) and State authorities (governor, directors of spatial planning, congress representatives), demonstrated in Figure 21. National authorities were not surveyed because they are not involved in local/regional planning and spatial development, but only in the national policy and/or national development goals.

The State of Puebla authorities have an important role through the offices of Spatial Planning; they authorize bigger residential developments, new infrastructure projects, and major changes in the land uses and densities regulations. Sometimes they are negotiators between the local authorities and the local population when is a big conflict of interests.

The local authorities, through the municipality and the council, have the most important role and influence in this context. They receive and authorize – through the *Cabildo* or local council sessions – the initiatives from investors, as well as changing construction regulations. This is the point when many times the authorities and residents come into conflict, because it is common that the council and the urban planning office do not respect the planning and construction regulations and authorize controversial projects without consulting the population.

In this matter, the private sector plays an important role with the authorities, being the ones that negotiate the provision of some public services or the construction of infrastructure with the authorities to be flexible on land uses, edification restrictions, or densities. To avoid this conflict of interests, a strategic partnership between authorities, private sector, universities and residents is needed to implement congruent development projects. This partnership is more than essential to analyse the different groups' voices, needs, and interests.

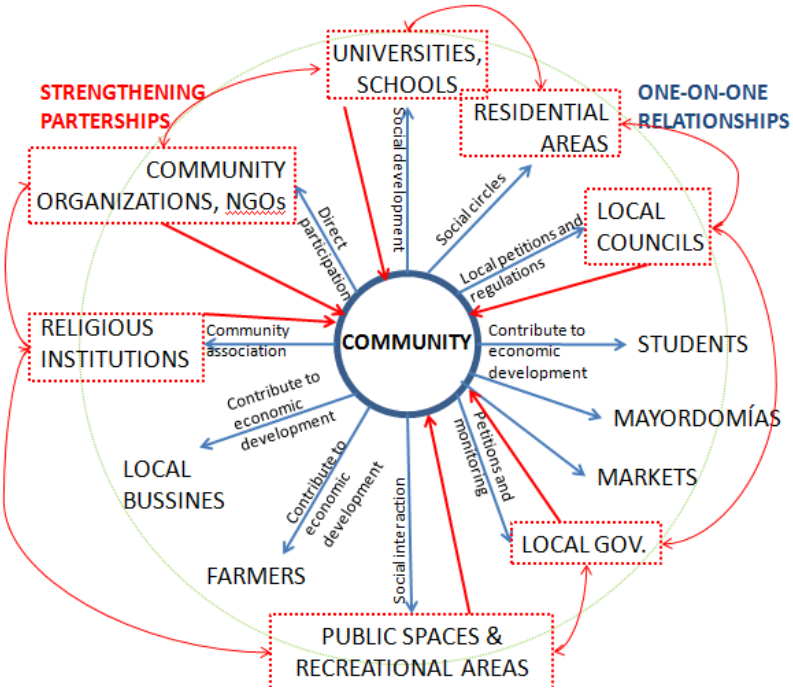


Figure 23 Community' strategic partnerships and assets, Source: adapted from Kretzmann &McKnight (1993)

8.5,3 COMMUNITY

This group is diverse and responds to the socio-cultural concern, demonstrated in Figure 23 and Image 32. The representatives of this group could have different interests between San Pedro and San Andrés, or between the barrios and a gated community. In order to bring together the key actors the following stakeholders were considered: from Cholula's urban cores, from the barrios, from the gated communities, local NGO's, farmers, former farmers and new established inhabitants. One of the key informants that play an important role in this group as mixed stakeholders are the descendants of the caciques families[67] owners of big portions of land. They are farmers, merchants and owners of retail areas, hotels, party-halls; or work as politicians such as mayors, representatives, counsellors, and real estate developers.

The community group includes a wide range of organisations, residents, institutions, and public spaces. For that it is essential to strengthen the interactions and partnerships between the resident's areas, the local organisations, the educational centres, the public spaces, and the authorities. This creates a complex mixture of ideas, concerns, and uses of space, but may be a unique opportunity to embrace the local identity and the sense of community, which is normally reduced to the barrios, or inside gated communities.

One of the key people of this group is the members of the *sistema de cargos*, the socio-religious organisation through *mayordomías* of each barrio. These organisations have the strongest and oldest social network as a community in Cholula. They participate and organize with the church the religious festivities and have the best local knowledge of Cholula. Not all the residents of Cholula are members of the *sistema de cargos,* currently they are becoming a minority group and it is extremely important to improve the bonds between these traditional organisations with other members of the community to empower the citizen initiatives.

[67] See Chapter IX

Figure 24 Private Sector's strategic partnerships and assets, Source: adapted from Kretzmann &McKnight (1993)

8.5.4 PRIVATE SECTOR

This group is represented by the private investors, real estate developers or agencies, architects, and planners, demonstrated in Figure 24. The investors that develop massive social housing units and gated communities are normally not entirely from Puebla, or are associated with local politicians. Minor investors in real estate may be from local economic capitals. Architects play an important role because they work with the clients, deal with the investors, or are the investors, negotiate and broker the construction regulations, while being part of the community.

Therefore, the private sector should improve first their relationship with local authorities, council and planning offices, and work through them to get better deals and communication with the local residents. In particular, one affected group are the farmers, owners and sellers that normally are not included or even consulted in bigger urban development projects.

Due to the lack of transparency in big public projects, the local residents are sceptical when government and private sector impose new developments. A big issue for good urban governance is happening; however this does not mean that it is plausible to have private investment, on the contrary. It could be a big asset to integrate in a congruent and solid way the private investors with the common wealth; the big issue is the role of the authorities in controlling and monitoring the private developments with a clear communication plan with the citizens.

8.6 STAKEHOLDERS' ANALYSIS

The division of the stakeholders into groups was the starting point of the field work in 2014. The primary grouping was selected through the first interviews from people of the area, through research media and through the analysis of the municipal plans. They represent the traditional differentiation between socioeconomic, socio-cultural or socio-spatial characteristics. Although there are some key informants with principal tasks and roles, stakeholders can play different roles in

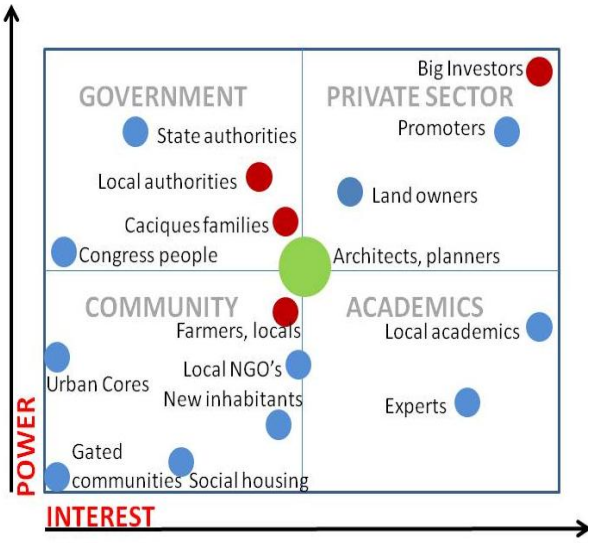


Figure 25 Stakeholders´matrix. Source: adapted from World Bank (2011)

different groups. For instance architects and planners may play different roles and interact with other type of stakeholders simultaneously, as well as caciques' families, in which their members can be organized to represent different roles in order to maintain respect.

Every stakeholder group responds to a certain level of power and interest, the matrix from Figure 25 represents those levels, based on the responses of the key informants.

From the private sector, it is clear that big capitals represent the stakeholders with more economic power and benefit.

On the contrary, people from the gated communities and social housing have less power and less interest in becoming more familiar with Cholula's context. Normally, there are inhabitants from other parts of the region or the country that prefer to live in gated places for security reasons and do not want to get involved with the rest of the local population[68].

The Academic group, represented by researchers, professors and experts has influence at local and regional level and they are moved by a social interest. Generally, they represent the people who study the territory of Cholula and are concerned about the future of the citizens and the development of the territory. This group also works closely with the other three.

The Government group is influenced depending on the type of stakeholder, the caciques' families could be considered in this group, because of their influence in political matters at a local level[69]. The State authorities and the local authorities work with the private sector; however, the State and the big investors work in a closer relationship. The local authorities have power in the decision-making process, and they put into action the decisions between the State and the investors.

The land owners are part of the community and private sector as well, because they are motivated by the cost of the land and the opportunity to sell it later at an increased price. They are followed by the real state promoters, who are interested in the economic benefit.

Architects and planners are situated at a midpoint, since they play different roles and represent different stakeholders. They may be moved by economic benefit or by social interest. They can be in a better power position as negotiators than the farmers and locals – who are a very vulnerable group who can be moved depending on the interests of others –.

[68] Interview with residents from the gated-community Lomas de Angelópolis in June 2014

[69] According to a real estate developer and member of one of the caciques groups in Cholula, as families and decision makers are represented in different political parties or Mayors. However does not mean that every time the families agreed among themselves.

Table 27 Stakeholder's matrix. Source: author

AUTHOR'S MATRIX PERCEPTION ON STAKEHOLDERS´ RELATIONSHIP																	
	GRADE OF INFLUENCE: A. VERY IMPORTANT B. IMPORTANT C. NEUTRAL D. LESS IMPORTANT E. NOT IMPORTANT FROM THE PERSPECTIVE OF:	RELATIONSHIP WITH:															
		POLITICAL FACTORS				MARKET FACTORS			DEMOGRAPHIC FAC.			SPATIAL FACTORS					
		MUNICIPAL PLANS	PLANNING REGULATIONS	ADMINISTRATION PERIOD	OFFICIAL CHANGES IN LAND USE	FEAR & CONSUMPTION	REAL ESTATE TRENDS	LAND SPECULATION	CULTURE	IDENTITY	POPULATION MOVEMENTS	HOUSING	INFRASTRUCTURE	SERVICES	RECREATION	ENVIRONMENT
PRIVATE SECTOR	BIG INVESTORS	B	A	A	A	B	A	A	E	E	E	A	B	C	D	E
	LOCAL INVESTORS	A	A	A	A	B	B	B	C	C	E	A	B	C	C	D
	PROMOTERS	C	A	C	A	A	A	B	D	E	B	A	B	B	B	E
	LAND OWNERS	C	A	B	A	C	C	B	D	D	C	B	B	C	C	D
	ARCHITECTS	C	A	C	A	C	B	C	D	B	C	B	C	B	B	C
GOV.	STATE GOVERNMENT	B	C	A	A	C	D	B	D	E	C	C	B	B	D	D
	LOCAL GOVERNEMT	A	A	A	A	E	E	B	D	D	D	E	A	A	D	E
	DIRECTORS OF SPATIAL PLANNING	B	B	B	B	D	D	B	E	E	E	B	B	B	B	B
COMMUNITY	CACIQUES FAMILIES	B	C	A	B	E	E	B	B	B	B	D	D	D	D	D
	FARMERS	E	E	E	E	E	E	B	A	A	E	E	E	E	E	A
	LOCAL INHABITANTS URBAN CORES	E	E	E	E	C	E	E	A	A	A	C	C	C	A	A
	NEW INHABITANTS URBAN CORES	E	E	E	E	C	E	E	A	A	A	B	B	B	A	A
	HABITANTS FROM GATED COMM.	E	E	E	E	A	A	C	E	E	D	A	A	A	A	C
	HABITANTS FROM SOCIAL HOUSING	E	E	E	E	A	A	C	E	E	D	A	A	A	A	C
	LOCAL NGO'S	C	B	C	B	E	E	B	A	A	A	D	D	B	A	A
ACAD.	LOCAL ACADEMICS	D	D	E	E	E	E	C	B	B	B	E	E	E	D	A
	NATIONAL EXPERTS	D	D	E	E	E	E	E	C	C	C	C	D	D	D	C
	LOCAL EXPERTS	B	B	E	E	E	E	E	A	A	A	C	C	C	C	A

Farmers and ex-farmers are more familiar with economic needs rather than benefits. This group may have social influence but can be much manipulated from other stakeholders, depending on the need and the demand.

In the last years the local NGOs and the new inhabitants of the traditional Cholula are gaining social power amongst the community. They show more interest in preserving the culture, the environment; and they are very concerned about speculation and dispossession of the territory. Both groups are working hand in hand with the local population to protect the heritage of Cholula.

