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EVALUACIÓN Y PROYECTOS

REGIONAL NOTEBOOK

*Agricultural Change, Population, and labor
in the Zapotlán Valley*

*Agustín Escobar Latapí / Elisa Alejandra Martínez Rubio /
Michelle Judd de la Luz*

1



Farmworkers in Mexico's Export Agriculture

Regional Notebook 1

**Agricultural Change, Population and Labor in the
Zapotlán Valley**

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Agustín Escobar Latapí
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Regional Notebook Series 1

Agricultural Change, Population and Labor in the Zapotlán Valley

Agustín Escobar Latapí, Elisa Alejandra Martínez Rubio, and Michelle Judd de la Luz

Our regional studies series analyzes interactions between agricultural development and social dynamics in specific Mexican regions.

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The findings, conclusions and recommendations presented in this report are those of the author(s) alone, and do not necessarily reflect the opinions of the sponsors.

2023



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Abbreviations

AHIFORES: Alianza Hortifrutícola Internacional para el Fomento de la Responsabilidad Social. International Horticultural Alliance for the Promotion of Social Responsibility

CDI: Comisión Nacional para el Desarrollo de los Pueblos Indígenas. Commission for the Development of Indigenous Peoples. Renamed as INPI in 2019 (National Institute of Indigenous Peoples).

CEA Jalisco: Comisión Estatal del Agua Jalisco. Jalisco State Water Commission.

CELADE: Centro Latinoamericano y Caribeño de Demografía. Latin American and Caribbean Demographic Centre.

CEPAL: Comisión Económica para América Latina y el Caribe de las Naciones Unidas. Economic Commission for Latin America and the Caribbean.

CIESAS: Centro de Investigaciones y Estudios Superiores en Antropología Social. Center for Research and Higher Studies in Social Anthropology.

CONAGUA: Comisión Nacional del Agua. National Water Commission.

CONAPO: Consejo Nacional de Población. National Population Council.

CONEVAL: Consejo Nacional de Evaluación de la Política del Desarrollo Social. National Council for the Evaluation of Social Development Policy.

COVID-19: 2019 Coronavirus Disease.

CUO: Clasificación Única de Ocupaciones. Unique Classification of Occupations.

EAP: Economically Active Population

IIEG: Instituto de Información Estadística y Geográfica. Institute of Statistical and Geographic Information.

IMSS: Instituto Mexicano del Seguro Social. Mexican Social Security Institute.

INEGI: Instituto Nacional de Estadística y Geografía. National Institute of Statistics and Geography.

INPC: Índice Nacional de Precios al Consumidor. National Consumer Price Index.

INSABI: Instituto de Salud para el Bienestar. Institute of Health for Well-being.

ISSSTE: Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado. Social Security Institute for State and Civil Service Workers.

JORNAMEX: Jornaleros en la Agricultura de Exportación. Farmworkers in Mexico's Export Agriculture.

PEMEX: Petróleos Mexicanos. Mexico's State Oil Company.

RNJJA: Red Nacional de Jornaleros y Jornaleras Agrícolas. National Network of Farm Worker Men and Women.

SDN: Servicios de Salud para la Defensa Nacional. Health Services for the Armed Forces.

SIACON: Sistema de Información Agroalimentaria de Consulta. Agrifood Information System.

SIAP: Servicio de Información Agroalimentaria y Pesquera. Agri-food and Fisheries Information Service.

SINCO: Sistema Nacional de Clasificación de Ocupaciones. National Occupational Classification System.

SM: Servicios de Salud para la Marina. Health Services for the Navy.

SPSS: Sistema de Protección Social en Salud. Social Protection System in Health.

SSA: Secretaría de Salud. Secretariat of Health.

TPT: Taxis, Praxis, Telos, Evaluación y Proyectos [TPT Consultants].

U.S.: United States of America.

USMCA: USMCA: North American Free Trade Agreement/United States-México-Canada Agreement. United States-México-Canada Agreement.

PRESENTATION

Over the past century, Mexico has become an agricultural powerhouse providing a wide range of fresh fruits and vegetables to consumers in Mexico, North America and beyond. As the sector has grown, so too have concerns regarding the treatment of the workers who plant and harvest these products. Some Mexicans of working age, with little formal education, and limited employment prospects, migrate from southern Mexico to communities in the central and northern parts of Mexico where the agricultural boom has led to labor shortages and thus opportunities for low-skilled workers. While many earn a respectable living, others are subject to exploitation. The working conditions of Mexico's agricultural sector have long been a concern of activists and policy analysts in Mexico and the United States. In fact, the increased focus on labor conditions was an important driver for the inclusion of labor in the formal text of the United States-Mexico-Canada Agreement (USMCA) that entered into force on July 1st, 2020. Further, Mexico undertook major reforms of its labor laws, regulations and practices, which are strongly supported by the López Obrador administration. Trade agreements and domestic reforms are critical aspects of efforts to improve labor conditions but are truly only effective if they are implemented on the ground. This requires an assessment of wages and benefits including access to livable accommodations. Such analyses are often conducted at a national or state level and may miss pockets of abuse or mistreatment and overlook distinctions between, for example, conditions on farms producing for export and farms whose products are consumed in Mexico.

To provide a more granular picture of the history of Mexican agriculture and assess the current labor conditions among those working on farms for export and domestic production, the Woodrow Wilson Center, TPT Evaluación y Proyectos [TPT Consultants], and the Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS) [Center for Research and Higher Studies in Social Anthropology] have carried out a regional study of the Zapotlán Valley. We are pleased to publish *Agricultural Change, Population and Labor in the Zapotlán Valley*, a study that describes the development of one of Mexico's most productive agricultural regions and assesses the conditions of the current agricultural workforce. Through demographic and economic analysis, a clear understanding of the relevant provisions of Mexican law, a specially developed survey, interviews and visits to the homes and workplaces of current workers, the authors provide a comprehensive analysis of the labor conditions for agricultural workers in this region. In doing so, they hope to have contributed to enhanced understanding of the nuances and complexities of Mexico's agricultural sector, including significant differences between formal and informal workers.

TPT, CIESAS and the Mexico Institute are grateful for the financial support of the WalMart Foundation, without which this report could not have been completed, and to everyone, in the research team and in Jalisco, who contributed with their work or their life experiences.

Andrew I. Rudman
Director, Mexico Institute
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EXECUTIVE SUMMARY

“Farm Workers in Mexico’s Export Agriculture” is a study funded by the Mexico Institute at the Wilson Center, the Walmart Foundation, and the H.G. Buffett Foundation. The research team is based at CIESAS and TPT, in Guadalajara. Its goal is to provide an independent, accurate and rigorous description of working conditions in Mexico’s export agriculture, and to explain how these conditions have evolved in different Mexican regions. Our regional studies are based on large surveys of formal and informal workers, as well as on anthropological fieldwork. We acknowledge the logistical support of farm export associations, from which we derive random formal worker samples. Our informal worker samples are derived from on-site anthropological work.

With this Regional Notebook we launch a series of regional studies providing in-depth description and analysis of the social changes taking place in regions where export agriculture has been particularly dynamic for the past two decades. At their core, these studies ask the following questions: are labor conditions in export agriculture complying with Mexican legal standards? Is social change taking place in these regions mainly positive or not? What are the conflicts and tensions arising from this economic, demographic and social change?

Regional Notebook #1, on the Valley of Zapotlán, derives from work carried out during the most restrictive months of the COVID-19 pandemic. Therefore, most of the analysis is based on sources that could be accessed from researchers’ homes. In-person fieldwork was extremely short, and complied with prevailing protocols. Later regional studies benefitted from longer periods of in-person fieldwork.

Southern Jalisco was a region showing remarkable economic development during the late XIX Century. However, starting in 1890 or so, it began to lag behind other, more urban, regions of the state of Jalisco. It consistently lost population, and economic growth was very low, in spite of hosting a few large agro-industrial firms. Starting in the late 1990’s, however, stagnation ended and growth resumed. At the core of this growth was the arrival of large companies exporting tomatoes—in the Valley of Sayula—, berries, and avocados. Since then, the value of crops harvested and sold has multiplied roughly 8 times. Cereals and animal feed have been abandoned, and high-value, labor-intensive, high-productivity crops have taken their place.

The Valley’s population used to exhibit, until 1990, substantial emigration of mostly males in their twenties. This emigration included substantial undocumented emigration to the U.S. Since then, emigration has fallen substantially. Although we believe that the 2010 and 2015 population sources do not capture the entire migrant farm worker population, the presence of immigrants from Guerrero, Chiapas and other southern states is increasing, as is the population speaking indigenous languages.

In the two municipalities we examined, the percentage of the population working in the primary sector has increased in recent years. In the more rural municipality, farm workers doubled their share of the Economically Active Population (EAP) in five years. This reversed



previous tendencies. In spite of this, however, the population declaring access to social security health services has also risen. In other words, the Valley's "primarization" has been accompanied by increasing job formality. In seven years, the number of the Instituto Mexicano del Seguro Social (IMSS) [Mexican Social Security Institute] affiliated workers rose by 79% in Gómez Farías and 58% in Ciudad Guzmán. In the more rural municipality, affiliation rose from 7 in 2012 to 202 in 2019, while in Ciudad Guzmán the change is from 5,893 to 14,338. While workers acknowledge it isn't worthwhile to lose a day's work to attend the IMSS clinic when they have a cold, they report using it for major illnesses, or during pregnancy.

Multidimensional poverty, and extreme poverty in particular, has fallen in both municipalities since 2015, as have a number of deprivations: food, household services, social security, or access to health in general. Moderate poverty increased slightly in Guzmán, however. Our 2019 survey showed farm workers in berry-exporting companies earned wages equivalent to 2.3–2.6 times the 2019 minimum wage, and they reported basic benefit coverage of 94–96%, except for child care and access to the housing fund, which were very low.

A number of local leaders expressed their opinions concerning the growth of export agriculture. To some, the growth in farm worker jobs meant importing poverty from poorer regions in Mexico, and, to them, Zapotlán would do better without "10,000 minimum-wage jobs". Others pointed at a number of rising costs, particularly rents, which were driving out poor local Zapotlanenses from their houses in town. Town officials had a more mixed message: while the jobs were good, and better on average than previously, Ciudad Guzmán had difficulty financing more services, particularly for low-earners, since they did not contribute substantially to the municipality's tax fund. High-ranking officials in the local university also stated that the plastic tunnels sheltering berries not only polluted visually, but also contributed to rising temperatures, and to silt build-up in Zapotlán's lake.

In sum, a number of indicators relating to income, economic growth, poverty, and social security have been improving, largely as a result of the growth of export agriculture. Nevertheless, this growth has not been without tensions. Working with local society to provide satisfactory answers to these questions is, in our opinion, necessary.



INTRODUCTION

The concept of region is characterized by multiplicity and change. Among the diverse elements that contribute to configuring a specific geographic space into a region are the productive systems that serve as linkages to define and organize it (De la Peña, 1999). In the Zapotlán Valley, located in the heart of the southern region of Jalisco,¹ the productive system has been structured around agricultural activity. In “Evolución agrícola y poder regional en el sur de Jalisco” (1980), Guillermo de la Peña describes how the role of agriculture has been fundamental to the economic development of the region since the seventeenth century, when the haciendas provided the region with an internal market that allowed for its organization and development. Because of their economic and social importance, the haciendas also generated relationships in other areas. De la Peña defines these relationships as “dynamic nuclei of production,” which offered the needed products and services for the territory’s major economic activities.²

In southern Jalisco, space was organized by the hacienda system through the mid-twentieth century, until it was replaced by an agroindustrial model dedicated to the production of sorghum, corn, and sugar cane (De la Peña, 1980; Escobar-Latapí & González-de la Rocha, 1988). The change in agricultural production was a consequence of the social and economic transformations in Mexico at the time, including the end of the Revolution and the Cristero War, land reform, the creation of new transportation networks, the consolidation of the state, and the integration of a national market. In the Zapotlán Valley these changes reduced the options for agriculture to seasonal corn and vegetables planted at the foot of the lake (De la Peña, 1980; Escobar-Latapí & González-de la Rocha, 1988), resulting in economic stagnation. Years later, the situation changed with the introduction of hybrid varieties of corn and sorghum that adapted to the soil³ and allowed for investment in fodder and sugar cane (De la Peña, 1980). These were the characteristic crops in the Zapotlán Valley until a decade ago. In recent years they have been displaced by an agroindustrial model dedicated to the production of berries and avocados for export.

1 The Zapotlán Valley is bounded by the Tigre and Tapalpa sierras, the Colima volcanos, the basins that form the Tuxpan River, and the Sayula Basin (De la Peña, 1980; Escobar-Latapí & González-de la Rocha, 1988). This geographic space includes the municipalities of Gómez Farías and Zapotlán el Grande. Southern Jalisco is made up of “the Sayula Basin and the Zapotlán Valley, the Tapalpa and Tigre Sierras, and various communicating basins, flanked by the Tigre mountains and the Colima volcanos, that is located southwest of Zapotlán and northeast of the state of Colima” (De la Peña, 1980, p. 40).

2 An example of the dynamic nuclei of production are the sugar mills and mines that supplied the hacienda system in the nineteenth century (De la Peña, 1980). As De la Peña explains, the mills “provided stimulus for the sugar plantations, the production of food for the sugar workers, the construction of roads for transporting the cane, the breeding of draft animals, the collection of firewood for the cauldrons, the forging of cauldrons, the collection of mesquite wood to make plows, the forging of agricultural implements” (1980, p. 48).

3 De la Peña explains that because of its climate and soil type, the Zapotlán Valley is less conducive to agriculture than other parts of the region: “its soils (brown, reddish brown, Chernozem) are less rich or deep than the agricultural area of the Sayula Basin: they have less nitrogen, phosphorous, and magnesium. They are also much more permeable, with a high clay content, and their usual base of quartz contains fissures through which the water drains to deep levels” (1980, p. 42).



The recent development of an agricultural export industry has affected not only agriculture itself, but also other aspects of society and the economy, generating new relationships and ways of organizing the geographical space. According to De la Peña (1980), prolonged agricultural use of a territory can become a project that configures the space as a region. In this article, we argue that the export agriculture that has developed in the Zapotlán Valley in recent decades is the basis for its definition as a microregion. This model has favored socioeconomic changes that are reflected in the population structure, in labor migration, in the structure of employment, in access to social security, and in the indexes of poverty. We analyze from a regional perspective the social change that has been produced by the development of export agriculture in the Zapotlán Valley. We use census data and databases that allow us to compare the years before and after its development. It should be emphasized that a more complete future analysis will have to include the results of the 2020 Census of Population and Housing of the Instituto Nacional de Estadística, Geografía e Informática (INEGI) [National Institute of Statistics and Geography], since this industry only began ten years ago. We also include ethnographic data collected during two periods of fieldwork in southern Jalisco,⁴ which complements the census data and allows us to make comparisons.

The first section analyzes the demographic dynamics of the Zapotlán Valley, which show a clear increase in the population of economically productive age groups. It also presents information concerning migration and the indigenous population of the region. Section two focuses on the agricultural changes and describes the transformation in crops and production. These data show a clear decrease in the production of traditional crops, with ever greater production of berries and avocados. A section on employment structure and economic change provides data on the distribution of the working population, which shows a clear increase in primary sector workers. This section also analyzes enrollment in social security by economic sector. The final section presents a comparative analysis of the 2010 and 2015 Consejo Nacional de Evaluación de la Política del Desarrollo Social (CONEVAL) [National Council for the Evaluation of Social Development Policy] indices of multidimensional poverty, where we describe the impact of export agriculture in the Zapotlán Valley during the past ten years. Its effects on various socioeconomic characteristics of the municipalities in the Valley allow us to argue that industrial export agriculture is a project that organizes the space and configures it as a microregion.

⁴ The fieldwork was conducted for the project “Farm Labor and Mexico’s Produce Industry,” directed by Dr. Agustín Escobar Latapí in collaboration with the CIESAS, and the Wilson Center. The first ethnographic fieldwork period was January-July 2019; the second was carried out during the month of July 2020 in the context of the COVID-19 pandemic. Both periods included interviews with agricultural workers, personnel from the berry companies, and important social actors in the community.



I. POPULATION GROWTH AND MIGRATION

The Zapotlán Valley has an area of 639.18 square kilometers, divided into two municipalities: Zapotlán el Grande with 295.29 square kilometers and Gómez Farías with 343.89 square kilometers (INEGI, 2015). Zapotlán el Grande has 52 localities, and the municipal seat is Ciudad Guzmán.⁵ Gómez Farías has 19 localities, and its municipal seat is San Sebastián del Sur. The land use in Zapotlán is mostly agricultural: 48.5% of its total area. Gómez Farías is 55.4% forest and 34.3% is devoted to agricultural use (IIEG, 2019a, 2019b). Although a large part of the area is used for agriculture, recent decades have seen growing urbanization driven by real estate development following the 1985 earthquake in Ciudad Guzmán (Cabrales-Barajas & Medina-Ríos, 1997). Since then the urban population of the Valley has increased and the rural population has decreased, mainly in the municipality of Gómez Farías. In Zapotlán el Grande the urban population has been nearly constant, with a decrease of one percentage point from 2000 to 2010.

Table 1. Urban and Rural Population in the Zapotlán Valley, 1980-2010

Gómez Farías				
	1980	1990	2000	2010
Urban Population	83%	85%	86%	88%
Rural Population	17%	15%	14%	12%
Zapotlán el Grande				
	1980	1990	2000	2010
Urban Population	98%	98%	98%	97%
Rural Population	2%	2%	2%	3%

Source: Authors' elaboration with data from the 10th General Census of Population and Housing (1980), INEGI; the 11th General Census of Population and Housing (1990), INEGI; the 12th General Census of Population and Housing (2000), INEGI and the 2010 Census of Population and Housing, INEGI.

The urbanization process has been accompanied by a significant increase in population. From 1980 to 2015 the population of the Zapotlán Valley increased by 64%: 34% in Gómez Farías and 69% in Zapotlán el Grande. This increase is seen in the population density: from 1980 to 2015 the density in Gómez Farías increased from 30.87 to 40.4 inhabitants per square kilometer; in the same period the density of Zapotlán el Grande increased from 211.15 to 385.47 inhabitants per square kilometer.

⁵ In 1856 the name of the municipality of Zapotlán el Grande was changed to Ciudad Guzmán (De la Peña, 1980). In 1997 the name was changed back, and the municipal seat kept the name of Ciudad Guzmán.



Table 2. Total Population by Sex in the Zapotlán Valley, 1980-2015

	1980	1990	2000	2010	2015
Total Population in the Municipality of Gómez Farías	10,616	11,699	12,705	14,011	14,278
Male	5,246	5,590	6,051	6,778	6,810
Female	5,590	6,109	6,665	7,233	7,468
Total Population in the Municipality of Zapotlán el Grande	62,353	74,068	86,743	100,534	105,423
Male	30,035	35,704	41,398	48,661	51,215
Female	32,318	38,704	45,354	51,873	54,208
Total Population in the Zapotlán Valley	72,969	85,767	99,448	114,545	119,701
Male	35,281	41,294	47,449	55,439	58,025
Female	37,908	44,813	52,019	59,106	61,676

Source: Authors' elaboration with data from the 10th General Census of Population and Housing (1980), INEGI; the 11th General Census of Population and Housing (1990), INEGI; the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the the 2015 Intercensal Survey, INEGI.

In 2015 the Valley had a total population of 119,701, 58,025 male and 61,676 female, with the majority concentrated in Ciudad Guzmán, with 100,127 inhabitants, according to INEGI (2015). This concentration in Ciudad Guzmán is the result of the economic development of recent decades. The city has become one of the major cities in the state of Jalisco: by 1995 it had become the third-largest city (Cabralles-Barajas & Medina-Ríos, 1997, p. 324). Macías-Macías (2004) calls it one of the state's medium-sized cities, on a par with Puerto Vallarta, Lagos de Moreno, Tepatlán, and Ocotlán. All of these are distinguished from other urban centers by their economic and commercial growth in the past few decades. Ciudad Guzmán has acquired importance in large part because of its strategic geographic position, which connects Jalisco with the neighboring state of Colima, which hosts one of the country's major ports. Although Zapotlán el Grande is characterized by its urban and commercial growth, agriculture continues to be one of the main economic activities of the microregion.

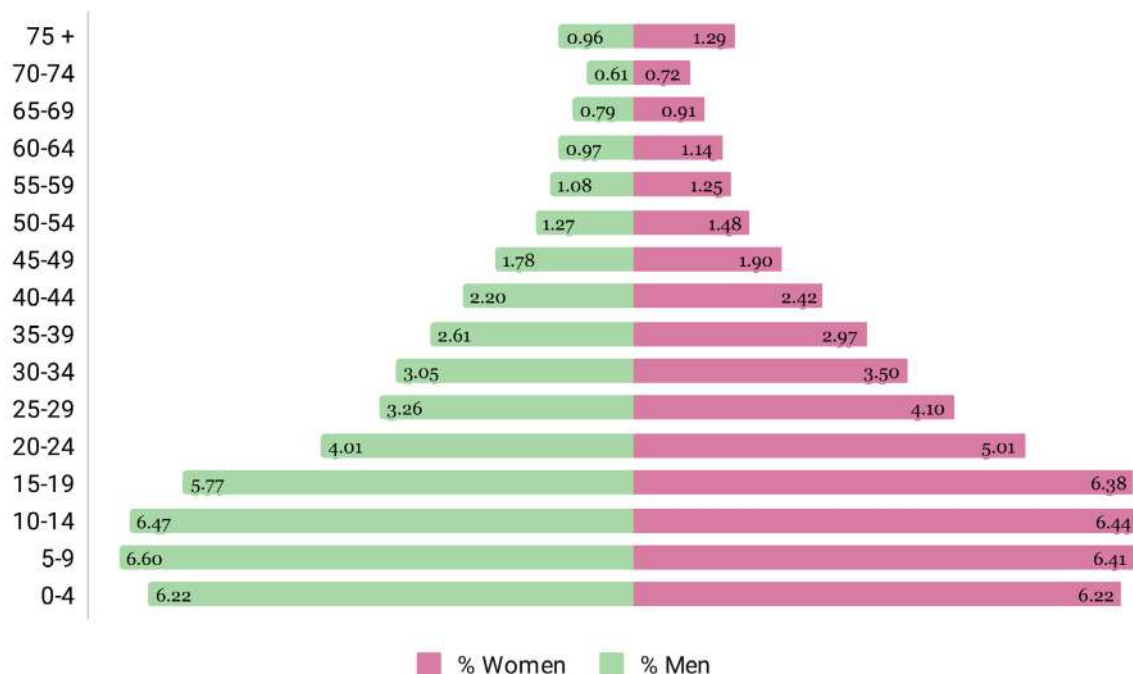
The demographic growth of the past decade has been not only an effect of urban development, but also of the recent emergence of the agricultural export industry of fruits and vegetables. This type of productive development usually attracts labor from other places at the same time that it creates jobs for local workers. The population growth of a municipality not growing fruits and vegetables, in a region still devoted to traditional agriculture, is much less than that in the municipalities of the Valley. One example is Amacueca, 51.9 km from the municipal seat of Zapotlán el Grande, in which the population increased only 15% from 1980 to 2015, a much lower rate of growth than in municipalities that are growing fruits and vegetables. In Tepatlán de Morelos, however, whose municipal seat is also described by Macías-Macías



(2004) as one of the state's medium-sized cities, the rate is greater than in the municipalities of the Valley: from 1980 to 2015, it grew by 80%, 66% more than Amacueca and 11% more than Zapotlán el Grande. The dairy, poultry, and textile industries in Tepatitlán have been in the region longer than the fruit and vegetable industry of southern Jalisco, a sign that the agroindustrial or industrial productive systems developed under the economic model of clusters,⁶ like poultry and textiles, have the effect of increasing the population.

The age and sex distribution in the region has also changed in recent decades. In 2010 there was a marked increase in the population in economically productive age groups, especially aged 20-24 and 25-29, as seen clearly in the population pyramids from 1990 to 2015 (Figures 1, 2, 3, and 4). In this period the bases of the pyramids narrowed and the centers and apexes widened.

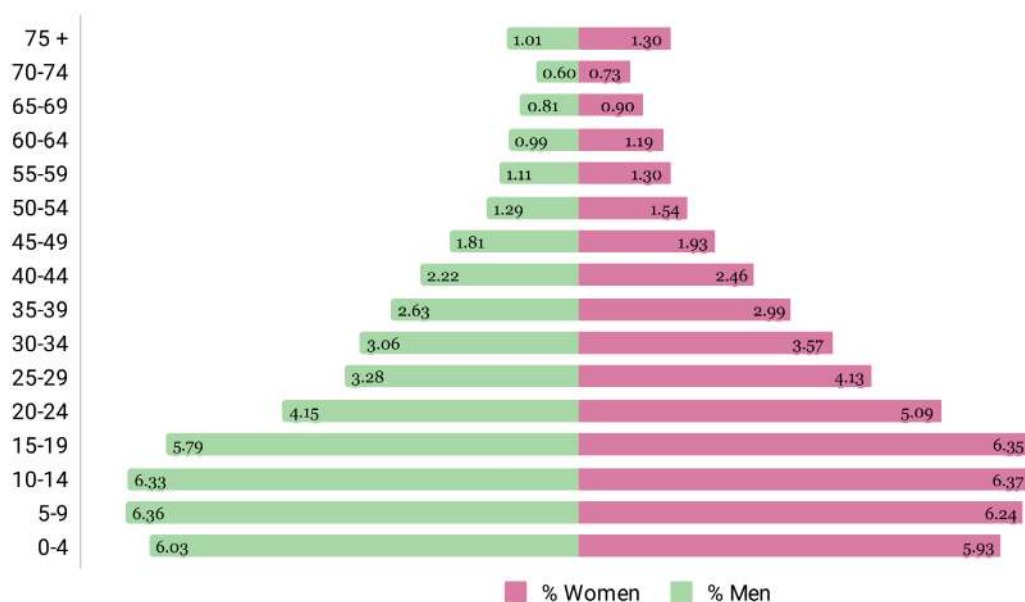
Figure 1. Population Pyramid by Percentage for the Zapotlán Valley Microregion, 1990



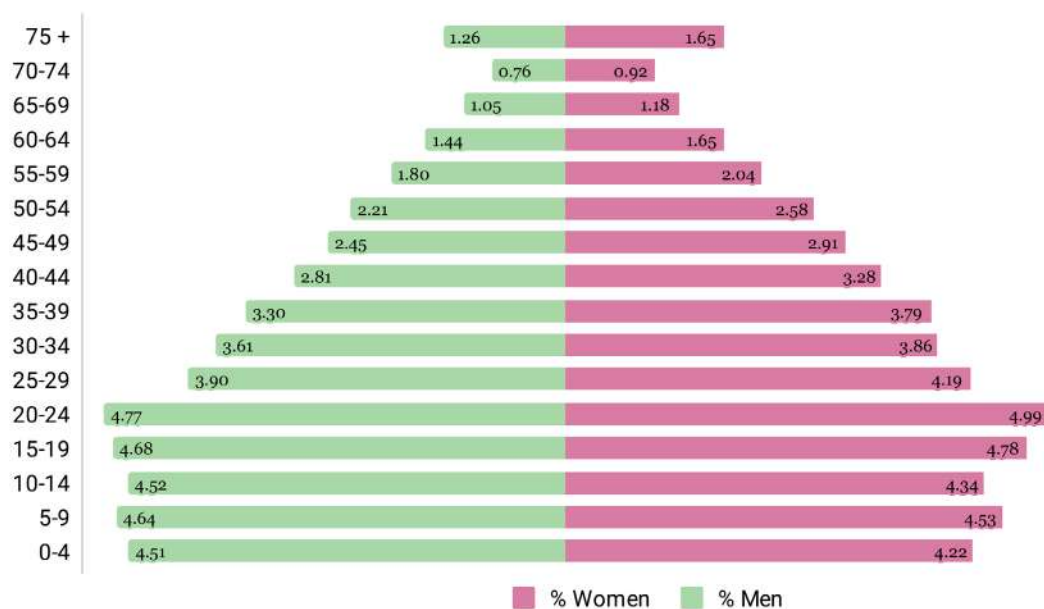
Source: Authors' elaboration with data from the 11th General Census of Population and Housing (1990), INEGI.

6 Alejandro Macías-Macías (2003) returns to Michael Porter's (1999) concept of "clusters," defined as a conglomerate of companies and institutions in related, interconnected sectors that are characterized by cooperation and competition in pursuit of greater levels of development and economic growth within a specific geographic space. These companies and institutions must be capable of incentivizing an intense local competition through the supply of goods and services to other industries, as well as the constant stimulation of innovation and the generation of mature and exacting local demand (Macías-Macías, 2003, pp. 94-95). According to Macías-Macías, there were five clusters in Zapotlán el Grande at the beginning of the twentieth century: dairy, lumber, corn, tourism, and medical services.



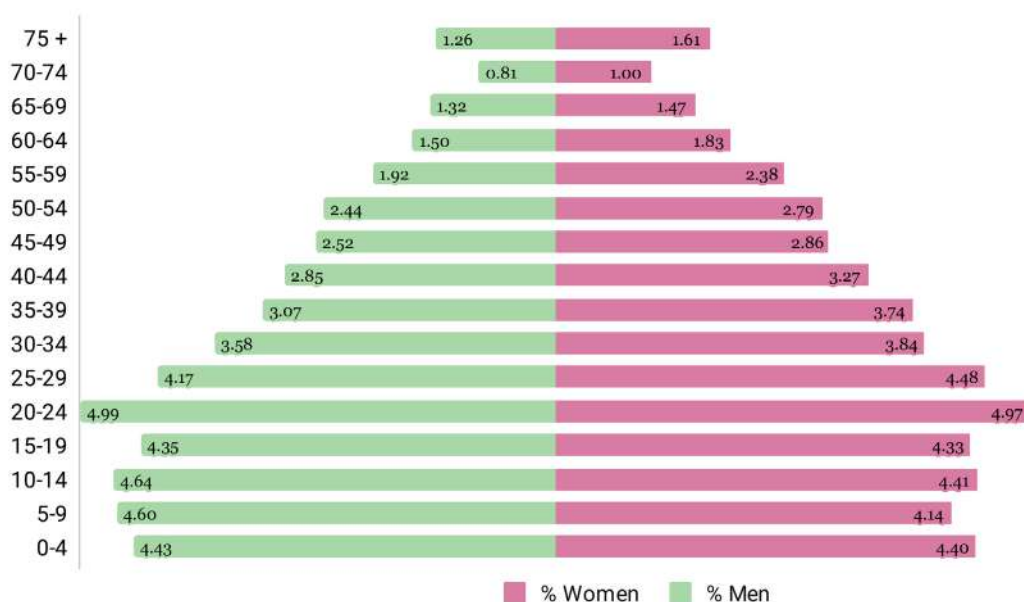
Figure 2. Population Pyramid by Percentage for the Zapotlán Valley Microregion, 2000

Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI.