All of these stakeholders have different levels of influence in the changes of land use. These levels correspond to factors that contribute to peri-urbanisation. Based on the field work and personal observations for the case of Cholula the following factors were identified:

- *Political factors* – municipal plans, regulation, changes of administration, and changes in official land uses.
- *Market factors* – fear & consumption[70], speculation, real estate trends.
- *Demographic factors* – culture, identity, population movements.
- *Spatial factors* – housing, infrastructure, services, recreation, and environment.

These factors are correlated and can be considered as a cyclical loop, however the political and market factors are fundamental for the case study. Due to the offers and demands on goods and needs, the plans and regulation are adapting to the market trends, as a consequence this action

[70] Fear and consumption, it is referred to the theories of Jean Baudillard (1970) about the consumer society and is applicable to the case of Cholula. It means that the market uses the fear as a selling factor to the people; in this case, the investor and promoter's use the fear and the need of security for selling gated communities to the families.

affects the population's movements, the changes in local identities and how the peri-urban space is developed and constructed.

The four factors act as general agents of change and the stakeholders act as well at their own scale and level of influence. People use the different factors' mechanisms to impact – consciously or unconsciously – the urbanisation process, based on their personal interests.

To analyses those relationships between stakeholders and the list of factors that contribute to peri-urban development, a matrix was developed in the Table 27 to describe the level of influence.

With the matrix information, the following observations can be stated:

- The level of influence of the different stakeholder groups depends on their relationship with the political, market, demographic and spatial factors.
- The private sector has relationship and big influence with politics and market factors.
- The Government is related to the politics, demographics and spatial issues and its influence can vary.
- The community has less relationship with the political factors but better relation and influence in other ones.
- The last group, the academics and experts have very little influence and relation with the market group but as locals may have influence in the decision-making process.
- The influence of the community sector is not important for the political factors that contribute to peri-urbanisation, but the private sector has more influence on the policies, regulations, and the market factors.
- The farmers may have important influence on the demographic factors, but they do not have influence on the political and market forces.
- The spatial factors are different from one group to another, having special importance to community in general.

The relationships between stakeholders generate several motivations and interests to transform or not the land use, having different impact levels with several socioeconomic consequences.

When the State and Local Government made development plans to benefit the private sector, it has for one side economic opportunities for real estate developers; on the other side it has social consequences as gentrification of public and green spaces occurs. This is a common practice not only perceived in Cholula, also worldwide.

As part of the neoliberal policies promoted in the decades of 1980 and 1990, the Government left the development and administration of public services, housing and infrastructure to the private sector. This case is perceived in Puebla, the RDPA was created from the State for the development of private investment[71]. This condition generated unclear communication between State, local authorities, and private investors with the *ejidatarios,* when the *ejido* land was expropriated.

[71] Interview with planner and academic expert in June 2014

Since then, the miscommunication channels are divided between two groups: the *State-private investors* and *farmers-community*. In the first group the local authorities play an important role as negotiators with the second group. However, the lack of good communication channels since the implementation of the RDPA creates a growing public discontent when the State proposes new urban projects or changes the land uses[72].

There is even miscommunication between the different Government levels. For local authorities the management or implementation of new projects from the State Government[73] is unclear. For example, the construction of a polemic infrastructure bridge in 2014 in the entrance to Cholula, it was the Governor's project over a local road of San Andrés, not contemplated in the municipal plan and not consulted with local authorities or the local population.

Another consequence of these actions was that the Government gave too much power and influence to the private sector, interested in privatizing public services like water, social housing, and public spaces. The economic interest from the investors pushes the locals and *ejidatarios* to sell and move far away; and attracts new incomers by selling security and services inside gated communities – that the State sometimes does not want to be responsible for,

The discontent of the community, academics, and farmers sometimes generates political apathy, or to the contrary generates social concern about the future of the city and the land.

For instance, in 2014 a big social movement that grouped local associations and NGOs like *Círculo de Defensa del Territorio* and *Cholula Viva y Digna,* was sparked in Cholula because the State and local authorities of San Andrés and San Pedro wanted to impose an urban project below the Great Pyramid.

Regional and local authorities proposed a modern park with restaurants, coffee-shops, artificial lakes and parking over private agricultural plots, and expropriated land that was protected inside the archeological area. The opposition of the inhabitants of Cholula was impressive[74], first of all because the State tried to expropriate the land and pay it at a very low cost[75], and second because the urban project generates negative gentrification, did not include the farmers and did not have any type of contextualization, damaged the archeological site, did not have respect for the environment, denied local identity, did not respect the sacred condition, and commercialized the historical landscape.

During this conflict was the first time that many stakeholders showed their voices and interests wide openly, the State's economic interest over the common desire to preserve the archeological site and the rural-urban landscape was made particularly clear.

[72] Interview with local NGO representative and community leader in July 2014

[73] Interview with key informant from the Municipal Planning Institute of Puebla in June 2014

[74] Several persons that protest against the construction of the project below the Pyramid are in jail and others have arrest warrants and are currently in exile.

[75] The owners reported the local Government tried to pay the properties between 7-100 Mexican pesos (0.38- 5.55 EUR) per square meter, when the current value of the properties in the area is between the 1,000-2,000 (55.55- 111 EUR) Mexican pesos per square meter.

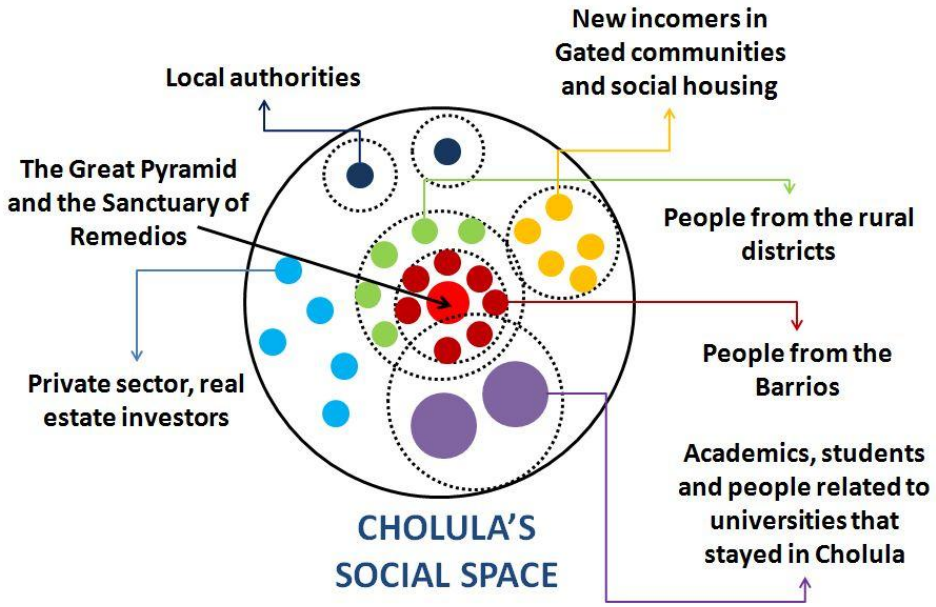


Figure 26 Cholula's stakeholders interactions as an unrelated space, Source: adapted by the author based on conversations with Dr. Margarita Tlapa- Almonte

Although this social movement is well rooted in Cholula – because of identity issues - and the population discontent is bigger in all Puebla State, the community interest is not the same in the gated communities of Angelópolis district. The people living inside them are more preoccupied about having security and leisure than having concerns of land expropriations in Cholula. This is one of the problems that are creating several social issues due to the economic interests of the State, local authorities and the private stakeholders. As Naomi Klein (2000) States, those interests are reflected trough the privatization of space: the construction and development of gated communities and the mall culture are isolating the different social sectors, weakening the sense of community, and reducing the State's responsibilities.

Another economic and political interest that affects the peri-urban development is the partnership between private sector and local authorities which transform, adapt, or ignore the planning and construction regulations. This is visible in the housing sector, in San Andrés and the Angelópolis district; the local authorities allow the change in land use and densities like the new condominiums in order to obtain bigger incomes through construction licenses and taxations. On the contrary, the same local authorities do not control or supervise the construction adaptations of social houses because they do not represent higher incomes. More than that, the municipalities prefer to give better maintenance and infrastructure to the middle-high residential areas than to the rural and low-income urban areas.

All the aforementioned conditions are a consequence of miscommunication, unwillingness and lack of community integration between the different stakeholders.

8.5 CONCLUSIONS

Having the analysis and description of the pattern of land uses in Cholula and the organic-tree growth model, two conclusions can be formed: **the RDPA through the planning regulations promoted and developed urban sprawl and the land use change is developed by individual benefit.**

It is noted that the changes in land uses in Cholula have some features in common, like the density, the rural presence, the gated communities, urbanisation over road-network, sprawl, and different levels of socio-spatial integration. These features are summarized in Map 17 and are based on the analysis of the patterns of land use and models of spatial development. This mapping information is useful to determine patterns of urban growth and to understand how stakeholders shape the city.

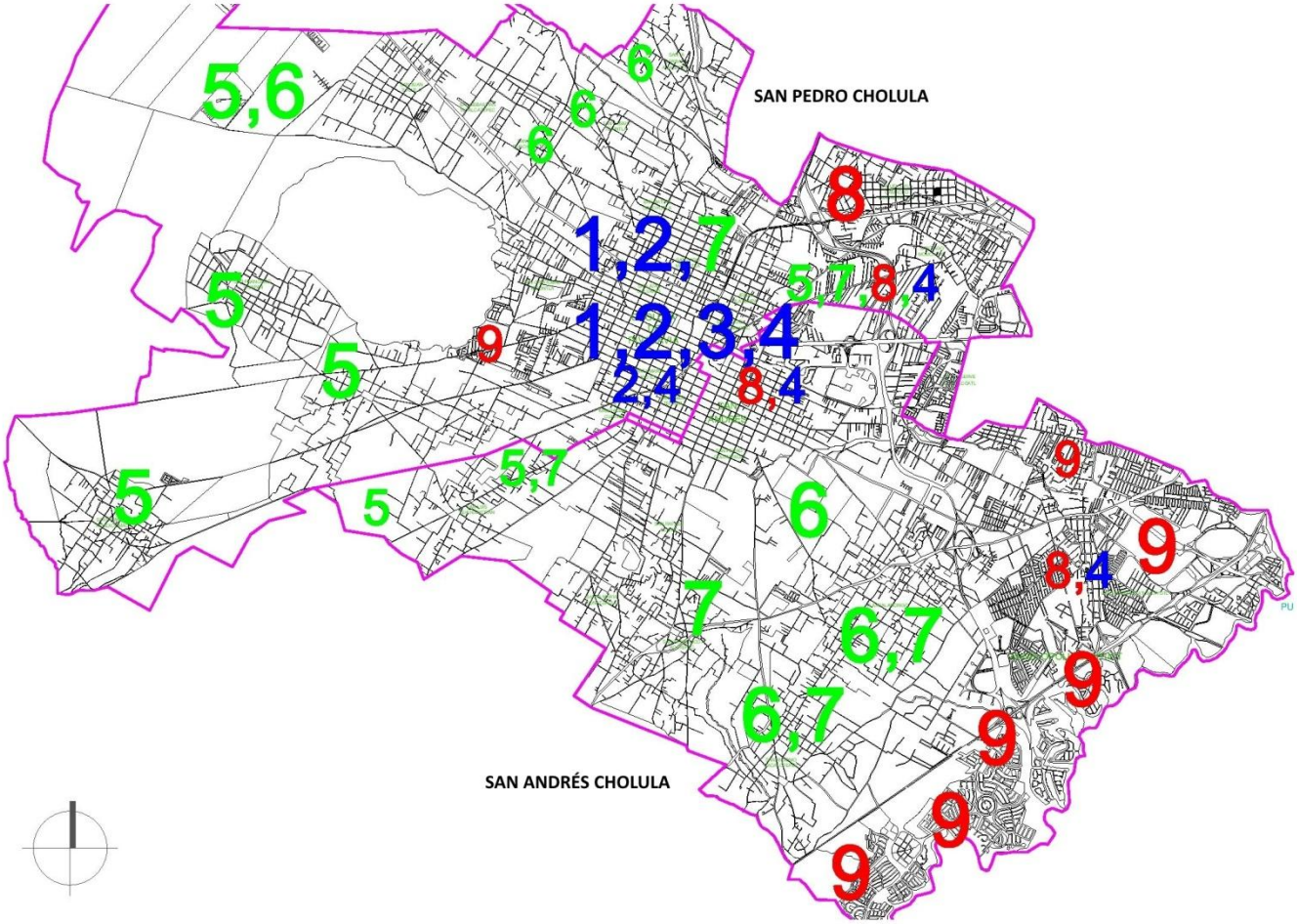
As detailed in this chapter, the rural presence is evident in many of the patterns, due to strong identity values that persist in the local communities of Cholula. The agricultural fields are the most vulnerable ones, but the social-spatial integration of the compact and rural models allows a better connection with the context, in contrary to the metropolitan model and the hermetic gated communities.