Figure 3. Population Pyramid by Percentage for the Zapotlán Valley Microregion, 2010

Source: Authors' elaboration with data from the 2010 Census of Population and Housing, INEGI.



Figure 4. Population Pyramid by Percentage for the Zapotlán Valley Microregion, 2015

Source: Authors' elaboration with data from the 2015 Intercensal Survey, INEGI.

As can be seen in these figures, the 1990 population pyramid is progressive, with a wide base that narrows in the older groups. The 2015 pyramid, however, begins to take the form of a rhombus. In 1990 the population was predominantly young, with a high proportion of children and adolescents, the product of high birth and death rates. In 2015, there was a decline in these age groups, with a notable increase in the population of older adults. The dependence index,⁷ the ratio between the inactive population —defined as people younger than 15 or older than 64— and the theoretically active population, was 78% in 1990, but had fallen to 52% in 2015. Although not all of the inactive persons were outside the labor market,⁸ this indicator allows us to see an increase or decrease over time. Even though the dependence index decreased from 1990 to 2015, the population aged 65 and older increased, a dynamic that can be seen in the composite pyramid that compares data from 1990 to 2015 (Figure 5), where the bars representing older adults are widened.

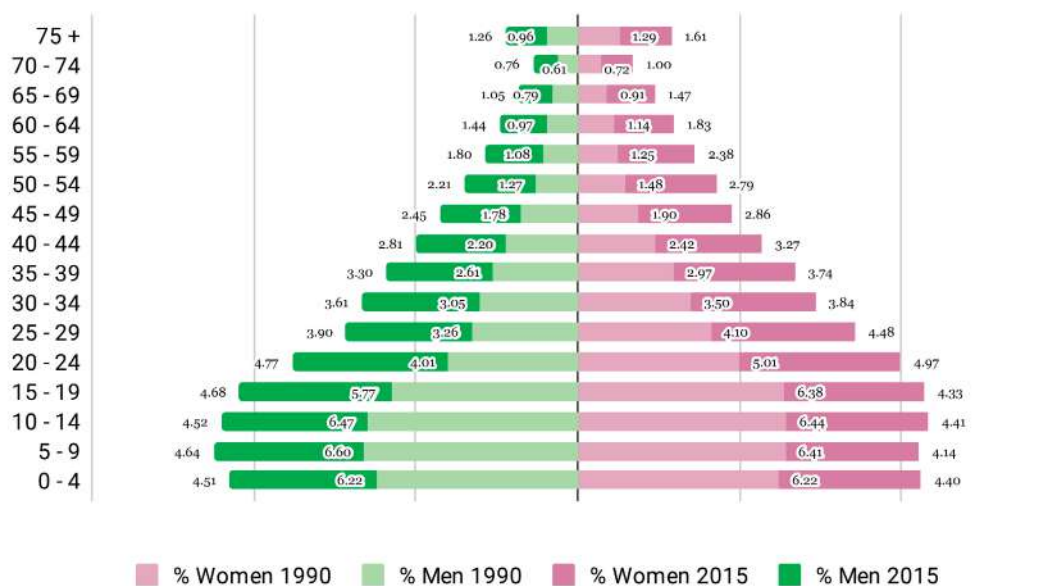
⁷ The dependence index or ratio “measures the population in ‘theoretically’ inactive ages relative to the population in ‘theoretically’ active ages” (CELADE, s.f.). The calculation is made by dividing the total population aged 0-14 or 65 and older by the total population aged 15-64, and multiplying by 100. This index expresses a potential relationship of dependence, since not all of those defined as economically inactive are actually outside the labor market. Indeed, there are cultures and communities in which family labor is part of social reproduction.

⁸ For example, child labor was previously common in the agricultural sector. The industrial export agriculture in the region now prohibits the hiring of minors, but it also employs workers older than 65, which was not previously a practice (Escobar et al., 2019).



From 1990 to 2015 the proportion of persons older than 60 increased from 7% to 10%. The rate of aging⁹, which describes the ratio of older adults to children and young people, shows a notable increase in the older population. In 1990 it was 19%, meaning that for every 100 persons younger than 15 there were 19 adults older than 60; this figure doubled by 2015 to 41%.

Figure 5. Population Pyramid Based on Percentages for Zapotlán Valley, 1990–2015



Source: Authors' elaboration with data from the 11th General Census of Population and Housing (1990), INEGI, and the 2015 Intercensal Survey, INEGI.

The decline in children and adolescents is a more accelerated process than the increase in older adults, a result of the decline in fertility on a national level as a consequence of the demographic transition.¹⁰ This decline is corroborated by an analysis of the total fertility rate for women in the Zapotlán Valley,¹¹ which was 3.6 in 1990 and declined to 2.1 by 2015.¹² The age ranges 20-24 and 25-29 were those with the greatest increase in the last decade, which suggests changes in the patterns of migration. The state of Jalisco has had a strong tradition of migration to the

⁹ The rate of aging is calculated by dividing the population older than 60 by the population aged 0-14 and multiplying by 100.

¹⁰ This process refers to the demographic change in which birth and death rates decline. In Mexico the first phase was from 1945 to 1960, a period in which death rates declined but birth rates increased. The second phase began in 1970 with the decline in fertility. The third phase is a convergence of birth and death rates; it is projected to take place in the second half of the twenty-first century (Partida-Bush, 2005).

¹¹ The total fertility rate is the average number of children a woman will have during her reproductive life.

¹² The 1990 total fertility rate was obtained from data from the 11th General Census of Population and Housing (1990). The 2015 rate was calculated by adding the specific fertility rates of five-year age ranges for women aged 15-49, multiplied by five, for women usually residing in the municipalities of Gómez Farías and Zapotlán el Grande. This calculation was based on the definition of the Sistema de Indicadores Sociodemográficos de Poblaciones y Pueblos Indígenas (SISPPi) [System of Sociodemographic Indicators of Populations and Indigenous Peoples] (CELADE, s.f.).



United States since the first half of the twentieth century. The 2010 index of migratory intensity of the Consejo Nacional de Población (CONAPO) [National Population Council],¹³ classifies the state as high intensity; it is above the national average for the four indicators used by CONAPO. Migration became a highly important phenomenon in the second half of the twentieth century, a consequence of the lack of employment opportunities in the region (De la Peña, 1980). An analysis of the number of persons living outside the state or country for five years prior to each census confirms the persistence of this dynamic of migration (Table 3).

Table 3. Residents of Same State Versus Other State or Country Five Years Ago, by Census Year

	Residents of Same State 5 Years Ago	Residents of Other State or Country 5 Years Ago	Residents of Same State 5 Years Ago	Residents of Other State or Country 5 Years Ago	Residents of Same State 5 Years Ago	Residents of Other State or Country 5 Years Ago	Residents of Same State 5 Years Ago	Residents of Other State or Country 5 Years Ago
Municipality	1990	1990	2000	2000	2010	2010	2015	2015
Gómez Farías	9,848	176	10,848	284	12,135	310 ¹	12,587	232
Zapotlán el Grande	62,514	2,257	74,881	2,212	87,360	2,841 ²	92,246	3,522
Total	72,362	2,433	85,729	2,496	99,495	3,151	104,833	3,754

Source: Authors' elaboration with data from the 11th General Census of Population and Housing (1990), INEGI; 12th General Census of Population and Housing (2000), INEGI; 2010 Census of Population and Housing, INEGI; and the 2015 Intercensal Survey, INEGI.

¹ Of the total number of persons resident outside the state, 125 lived in another state, 184 lived in the U.S., and one lived in another country.

² Of the total number of persons resident outside the state, 1,745 lived in another state, 1,050 lived in the U.S., and 46 lived in another country.

Data from the 2010 census are sufficiently disaggregated to determine the number of people who lived in the U.S. five years before. Of the 310 persons in Gómez Farías who lived then in another state or country, 184 lived in the U.S.; of the 2,841 in Zapotlán el Grande, 1,050 lived in the U.S. From 2010 to 2015, the number of residents of Gómez Farías living outside the state or country declined by 25%, which could be related to the development of export agriculture and the new sources of employment it has generated in the region in recent years. Previously, the main employment options were in the commercial cultivation of sugar cane, corn, and

13 CONAPO's index of migratory intensity "considers the demographic and socioeconomic dimensions of international migration, and is a summary measurement that allows for the differentiation between the country's states and municipalities according to the intensity of different modalities of migration to the U.S. and the receipt of remittances" (CONAPO, 2012, p. 27). The estimation of the indices published in 2012 was carried out based on a sample of ten percent of the 2010 Census of Population and Housing, using information from the extended questionnaire. The unit of analysis is the household, and four characteristics are considered: households that receive remittances, households with emigrants to the U.S. during 2005-2010, households with emigrants to the U.S. who also returned to Mexico during that same period and continued to live there until the day they were counted (circular migrants), and households with migrants who lived in the U.S. in 2005 but returned to Mexico before the 2010 census was taken—return migrants—(CONAPO, 2012).



tomatoes, all of which were characterized by low wages, casual employment, and informal hiring. Men chose to migrate in search of other jobs, as in the case of Carlos:

Carlos is a 45-year-old farmworker currently employed as a security guard, fumigator, and picker in one of the berry fields in the region. He began working at the age of 15 as a casual worker growing tomatoes in Sayula. When he formed his own household and increased the number of his dependents, the wages he earned in the tomato fields were not enough to pay his household expenses. Worries about having enough food and the long workdays in the fields caused serious family problems. For this reason, in 2006 Carlos decided to look for a better job in the U.S. There he worked as a gardener and cleaner. A year after he went to the U.S., Carlos made a visit to Jalisco and learned that people were being hired to work in the berry fields that had recently begun to operate in the region. Since then he has worked in different companies dedicated to this crop. This job has provided him with better wages and working conditions than previous jobs, including in the U.S. With the wages Carlos earns in the berry fields he has been able to support his family without having to leave the region (Case study of Carlos, compiled by Michelle Judd).

The phenomenon of migration is directly related to the employment opportunities available in an area. When there are few employment options, people leave their homes to look for other sources of income, reducing the availability of labor. However, when an area has an economic activity with a significant need for labor and that offers better wages, there is migration to that place, as is the case in southern Jalisco.

The berry and avocado crops in southern Jalisco have become an employment option for the people of the region. As a new option in the agricultural labor market, its development could play a role in reducing migration to the U.S. The difference between the CONAPO index of migratory intensity in 2000 and in 2010 suggests an important reduction in migration from the Zapotlán Valley to the U.S. This index measures the number of households that receive remittances and those that report emigrants to the U.S., circular immigrants, and return immigrants. It shows that the degree of migratory intensity has remained steady in Gómez Farías, where it is medium-level, and in Zapotlán el Grande, where it is low.¹⁴ However, all of the indicators have declined except return migration, which has increased. In Gómez Farías the indicators with the greatest decrease are households with emigrants to the U.S., which fell from 8.32% to 4.60%, and circular migrants, which fell from 2.24% to 0.42%. In Zapotlán el Grande the percentage of households with emigrants to the U.S. showed a greater decrease, a reduction of 4.82 percentage points. These figures mean that fewer people are leaving for the U.S. and more are returning to their places of origin. The reduction in migration allows us to posit that jobs growing berries and avocados are retaining local labor, though we also cannot overlook other factors affecting migration, such as increased prison terms, greater border vigilance, and the presence of organized crime.

¹⁴ The degrees of migratory intensity in the municipalities of the Valley are also a reflection of the greater opportunities for employment in Zapotlán el Grande, given its urban development.



Table 4. Index of Migratory Intensity, 2000 and 2010

Municipality	Total Households ¹		% Households Receiving Remittances		% Households with Emigrants to U.S. in the Previous 5 Years		% Households with Circular Migrants in the Previous 5 Years		% Households with Return Migrants in the Previous 5 Years		Degree of Migratory Intensity
	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	
Gómez Farías	2,766	3,566	8.46	8.20	8.32	4.60	2.24	0.42	3.00	4.75	Medium
Zapotlán el Grande	21,057	24,733	6.54	3.51	5.80	0.98	0.93	1.23	1.14	2.11	Low

Source: Authors' elaboration with data from the 2000 and the 2010 Index of Mexico-U.S. Migration of the CONAPO (2002, 2012) and the indexes by state and municipality of the CONAPO (2017).

¹ Total number of households in the political-administrative unit; may be greater than or equal to the denominator used for the calculation of each indicator.

Export agriculture has not only had an impact on migration from Mexico to the U.S.; it has also generated new currents of internal migration. The literature on agricultural markets has demonstrated that regions with significant industrial agriculture receive a large number of farmworkers every season from other parts of the country (Lara-Flores, 2006, 2012; Rojas-Rangel, 2017; Sánchez-Saldaña 2001). The Zapotlán Valley is no exception, as noted by Escobar et al., (2019). During the harvest, workers arrive in this region from other parts of the country, mainly from Chiapas, Guerrero, Oaxaca, Tabasco, and Veracruz. This dynamic is visible in the CONAPO data (2017) for the category of municipal migration.¹⁵ In 1995-2000, Zapotlán el Grande had a high level of emigration. By 2005-2010 it was in a state of equilibrium, with emigrants leaving and people arriving from other parts of the country. Gómez Farías, however, went from a medium to a high level of emigration, first, because most of the housing for temporary agricultural workers is located in Ciudad Guzmán, and second, because the expansion of the berry fields arrived there later. Data from the Servicio de Información Agroalimentaria y Pesquera (SIAP) [Agriculture and Fisheries Information Service] show that in 2011 only two hectares of blueberries were planted there; it was not until 2015 that the area dedicated to this crop began to increase. With these data we suggest that the development of export agriculture has affected migration in this region. It has become a new source of employment, one that has reduced migration to the U.S., and it has also generated a dynamic of labor migration that is attracting young people at economically productive ages to work in the berry fields and avocado groves. The growth of this labor market explains the increased numbers in productive age groups: young people from the area stay to work in the region, and men and women arrive from other states to work in the Zapotlán Valley.

Among the latter are the workers who come from the foothills of Guerrero. In their testimonies these workers say that the main economic activity in their communities is agriculture: the planting of corn, beans, squash, and chickpeas, mainly for their own consumption. They plant their own fields and sometimes "rent" themselves as laborers for a wage that varies from 80 to 120 pesos a day. The lack of employment and low wages force them to migrate to the

¹⁵ These data reflect the dynamics of internal migration in Mexico.



U.S. or to other states in Mexico in search of subsistence. Among the states they migrate to are Sonora, Sinaloa, Baja California, and Michoacán, where they work at temporary jobs in the cultivation of tomatoes, grapes, and chiles. A little more than five years ago they also began to migrate to Zapotlán el Grande to work in the berry fields. In recent years, berries and tomatoes have become one of the major sources of employment for people from these communities. One farm worker says that in his town “half go to Sinaloa and the other half come to Jalisco” (Interview with Ramiro, July 18th, 2020). Among the many cases is Alberto, who migrated from Guerrero to Ciudad Guzmán in 2016:

Alberto is a young man, 25 years of age, from Pantitlán, a small town in the foothills of Guerrero. When he was very young he began work in the family's field and as a laborer in the corn fields. After much sacrifice he finished high school and entered a technical training program in Chilpancingo in the hope of finding better employment opportunities.