One of the main problems of those conditions is the fast urban growth and the continuous violation of construction regulations. With this, the official land uses become useless in regulating urban growth. For the case of San Andrés, the official land uses of 2008 do not correspond with the territorial reality. At this point, the conflict between land reserves, territory, plans, and urban reality is propitiated by different stakeholders that play an important role as agents of change in the peri-urban and metropolitan development.

After the implementation of the RDPA in the decade of 1990, the expropriation of rural land transformed Cholula into the new metropolitan district of Puebla. This new urban façade provoked ambiguous structural spatial changes where they share Cholula as an unrelated space with stratified social interactions (Schumacher M. , 2012) among the different stakeholders' groups (see Figure 26).

What is worrisome is the abuse of speculation practices from the real estate investors and developers which are tolerated by the local authorities – because these sectors represent more taxation –. Due to the insecurity and increasing violence in many parts of Mexico, a national paranoia rises around security issues, many families prefer to live inside the gated communities rather than in open neighbourhoods of Puebla or the *barrios* of Cholula. Although this trend in housing development is very popular among society, this research considers that the urban growth promoted by the local authorities and private investors, is in no way sustainable, accountable, or socially inclusive.

Based on the community assets mapping and stakeholder analysis, it can be stated that**: the role of stakeholders in Cholula's peri urban development is guided by the modification of planning and construction regulations, followed by the market pressure that promotes urban sprawl.** The market and the private sector give place to the trends in urbanisation and shape the morphology of Cholula's rural-urban fringe. The investors with the consent of the State and local authorities promote low density housing and retail units, high-density for higher-incomes and an inclination towards privatizing the public services. This developing pattern of the metropolis is creating gentrification that increases the social inequality between the rural, the traditional and the metropolitan Cholula. More than that, the miscommunication and disintegration between stakeholders are creating a bigger problem, the lack of urban land management.



DISTRICT	DENSITY	RURAL PRESENCE	GATED COMMUNITY	URBANIZATION OVER ROADS	SPRAWL	SOCIO-SPATIAL INTEGRATION	MODEL	PATTERN
SAN PEDRO CHOLULA								
Cholula de Rivadavia	M						M, R, PD	1,2,3,4,5,7,8
Santa María Acuexcomac	L						R	5
San Diego Cuachayotla	L						R	6
San Cosme Texintla	L						R	6
San Francisco Coapan	L						R	5
Santiago Momoxpan	M						M, R, PD	4,7,8
San Cristobal Tepontla	M						M, R	2,4,7
Rafel Ávila Camacho	M						M, PD	8
San Agustín Calvario	L						R	5
San Sebastián Tepalcatepec	L						R	6
San Juan Tlautla	L						R	5,6
San Matías Cocoyotla	L						R	1,2,7
San Gregorio Zacapechpan	L						M, R	4
Land Reserve Quetzalcóatl	M						PD	4,8
SAN ANDRÉS CHOLULA								
San Andrés	M						M, R, PD	1,2,3,4,5,7,8
San Antonio Cacalotepec	L						R, PD	6
Tlaxcalancingo	L						R	6,7
San Francisco Acatepec	L						R	4,6
San Luis Tehuiloyocan	L						R	4,6
San Rafael Comac	L						R	6
Santa María Tonatzintla	L						R	4,5,7
Land Reserve Atlixcáyotl (Angelópolis)	M H						PD	3,9

COLORS TO REPRESENT THE PATTERNS ON THE MAP

MODULAR
1,2,3,4
RURAL
5,6,7
PRIVATE- DEVELOPMENT
8,9

MAIN FEATURES
- Low representation
- Medium representation
- High representation

DENSITY
(L) Low
(M) Medium
(H) High

MODEL OF SPATIAL DEVELOPMENT
(M) Modular
(R) Rural
(PD) Private-dev.

DATA / CLASSIFICATION

SOURCE
MAP: INEGI 2010
CLASSIFICATION: Author, adapted from INEGI 2010, satellite images by Google Earth 2015 and field research

PATTERN OF LAND USE
1 Modular urban core
2 Modular rural-urban core
3 Housing core
4 Road-network urbanization
5 Rural core
6 Rural localities sprawl
7 Rural-urban fringe
8 Sub-urban core
9 New centralities

SPATIAL DEVELOPMENT SUMMARY CHOLULA
M17

Image 33 "*Abracemos nuestro hogar*" community meeting over the Great Pyramid, Source: Author (2015)

IX SOCIO-SPATIAL MANAGEMENT MODEL: STATEMENTS AND STRATEGIES

"The writers of history have seldom noted the importance of land use. They seem not to have recognized that the destinies of most of man's empires and civilizations were determined largely by the way the land was used." E.F. Schumacher

9.1 INTRODUCTION

In former chapters, the impacts of planning policies implemented at local level were studied. The evidence from the case-study analysis showed that planning and construction regulations are normally modified by certain stakeholders to their convenience. This condition is merging management problems over spatial planning.

To accomplish the aims of this research, this chapter is divided into three parts: the first one contains the general statements for each research question posed in Chapter I. The second part consists of the learned experiences and focuses on a socio-spatial proposal model to integrate the planning and management visions for land uses in Cholula. At last, the third part contains the methodological limitations and final conclusion.

9.2 GENERAL STATEMENTS

In order to answer the five main research questions in Chapter I, the theoretical discussion and analysis of the case-study leads to four general statements or conclusions and one model proposal. The research interrogations were focused on five main issues related to the case study:

- *Urbanisation* – impact over the territory and peri-urban areas in Cholula.
- *Stakeholders* – relationship between stakeholders and spatial development.
- *Policies and regulations* – impact of planning regulations in spatial development.
- *Pattern of land use* – models and patterns of land use.
- *Spatial planning* – strategies to improve in spatial and local management.

9.2.1 FIRST STATEMENT: THE RPDA TRIGGERED SPRAWL & PERI-URBANISATION

The RDPA developed sprawl over rural land in Cholula. This condition corresponds to the first research question in order to understand how a "planned" urban area is developing sprawl and peri-urbanisation. Despite the fact that the RDPA was conceived to regulate the urban growth in Puebla, the implementation of the plan transformed 1,081 Hectares of rural land into a metropolitan, unsustainable and exclusive territory. The planned territorial-urban reserve resulted in a formal/ informal housing, low-density predatory urbanisation where real estate development pushes the rural areas to adapt into urban land uses. Besides this, continued changes in the regional programs regarding urban development are driving peri-urbanisation over former rural towns like Ocoyucan and San Gregorio Atzompa.

9.2.2 SECOND STATEMENT: STAKEHOLDERS SHAPE SPATIAL DEVELOPMENT

The population's needs are the base for territorial transformations. In those transformations, the stakeholders, through their diverse interests, play an important role as agents of change in spatial development. This statement answers the second question of this research, where the relationship between stakeholders and the land is intrinsically related to the pursuit of food, shelter, security, health and quality of life for some; and economic benefit for others.

9.2.3 THIRD STATEMENT: PLANNING REGULATIONS ARE USED TO CONVENIENCE

As for the third research question, the Mexican planning systems have several policies that protect and develop the territory, as seen in Chapter V. However, the control and implementation mechanisms are used at the convenience of the local authorities and the private sector, like urban development programs, construction regulations, and land use restrictions. The convenience approach generates a spatial management problem due to the lack of interest in control from local authorities, and the miscommunication between stakeholders who damage vulnerable land uses.

9.2.4 FOURTH STATEMENT: RURAL LAND IS DEVELOPABLE LAND

The rural land is the most vulnerable land type in the region of Cholula due to three main factors: first, the land speculators are acting as predators of the agricultural plots. Second, due to a forced neo-liberal economy in a rural-based territory, land owners face precariousness and are pushed to sell their land to the best public or private investor. Third and most critically, the vulnerability lies

in the precedent established by the authorities – and broadly accepted by people in general – that rural land is developable land. This statement answers the fourth research question; the pattern of land use in Cholula is developing urban sprawl over agricultural fields, thus the rural area is being reduced to an economic instrument for land speculators and a taxation income source for local authorities.

Adding those facts, there is no incentive taxes over agricultural plots. It results non productive to farmers that have agricultural plots inside the urban core to continue farming, the property tax becomes higher.

9.2.3 CONFIRMATION OF HYPOTHESIS

The research indicates the confirmation of the hypothesis. The current spatial development of Cholula is being modified through regional plans and urban development regulations. In this matter, the diverse stakeholders played an important role as peri-urban developers.

The extensive planning policies in Mexico are opposed by its local management. For this reason, this research proposes a socio-spatial management model with a participatory approach that would be led by the local management in order to integrate congruent community building, network, and planning. The model gives response to the question related to strategies and recommendations to improve spatial planning.

9.3 TOWARDS A SOCIO-SPATIAL MANAGEMENT MODEL FOR CHOLULA

Why a socio-spatial model? A spatial model gives a holistic approach to socioeconomic and territorial manifestations that share the bi-dimensional space. In this way, sociological interactions influence land development. Therefore, this research considers a socio-spatial integration as a "*multidimensional relationship that may work independently and at different scales*" (Ruiz-Tagle, 2013).

Modelling is as well a helpful instrument to visualize current and future problems inside and outside the cities. Beyond this, the purposes of spatial models are diverse, according to EUNOIA (2012), there are three main modeling purposes:

> *"First, models help to achieve an enhanced understanding of urban dynamics (in an explanatory role). Second, they enable virtual experimentation allowing prediction of the impact of new infrastructures, technologies, or policies (in a predictive role). Finally, models are powerful tools to facilitate participatory process for collaborative decision making (in policy and design roles)" (p.4)*

To complement the modelling process, Wegener (2001) enlists modelling disciplines that contribute to it and create different categories like: Economic, Geographical, Sociological, Transport Engineering, and Integration. The last category, "*includes approaches in which two or more of the above specialized models are combined, such as integrated models of spatial development at the metropolitan scale*" (p.5).

In order to answer the fifth research question related to spatial planning strategies, this research proposes using a sociological-integrated model due to the importance of socioeconomic segregation and urban dynamics that the object of study is presenting.