To pay for his studies Alberto worked at a convenience store and in a tortilla shop, jobs where he earned a weekly wage of 800 pesos. When he finished he worked in different auto shops, earning a weekly wage of 1200 pesos. He had no formal contract or benefits in any of these jobs. In 2016, when he was 21, an uncle invited him to work in the berry fields in southern Jalisco. Together with 11 others from Pantitlán—including his uncle, his girlfriend, his sister-in-law, and five cousins—he traveled to Zapotlán el Grande. Since then, he has worked for the same company, and he returns to Guerrero only to visit family and friends. He says he has better wages and benefits in Zapotlán el Grande, which would be difficult to find in Guerrero (Case study of Alberto, compiled by Elisa Martínez).

The testimonies of the farm workers arriving in Jalisco make constant reference to the lack of employment options and the low wages in their communities of origin. The situation is more critical for women, whose only options are working in the family field or in the home. The fields of Jalisco have become one of the destination points on the migratory routes of farm workers, and a better option even than other areas dedicated to export agriculture, like the tomato fields of Sinaloa or the vineyards of Sonora. Many of the farm workers who previously migrated to fields in the north or in the U.S. now choose to stay and work in the Zapotlán Valley.

The agricultural workers arriving from other states include those from indigenous groups (Escobar et al., 2019). According to the Comisión Nacional para el Desarrollo de los Pueblos Indígenas (CDI) [Commission for the Development of Indigenous Peoples],¹⁶ in 2015 0.4% of the population of the Zapotlán Valley were indigenous people aged five years

¹⁶ Data for the indigenous population are obtained using the methodology of the System of Information and Indicators for the Indigenous Population of Mexico of the CDI, which is based on “identification of the indigenous household and the quantification of the population based on the number of household members” (CDI, 2016). “The concept of the indigenous household is defined as one where the head of the household, spouse, mother, father, stepmother, stepfather, grandfather, grandmother, great-grandfather, great-grandmother, great-great-grandfather, great-great-grandmother, father-in-law, or mother-in-law indicates that they speak an indigenous language. All of the household members are counted as indigenous even if they do not speak an indigenous language. To supplement the quantification of the indigenous population in indigenous households, the number of speakers of indigenous languages that do not form part of these households is added” (CDI, 2016).



or older. This figure corresponded to 463 people, 67 in Gómez Farías and 396 in Zapotlán el Grande. The majority of indigenous people were in the age range of 15 to 64 years, that is, in the economically productive age group. We interpret these data to mean that part of this population is not originally from the area, but consists of people who have come from other parts of the country to work in the region.

Table 5. Distribution by Age and Sex of the Indigenous Population in the Zapotlán Valley

Municipality	Total		Total	Male			Total	Female		
	2015 Indigenous Population	%		0-14 years	15-64 years	65+ years		0-14 years	15-64 years	65+ years
Gómez Farías	67	0.5	32	10	22	-	35	13	21	1
Zapotlán el Grande	396	0.4	210	22	179	9	186	31	146	9
Total	463	0.4	242	32	201	9	221	44	167	10

Source: Authors' elaboration with data from Socioeconomic Indicators for the Indigenous Peoples of Mexico, CDI, which uses the System of Information and Indicators for the Indigenous Population of Mexico, and data from the 2015 Intercensal Survey, INEGI.

This interpretation is supported by an analysis of the total indigenous population born in the state. Only 66.3% is originally from Jalisco; 33.7% were born in other states. The 2015 data regarding places of residence show that five years before, 10% of the indigenous population of the Valley had lived in another state. There is thus a migratory dynamic in the population of indigenous households in the region.

This dynamic can also be seen in the number of speakers of indigenous languages, especially in Gómez Farías. In 2015, there were 183 in the Zapotlán Valley, 32 in Gómez Farías and 151 in Zapotlán el Grande. These numbers increased in both municipalities in 1995-2000, and then decreased, but in 2010-2015 there was again an increase in Gómez Farías, from 5 to 32.

These changes in the distribution of the population lead us to argue that the past decade has been a watershed in the demographic dynamics of the Zapotlán Valley. Although the decline in fertility and the increase in population of older adults are part of the process of demographic transition, the growth in economically productive age groups and in the overall population testify to the development of productive activities and the change in the region's migration trends. On the one hand, the proportion of persons leaving their homes to look for better opportunities in the U.S. has decreased. Although this decrease is a response to diverse factors, one of these is the improved options for employment in the region, among them industrial export agriculture as a source of jobs for women and men. On the other hand, work in the berry and avocado fields has promoted the transformation of the Zapotlán Valley



into one of the employment destinations on the migratory routes of agricultural workers. Its importance as an economic activity and in the labor market leads us to conclude that it has played an important role in the demographic dynamics of the past decade, and that changes in the patterns of cultivation have affected other economic and social characteristics of the region.

Table 6. Indigenous Population by State of Birth and Place of Residence, 2015

Municipality	Total Population of Indigenous Households, 2015	Place of Birth				Place of Residence in 2010				
		Jalisco	%	Other State	%	Total Population of Indigenous Households, 2015	Jalisco	%	Other State	%
Gómez Farías	67	24	35.8%	43	64.2%	59	38	64.4%	21	35.6%
Zapotlán el Grande	396	283	71.5%	113	28.5%	382	351	91.9%	21	5.5%
Total	463	307	66.3%	156	33.7%	441	389	88.20%	42	9.52%

Source: Authors' elaboration with data from Socioeconomic Indicators for the Indigenous Peoples of Mexico, CDI, which uses the System of Information and Indicators for the Indigenous Population of Mexico, and data from the 2015 Intercensal Survey, INEGI.

Table 7. Population Aged 5 Years and Older Speaking an Indigenous Language, 1995-2015

Municipality	1995	2000	2005	2010	2015 ¹
Gómez Farías	3	24	19	5	32
Zapotlán el Grande	110	266	246	214	151
Total	113	290	265	219	183

Source: Authors' elaboration with data from the 1995 Population and Housing Count; the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the 2015 Intercensal Survey, INEGI; and the Socioeconomic Indicators for the Indigenous Peoples of Mexico, CDI (2016).

¹ The data for 2015 were taken from the Socioeconomic Indicators for the Indigenous Peoples of Mexico, CDI (2016). The 2015 INEGI Sociodemographic Panorama indicates that data for these two municipalities is not available for lack of a sufficient sample.



II. FROM CORN TO BERRIES

The Zapotlán Valley is in Irrigation District 094 in the hydrological administrative region of Lerma-Santiago-Pacífico. During the agricultural year 2017-2018 this district supplied water to a total area of 21,850 hectares, of which 14,319 were irrigated surface for agricultural use (CONAGUA, 2019). The available hydrological basins in the Valley are the Quito basin, the Laguna de Zapotlán basin, and the Laguna de Sayula basin.¹⁷ The largest volume of groundwater from the basins is for agricultural use.¹⁸

In 2015, 73.31% of the 330 users of groundwater in Zapotlán el Grande were agricultural, and 76.96% of the 218 in Gómez Farías. These figures reflect the importance of agricultural activity in the region. Zapotlán el Grande has one of the highest levels of agricultural participation, measured as the value of its product, of any municipality in the state of Jalisco. In recent years, its participation has been approximately 3%: 3.9% in 2016 and 2.9% in 2019. Although the percentage of participation declined slightly in this period, the value of production has continued to increase: in 2019 it was 2.13 billion pesos.

Table 8. Value of Agricultural Production in Millions of Pesos* and Percentage of Participation of the Zapotlán Valley in the State of Jalisco, 2015-2019

Indicator	2015	2016	2017	2018	2019
Value of Production in Jalisco	46,409.15	50,620.44	60,281.11	66,913.17	74,447.71
Value of Production in Gómez Farías	212.44	283.86	286.92	359.80	534.75
% Participation of Gómez Farías in Jalisco	0.46%	0.56%	0.48%	0.54%	0.72%
Value of Production in Zapotlán el Grande	1,334.82	1,972.37	1,787.96	1,891.88	2,130.70
% Participation of Zapotlán el Grande in Jalisco	2.90%	3.90%	3.00%	2.80%	2.90%

Source: Authors' elaboration with data on agricultural production for 2015-2019 from the SIACON.

* Value of production expressed in real pesos based on the INPC, base year 2018.

The increase in the value of production responds to a change in the patterns and types of crops. Although this region has a long agricultural tradition, the volume of production and the value per hectare harvested has increased considerably in the last ten years, with little change

17 For geohydrographic file of the Zapotlán Valley, see appendix A.

18 For the uses of water in the Zapotlán Valley, see appendix B.



to the total area planted. This can clearly be seen in Tables 9 and 10, which show the evolution of agricultural production in each of the municipalities of the Valley.

Table 9. Agricultural Production* in the Municipality of Gómez Farías, 2005-2019

Year	Area Planted (hectares)	Area Harvested (hectares)	Production in Metric Tons	Percent Increase in Production in Tons	Value of Production in Thousands of Pesos	Percent Increase in Production in Thousands of Pesos	Value per Hectare Harvested in Thousands of Pesos
2005	5,817.95	4,489.85	53,226.13		81,030.40		18.05
2006	5,265.50	4,856.50	55,818.35	4.87%	96,278.50	18.82%	19.82
2007	5,379.56	5,053.56	65,615.73	17.55%	163,318.59	69.63%	32.32
2008	5,143.50	4,986.58	60,511.64	-7.78%	147,501.72	-9.68%	29.58
2009	5,298.50	4,407.50	39,589.23	-34.58%	153,687.40	4.19%	34.87
2010	5,488	5,262	50,998.96	28.82%	198,088.29	28.89%	37.65
2011	5,973.20	5,741.50	58,635.41	14.97%	165,074.75	-16.67%	28.75
2012	6,383.20	6,151.50	45,373.60	-22.62%	165,650.35	0.35%	26.93
2013	6,453.61	6,153.61	54,157.88	19.36%	173,123.75	4.51%	28.13
2014	7,244	6,735.60	99,669.62	84.04%	194,693.97	12.46%	28.91
2015	6,693.50	6,258.59	94,106.82	-5.58%	212,445.85	9.12%	33.94
2016	8,326.45	7,249.59	120,953.08	28.53%	283,861.35	33.62%	39.16
2017	8,147.46	7,145.60	142,457.45	17.78%	286,926.69	1.08%	40.15
2018	7,699.96	7,376.33	135,811.72	-4.67%	359,805.59	25.40%	48.78
2019	6,841.96	6,423.33	110,597.55	-18.57%	534,756.65	48.62%	83.25

Source: Authors' elaboration with data on agricultural production for 2005-2019 from the SIAP.

* Value of production expressed in real pesos based on the INPC, base year 2018.

In the municipality of Gómez Farías the most notable increases in the value of production were in 2007, 2016, and 2019. In the latter year production increased by 54% over the previous year. However, the area planted and harvested has increased little over the past 14 years. From 2005 to 2019, the area planted increased only 18%, while the value per hectare increased by 361%. The increase in value is constant from 2015, but it was in 2018 that it nearly doubled. These changes coincide with the expansion of industrial agriculture dedicated to the cultivation of berries and avocados. Although the planting of blueberries began here in 2011, it was not until 2015 that the area dedicated to this crop was extended.



Table 10. Agricultural Production* in the Municipality of Zapotlán el Grande, 2005-2019

Year	Area Planted (hectares)	Area Harvested (hectares)	Production in Metric Tons	Percent Increase in Production in Tons	Value of Production in Thousands of Pesos	Percent Increase in Production in Thousands of Pesos	Value per Hectare Harvested in Thousands of Pesos
2005	15,298.45	14,775.30	209,586.45		373,699.83		25.29
2006	14,139.50	13,760.50	13,681,672.56	6427.94% ¹	780,136.15	108.76%	56.69
2007	15,389.50	15,041.50	16,178,257.10	18.25%	588,932.75	-24.51%	39.15
2008	15,575	15,366.58	11,885,609.87	-26.53%	554,341.49	-5.87%	36.07
2009	17,584	13,344.80	13,026,709.51	9.60%	496,600.50	-10.42%	37.21
2010	19,401	18,875	22,879,547.51	75.64%	778,788.78	56.82%	41.26
2011	18,075.59	17,508.59	36,317,945.30	58.74%	671,482.10	-13.78%	38.35
2012	19,244.09	19,210.09	25,855,191.51	-28.81%	1,055,141.49	57.14%	54.93
2013	18,034.63	17,589.83	43,177,874.19	67.00%	1,253,942.38	18.84%	71.29
2014	13,811.72	13,009.33	51,693,078.91	19.72%	1,064,087.86	-15.14%	81.79
2015	12,559.79	11,803.70	52,664,456.18	1.88%	1,334,825.95	25.44%	113.09
2016	11,619.29	10,541.86	21,513,667.03	-59.15%	1,972,377.28	47.76%	187.10
2017	10,828.49	9,648.26	62,008,350.27	188.23%	1,787,963.19	-9.35%	185.31
2018	10,825.29	9,722.06	62,591,247.30	0.94%	1,891,884.67	5.81%	194.60
2019	10,175.29	8,905.06	45,186,511.34	-27.81%	2,130,706.71	12.62%	239.27

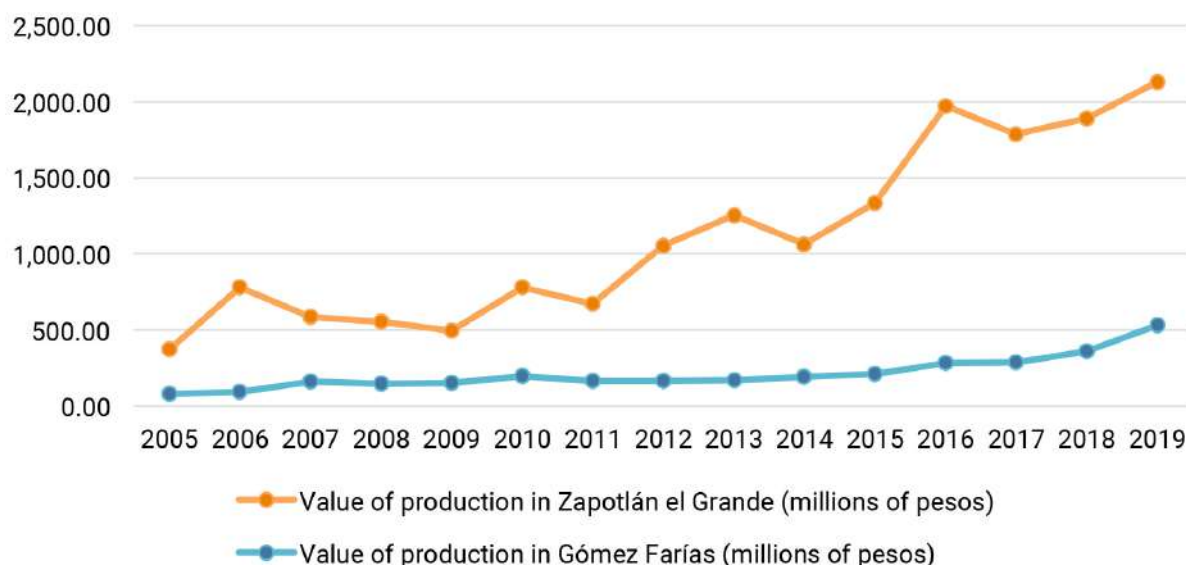
Source: Authors' elaboration with data on agricultural production for 2005-2019 from the SIAP.

* Value of production expressed in real pesos based on the INPC, base year 2018.

¹The increase in the volume of production this year reflects the production of strawberries in the region. The unit of this crop is the plant, not the metric ton, as is the case for the other crops, because production is of the plants in greenhouses. In this year there was also an increase in the area of sugar cane harvested of 216.86%, and an increase in the volume of production of 175.82%. However, the area planted in sugar cane is the same as reported for the previous year.