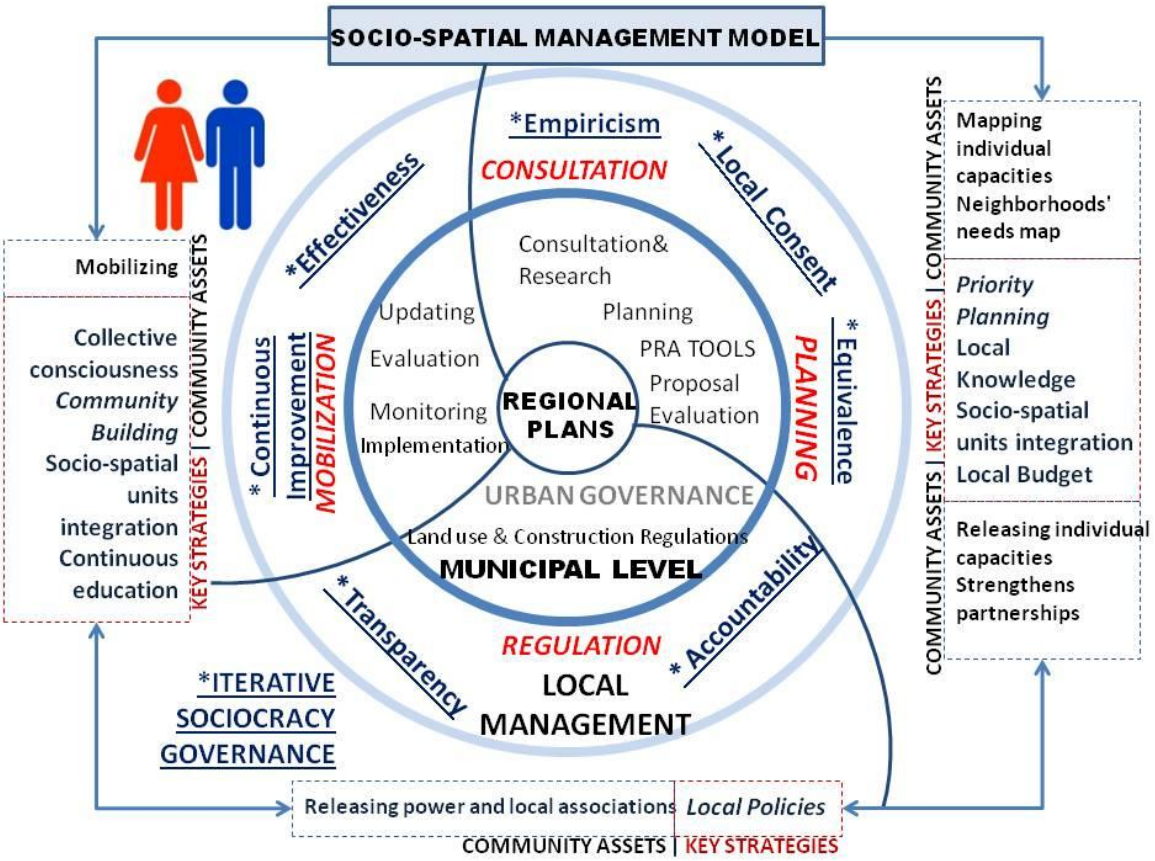


Figure 27 Socio-spatial management model loops. Elaborated by the author based on Sociocracy concepts by Bockelbrink & Priest (2015), and Community assets by Kretzmann& McKnight

Through the field research and data analysis, a constant problem between plan implementers and their management was observed: whilst there are extensive planning information and procedures – e.g. the COESPO planning guides and the National Planning Law – there is not enough awareness of the need for congruent spatial management at regional and local level.

The proposed model complements the current planning and implementation mechanisms in Mexico with a local management approach through sociocracy governance. It was important to consider three aspects: the modelling proposal, the guiding principles for planning, and the implementation strategies.

The differences between the three models for Cholula's development should be noted: *historical, rural, and metropolitan.* Considering this, it is not possible to have an integral socio-spatial model without considering each of them individually but, at the same time, with their complex socioeconomic and cultural connections.

9.4 ITERATIVE MODEL: FROM REGIONAL PLANS TO LOCAL MANAGEMENT

Through the land use analysis of this research, it was possible to observe that regional programs have a bigger impact than operative mechanisms in spatial development. At municipal level, it was confirmed that the developmental plans are used to establish the administrative vision for each Mayor, rather than being key planning mechanisms. On the contrary, urban development programs

are key mechanisms for spatial development with important instruments like construction regulations; the official land uses map and the local cadastre.

In the traditional planning process, the municipal plans and programs follow the normal steps from *planning → regulation →implementation →updating* and it stops without a serious evaluation of gains and losses. In this traditional way, the local observatories, NGO's, research institutes, and universities lead the monitoring and evaluation of each administration, but normally their evaluations are not considered officially. In this planning procedure this research supports Flores-González's (2006) vision; he highlights the importance of community participation in the planning process. In fact, this democratic action is more important than the formal procedure itself, because at the end the plan *belongs* to the community and not only to individual interests. This action will lead strategic planning. Other community proposals by Rosa et al. (2013, p. 20) reaffirm that the participatory process activates "*collective space*" and visualizes *"future scenarios"*. More than that, the authors state that

> *"Investigating small-scale and sometimes invisible urban processes can reveal not only opportunities for action, but methods of operation that could be relevant to others. This approach suggests a transversal way of thinking about planning, one that acknowledges the equal importance of all the different voices compiled here."*

Taking Flores-González and Rosa et al.'s statements, this research found that it is necessary to integrate a third management level through the **community and by local socio-spatial units**. It means that regional and municipal programs should be aligned with local management. Why? Because having an integral community management will lead to improvements in imperative issues, like:

- The current monitoring and evaluation instruments.
- The communication channels between Cholula's different social units – barrios, gated communities and rural villages–.
- An improvement in the collective consciousness about the vulnerable areas and the importance of having a local identity.

In addition, it is important to highlight the planning and management as an iterative process, through feedback loops, as described in the Figure 27. The model consists in three planning and management levels, ordered by management and governance principles, shown in Table 28.

There are as well the State and National plans, although this research considers regional, municipal, and local plans because they are mechanisms that have a closer impact over the territory.

Table 28 Level, guiding and governance principles for a Socio-Spatial Management model, Source: author

LEVEL	GUIDING PRINCIPLES	GOVERNANCE & MANAGEMENT PRINCIPLES
REGIONAL	Delimitation of Metropolitan Areas by SEDATU, Development plans by State	Urban Governance
MUNICIPAL	Land Use by GIZ, PRA tools, planning guidelines by COESPO	Urban Governance /Sociocracy
LOCAL	Community Assets by Kretzmann& McKnight	Sociocracy

The regional plans are based on important national mechanisms such as the delimitation of metropolitan areas by SEDATU/SEDESOL and are aligned with the State development plans.

The municipal plans and programs are normally aligned with the regional and State plans. For planning purposes, the guidelines by COESPO are very useful for incorporating local geo-data and statistics from the municipality; and can be complemented by the PRA tools and Land Use guidelines from GIZ in order to have a better population approach. Currently there are some local methodology examples like the PIUS "*Programas e Iniciativas Urbano Sociales*" (Atanacio, Hernández, & Sánchez D., 2014), socio-urban initiatives for local projects that have field experiences with urban projects and vulnerable groups in the City of Puebla.

The local level is a key factor for socio-spatial management because it integrates society units, stakeholders, and the community in general to have a collective responsibility at local and territorial scale. It has been demonstrated, through urban projects at local scale in cities like Medellin, Bogotá, Curitiba, Mexico City, and Puebla[76] that working at local scale with the community generates better integration, networking, and improves quality of life at regional level.

Before entering the different management loops, it should be noted that the priority placed on urban governance guidelines. Without a strong base in governance, it is not possible to improve communication channels between stakeholders, and more than that, the transparency and accountability aspects that affect every single organisation scale. The governance aspect is ordered by Sociocracy 3.0 principles that improve the decision-making process through groups of individuals.

9.4.1 FIRST LOOP: REGIONAL LEVEL

As was noted earlier, the regional plans and programs are the origin of the iterative process. For the local case, it is important to consider Cholula's role inside the Metropolitan Area of Puebla-Tlaxcala as an educational, touristic, and residential territory. This role dictates the regional plans, like the RDPA and sub-regional and sub-sector programs. The metropolitan indicators and geo-data offered by CONAPO, SEDATU or INEGI are guidelines to understand urban growth. In this case, the planning responsibility of regional plans goes to the State authorities, and the implementation accountability to the next level, the municipal.

9.4.2 SECOND LOOP: MUNICIPAL LEVEL

→*Planning (Consultation & Research, Analysis, Evaluation)* → *Regulation (land use, cadastre, construction)* →*Implementation (monitoring, evaluation, updating)* →

The municipal level is aligned with regional plans; at this level, urban governance is the challenge. The traditional planning system can be considered within the COESPO guidelines for municipal plans' elaboration, but having a bigger emphasis in consultation & research, transparency, and evaluation. The PRA tools, and land use regulation guidelines from GIZ are useful instruments to

[76] A good implemented community project is the "*Ciudad Mural*" from Colectivo Tomate. The organisations worked with neighbors from the former depress barrio of *Xanenetla* in Puebla. The project consisted in the facades improvement of antique houses with murals from urban artists; the object of this activity was to "build community", rescue the identity of the barrio, and integrate the neighbors. More information https://pueblaciudadmural.wordpress.com/

complement the official information, particularly for having an integral approach for population needs. All of these are enlisted in the Table 28.

Table 29 Municipal level processes, stages and tools. Source: author

PROCESS	STAGES	INSTRUMENTS
PLANNING	- Consultation & Research - Analysis - Evaluation - Presentation	- PRA tools - Community assets -Guidelines from CONAPO and local COESPO - Municipal information - Socioeconomic and geo-data from INEGI
REGULATION	- Official ratification through Official Newspaper publication	- Local cadastre - Official land use map - Construction regulations - Property taxation
IMPLEMENTATION	- Implementation - Continuous education - Control - Monitoring - Evaluation - Updating	- Urban Development offices and construction permissions - Local NGO's and local associations

In general terms, CONAPO/COESPO, INEGI and other public institutions provide good information and indicators for the creation of urban development programs and development plans. The geo-data and statistical information is vast, and the technical methodology is appropriate. Despite the fact that the social approach is not always developed, participatory practices are relatively new in Mexican policies. This is an important issue for the planning process; it needs to work parallel to the local management in order to generate better urban governance through transparency and communication between the different stakeholders.

9.4.3 THIRD LOOP: LOCAL MANAGEMENT MODEL

→*Consultation (collective knowledge)* → *Planning (community needs &Priority Planning)* → *Regulation (by units)* →*Mobilization (Improvement &community building)* →

The third level is the most important for this proposal. As was described in former chapters, the gap between planning and management at municipal level leads to social conflict when the authorities' vision is not shared by the local population. To ensure local management, the community and socio-spatial units must be the ones with **the will to change and do things**. Citizen's initiatives, compromises, and watch are key activities to demand transparent management between municipal and local levels.

Above all, the current urban projects that are being developed in Cholula by State and local authorities are a clear example that lack of transparency leads to corruption. To improve this condition, the role of all stakeholders is fundamental through the different stages in local management: *socio-spatial organisation, consultation &planning, regulation, and mobilization.*

(A) STAGE: SOCIO-SPATIAL ORGANISATION

The third loop represents **"unity in diversity"** meaning that the differences between socio-spatial units that share a common social space in Cholula are opportunities to improve an integral spatial development. In other words, the local management embraces observation, participation, watch, defence, communication, capacity, and integration of many socioeconomic aspects.

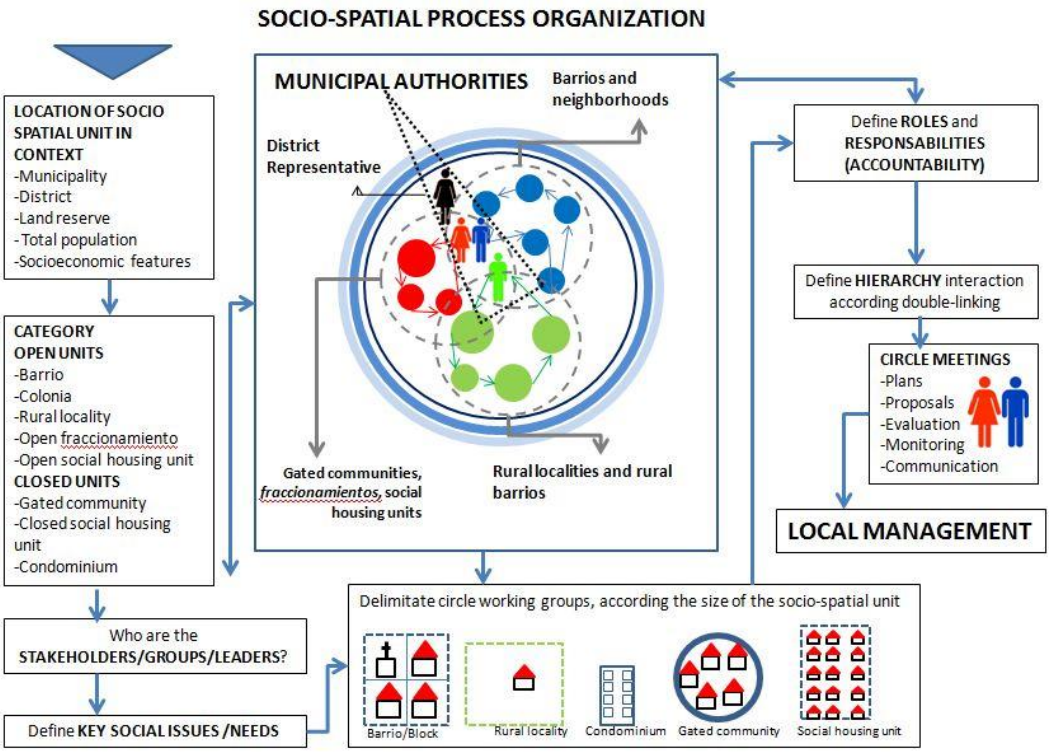


Figure 28 Overview of Socio-spatial process organisation, Source: author

One of the findings in this research was the lack of integration between the different socio-spatial units. There is a better historical communication among the barrios due to religious organisation, but barrios with *fraccionamientos* and other *colonias* are not so strong, or do not engage in this communication at all. This is one of the reasons to approach "unity in diversity" because it is not possible to manage an area without considering the diverse socio-spatial context.