In Zapotlán el Grande the largest increase in the value of production was in 2006, 2010, 2012, and 2016. From 2005 to 2019 the value per hectare increased 846%, while the area planted decreased by 5,870 hectares. The agricultural data show that in 2012 circumstances favored constant growth in production and value in subsequent years (see Figure 6). In this municipality the planting of berries began in 2010, in an area of 26 hectares. It was not until 2012, however, that their cultivation began to be extended in the region; since then their production has been increasing.



Figure 6. Annual Value of Agricultural Production* in the Zapotlán Valley

Source: Authors' elaboration with data on agricultural production for 2005-2019 from the SIAP.

* Value of production expressed in real pesos based on the INPC, base year 2018.

Analysis of the crops planted during this period shows that the increase in production and the lack of variation in the area planted is the result not only of the introduction of berries, but also of an increased production of avocados. These two crops of high added value have displaced traditional crops, a change reflected in a clear decrease in the amount of land devoted to traditional crops, and a resultant decrease in the variety of crops planted.¹⁹

In 2005 the most important crops in Gómez Farías were agave, avocados, green alfalfa, fodder oats, grasses, grain corn, and wheat. The municipality was dedicated mainly to the production of grains and fodder. In 2010 there was a notable increase in the volume and value of grain corn: in the following five years the volume increased by 171% and the value by 371%. The value of the avocado crop in that period rose by 151%. The value of other crops remained steady or decreased as they lost importance relative to corn and avocados. Although grain corn was still the crop with the largest number of hectares planted, the total area devoted to this crop decreased from 2010 to 2019. In 2010-2015, the area planted and volume of avocado production doubled, and the value of the crop increased by 5%; there was even greater growth in 2015-2019, with a doubling of the area planted and a tripling of production. The berries — blueberries, raspberries, and blackberries—, which had not previously been grown, appeared in 2015 with 8 hectares planted, increasing to 95 hectares by 2019. The latter year produced 1032 metric tons of berries, with a value of \$32.71 million pesos. With an area planted and production volume much less than that devoted to grain corn, the value of the berry crop was only \$11.70 million pesos less.

¹⁹ For a complete overview of agricultural development, see Appendices C and D.



Table 11. Agricultural Production* of the Major Crops in Gómez Farías, 2010, 2015, and 2019

Crop	2010			2015			2019		
	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)
Agave	226	8,040	13.19	449	8,726.8	44.91	378.63	6,073.2	144.86
Avocados	342	2,886	77.15	735.88	5,689.48	81.08	1,541.33	15,405.5	274.27
Blueberries	-	-	-	8	16.7	0.98	50	662	24.22
Fodder Oats	90	2,201	1.22	276	4,828.4	2.01	8	258.64	0.15
Sugar Cane	4	440.4	0.39	6	600	0.34	-	-	-
Raspberries	-	-	-	-	-	-	25	219.75	4.84
Desi Garbanzos	31.5	62.53	0.27	136	314	0.58	-	-	-
Fodder Corn	70	1,841	1.38	850	24,463	11.19	700	31,570	18.27
Grain Corn	3,370	19,568.16	78.84	2,436	11,412.85	44.44	2,700	14,765.1	44.41
Grasses	930	11,160	3.35	1,391.12	35,479.3	14.14	1,310	37,413.6	14.63
Grain Sorghum	120	624	2.25	100	200	0.77	-	-	-
Tomatoes	7	850.5	8.69	3.5	402.43	1.65	1	107.88	0.81
Wheat	60	237.5	0.88	70	385	1.45	10	55.3	0.26
Blackberries	-	-	-	-	-	-	20	149.9	3.64
Total	5,250.5	47,911	187.64	6,461.5	92,517.96	203.58	6,778.96	110,171.42	531.79

Source: Authors' elaboration with data on agricultural production for 2019 from the SIAP.

* Value of production expressed in real pesos based on the INPC, base year 2018.

These data show that the major crops in Gómez Farías are currently avocados, agave, grain corn, and berries. The predominance of these products has displaced other crops. In the period 2015-2019, the number of agricultural products fell from 24 to 15—considering the three types of berries, blueberries, raspberries, and blackberries, as a single product—. Berry and avocado fields have expanded in the municipality in these last five years. Sugar cane, chickpeas, and sorghum, which were traditional crops in the region, were not planted in 2019. Oats, wheat, and tomatoes continue to be grown, but over a much smaller area.



Table 12. Agricultural Production* of the Major Crops in Zapotlán el Grande, 2010, 2015, and 2019

Crop	2010			2015			2019		
	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (millions of pesos)
Agave	50	5,180	5.64	165	0	0.00	170.23	1,764	42.30
Avocados	2,300	9,000	122.91	3,402.19	24,241.02	368.60	5,031.9	43,669.16	791.49
Green Alfalfa	405	39,285	30.58	263	23,989.02	14.17	300	29,301	11.75
Blueberries	26	0	-	400	2,205	126.09	669.45	1,0394.37	382.59
Fodder Oats	250	7,690	5.29	373.25	11,635.75	5.92	56	1,898.4	1.19
Sugar Sane	118	12,980	11.55	150	17,250	9.66	-	-	-
Raspberries	-	-	-	500	9,390	202.98	1,970.71	30,353.05	604.15
Strawberries (plants)	140	22,579,200	30.52	350	52,500,000	42.03	75	45,000,000	52.10
Fodder Corn	2,000	30,800	27.34	155	6,975	5.18	370	17,005.9	10.05
Grain Corn	6,449	37,445.36	150.77	3,950	10,673	42.50	150	661.5	2.18
Grasses	4,950	119,250	48.62	995.85	26,576.7	11.10	1,053	30,431.7	11.61
Grain Sorghum	1,320	7,863.2	28.70	958	3,832	14.90	16	92.8	0.35
Tomatoes	315	16,122.6	239.17	248.5	16,465.6	411.63	115	17,250	153.30
Blackberries	-	-	-	-	-	-	120	1,576	38.31
Total	18,323	22,864,816.16	701.14	11,910.79	52,653,233.09	1,254.82	10,097.29	45,184,397.88	2,101.43

Source: Authors' elaboration with data on agricultural production for 2010, 2015 and 2019 from the SIAP.

* Value of production expressed in real pesos based on the INPC, base year 2018.

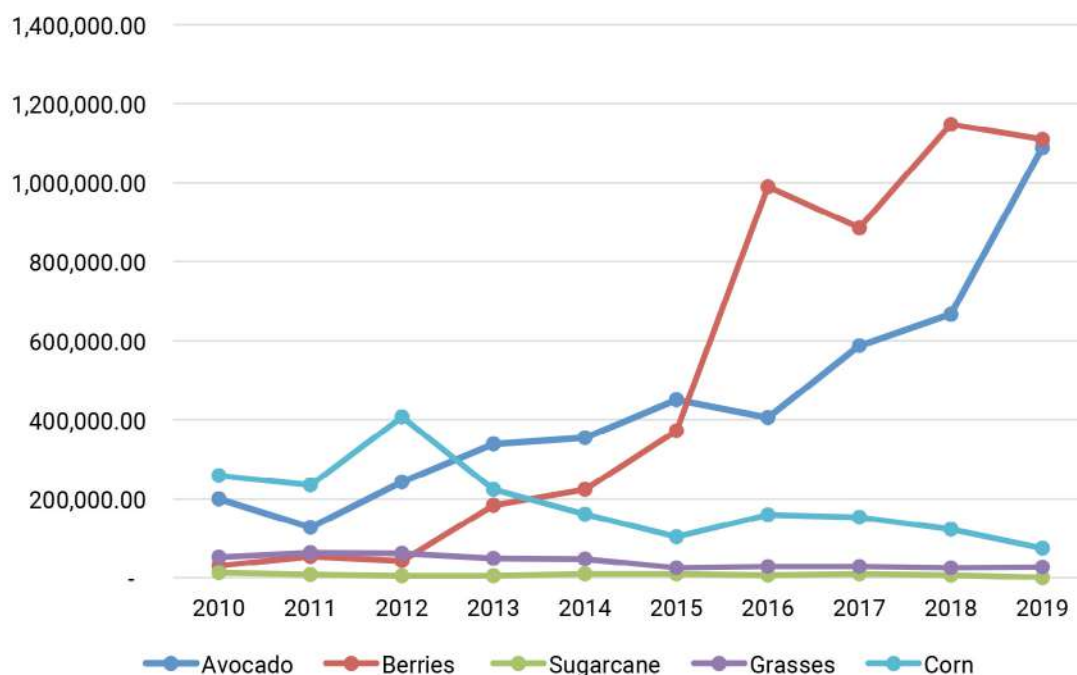
The decrease in the variety of crops is even more dramatic in the municipality of Zapotlán el Grande. From 2015 to 2019 agricultural producers stopped growing 16 crops (again considering the three types of berries as a single product). In 2005, the major crops there were green alfalfa, sugar cane, grain corn, grasses, grain sorghum, and tomatoes. In 2010 there was a slight increase in the production of grasses and tomatoes, but the most significant changes were the increase in avocado production and the introduction of strawberry plants. In those five years the production of avocados went from 240 to 9000 metric tons, and the value of the crop increased by \$120.48 million pesos. This growth continued in 2015, by which time the volume and production had nearly tripled over that of 2010. The cultivation of green alfalfa, grain and fodder corn, grasses, and grain sorghum all declined. That same year there were 900 hectares of land devoted to berry cultivation, with a value of \$329.08 million pesos. By 2019 the area cultivated had tripled, mainly for raspberries, with a value of \$1.025 billion pesos.

No sugar cane or wheat was planted in 2019, and neither were other products that had been cultivated on small fields, such as broccoli, beets, onions, cilantro, beans, limes, cucumbers, and *tejocotes*. The grain corn that had been the characteristic crop of the region was now limited to 150 hectares, with a production of 661.5 metric tons, valued at \$2.18 million pesos. This was an extremely important agricultural transformation. Apart from the change in products, the forms of cultivation had been replaced with a high-technology model of greenhouses and irrigation systems, which increased production. The change is also evident



in the landscape, which in recent years has turned white with the use of the macrotunnel greenhouses where berries are grown. Figure 7 shows the decrease in traditional crops, mainly grain and fodder corn, as well as the increase in berries and avocados in the Zapotlán Valley.

Figure 7. Value* of the five main crops produced in the Zapotlán Valley, 2010-2019 (millions of pesos)



Source: Authors' elaboration with data on agricultural production for 2010-2019 from the SIACON.

* Value of production expressed in real pesos based on the INPC, base year 2018.

The value of avocado production has grown since 2011, and the value of berries since 2012. The growth of avocados has been constant, with an acceleration in 2018; berries grew dramatically in 2018. The lowest value for corn was the same year in which the production of berries took off. This leads us to believe that corn was the crop most affected by this new value-added product, mainly in Zapotlán el Grande. What were previously cornfields are now rented to large transnational companies that produce berries.²⁰ This change has been noted by diverse local sources. For example, the parish priest of the Church of San Isidro in Ciudad Guzmán notes a reduction in recent years of the end-of-harvest blessings that corn producers used to request: now "they rent their lands to foreign companies." In addition to the strong incentive to change crops, some producers say that it is more profitable to rent their lands than to keep growing corn.

20 Information obtained in interviews with *ejidatarios* from Zapotlán el Grande, 14 July 2020.



The change in agriculture has not only increased the value of production, but its great demand for labor has also affected the structure of employment. Large groups of workers arrive in the harvest season to pick berries, and the residents of the Valley join them. Along with the crop's intense demand for workers, these producers also have to comply with practices of social responsibility that include higher wages, benefits, and decent working conditions. This is an important change in agricultural labor in Mexico, which has been characterized by a lack of formal contracts or benefits, and bad working conditions that have been documented by a large number of researchers (Lara-Flores, 2001; Arellano-Gálvez, 2014; RNJJA, 2019). The wages and working conditions offered by the berry industry in southern Jalisco mean that it competes not only within the agricultural sector, but also with secondary and tertiary sector economic activities. It has given rise to a displacement of workers from urban employment to agriculture, as the next section will discuss.

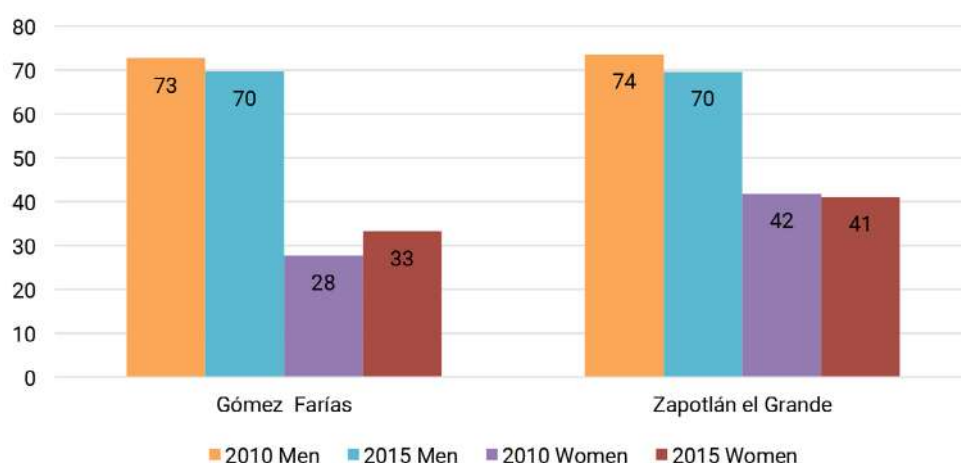


III. EMPLOYMENT STRUCTURE AND ECONOMIC CHANGE

The urban growth that has characterized Zapotlán el Grande since the 1980s has favored an economy centered on business and services. Although agriculture has been one of the main activities in the Valley, a large part of the economically active population has been employed in the tertiary sector. The transformations in agricultural activity of the last ten years have changed this situation. Although the growth of industrial export agriculture can best be understood in the results of the 2020 Population and Housing Census, data from the 2015 Intercensal survey already show changes in the occupational distribution. In 2010 the rate of economic participation in the Zapotlán Valley was 56%; in Gómez Farías it was 49% and in Zapotlán el Grande it was 57%. In 2015 the rate dropped to 54%; although in Gómez Farías it increased by one percentage point, in Zapotlán el Grande it decreased by two percentage points. Men have the highest participation rate, 70% in both municipalities. The highest rate for women is in Zapotlán el Grande, where it was 41% in 2015. The rate is lower in Gómez Farías, though it is important to note that it increased by five percentage points from 2010 to 2015, while the rate for men fell by three percentage points in the same period.

Apart from the slight decline from 2010 to 2015 in the economic participation rate, the important change is found in the distribution of the employed population. In both of the municipalities under study there was an increase in the number of workers employed in the primary sector. In Gómez Farías the increase was almost 10 percentage points, with a decline in the other sectors. In Zapotlán el Grande there was an increase in the secondary as well as the primary sector. However, the secondary sector increased by only one percentage point, while the primary sector increased by three percentage points. Employment in the tertiary sector decreased, mainly in services.

Figure 8. Economic Participation Rate by sex in the Zapotlán Valley, 2010 and 2015



Source: Authors' elaboration with data from the 2010 Census of Population and Housing and the 2015 Intercensal Survey, INEGI.