According to Figure 28 it is necessary to integrate the different socio-spatial units in Cholula. Some of these groups can be part of an open or closed space, for example, former *fraccionamientos* were developed without gates or were enclosed when the insecurity grew.

Based on Sociocracy principles, Buck & Endenburg (2012) state that creating a structure of socio-spatial units, or autonomous circles of individuals; will help to organize the decision-making process by *leading, doing, and measuring/feedback*. The authors add that "*a circle makes its own policy decisions by consent, maintains its own memory system, and develops itself through integral research, teaching, and learning" (p.4).*

This model strongly supports the consolidation of circle-organisation not only in barrios or marginal areas. Owing to Cholula's social reality which has so many gaps between socioeconomic groups, it is necessary to connect each group in order to "build a community". More than that, this model respect individual decisions but encourages a social responsibility through doing.

In order to develop community network, is fundamental to delimitate the spatial-units, a clear definition of roles, and accountability for each of them. This organisation will lead to another iterative process: local management.

This research proposes to name as **socio-spatial unit** to every housing area or group of houses.

Every socio-spatial unit has some important geo-data that can be found in INEGI statistics and local data:

a. *Official delimitation* – urban /rural locality, *colonia, unidad habitacional, fraccionamiento.*
b. *Population number*
c. *Socioeconomic activities*
d. *Land use status* – informal /formal, type of taxation
e. *Citizens' organization*
f. *Meeting points*

Having this information it will be easier to locate the socio-spatial unit status and the possibilities to do establish net-working. To delimitate the size of each unit depend entirely on the individuality of each locality and the diagnosis of their social relations. For example, a gated community with 10-20 houses will be easier to organise in one circle-meting, instead of a gated community with 100 houses. In this case, several circle-meetings can be organising through blocks, or streets.

Currently, some socio-spatial units have something like cyclical-organisation but in different ways. For example, most of the historical barrios in the traditional Cholula have a religious hierarchical organisation for the festivities of each year. As was described in Chapter VII, the *mayordomos* and other members of the *sistema de cargos* are important figures that are permanently networking among barrios, and with the next religious level through the Parrish and the municipality representatives.

Another current organisation is formed by many of the *fraccionamientos* and gated communities that have their own regulations and representatives. They are normally in direct contact with the municipality; but, between these two socio-spatial organisations, *barrios* and gated-communities, normally there is no communication or interaction among them.

It is important to mention the current meeting places for *barrios* and *fraccionamientos*. There are two main areas, the **public space** like the churches, plazas, recreational areas, and parks; and the **private space** like the shopping centre and parks. In Places like Cholula, the churches – especially the parishes – are the most important community meeting points; also the private parks from *fraccionamientos.* These two spaces generate different private and public circles, still many of the residents from gated communities also attend their closer parish. It is easier for a resident from a condominium to move to the next religious centre than an external citizen enters to a gated community and participate in a meeting.

However, the most important public, green, archaeological, and public space that every resident from Cholula know is the Great Pyramid. This is an iconic and strategic meeting place that can join many socio-spatial units or representatives. This was already settled during 2014 and 2015 when neighbours from Cholula and local association organized several activities to protect the area against urban projects from the State.

At the end of Table 30 it is graphically described how the Great Pyramid is an archetype of convergence icon for the different stakeholders, associations, residents, and citizens. This icon is as well a good beginning to communicate socio-spatial units with upper levels. Bases on Sociocracy

principles, to complement the socio-spatial organisation it is recommendable to follow a *double-linking* meeting.

Through *double-linking* (Buck & Endenburg p.4) the socio-spatial units can communicate with other circles or with an upper hierarchy, meaning that at least two individuals from each unit "*are full members of the next higher circle".* This organisation fits with Cholula's social space, because many of the inhabitants of each spatial-unit are as well stakeholders or workers from other units. Within this, the communication *community – authorities* can be constant, and not only when there is a political election period.

This is one of the local limitations from Cholula, though exist many social groups that are interested in community building, there is as well big social indifference and apathy. This feeling is not exclusive from Cholula, but has its origins in the lack of results from authorities and representatives to eradicate corruption, insecurity, or poverty. This condition produces a global feeling of hopelessness that nothing will change, no matter what the citizens try to do.

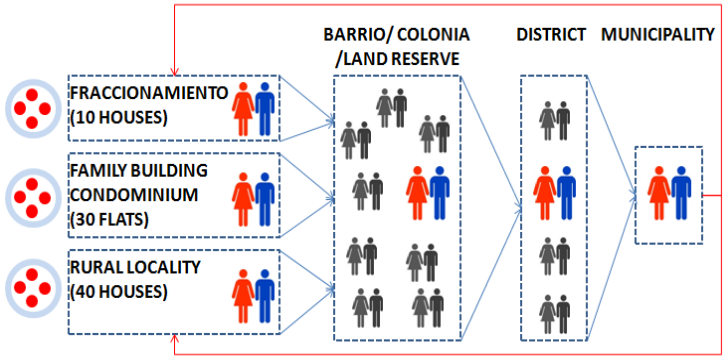
This is a reason why is important to empower citizens from the local scale to the municipal. Adding different circle-organisations make more pressure to representative's accountability than a single group of people. Inside Table 30, one can see an example of how socio-spatial units in Cholula can be double-linked to the next level. Depending on the number of the residents, each unit can have its own circles. At the end, the municipality should be able to give direct feedback to the smaller units.

To understand better this participatory approach, in the Table 30 it is enlisted the key process and guidelines within local management. Having established the socio-spatial unit organisation; this model proposes to follow some important stages that are aligned with local management: *consultation, planning, regulation, and mobilization*.

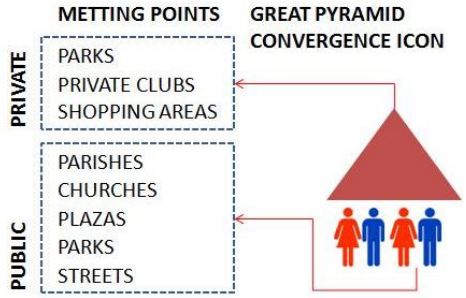
Table 30 Local management concepts, Source: author, adapted from Kretzmann & McKnight, Priest, and Buck & Endenburg.

STAGES	KEY SOCIAL STRATEGIES	PARTICIPATORY & GOVERNANCE GUIDELINES		INSTRUMENTS
		COMMUNITY ASSETS	*SOCIOCRACY (GOVERNANCE)*	
CONSULTATION & PLANNING	- Local &Academic Knowledge -Socio-spatial self governance	- Mapping individual capacities	- Empiricisms - Local consent	- Municipal socioeconomic indicators - Academic research
	- Socio-spatial units network - Priority Planning - Sustainability	- Neighbourhoods' needs map - Realising individual capacities (one-on-one relationships) - Strengthens partnerships	- Equivalence	- PRA Tools - Land use map - Local cadastre - Urban development programs
REGULATION	- Local regulations by units - Participatory budget	- Releasing power and local associations	-Accountability - Transparency	- Neighbourhood's regulations - Barrio's organisation
MOBILIZATION	- Local improvement	- Community building	- Effectiveness - Continuous	- Local observatories'

	- Feedback - Collective consciousness - Motivation - Local associations	- Mobilizing	improvement - Celebration (feedback & reflection)	reports and data. - Local NGO's reports and data.



CIRCLE-MEETING ORGANISATION
Example of socio-spatial unit double-linking with three types of community.



CIRCLE-MEETING POINTS
Main private and public areas with an important convergence icon for the different socio-spatial units.

(B) STAGE: CONSULTATION & PLANNING

During consultation, it is important to use academic and local knowledge when developing local plans. How people perceive their context is essential for developing a sense of community through local consultation. Through these two groups, stakeholders and socio-spatial units can work each other and parallel to authorities. The municipality can promote the management loop or social projects at local level, but it is ideal that new projects emerge from each socio-spatial unit or among other units. It is very important to initiate local management practices because communities' development should not follow any more centrally imposed or alms programs and other governmental projects that are only focused on electoral purposes.

As a socio-spatial unit, being able to have self-governance will develop networking, with the possibility of being supported by academics and applying the local wisdom that locals are the ones that know best the territorial issues. These are key social strategies that can be complemented by participatory guidelines like mapping individual capacities, and the first steps for governance through experientialism (empiricism) and local consent.

This is the stage for "knowing" how the socio-spatial structure works, identifying social needs and priorities, and connecting the diverse units into one holistic approach. All the information generated will help us to better understand the socioeconomic development and to identify future vulnerabilities or key issues.

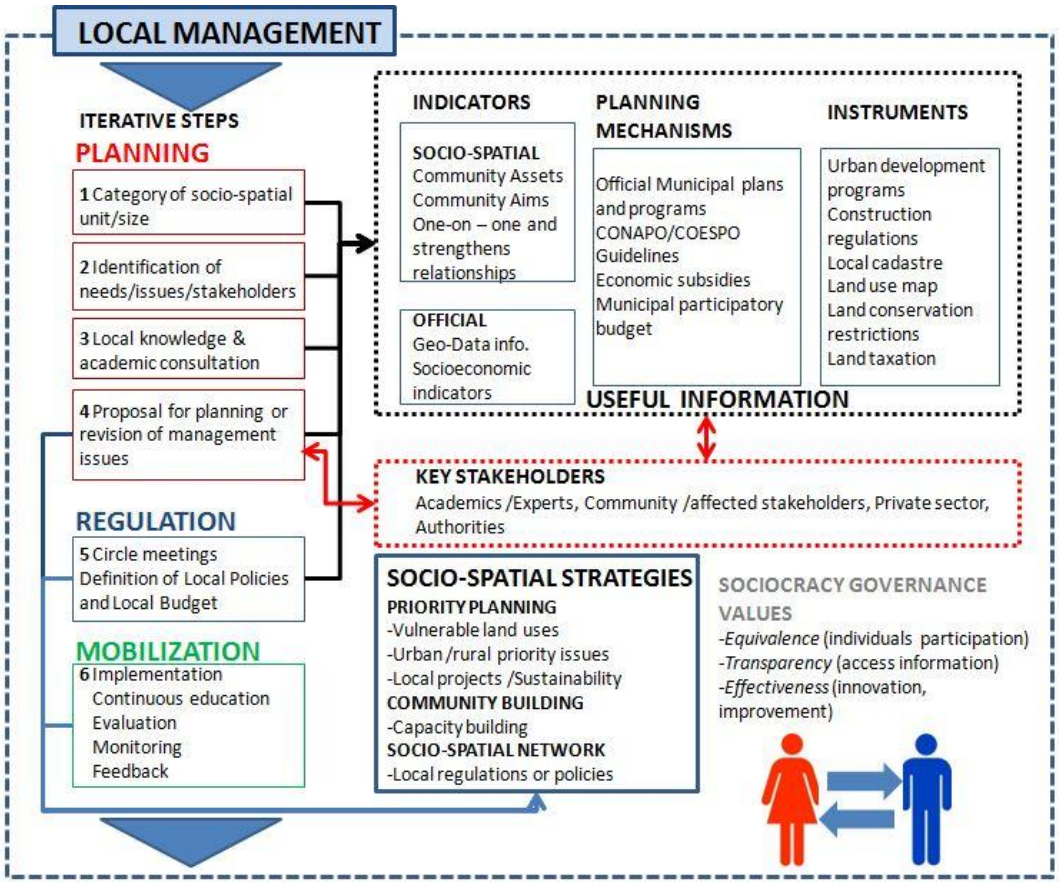


Figure 29 Overview of Local Management model, Source: author

Through the planning process, the different stakeholders and units will express their interests, benefits, and affectations. The Community Asset guidelines reinforce the individual capacities of each unit to make one-on-one relationships, as discussed in Chapter VIII for Cholula. Those analyses represent an opportunity to strengthen partnerships between stakeholders. Getting social units together can help identify aims and issues inside and outside their areas.