Table 13. Total Employed Population and Percentage Distributions by Economic Sector, 2010 and 2015

	Gómez Farías		Zapotlán el Grande	
	2010	2015	2010	2015
Total Employed Population	5,827	5,461	40,764	44,816
Primary¹	30.89	40.36	8.17	11.13
Secondary²	30.58	23.18	20.40	21.52
Business	14.54	13.06	24.09	22.74
Services³	23.43	22.27	46.40	43.88
Not Specified	0.57	1.14	0.93	0.73

Source: Authors' elaboration with data from the 2010 Census of Population and Housing, INEGI; and the 2015 Intercensal Survey, INEGI.

¹ It includes: agriculture, livestock, forestry, fishing, and hunting.

² It includes: mining, oil and gas extraction, manufacturing, electricity, water, and construction.

³ It includes: transportation, government, and other services.

In the economic participation by occupational category there was also an increase in the number of agricultural workers, by 91% in Gómez Farías and 30% in Zapotlán el Grande.

Table 14. Total Employed Population and Percentage Distributions by Occupational Division, 2010* and 2015**

	Gómez Farías		Zapotlán el Grande	
	2010	2015	2010	2015
Total Employed Population	5,827	5,461	40,764	44,816
Civil Servants, Professionals, Skilled Workers, and Administrators¹	11.21	11.74	31.82	29.04
Agricultural Workers	17.64	33.77	6.58	8.57
Industrial Workers²	26.05	19.37	20.61	20.00
Merchants and Service Workers³	44.53	34.35	40.71	41.67
Not Specified	0.57	0.77	0.28	0.72

Source: Authors' elaboration with data from the 2010 Census of Population and Housing, INEGI; and the 2015 Intercensal Survey, INEGI.

* Corresponds to the first level of categories in the CUO, 2010.

** Corresponds to the categories in the SINCO, 2011.

¹ For 2010 and 2015 includes: civil servants, directors and supervisors, professionals and skilled workers, and support staff in administrative activities.

² For 2010 includes: mechanics, industrial and artisanal workers, industrial machine operators, assemblers, and drivers. For 2015 includes: artisanal workers, industrial machine operators, assemblers, and drivers.

³ For 2010 includes: merchants, store clerks, and sales personnel, personal services workers, security and armed forces, and laborers and support workers.



These data show that a greater rate of participation in the agricultural sector is related to a greater supply of jobs in the sector. The growth in cultivation of berries and avocados has created new jobs, especially berries, which require a large number of workers in the high season. The increase in workers employed in this sector is also related to higher wages, formal contracts, and job benefits that are not found in the secondary and tertiary sectors, as described in the following case study:

Montse is a 19-year-old university student who began working in the berry fields when she was 13 years old and berries had just begun to be grown in the region. Since then she has worked in the fields as a casual laborer. She recognizes that work in the fields is very strenuous, and she has looked for jobs outside of agriculture. However, the possibilities she has found have come with lower wages, longer days, and no benefits. For a short time she worked in a shoe store in Ciudad Guzmán at a wage of \$130 pesos for a workday from 10 a.m. to 2 p.m. and 4 to 9 p.m. When she worked in the fields her wages varied between \$200 and \$300 pesos a day. The workday in the fields begins around 7 a.m. and ends between 3 and 4 p.m. when it is not harvest season. For this reason Montse keeps returning to the berry fields as a strategy to contribute to the household and to pay for her studies. (Case study compiled by Elisa Martínez.).

This account explains the reduced participation in the industrial sector, which had offered better benefits and working conditions than agricultural work (Escobar et al., 2019). Among the benefits offered by the berry companies is social security. The possibility of receiving this benefit may be one of the factors behind increased labor participation in the fields. One of the prominent advantages of this benefit is access to health services.



IV. SOCIAL SECURITY AND HEALTH SERVICES

There are 17 health centers in the Zapotlán Valley: 14 in Zapotlán el Grande and three in Gómez Farías (IIEG, 2019a, 2019b). The former is home to the regional hospital of the IMSS that also provides care on a regional level. According to data from the *Instituto de Información Estadística y Geografía de Jalisco*, IIEG [Jalisco Institute of Statistical and Geographic Information] 2019a and 2019b, affiliation with IMSS in the Zapotlán Valley has increased in recent years.²¹ In December 2019, Zapotlán el Grande was the southern Jalisco municipality with the largest number of workers enrolled in IMSS: 56%. Gómez Farías was sixth, with 2% (Table 15).

Table 15. Workers With IMSS Social Security in Southern Jalisco

Municipality	2012	2013	2014	2015	2016	2017	2018	2019	% part. 2019
Gómez Farías	665	740	835	915	1,062	1,045	1,146	1,190	1.97%
Jilotlán de los Dolores	20	21	23	21	35	39	98	48	0.08%
Pihuamo	431	541	448	384	382	444	399	411	0.68%
San Gabriel	1,262	1,950	2,600	2,491	3,179	3,105	3,794	4,183	6.93%
Tamazula de Gordiano	7,322	7,397	7,320	6,706	7,304	7,492	7,849	7,593	12.57%
Tecalitlán	541	537	472	521	624	689	718	702	1.16%
Tolimán	321	351	665	725	703	796	907	888	1.47%
Tonila	271	231	347	284	329	334	346	425	0.70%
Tuxpan	2,552	2,473	3,196	3,606	3,395	3,501	3,462	3,593	5.95%
Zapotiltic	4,552	4,927	5,290	5,127	5,445	6,057	6,511	7,439	12.32%
Zapotitlán de Vadillo	45	49	46	44	44	55	41	44	0.07%
Zapotlán el Grande	21,466	23,001	24,692	26,273	27,935	30,141	32,315	33,877	56.09%
Total	39,448	42,218	45,934	47,097	50,437	53,698	57,586	60,393	100%

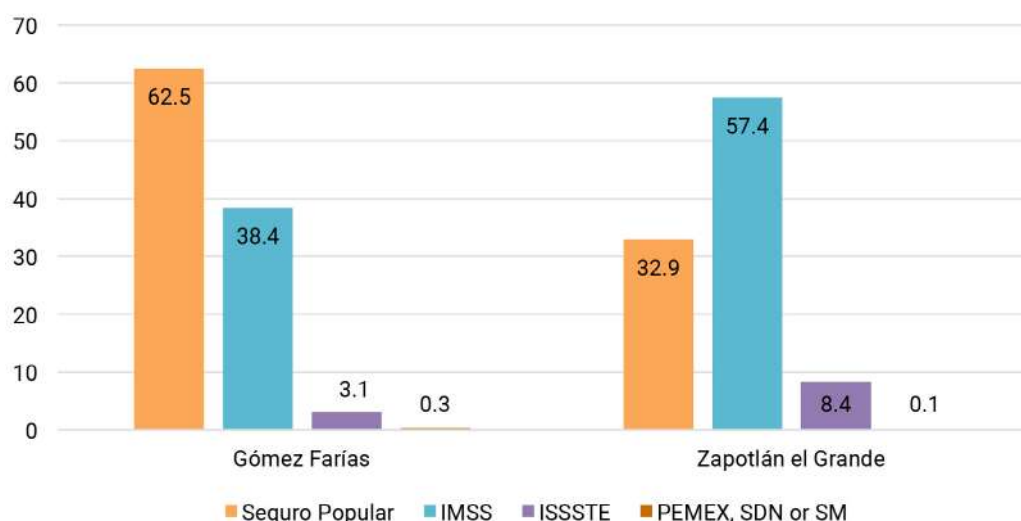
Source: Authors' elaboration with data from the municipal analyses for southern Jalisco, IIEG (2019a, 2019b).

²¹ The IIEG (2019a and 2019b) considers southern Jalisco to include the municipalities of Gómez Farías, Jilotlán de los Dolores, Pihuamo, San Gabriel, Tamazula de Gordiano, Tecalitlán, Tolimán, Tonila, Tuxpan, Zapotiltic, Zapotitlán de Vadillo, and Zapotlán el Grande. By this definition the Sayula basin is not included.



In 2015, 55% of the Valley's enrollees in health services were affiliated with IMSS, followed by 36% in Seguro Popular.²² The majority in Zapotlán el Grande were affiliated with IMSS, but in Gómez Farías there were more affiliated with Seguro Popular.

Figure 9. Percentage* Distribution of Enrollment in Social Security Health Services in the Zapotlán Valley, 2015



Source: Authors' elaboration with data from the 2015 Intercensal Survey, INEGI.

* Sum of the percentages may exceed 100% because people may be affiliated with more than one institution.

In general, the number of persons enrolled in health services increased from 2000 to 2015. In Zapotlán el Grande it went from 46,243 to 91,749 enrollees, growing an average of 26% every five years, and in Gómez Farías it increased from 3,830 to 14,278 with an average growth of 50%.

In Zapotlán el Grande the greatest population increase was from 2010 to 2015, which saw a growth of 30%, coinciding with the beginning of industrial export agriculture in the Valley. The largest increase in Gómez Farías was a growth of 65% from 2005 to 2010. Here, given the later development of export agriculture and the greater percentage of affiliates in Seguro Popular, we can infer that the growth was an increase in the number of people enrolled in that program.

Enrollment in health services doubled in the Valley from 2000 to 2015. IMSS had the largest number of affiliates, and Seguro Popular had the greatest growth. In 2015 there were 57,528 people from the Valley enrolled in IMSS, 22% more than in 2005. Data from IIEG (2019a,

22 Seguro Popular was a government social initiative to provide access to health care that was piloted in 2001 and in 2004 became Seguro Popular, or Sistema para Protección Social en Salud. With the change in presidential administration on 1 December 2018, existing social programs were replaced by others that have been implemented without clear regulations and with an emphasis on direct monetary transfers. Seguro Popular was replaced on 1 January 2020 by the Instituto de Salud para el Bienestar (INSABI) [Institute of Health for Well-being]. Although various studies pointed to the deficiencies in Seguro Popular (Escobar-Latapí & González-de la Rocha, 2022), INSABI was initiated without clear guidelines and with numerous problems in coverage and health services.



2019b) show that the number of enrollees in IMSS continued to increase after 2015. This latter increase is mainly a result of the formalization of employment in the agricultural sector, whose workers affiliated with IMSS have increased since 2012.

Table 16. Enrollment in Social Security Health Services in the Zapotlán Valley by Institution, 2000-2015

	Gómez Farías				Zapotlán el Grande			
	2000	2005	2010	2015	2000	2005	2010	2015
Seguro Popular ¹	-	2,251	5,516	7,926	-	3,220	13,622	30,146
IMSS	3,514	3,394	3,921	4,872	38,979	43,827	47,646	52,656
ISSTE	317	343	355	388	7,537	8,422	8,899	7,730
Pemex, SDN, or SM	8	13	23	41	45	82	58	48
Other institution ²	0	50	180	314	55	1,249	2,296	3,439
Sum of enrollments ³	3,839	6,051	9,995	13,541	46,616	56,800	72,521	94,019
Total population enrolled	3,830	6,031	9,950	12,675	46,243	55,581	71,177	91,749

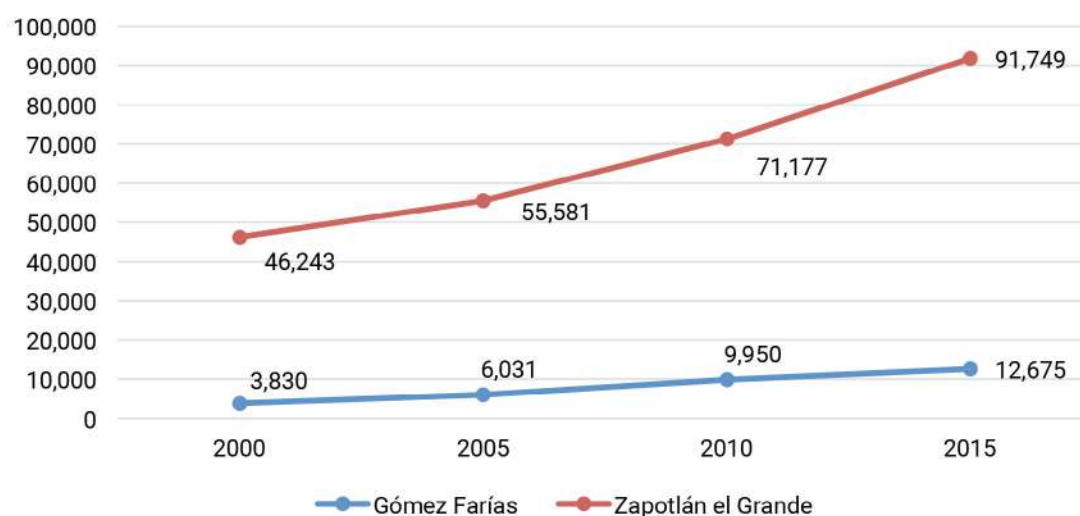
Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; 2005 Population and Housing Count, INEGI; 2010 Census of Population and Housing, INEGI; and 2015 Intercensal Survey, INEGI.

¹ Seguro Popular began as a pilot program in 2001, so there are no data for this program for the year 2000. The figure for 2010 includes the SPSS, coordinated by the SSA.

² Includes the state government social security institutions and other types of public and private health care institutions.

³ The sum of enrollments in different institutions may be greater than the total enrolled population because individuals may receive services in more than one institution.

Figure 10. Population Enrolled in Health Services in the Zapotlán Valley, 2000-2015



Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; 2005 Population and Housing Count, INEGI; 2010 Census of Population and Housing, and 2015 Intercensal Survey, INEGI.



Table 17. Agricultural Workers as a Percentage of Total Workers Enrolled in IMSS in the Zapotlán Valley

	2012	2013	2014	2015	2016	2017	2018	2019
Gómez Farías	1.05%	1.62%	1.56%	8.42%	12.52%	11.87%	17.36%	16.97%
Zapotlán el Grande	27.45%	29.33%	33.02%	36.93%	38.08%	38.34%	41.10%	42.32%
Total workers enrolled	28.51%	30.96%	34.58%	45.35%	50.60%	50.21%	58.46%	59.30%

Source: Authors' elaboration with data from the municipal analyses for southern Jalisco, IIEG (2019a, 2019b).

In Gómez Farías the enrollment of agricultural workers began to increase in 2015. By 2019, agriculture was the occupation with the second-highest rate of enrollment in IMSS. The highest rate was in activities related to food processing that could be linked to agriculture, such as packing or fruit processing. In other occupational groups the number of enrollees remained constant, and there were even occupations where the number declined, such as the wood and cork products industry —except furniture—, mining and processing of coal, minerals, and graphite, and forestry.

Table 18. Workers in Gómez Farías Enrolled in IMSS, by Occupational Group

Occupational Group	2012	2013	2014	2015	2016	2017	2018	2019	% Part. 2019
Agriculture	7	12	13	77	133	124	199	202	16.97%
Food Processing	10	53	57	77	112	127	178	254	21.34%
Wood and Cork Products Industry (except furniture)	120	112	146	120	150	164	151	120	10.08%
Manufacture of Rubber and Plastic Products	95	93	92	92	93	101	105	100	8.40%
Mining and Processing of Coal, Minerals, and Graphite	73	82	79	88	69	69	73	40	3.36%
Purchase and Sale of Gases, Fuels, and Lubricants	28	26	24	35	79	62	63	65	5.46%
Public Administration and Social Security Services	70	77	71	75	72	75	58	78	6.55%
Purchase and Sale of Raw Materials, Materials, and Secondary Materials	26	32	66	84	48	45	53	45	3.78%
Ground Transportation	35	35	37	34	39	64	49	68	5.71%
Forestry	10	50	50	55	67	49	46	28	2.35%
Building Construction and Civil Engineering	41	27	50	30	60	38	43	44	3.70%
Livestock	26	23	25	23	28	30	30	27	2.27%
Other	124	118	125	125	112	97	98	119	10.00%
Total	665	740	835	915	1,062	1,045	1,146	1,190	100.00%

Source: Authors' elaboration with data from the municipal analyses for southern Jalisco, IIEG (2019a, 2019b).