The findings from key relationships and community assets will help to develop congruent socio-urban projects, especially when there is miscommunication between *authorities – developers – affected people*. Those projects and partnerships have access to a wide range of official information to complement their proposal through cadastre, land use maps, urban development programs, among others.

(C) STAGE: REGULATION

Through strengthening relationships and empowering local associations, it is possible to develop in the "regulation stage" a local policy that helps to regulate actions and future projects. These local policies are used in some parts of Puebla and Cholula, especially in *fraccionamientos* as "*Reglamento de colono/vecinoss*" or "neighborhood regulation". This practice can be extended to *barrios* and rural localities:

Defining the local roles by socio-spatial units provides accountability and consciousness about the acts and consequences of individual/collective actions. Sociocracy principles observe that at this

stage transparency is fundamental in order to have fluid information and communication inside units.

Through accountability and transparency, the local regulations or policies can provide the ordering principles for each socio-spatial unit; this is one of the key social strategies that will help the adoption of the participatory budget. This mechanism is a new municipal law; in 2014 it was already implemented in San Pedro Cholula, where a public consultation process decided which part of the public budget should be used for social or infrastructure projects. With this mechanism, the local regulations can be linked with the municipal participatory budget in order to generate better socio-urban projects proposed by the people and not only by the authorities.

(D) STAGE: MOBILIZATION

This stage provides the opportunity to develop what Diana Leafe Christian (2013) names as "*community glue*", meaning that, initiating social activities in a unit will develop a healthy environment through community integration.

This is a key stage because it will provide evaluation, control, and feedback to the local authorities about the plan for implementation or regulations performance. Through integral and iterative monitoring, the collective consciousness creates one of the most important assets: community building with a continuous improvement cycle.

This model considers mobilization as the permanent – active stage and one of the most important of the local management loop. The reason is based on the local evidence, for one side the municipal plans have short-term-periods without continuity to the next administration. On the other side, there is a lack of local authorities' control over land use, construction; environmental regulations that generate constant violations which normally are tolerated by the same authorities.

Thanks to this lack of interest, the empowerment of the citizen became an important control tool for authorities. The most important stakeholders that play a vital role in this stage are:

- *Academics & local experts* – universities, institutes.
- *Community* – local associations, socio-spatial units' representatives.
- *Private sector* – developers, real estate agents, architects.
- *Local authorities* – urban development, environmental, tourism, construction representatives, deputies, delegates.

Mobilizing the socio-spatial units helps to monitor the municipal activities and improves collective consciousness and capacity building about their own home. This is the most important step; when the community is embracing the value of their land, of their barrios and gated communities, this will help them to make the most of the opportunity of having a thriving community in Cholula.

As a summary of the process, in Figure 29 is shown the overview of the iterative steps for local management. The process should be followed at any moment with the available information, the key stakeholders and Sociocracy values that will lead to three socio-spatial strategies: *priority planning, community building, and socio-spatial network.*

9.5 LIMITATIONS AND KEY STRATEGIES TO PROCEDURE

The proposed socio-spatial strategies for local management are the result of the analysis of planning and governance issues arising in the case study. An overview is shown in Figure 29; the procedures can work as well with the improvement of the next general emerging issues and limitations:

- *Exclusive urban development* – the trends resulting from neo-liberal policies, insecurity, social change, urban sprawl, among others are generating in the metropolitan sector of Cholula an exclusive urban development that is pushing forwards the local rural population and is consolidating the gap between socioeconomic classes.
- *Taxation and land speculation* – Cheaper developable land is a business opportunity for speculators and an attractive permanent taxation for the municipalities. This situation is surpassing San Andrés and San Pedro's boundaries, extending urban land use change to the rural municipalities.
- *Urban land management and governance* – the lack of transparency at municipal level is generating several land use and construction violations. A weak management in San Andrés and San Pedro generates a weak governance issue.
- *Rural land conservation* – as consequences of the peri-urbanisation process, the rural land is becoming urban land, but it can be recognized as an important "green lung" for the metropolitan area.
- *Social Apathy* – this is one of the most important issues at community level. As it was already described, the corruption, poverty, or insecurity represents the lack of results from the representatives to improve the quality of life. The general apathy moves to a lack of participation in community projects, or to indifference in demand accountability to the authorities.

Each of them corresponds to a peri-urban reality that is merging inside the MAP-T. In this aspect, the role of socio-spatial management model is essential inside a metropolitan environment. The local interactions need to create better socio-spatial networking in order to improve some of the management limitations selected by Iracheta (2009, p. 254):

- *The administrative accountability* – the Federal and State Governments have a bigger participation in metropolitan management and a lower participation from municipal and local authorities. Both levels have as well a big limitation regarding accountability, being very easy for authorities to get corrupt thanks to the flexibility of laws and regulations.
- *The lack of participative mechanisms in the planning/management structure*
- *Municipal participation* – The spatial planning needs to work at local scale in order to implement better congruent management of regional plans.
- *Lack of coordination structures* – due to the complexity of the planning system in Mexico, better coordination structures are needed among the thousands of local authorities in order to develop metropolitan management.

Rosa et al. (2013) support as well that metropolitan limitations are one of the biggest challenges that define the local management in a "*mainstream planning*".

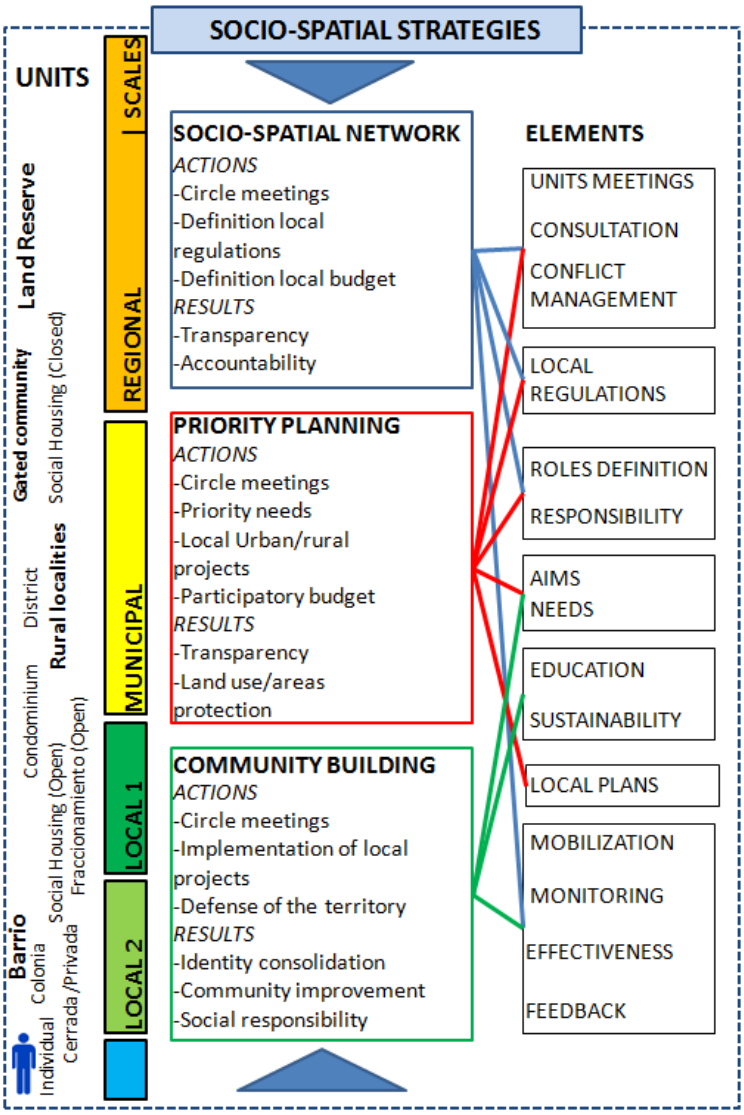


Figure 30 Overview of socio-spatial strategies for local management, Source: author

However the authors state that it is necessary to have a "*drastic change in the conception of the city. In this new form of planning, metropolitan systems would need to not only support the service economy but also allow for production: urban faming, small-scale manufacturing, social enterprises, creative practices, informal economies, and so on" (p.20).*

In this aspect, the local limitations that challenge as well the socio-spatial model can be summarized in two areas:

a. *The political*
   - The politicisation of the model, for electoral purposes or individual interests.
   - Lack of governance transparency and accountability
   - Lack of will from local authorities to integrate participatory models.

b. *The socio-spatial*
   - Physical segregation among local population.
   - Lack of communication among stakeholders.
   - Lack of interest among stakeholders to improve community-building, accountability, and capacity.

These two local limitations are visible among stakeholders that generate social conflict over urban development. This is what Rosa et al. *(ibidem)* name as lack of "*transversal thinking in official planning*". Consequently, the role of Cholula's' local management inside a metropolitan planning is exemplary to develop better regulation and net-working mechanisms among stakeholders, where a participatory approach could be the first step to improving a transversal management.

To improve those metropolitan and local limitations, some key procedures should be taken into consideration to make the proposed model feasible: *priority planning, socio-spatial unit's network, and community building*.

9.5.1 PRIORITY PLANNING

As was quoted in former chapters, Lefebvre's theories established that the construction of the city is done by individuals, groups, population, among others. Following this statement, the priority planning is an effective strategy that integrates local knowledge, socio-spatial units, and stakeholder's interests. It is considered as a "priority" as it is easier to prioritize the needs and work on effective measures in the short, middle, and long term.

Priority planning is a fundamental practice that influences communities at regional level. This is a useful urban planning and participatory method in several countries in Latin America. Through priority planning, social, urban, and rural projects can emerge that will be led by individuals. The basis is that the initiatives should come not only from authorities, rather born in the heart of each community, or in the case of Cholula, from the circles of the socio-spatial units.

For the case study, priority planning can complement the socio-spatial organisation of barrios, *fraccionamientos*, and rural localities. Furthermore, working at local and community level will help to prioritize actions in order to protect vulnerable land uses, land use changes, monitor regulation's violations, and propose community projects.

It is important to mention that a big challenge/ limitation for this key procedure are the liability of every project, plan, or idea. In this matter, it is fundamental the accountability of the community to establish the priority planning and to demand transparency to the local authorities. Without this, it is very easy to transform an honourable idea into a political or corruptible mechanism.

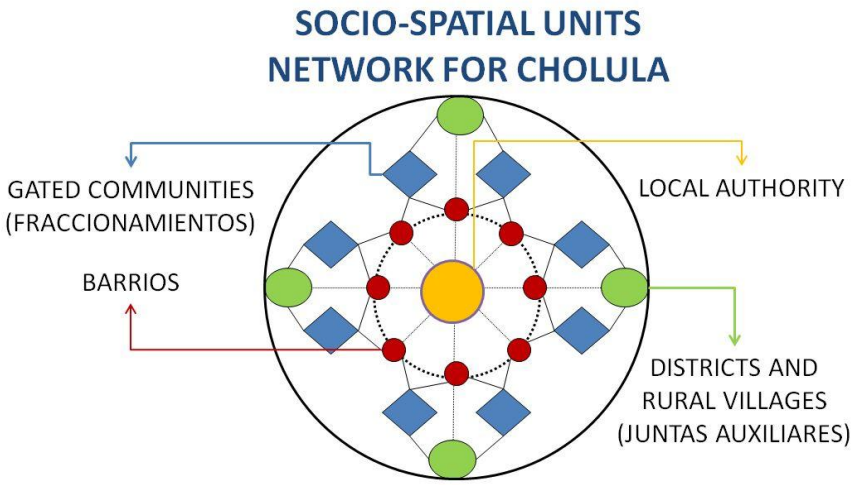


Figure 31 Example of socio-spatial units' network between barrios and fraccionamientos for Cholula and the communication with local authorities and districts. Source: author (2015)

9.5.1 SOCIO-SPATIAL UNITS NETWORK

The socio-spatial units are the elements that give structural and social cohesion to local management. Having characterized each unit by category, population size, or rural locality, there are three important strategies that should be followed: *the network, the local policies, and the local budget*. First of all, generating a socio-spatial network (see Figure 31) for places like Cholula, will allow an interrelationship between *fraccionamientos*, gated communities, barrios, *colonias*, districts, etc.