In Zapotlán el Grande there was also an increase of 250% in the number of agricultural workers enrolled in social security, an increase so large that in 2019 they became the largest group of workers affiliated with IMSS: 42% of the total. The number of affiliates working in public administration and in social security services remained the same.

Table 19. Workers in Zapotlán el Grande Enrolled in IMSS, by Occupational Group

Occupational Group	2012	2013	2014	2015	2016	2017	2018	2019	% Part. 2019
Agriculture	5,893	6,747	8,154	9,703	10,638	11,556	13,280	14,338	42.32%
Public Administration and Social Security Services	2,801	2,869	2,820	2,644	2,778	2,918	2,967	3,001	8.86%
Purchase and Sale of Food, Drink, and Tobacco Products	1,655	1,781	1,800	1,920	2,031	2,172	2,250	2,233	6.59%
Building Construction and Civil Engineering	1,105	1,175	1,164	1,111	1,267	1,314	1,284	1,400	4.13%
Ground Transportation	621	562	601	683	727	832	1,043	1,218	3.60%
Food Processing	602	617	673	742	762	868	942	963	2.84%
Purchase and Sale of Raw Materials, Materials, and Secondary Materials	756	732	627	634	692	800	844	904	2.67%
Professional and Technical Services	656	888	1,001	822	701	728	748	793	2.34%
Purchase and Sale in Self-Service Stores and Specialized Department Stores	733	738	900	860	708	674	741	839	2.48%
Purchase and Sale of Clothing and Personal Items	743	730	716	682	672	642	666	648	1.91%
Food and Drink Preparation and Service	483	528	518	570	586	610	665	717	2.12%
Personal Services for the Home and Other	529	589	509	626	617	778	665	623	1.84%
Purchase and Sale of Gases, Fuels, and Lubricants	441	473	470	519	508	528	550	599	1.77%
Teaching, Research, and Cultural Promotion Services	432	436	442	466	498	538	560	549	1.62%
Purchase and Sale of Articles for the Home	213	232	275	279	586	586	530	513	1.51%
Other	3,803	3,904	4,022	4,012	4,164	4,597	4,580	4,539	13.40%
Total	21,466	23,001	24,692	26,273	27,935	30,141	32,315	33,877	100.00%

Source: Authors' elaboration with data from the municipal analyses for southern Jalisco, IIEG (2019a, 2019b).



The increase in the number of agricultural workers and the number of enrollments in social security are changes that we attribute to the development of the berry export industry. Our fieldwork shows that formal hiring is a constant in the berry fields, an important milestone that is reflected in the number of workers in this sector. However the growth in enrollment brings with it the need to provide better information and health services. In the testimonies collected in fieldwork, workers said they did not use IMSS health services because they did not know what it covered or how to use it. Asked in an interview if he had social security, one worker responded: "Supposedly, they tell us we do, but I don't know what's up with that.... They ask us for our social security number, we give them all our papers, but that's it (Interview with Jesús, August 2nd, 2020). Some families, in spite of having social security, prefer to use Seguro Popular²³ or the private doctor's offices located in pharmacies. Their main complaint is that the service in IMSS clinics is slow and inefficient, and waiting their turn means missing a day of work. One supervisor, whose responsibilities include taking workers to the doctor when they are sick or have an accident, comments that the care at IMSS is "bad" because it is very slow. With this view, many workers only go to the social security clinic when they have a serious illness or accident. However, they increasingly emphasize its importance, as one worker who has enrolled her mother, her son, and her husband comments:

I tell [my husband]: "If I leave my job, that would be the end of insurance for my mom, that would be the end for the child, that would be the end for me and for you." I told him, "You'd then be without any insurance. What would we do? In an emergency?" A cold, that's less serious, but a more serious illness, well yes. He tells me, "Don't work anymore," and now that he got sick, I tell him "You see! I didn't work." (Interview with Edith, February 10th, 2019).

Workers also use this health benefit when they get pregnant, not only for prenatal care and childbirth, but also so they can get maternity leave. The increase in worker enrollment is clearly an extremely important change in agricultural labor. However, it is necessary to highlight the need to increase the capacity of clinics and hospitals in order to serve the population. Employers also need to provide workers with more information about the procedures and coverage available. Workers know they have access to health services, but very few know that social security also provides a pension, housing, and childcare benefits. Effective access to these services means going beyond the forms and social security numbers; it is fundamental to workers' social welfare.

23 The Seguro Popular program still existed during the first period of fieldwork.



V. INDUSTRIAL EXPORT AGRICULTURE, POVERTY AND SOCIAL WELFARE

In the Zapotlan Valley, industrial export agriculture is characterized by formal contracts and benefits. This is not only an important change in agricultural labor, but also one for the analysis of the social conditions of the region. A lack of access to social security is one of the indicators of a gap in social support [*rezago social*], according to the CONEVAL, and access to health services and social security are one of CONEVAL's indicators for measuring multidimensional poverty. The indicators for its general social deprivation index²⁴ include school attendance, housing conditions, and enrollment in social security. In 2010-2015, deprivations decreased in the municipalities of the Valley. The greatest declines were reflected in the percentage of persons without social security and the number of households without electricity or running water. In Zapotlán el Grande the number of households without plumbing declined by 72%. The decline in the number of persons without access to health was also significant: it fell from 28% to 11% in Gómez Farías and from 28% to 13% in Zapotlán el Grande.

Indicators related to education showed less of a reduction. However, they are still important, because they show a clear decline in the population 15 years of age or older that cannot read or write or that has not finished junior high school, and in the population 6-14 years of age not attending school. This decline is the result of various factors, among them access to schools at different levels. The Zapotlán Valley has educational institutions ranging from primary schools to universities. According to the IIEG, Zapotlán el Grande has 94 schools and Gómez Farías has 20 (2019a, 2019b).²⁵ The highest illiteracy rates are found in people aged 65 and older; illiteracy has decreased less in this age group than in the rest, especially in Gómez Farías. The groups with the lowest illiteracy rates are 15-24 and 25-34 years of age.

It should be emphasized that in 2000 and 2010 the illiteracy rate in Gómez Farías was higher among women, but in 2015 it was higher among men, in all age groups, but especially aged 15-24 years. These figures attest to the narrowing of the gender gap in education, the result of greater access to education and a transformation in traditional gender roles that limited women to the domestic sphere. The development of social policy to keep women and girls in school by providing gender-specific support has also played an important role in closing the gender gap (González-de la Rocha & Escobar-Latapí, 2016). In Zapotlán el Grande, however, the highest illiteracy rates are among women. In 2010, women had greater illiteracy only in the 45-54 and 55-64 age groups. In 2015, women in all age groups except 25-34 have greater illiteracy than men.

24 See Appendix E.

25 These figures include only places with more than 2500 inhabitants.



Table 20. Illiteracy Rates by Sex and Age Group in Gómez Farías, 2000-2015

Age Groups	2000			2010			2015		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
15-24 Years	3.60	53.61	46.39	1.69	55.32	44.68	1.16	73.39	26.61
25-34 Years	6.82	47.32	52.68	4.02	50.59	49.41	2.81	60.94	39.06
35-44 Years	13.83	48.86	51.14	6.19	47.12	52.88	4.22	56.79	43.21
45-54 Years	20.68	44.62	55.38	12.28	47.02	52.98	7.09	52.17	47.83
55-64 Years	32.45	38.18	61.82	24.35	44.25	55.75	17.33	50.89	49.11
65 Years and Older	47.69	41.88	58.12	42.05	43.28	56.72	36.34	44.47	55.53

Source: 12th General Census of Population and Housing 2000, INEGI; 2010 Census of Population and Housing, INEGI; 2015 Intercensal Survey, INEGI.

Table 21. Illiteracy Rates by Sex and Age Group in Zapotlán el Grande, 2000-2015

Age Groups	2000			2010			2015		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
15-24 Years	1.38	59.60	40.40	0.60	57.76	42.24	0.47	49.46	50.54
25-34 Years	2.37	51.94	48.06	1.30	55.88	44.12	1.26	53.05	46.95
35-44 Years	4.81	40.19	59.81	2.09	60.71	39.29	1.48	49.25	50.75
45-54 Years	9.57	39.01	60.99	4.10	41.78	58.22	1.84	39.05	60.95
55-64 Years	15.50	37.21	62.79	9.39	41.27	58.73	5.09	18.27	81.73
65 Years and Older	29.66	40.00	60.00	20.31	38.43	61.57	14.48	35.60	64.40

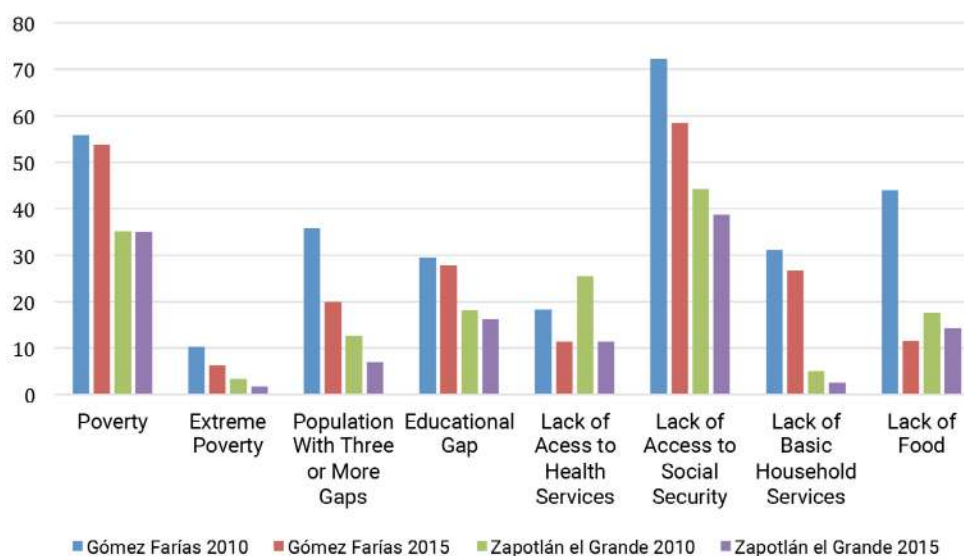
Source: 12th General Census of Population and Housing 2000, INEGI; 2010 Census of Population and Housing, INEGI; 2015 Intercensal Survey, INEGI.



The average educational level of the population aged 15 and older has also increased. In the period from 2010 to 2015, it rose in Gómez Farías from 5.7 to 7.8 years and in Zapotlán el Grande from 8.2 to 9.9 years. This increase helps to explain the decline in the factor of education in the measurement of general social deprivation in social support. There are various contributing factors, the most important of which are access to educational institutions, financial support for staying in school, and the social transformations that place a higher value on education. The decrease in recent decades in the use of child labor has also played an important role, particularly in rural areas where household survival depends on family labor. One of the policies implemented by the berry companies has been the eradication of child labor. Although this policy creates challenges for households and women workers (González-de la Rocha & Martínez-Rubio, forthcoming), it is clearly a factor that contributes to children and adolescents staying in school.

The multidimensional poverty indicators of deprivations also show decreases in the period from 2010 to 2015.²⁶ The most important decrease in Gómez Farías is in extreme poverty, in the most vulnerable population. Moderate poverty, however, showed an increase of almost two percentage points, and although the population vulnerable to deprivations fell by 20%, those with income poverty increased by 5.7 percentage points. It is worth noting the overall decrease in gaps and in gaps in social services, but the population earning below the poverty line increased by 6%. There is also a clear decline in the indicators of deprivations. Those with the greatest decreases are food and access to health services, while those with the smallest decreases are education and the quality and size of housing.

Figure 11. Poverty in the Zapotlán Valley, 2010 and 2015
Selected indicators (%)



Source: Authors' elaboration based on a dynamic search of results from the 2010 and 2015 Municipal-Level Assessment of Poverty, CONEVAL, 2017.



In Zapotlán el Grande there was also a decrease in extreme poverty and deprivations. Moderate poverty increased by 1.3 percentage points and income poverty by 4.3 percentage points. Overall gaps declined, except for access to basic household services, which showed a slight increase. The population with at least one gap in social support decreased by 10% and those with at least three gaps decreased by 45%. Lack of social security showed the most significant decline in percentage points. The improvement in indicators for access to social security, health care, and food is an important sign of social welfare in the region. Although there are various factors that affect the decline in deprivations and multidimensional poverty, among them growing urbanization and a national increase in social security coverage, it is possible to conclude that industrial export agriculture, with its practice of formal contracts, benefits required by law, and above-minimum wages also have an effect.

These factors have clearly contributed to the reductions in deprivations, but at the same time they demonstrate the need to create more infrastructure and services for the population that comes to work in the fields of southern Jalisco. Among these needs is decent housing for workers coming from other states. Employers provide temporary housing for workers who come for the harvest, but various interviewees have described problems of crowding and hygiene that describe an urgent need to improve the conditions there. It is also necessary to establish a dialogue among companies, government, and communities to address the challenges posed by the growth of this new economic activity. The transformations and problems are part of the social change that has been generated by the expansion and development of industrial export agriculture in the region.



FINAL REMARKS

This report has presented an analysis of the major social, demographic, and economic indicators in recent decades in the Zapotlán Valley. The changes found have come in response to various factors, among them the transformation in agricultural activity. In the last ten years the Zapotlán Valley has gone from being a region producing corn to one dedicated to the cultivation of high added-value produce for export. The economic and social transformations unleashed by this agricultural activity have turned it into a project that has organized the area into a microregion. This project is developing in a geographic area that for several decades has been experiencing a growing process of urbanization and of economic and commercial development. These characteristics are precisely what allows the flourishing of industrial export agriculture. The space can supply the needs for products and services demanded by this new agricultural activity, which has generated important changes in the socioeconomic structure of the region. The most obvious of these changes is its population growth: not only has the population increased in recent decades, but the greatest growth in the municipalities of the Zapotlán Valley in the last ten years has been in economically active age groups.

The growth in the economically active population is related to the phenomenon of migration. It is here that the labor market for the cultivation of berries and avocados is relevant. This is a region where employment options were limited to traditional crops or to the industries surrounding the Valley, to such an extent that migration to the U.S. became one of its major sources of household income. The expansion of berry cultivation has generated a new employment niche not only for people from the region, but also for those coming from other states. It is in this sense that agricultural activity has affected migration and the increase in the economically productive population. People who traditionally would have left for the U.S. now have an option in the region. In addition, large numbers of workers arrive at harvest time to work in the berry greenhouses.

The demographic dynamics of the Zapotlán Valley are part of the change in agricultural activity and the structure of employment. The urbanization process in recent years has concentrated the participation of the economically active population into sectors like business and industry, and since the development of industrial export agriculture there has been an increase in this participation. In the past ten years, the traditional agricultural model of the Valley, which produced sorghum, corn, and sugar cane, moved to the production of berries and avocados. This has increased the volume and value of agricultural production, even though there has been little change in the area planted. The relationship between the area planted and the value of the product is a reflection of the change in crops and the technological development of the fields. Labor demand has also increased: in recent years the population employed in the secondary and tertiary sectors has moved to the primary sector. Although in the municipality of Zapotlán el Grande a large part of the population is still in the tertiary sector, the increase in the number of workers in agricultural activities is clear. This transition is the result, in part, of



the working conditions offered by these companies: work with these new crops offers better wages and working conditions than those in traditional agriculture or even industry.

These factors have led to reductions in deprivations and in various dimensions of poverty. For example, the elimination of child labor may be contributing to increased educational levels and a reduction in the economic activity of 12- to 19-year-olds. High school and college curricula have also been diversified to adapt to the new demands of this labor market. There has also been an increase in social security enrollment. From 2000 to 2015 the largest number of affiliations were with Seguro Popular and IMSS, and the number of enrollments has steadily increased. Zapotlán el Grande has the greatest participation in social security of any municipality in the region, with just over 50% of workers enrolled. The largest part of the increase in IMSS enrollments has come from the agricultural sector.

Access to social security and health services is one of the factors in measuring a gap in social support. In the Zapotlán Valley, the population lacking social security has declined, and access to social security is the factor where this gap has been reduced the most. In this change lies the regional importance of formalizing agricultural labor and of the policies of social responsibility. However, as we have argued, it is essential to study the effectiveness of access to health services. Along the same lines, the improvement in the working conditions of agricultural workers and making their employment less seasonal has allowed migrant workers and their families to settle for periods of time or permanently in the Zapotlán Valley. For families coming from states with higher poverty levels, this migration represents an opportunity to increase their household income and improve their standard of living. However, these changes are accompanied by important challenges in the provision of services and the development of infrastructure. There are particularly clear needs in housing and in effective access to health care, and these issues should be more fully examined. The impact of the agricultural sector on the economy, the population, urban development, and regional politics shows how the cultivation of berries and avocados has increasingly become fundamental to the geographical organization of the region.



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APPENDIX

Appendix A. Basic Geohydrographic Data for the Zapotlán Valley Selected indicators (%)

Municipality	Gómez Farías	Zapotlán el Grande
Area	363 sq. km	316 sq. km
Altitude	1506 m (municipal seat)	1529 m
Average Annual Temperature	16.1 °C.	17.4 °C.
Climate	Semi-warm, semi-humid	Semi-warm, semi-humid
Average Annual Precipitation	1174 mm	871 mm
Average Annual Evaporation	600 mm	600 mm
Groundwater Availability	Lagunas (18.57 Mm ³), Aguacate (-0.76 Mm ³), and Ciudad Guzmán (-20.95 Mm ³)	Ciudad Guzmán (-20.95 Mm ³)

Source: Authors' elaboration using data from the municipal hydrological specifications for Gómez Farías and Zapotlán el Grande, CEA Jalisco, 2015.

Appendix B. Water Use in the Zapotlán Valley, 2015

Municipality	Zapotlán el Grande			Gómez Farías				
Availability of the Hydrological Basins	Quito (253.44 Mm ³) and Laguna de Zapotlán (16.67 Mm ³)			Laguna de Zapotlán (16.67 Mm ³), Quito (253.44 Mm ³), and Laguna de Sayula A (0.00 Mm ³)				
	Surface Water							
	Total 22 users			Total 38 users				
	Use	Quantity	Volume (Mm ³)	% (Volume)	Use	Quantity	Volume (Mm ³)	% (Volume)
	Urban Public	10	0.739258	47.18	Aquaculture	5	0.782374	20.52
Agricultural	5	0.210702	13.45	Agriculture	24	2.934112	76.96	
Domestic	2	0.004103	0.26	Livestock	3	0.005974	0.16	
Livestock	2	0.0027375	0.17	Urban Public	4	0.089345	2.34	
Services	2	0.60876	38.85	Services	2	0.00076	0.02	
Multiple	1	0.001261	0.08	Total	38	3.812565	100	
Total	22	1.5668215	100					
Groundwater								
Total 330 users				Total 218 users				
Use	Quantity	Volume (Mm ³)	% (Volume)	Use	Quantity	Volume (Mm ³)	% (Volume)	
Agriculture	292	55.365405	73.31	Aquaculture	5	0.782374	20.52	
Urban Public	21	19.147863	25.35	Agriculture	24	2.934112	76.96	
Services	4	0.354603	0.47	Livestock	3	0.005974	0.16	
Other	1	0.384	0.51	Urban Public	4	0.089345	2.34	
Livestock	8	0.084631	0.11	Services	2	0.00076	0.02	
Multiple	1	0.12	0.16	Total	38	3.812565	100	
Industrial	3	0.07043	0.09					
Total	330	75.526932	100					

Source: Authors' elaboration using data from the municipal hydrological specifications for Gómez Farías and Zapotlán el Grande, CEA Jalisco, 2015.



Appendix C. Agricultural Production* by Crop in Gómez Farías in 2010 and 2019

Crop	2010			2019		
	Area Planted (hectares)	Production (metric tons)	Value of Production (thousands of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (thousands of pesos)
Agave	226	8,040	13,190.09	378.63	6,073.2	144,865.88
Avocados	342	2,886	77,152.15	1,541.33	15,405.5	274,272.58
Green Alfalfa	-	-	-	35	3,490.55	1,383.21
Blueberries	-	-	-	50	662	24,224.72
Fodder Oats	90	2,201	1,226.66	8	258.64	159.72
Eggplant	-	-	-	-	-	-
Broccoli	20	260	1,455.91	-	-	-
Canola	-	-	-	-	-	-
Sugar Cane	4	440.4	392.17	-	-	-
Zucchini	-	-	-	-	-	-
Safflower	-	-	-	-	-	-
Grain Barley	55.5	333	1,364.40	30	180	902.12
Onions	-	-	-	-	-	-
Chía	-	-	-	-	-	-
Green Chile	9.5	120.5	1,321.38	-	-	-
Cilantro	5	50	341.44	-	-	-
Cabbage	-	-	-	-	-	-
Cauliflower	20	360	1,229.19	-	-	-
Peaches	-	-	-	2	9.12	150.12
Corn	18	152.1	457.01	-	-	-
Asparagus	-	-	-	5	31	1,007.75
Raspberries	-	-	-	25	219.75	4,844.39
Fodder garbanzos	-	-	-	-	-	-
Desi Garbanzos	31.5	62.53	271.10	-	-	-
Pomegranates	-	-	-	3	16.65	188.08
Guavas	3.5	12.27	50.29	-	-	-
Lettuce	-	-	-	-	-	-
Key Limes	-	-	-	-	-	-
Fodder Corn	70	1841	1,382.91	700	31,570	18,277.44
Grain Corn	3,370	19,568.16	78,840.33	2,700	14,765.1	44,415.56
Grasses	930	11,160	3,353.23	1,310	37,413.6	14,632.09
Radishes	-	-	-	-	-	-
Grain Corn Seed	90	720	2,851.72	23	189.36	712.59
Grain Sorghum	120	624	2,258.43	-	-	-
Tomatoes	7	850.5	8,695.15	1	107.88	810.40
Tomatillos	16	200	1,371.23	-	-	-
Wheat	60	237.5	883.49	10	55.3	267.65
Carrots	-	-	-	-	-	-
Blackberries	-	-	-	20	149.9	3,642.36
Total	5,488	50,998.96	198,088.29	6,841.96	11,0597.55	534,756.66

Source: Authors' elaboration with data for 2019 from SIACON.

* Value of production expressed in real pesos based on the INPC, base year 2018.



Appendix D. Agricultural Production* by Crop in iZapotlán el Grande in 2010 and 2019

Crop	2010			2019		
	Area Planted (hectares)	Production (metric tons)	Value of Production (thousands of pesos)	Area Planted (hectares)	Production (metric tons)	Value of Production (thousands of pesos)
Swiss Chard	30	334	315.49	-	-	-
Agave	50	5,180	5,648.41	170.23	1,764	42,300.85
Avocados	2,300	9,000	122,918.98	5,031.9	43,669.16	791,495.18
Artichokes	-	-	-	-	-	-
Dried Alfalfa	-	-	-	-	-	-
Green Alfalfa	405	39,285	30,582.86	300	29,301	11,755.07
Blueberries	26	0	-	669.45	1,0394.37	382,591.21
Fodder Oats	250	7,690	5,293.30	56	1,898.4	1,190.67
Beets	20	413	2,160.85	-	-	-
Broccoli	105	1,316	7,730.03	-	-	-
Sugar Cane	118	12,980	11,558.43	-	-	-
Zucchini	70	1,394.4	8,310.96	1	20.2	126.69
Onions	20	510	4,744.85	-	-	-
Green Chiles	47	680.4	8,504.55	-	-	-
Cilantro	36	477.3	3,173.77	-	-	-
Cabbage	35	940	2,805.28	3	132	229.51
Cauliflower	8	180	639.18	3	62.1	509.33
Peaches	74	307.2	1,632.36	7	34.56	606.62
Corn	120	1,843	4,479.51	-	-	-
Raspberries	-	-	-	1,970.71	30,353.05	604,154.96
Strawberries	-	-	-	-	-	-
Strawberry Plants	140	22,579,200	30,529.54	75	45,000,000	52,105.47
Beans	10	21	358.51	-	-	-
Desi Garbanzos	-	-	-	-	-	-
Pomegranates	-	-	-	58	392.4	4,606.86
Guavas	-	-	-	-	-	-
Key Limes	14	109.2	313.20	-	-	-
Limes	-	-	-	2	21.8	103.38
Fodder Corn	2,000	30,800	27,342.65	370	17,005.9	10,055.51
Grain Corn	6,449	37,445.36	150,775.57	150	661.5	2,182.87
Apples	4	23.2	190.11	-	-	-
Grasses	4,950	119,250	48,622.45	1,053	30,431.7	11,616.12
Cucumbers	10	200	764.83	-	-	-
Pears	2	13	106.53	-	-	-
Radishes	55	1,001.25	3,423.88	4	153.2	532.17
Grain Corn Seed	150	1,215	4,895.25	-	-	-
Grain Sorghum	1,320	7,863.2	28,701.56	16	92.8	358.18
Tejocote	8	30.4	124.56	-	-	-
Tomatoes	315	16,122.6	239,173.11	115	17,250	153,308.95
Tomatillos	160	1968	13,439.14	-	-	-
Wheat	45	157.5	645.46	-	-	-
Carrots	55	1,597.5	7,201.00	-	-	-
Blackberries	-	-	-	120	1,576	38,315.89
Total	19,401	22,879,547.51	777,106.16	10,175.29	45,186,511.34	2,108,145.49

Source: Authors' elaboration with data for 2019 from the SIACON.

* Value of production expressed in real pesos based on the INPC, base year 2018.



Appendix E. Indicators of Gaps in Social Support by Municipality, 2010 and 2015

	Gómez Farías		Zapotlán el Grande	
	2010	2015	2010	2015
Total Population	14,011	14,278	100,534	105,423
Indicators (percentages)				
Age 15 and Older, Illiterate	4.22	2.92	4.22	2.92
Age 6-14, Not Attending School	4.28	3.01	3.49	2.64
Age 15 and Older, Has Not Finished Junior High School	54.84	48.29	35.67	31.99
Not Enrolled in Social Security Health Services	28.01	10.69	27.58	12.55
Housing With Dirt Floor	9.98	4.96	3.04	1.3
Housing Without Toilet	2.61	1.56	0.63	0.38
Housing Without Running Water	4.94	1.59	1.86	0.41
Housing Without Drainage	2.33	1.65	0.54	0.15
Housing Without Electricity	1.21	0.32	0.41	0.17
Housing Without Washing Machine	30.64	23.73	17.91	16.33
Housing Without Refrigerator	19.24	11.79	6.96	5.77
Index of Gap in Social Support (<i>rezago social</i>)	-0.80083	-	-1.43685	-1.2745
		0.79056		
Degree of Gap in Social Support	Very low	Low	Very low	Very low
Rank Among Municipalities Nationally	1,852	1,860	2,366	2,340

Source: Authors' elaboration based on 2015 national, state, and municipal data for the *índice de Rezago Social*, CONEVAL.



Appendix F. Indicators of Multidimensional Poverty in Gómez Farías, 2010 and 2015

Indicators	Percentage		No. of Persons		Average No. of Gaps	
	2010	2015	2010	2015	2010	2015
Multidimensional Poverty						
Population in Multidimensional Poverty	55.8	53.8	9,609	7,718	2.6	2.3
Population in Moderate Multidimensional Poverty	45.6	47.5	7,847	6,817	2.3	1.8
Population in Extreme Multidimensional Poverty	10.2	6.3	1,763	901	3.7	3.5
Vulnerable Population due to Social Deprivation	32.6	26.0	5,608	3,723	2.2	1.8
Vulnerable Population by Income	3.8	9.5	649	1,357		
Non-poor and Non-vulnerable Population	7.8	10.8	1,343	1,550		
Social Deprivation						
Population With at Least One Social Deprivation	88.4	79.7	15,217	11,441	2.4	1.9
Population With at Least Three Social Deprivations	35.8	20.0	6,166	2,873	3.7	3.4
Indicators of Social Deprivation						
Educational Gap	29.5	27.7	5,076	3,968	3.1	2.5
Access to Health Services	18.3	11.4	2,156	1,633	3.2	2.8
Access to Social Security	72.2	58.5	12,429	8,396	2.6	2.1
Quality and Space in Housing	19.6	17.4	3,365	2,503	3.7	2.7
Access to Basic Services in Housing	31.1	26.7	5,352	3,837	3.4	2.6
Access to Food	43.9	11.6	7,560	1,666	3.2	2.8
Welfare						
Population Below the Well-being Line	59.6	63.2	10,258	9,075	2.4	1.7
Population Below the Minimum Well-being Line	21.5	19.1	3,695	2,738	2.6	2.0

Source: Authors' elaboration based on a dynamic search of results from the 2010 and 2015 Municipal-Level Assessment of Poverty, CONEVAL, 2017.



Appendix G. Indicators of Multidimensional Poverty in Zapotlán el Grande, 2010 and 2015

Indicators	Percentage		No. of Persons		Average No. of Gaps	
	2010	2015	2010	2015	2010	2015
Multidimensional Poverty						
Population in Multidimensional Poverty	35.2	35.0	33,544	35,721	2.0	1.7
Population in Moderate Multidimensional Poverty	31.9	33.2	30,438	33,888	1.8	1.6
Population in Extreme Multidimensional Poverty	3.3	1.8	3,106	1,833	3.5	3.3
Vulnerable Population due to Social Deprivation	26.3	20.4	25,077	20,798	1.8	1.5
Vulnerable Population by Income	10.3	14.6	9,839	14,849		
Non-poor and Non-vulnerable Population	28.2	30.0	26,935	30,574		
Social Deprivation						
Population With at Least One Social Deprivation	61.5	55.4	58,622	56,519	1.9	1.6
Population With at Least Three Social Deprivations	12.7	7.0	12,100	7,118	3.4	3.3
Indicators of Social Deprivation						
Educational Gap	18.1	16.2	17,231	16,545	2.3	2.0
Access to Health Services	25.5	11.3	24,333	11,543	2.5	2.4
Access to Social Security	44.3	38.7	42,229	39,433	2.2	1.8
Quality and Space in Housing	6.7	7.2	6,364	7,334	2.9	2.4
Access to Basic Services in Housing	5.0	2.6	4,815	2,684	2.6	2.9
Access to Food	17.6	14.3	16,786	14,595	2.5	1.9
Welfare						
Population Below the Well-being Line	45.5	49.6	43,384	50,570	1.5	1.2
Population Below the Minimum Well-being Line	14.3	11.5	13,672	11,749	1.8	1.5

Source: Authors' elaboration based on a dynamic search of results from the 2010 and 2015 Municipal-Level Assessment of Poverty, CONEVAL, 2017.



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