Through networking Bonfil (1987) states that collective relationship improves the community life with an autonomous management. Each unit should be able to develop a local policy, like the current neighbor's regulations of many *fraccionamientos*. This instrument is a key factor to order management and livelihood among individuals through a human dimension, where Gehl (2010) states that *"has been seriously neglected in connection with urban development"*.

Many of the local regulations are made by gated-community's developers, but the majority is made by the neighbours' associations or residents. This is a common practice inside gated communities that can be interrelated with barrios and social housing areas.

In a socio-spatial network, the municipality is the foundation, but the residents from the land reserve, the rural localities, and the districts have great influence. Each of them is interlinked with gated communities, barrios, social housing areas, condominiums, etc. Regarding the local policies, the land reserve is more connected with residents' regulations, due to the great influence of gated communities, and the districts are more connected with social organisations – like religious groups – and neighbours' policies.

This is an opportunity not only to create social networking in a collective space, but is also a strategy to regulate each socio-spatial unit by population terms, and within this, accountability and roles' definition will be more congruent and with better communication with authorities.

Another important strategy inside this proposal is the consolidation of the participatory budget at district level and local budgets at spatial-units levels. The participatory budget[77] is a new responsibility of municipalities, but the people are the responsible for deciding in which projects or areas it should be implemented. This action generates better transparency of use of investment resources, where participants are able to be part of a decision-making process. This can be followed by the local budgets, which can help units and circles provide better management and actions in order to improve the quality of life of their community.

9.5.2 COMMUNITY BUILDING

Diana Leafe Christian (2013) adds that collective knowledge reinforces the sense of community through "*community share, good process and communication skills, and effective project management*". These three aspects are the base for good local governance, which generates better connection between

[77] Participatory budget was implemented by San Pedro Cholula in 2014. It was used as a transparency tool to communicate the public investments that is being done by the local government. To being able to participate, the residents that pay property taxation are the only ones that can decide in which area the municipal budget should be implemented. San Pedro Cholula is the first municipality in the State of Puebla that implements this instrument, it is only in the first phase with many possibilities to improve (E-consulta, 2015)

individuals and needs less "*conflict resolution*". This is not an easy task, particularly in countries like Mexico with a historical dispute between territories, social classes, and political interests. Nonetheless, this research strongly supports that the combination of priority planning and socio-spatial network builds a community.

The result of this combination is the emergence of a collective consciousness through local knowledge. Having a better perception of local identity will help to develop social bonds among residents, and this is a key strategy to protect vulnerable land uses, or to promote thriving and prosperous projects.

Community and capacity building represents people empowerment which pursues the achievement of the population's needs through self-sufficiency and local management. Without this, Atanacio et al. (2014) agree that one of the causes that damage the population is apathy and the lack of group-work. This causes a fragmented society and many emerging issues that were identified throughout the thesis.

In general terms, the socioeconomic and cultural conditions of the case study made plausible the proposal of the socio-spatial management model. Having a complex social and urban reality, the socio-spatial model tries to give answer to one of the many management issues regarding spatial planning. Current legal framework and instruments drives land development, undoubtedly, a participatory vision will drive the improvement of local networks and a congruent spatial management.

Land and people should be considered as one multidimensional unit. In this aspect, during the elaboration of this research, many other issues, processes, and challenges were found, besides, the methodological limitations allowed the findings on potential research in peri-urban development and participatory planning.

9.6 DIRECTIONS FOR FURTHER RESEARCH

In this research, some rural development issues in Cholula were described, but due to the research objectives, not completely studied. According to the official national delimitations, rural land cannot be defined only by population size – like INEGI and CONAPO definitions – the "new ruralities" are an example of that, where many new socioeconomic activities and cultural manifestations are being presented among the rural world. This is an emerging planning issue, not to consider only the agricultural plots only as developable land, but also as important conservation and green areas. This research encourages further investigations in the rural management area:

a. *New ruralities* – In Cholula, many new ruralities are being created, urban developers are predating green areas, and the urban sprawl is overlapping the agricultural uses. The target focus is not only to pursuit urban development as economic trigger, but to promote rural areas as important conservation places inside the peri-urban fringe.
b. *Rural cities in Latin America* – An interesting description that came out during this research was the "rural cities", and Cholula is a clear example of that. Embracing the rural identity will help to define new parameters to analyse and protect rural areas.

c. *The land tenure taxation in peri-urban areas* – Speculation of rural land in peri-urban areas. For Cholula, it will be useful to study how to protect rural plots and encourage farmers to be productive, especially due to the high taxation in land uses that do not help local producers, and promote the abandonment of agricultural activities.
d. *The vacant land, what to do with these areas* – as was studied through the analysis of municipal plans and Cholula´s maps, there are big areas of vacant land that remains unused. This is not only a local problem, but is well observed in many cities in Mexico and worldwide. It would be productive to make proposals that include more public and green spaces in these unused places.
e. *Socio-spatial units and organic-tree-growth model* – both areas were proposed and found by this research and will be extraordinary to continue the implementation of a socio-spatial organisation and a deeper study of the organic-tree-growth.

9.7 FINAL CONCLUSION

The purpose of this thesis was to develop a phenomenological investigation with qualitative features in order to get a "big picture" of the case study. Through an illustrative, descriptive, and explanatory analysis, the objective was to discuss the relations between stakeholders and planning regulations and identify how these two objects shape spatial development.

Cholula's land development and urban morphology demonstrates that it is a dynamic territory with different population needs and socioeconomic transformations. The three spatial development models: *modular-grid, rural, and private-development* have several patterns of land use that drive us to a peri-urbanisation trend trough an organic-tree growth.

Through the patterns of land use and the organic-tree-growth model, this research observed that the current spatial structure leads to anarchic and vulnerable land uses, like the rural ones due to the unsustainable spatial development that the MAP-T is having. With the definition of patterns and spatial models will be possible to diagnose and visualize future urban growth.

Spatial development in Cholula is as well an exemplary case of an implemented plan through the RDPA, and the following problems with management and accountability among the different administrative levels and their regulation instruments. The peri-urbanisation processes in Cholula lead to the prioritization of three areas that are not well integrated: **planning, implementation and management**.

The interrelationship between them may provide an alternative way to approach a better spatial development in Cholula. In this relationship, the stakeholder's networking is essential. Through socio-spatial management, the *"knowledge and findings compiled from these real world experiences can begin to feed-back into planning and policy*" (Rosa, et al., 2013). The stakeholders' analysis does not intend to analyse the power relationship among the different groups, on the contrary it was expected to comprehend the complex socio-spatial network inside Cholula´s space. Stakeholders' interests are difficult to predict and their influence develops in several ways the peri-urban land.

This was one of the reasons for this research to take a participatory approach – through a socio-spatial model – that will help to guide Cholula´s complex territory to better integral planning

strategies at regional and municipal level with the small "*human landscape*" (Gehl, 2010) scale through local socio-spatial units. The participatory approach for places with similar background as Cholula is already implemented in many cities in Mexico and Latin America.

As it was described in this chapter, the lack of will and individual interests from local authorities generates social indifference inside the localities. This may be the greatest limitation not only for the proposed model, also to participatory projects. Accountability and capacity building at a local level are fundamental to improve this condition and to avoid transforming good community projects into vulnerable instruments of corruption.

During the different stages and loops of the socio-spatial management model, it is very important to reinforce the social compromise and will from each unit to demand good management from local authorities. In resume, the authorities or representatives would not improve their accountability if they do not see a particular benefit, and that is precisely the reason why this research encourages commitment and mobility at a local scale, to change it.

Cholula represents both sides of the socio-spatial structure. On one side, the mixture among socio-spatial units lead to people empowerment and construction of urban space by the citizen, united in one important convergence icon: the Great Pyramid. On the other side, Cholula shows the paradigms on peri-urbanisation where the market forces guide urban growth, development plans are short-term political visions and exclusive land policies segregate and disperse the social fabric.

Because spatial planning itself is a big challenge, a participatory approach may not be the panacea to all planning issues, but with a socio-spatial management that pursues the integration of different society sectors; the local implementation of plans and projects will be more congruent with urban governance, transparency and planning strategies. This leads to a holistic approach to the territory as a complex-multidimensional space, where *"planning must start with people in the future*" (Gehl, 2010) with the capacity to **build unity in diversity**.

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APPENDICES

APPENDIX A. KEY INFORMANTS' INTERVIEWS AND AUTHORIZATIONS FORMAT

AUTORIZACIÓN PARA FILMACIÓN Y REALIZACIÓN DE ENTREVISTA

Yo, _____ autorizo a la arquitecta Melissa Schumacher González, estudiante de doctorado de la Universidad Técnica de Múnich (Technische Universität München) para que tome fotografías y realice una entrevista filmada en vídeo de mi persona y use dicho material en cualquier forma para cumplir con sus propósitos académicos. Yo doy mi consentimiento para que la entrevista, fotografías, vídeos y grabaciones de sonido puedan ser copiados y publicados ya sea en forma impresa o en la Red Mundial para fines de divulgación académica y del conocimiento, junto con las descripciones e información editorial.

Todas las fotografías, vídeos, grabaciones de sonido, entrevistas escritas, etc. son propiedad de la Technische Universtität München.

Firma:_____ Fecha:_____

AUTHORIZATION FOR FILMING AND RECORDING INTERVIEW

I, _____ authorize Melissa Schumacher González, PhD student from the Technische Universität München for taking photographs, recording, and filming an interview of myself. She can use any of the recorded material in any format in order to accomplish her academic purposes. I give my consent for the copying and publishing of the interview, be it pictures, videos and/or sound recordings in print format or through the World Wide Web. The purpose of this publishing is for academic outreach and dissemination of knowledge.

All pictures, videos, sound recordings, written interviews, drawings or any other data in relation to this interview are property of the Technische Universität München

*Signature:*_____*Date:*_____

TYPE OF STAKEHOLDER*	1
NAME OF RESPONDENT	
CONTACT DETAILS	
DATE:	**DURATION:**
KEY WORDS TO ACHIEVE	EXPERIENCE, KNOWLEDGE, OPINION, VISION

QUESTIONS

SPANISH	ENGLISH
1. ¿Cuál es su **experiencia** en planificación territorial	What is your **experience** in spatial planning?
2. ¿Cuáles han sido las **ventajas y desventajas** en el proceso de metropolización de Puebla? específicamente en la zona conurbada con Cholula	What are the **good and bad aspects** of the metropolisation process in Puebla? Especially in the area of Cholula
3. ¿Cuál es su **opinión** sobre el modelo de crecimiento urbano que están experimentando los municipios de San Pedro y San Andrés Cholula?	What is your **opinion** about the urban growth model that is developing in the towns of San Pedro and San Andrés Cholula?
4. ¿Qué **instrumentos** de planificación o implementación hacen falta para el mejor desarrollo sustentable de usos de suelo en las comunidades rurales y urbanas en Cholula?	Which planning and implementation **instruments** are needed for a better sustainable development of land uses in Cholula?

NOTES:

TYPE OF STAKEHOLDER*	**2**
NAME OF RESPONDENT	
CONTACT DETAILS	
DATE:	**DURATION:**
KEY WORDS TO ACHIEVE	HISTORY, CHANGES, COMMUNICATION, INTEGRATION, OPPORTUNITIES

QUESTIONS

SPANISH	**ENGLISH**
1. ¿Cuál su **historia** en Cholula?	What is your **history** in Cholula?
2. ¿Cuáles han sido los **cambios** a nivel urbano que ha vivido su comunidad?	What are the urban **changes** in your community?
3. ¿Considera que hay **integración** entre sus vecinos? ¿Cómo es la **comunicación** con el ayuntamiento?	Is there any **integration** between neighbors? How is the **communication** with the authorities?
4. ¿Se siente **parte de** Cholula? ¿Qué le **ofrece** Cholula que no ofrece otro sitio para vivir?	Do you **feel part of** Cholula? What **offers** Cholula that you do not find in other places?
5. ** ¿Por qué sigue cultivando? ¿El gobierno da algún tipo de **apoyo** para sembrar?	** Why are you still planting? ¿Did you receive any economic **support** from the Government?

NOTES:

**Only for farmers

TYPE OF STAKEHOLDER*	**3**
NAME OF RESPONDENT	
CONTACT DETAILS	
DATE:	**DURATION:**
KEY WORDS TO ACHIEVE	JOB SCOPE, INSTRUMENTS, COMMUNICATION

QUESTIONS

SPANISH	**ENGLISH**
1. ¿Cuáles son los **alcances** de su trabajo en ordenamiento territorial? ** ¿Cuál es su visión de Cholula como ciudad?	What are your **job scopes** in spatial planning? **What is your vision of Cholula as a city?
2. ¿Cuáles han sido los **alcances y limitaciones** de los planes de desarrollo?	What are the **scopes and limitations** of the planning regulations?
3. ¿Qué **instrumentos** de implementación y seguimiento existen o faltan en los planes de desarrollo?	Which implementation **instruments** exist or miss in the planning regulations?
4. ¿Cómo es la **comunicación** entre los diferentes niveles de gobierno, el sector privado y la ciudadanía? ¿De qué manera **influye** esta comunicación en el desarrollo de Cholula?	How is the **communication** between the different Governmental levels, private sector and the community? In which way does this communication **influence** the development of Cholula?

NOTES:

** Only for majors from San Andrés and San Pedro Cholula

TYPE OF STAKEHOLDER*	4
NAME OF RESPONDENT	
CONTACT DETAILS	
DATE:	**DURATION:**
KEY WORDS TO ACHIEVE	VISION, COMMUNICATION, CONTRIBUTION

QUESTIONS

SPANISH	**ENGLISH**
1. ¿Cuál es su **visión** de hacer ciudad?	What is your **vision** for developing a city?
2. ¿Cuáles han sido los **aportes** que ha realizado su empresa en el área de vivienda y urbanismo en Cholula?	Which are the **contributions** of your Enterprise in the area of housing and urbanism in Cholula?
3. ¿Qué **ofrecen** los desarrollos de su empresa a los nuevos y antiguos habitantes de Cholula?	¿What have the new residential areas for new & old inhabitants of Cholula to offer?
4. ¿Cómo ha sido la **comunicación** con las autoridades locales a la hora de desarrollar un sector residencial en Cholula?	¿How is the **communication** with the local authorities when you are developing a new residential sector in Cholula?

NOTES:

TYPE OF STAKEHOLDER*	**2.1**
NAME OF RESPONDENT	
CONTACT DETAILS	
DATE:	**DURATION:**
KEY WORDS TO ACHIEVE	VISION,CHANGES, INTEGRATION, COMMUNICATION,

QUESTIONS

SPANISH	**ENGLISH**
1. ¿Cuál es su **visión** de hacer ciudad?	What is your **vision** for developing a city?
2. ¿Qué **cambios positivos y negativos** ha tenido el crecimiento urbano en el Área Metropolitana de Puebla?	What are de **positive and negative aspects** in the urban growth inside the Metropolitan Area of Puebla?
3. ¿Considera que hay **participación ciudadana** para resolver los problemas de vivienda y desarrollo en las periferias? ¿Qué hace falta para una **mayor integración comunitaria**?	Do you consider there is citizen involvement for resolve the development and housing problems? What is missing for better community **integration**?
4. ¿Cómo ha sido la **comunicación** con las autoridades locales, sector privado y comunidad a la hora de desarrollar un proyecto social en Cholula?	¿How is the **communication** with the local authorities, private sector and community when you are developing a new residential sector in Cholula?

NOTES:

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APPENDIX B. SAN PEDRO CHOLULA AND SAN ANDRÉS CHOLULA OVERVIEW OF MUNICIPAL PLANS

SAN ANDRÉS CHOLULA MUNICIPAL PLANS

MUNICIPAL PLAN (H.Ayuntamiento San Andrés Cholula, 2008-2011)

One of the objectives of the plan of 2008-2011 was the administration and implementation of the "Sub-regional Urban Development Program in San Pedro, San Andrés, Cuautlancingo and Puebla" and the "Partial program of urban development for the Atlixcáyotl Territorial Reserve"[78]. This objective was represented by the Mayor's idea of protecting the territory between San Andrés and Puebla, a historical land conflict that depends on the taxes and the former borders.

The urban development is considered in the Strategic Axis 4 of the plan, having as a big menace the pronounced population growth rate – 6.5% the biggest in the State according to the diagnose – and the expansion of low density housing. The main strategy is focused in the control of the construction of new housing and the regulation of the land use through the Municipal Sustainable Urban Development Program[79]. The plan offers a major control in the land uses, proposing a digital and public archive of cadastre, land ownership.

In relation to the agricultural fields, it supports farmers for having an efficient production through national subsidy programs like PROCAMPO.

MUNICIPAL PLAN (H.Ayuntamiento San Andrés Cholula, 2011-2014)

Having the same party administration this plan does not refer to the land border conflict with Puebla, but it merely renames the Axis 4 as "sustainable environmental development" as the most relevant intervention in urban development. It shows an interest in spatial planning and the land tenure regularization – such as the sale of *ejidos* to private investors– without the relevant specifications. The infrastructure proposed in this plan focuses on responding to the basic needs of the population, such as the habilitation of streets, paving, drainage and water supply. However, it does not continue with the past initiative of the cadastre digital archive, while it maintains the support to farmer's production without delving into this.

In 2011, San Andrés and San Pedro were recognized as *Pueblos Mágicos*[80] which improve the urban façade of the historical districts and the Great Pyramid that improved the tourism in 30% **Invalid source specified.**.

MUNICIPAL PLAN (H.Ayuntamiento San Andrés Cholula, 2014-2018)

It was established in the last elections the extension of the Mayor administration to four years –one year more than the previous administrations- in the period of 2014-2018 foresees an impact in the time for the implementation of the plans and programs conceptualized in the Municipal Plan.

The urban planning is considered in the Axis 3 of "sustainable urban development, infrastructure and quality public services"[81]. The plan brings out the importance of San Andrés as an attractive place for real estate investment, trade and services, so the promotion and regulation of urban development is encouraged; having an "order, sustainable and inclusive approach" (H.Ayuntamiento San Pedro Cholula, 2014-2018). The action strategies that support this approach is the urban municipal planning, the inspection and control of spatial planning, the actualization of the land uses map and the formulation of an environmental local planning program in 2015-2016.

This plan considered as an implementation instrument the Operative Annual Programs but not well described. Other proposal of the plan is the action strategies through the *Pueblos Mágicos* program like the construction of bicycle roads.

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[78] *Programa Sub-Regional de Desarrollo Urbano para San Pedro Cholula, San Andrés Cholula, Cuautlancingo y Puebla; Programa Parcial de Desarrollo urbano para las Reservas Territoriales del corredor Atlixcáyotl-Sur*

[79] *Programa Municipal de Desarrollo Urbano Sustentable de San Andrés Cholula*

[80] The *Pueblos Mágicos* (Magical Villages) Program is a federal certification for towns that conserve typical cultural characteristics of architecture, gastronomy, dances, tradition. The Federal Government gives to each recognized town economic support for the rehabilitation of facades, historical downtown and other touristic areas.

[81] *Eje 3 "Desarrollo urbano sustentable, infraestructura y calidad en servicios públicos"*

This action was not new and was made years ago because Cholula is general considered as a "bike town" and many bicycle lines were made. With the recognition of San Andrés as *Pueblo Mágico* the bicycle lines were removed and not replaced. This caused discomfort of the local population, very used to this mobility option.

In 2014 the implementation of Governmental projects that were not initially included in this Municipal Plan aroused polemic concerning to the communicative dysfunctions between the different authority levels. One of them is a project of an inter-municipal park below the protected archeological zone of the Great Pyramid that shares jurisdiction with San Pedro (see illustration 11)[82].

SAN PEDRO CHOLULA MUNICIPAL PLANS

MUNICIPAL PLAN (H.Ayuntamiento San Pedro Cholula, 2008-2011)

During the elaboration if the municipal plan of 2008-2011, the PRI party was still ruling San Pedro. In comparison with the same administrative period of San Andrés, the plan does not consider urban development as a primary area or strategic sector to study, though it does mention the need to seek for economic resources from the Federal Government for land use planning. Furthermore, the plan emphasizes de need of building infrastructure and public services to the population. It considers the necessary actions to convert San Pedro in *Pueblo Mágico*.

MUNICIPAL PLAN (H.Ayuntamiento San Pedro Cholula, 2011-2014)

The priorities of the municipal plan of 2011-2014 focused on tourism. Just as San Andrés, San Pedro received the recognition of *Pueblo Mágico* in 2011. This achievement was one of the Governor Rafael Moreno Valle's goals, being accomplished in a time when the Mayors of San Pedro, San Andrés and the Governor of the State of Puebla were representatives of the same political party.

The topic on urban development is mentioned in the Axis 5 priority as "urban infrastructure and environment". The plan identifies the need on upgrading the land uses map, including a modification for the extension of land use destined for industry, commerce and services, as a strategy to consolidate San Pedro as an economic pole for investment. It also recognizes the need for developing a sustainable spatial planning, through upgrading the construction regulations and the establishment of technical regulations for the housing development and gated communities.

Concerning rural development, the plan does not present an innovation compared to the other plans, since it limits to mention the need to support the farmers and the local production, without deepening in the issue nor suggesting the protection of the rural areas, aside from the Zapotecas Hill which is a "green lung" in San Pedro Cholula and is protected as conservation area

MUNICIPAL PLAN (H.Ayuntamiento San Pedro Cholula, 2014-2018)

The Municipal Plan of 2014-2018 presents a new scope in political matters, due to the change in the ruling political party and the extension of the three years administration period into a fourth year period for electoral purposes.

Noteworthy, this plan made an effort of taking into consideration citizens' participation through community forums. Furthermore, it is the first plan to recognize in its diagnose the rural vocation of Cholula and the need to protect the agricultural activities, acknowledging that most of the territory of San Pedro is still farmable and the urban expansion is not as aggressive as in San Andrés.

The diagnosis recognizes the lack on planning regulations and implementations and suggests the upgrading of the Municipal Sustainable Urban Development Program. These actions should be followed in two priority areas:

1) The Axis 1 in institutional development where a Municipal Planning Institute should be created and the urban development program should be updated.

[82] This project is not considered in the Municipal Plan of both towns and expects to change the agricultural land use of the archeological area into entertainment, restaurants, artificial lakes and concrete squares, breaking the traditional landscape and vocation of the place.

2) The Axis 4 in urban and environment development which considers the update of the land use map - not updated in the former administration - and the creation of a mechanism that allows citizens to report the violations to the regulations of land use and construction.

The municipal plans should be an important mechanism of planning and control, as well as a ratification of the real compromises of the public administrations –rather than focusing on electoral promises.

The analysis of the plans of San Andrés and Cholula reveals the development priorities of the two noted administrations as it is show in the Table §0.

Table 31 Priority actions of municipal plans and programs, Source: author

PRIORITY AREA	SAN ANDRÉS	SAN PEDRO
SPATIAL PLANNING AND URBAN DEVELOPMENT	- Upgrade of official land use map for taxes - Development of gated communities for middle-residential housing - Low-middle density - Construction of new roads - Control of Angelópolis district territory - Infrastructure construction	- Upgrade of official land use map for control and planning - Development of industrial, commerce and services sector - Regulation of housing construction and gated communities - Preservation of the urban image - Infrastructure construction - Develop unused land in the urban core
RURAL DEVELOPMENT	- Support to farmers' local production through national programs like PROCAMPO, OPORTUNIDADES.	- Support farmers' local production through national programs. - Protection of natural areas

The vision of a stronger spatial development is not well comprehended by the municipal plans, neither at a regional nor a local scale. As it is shown in Table 30, the priorities in both administrations are taxation and infrastructure rather than applying control mechanisms for urban land management and protection of rural areas.

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