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The Culiacán Valley: A Divided Workforce

Agustín Escobar Latapí / Elisa Alejandra Martínez Rubio

2



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LA AGRICULTURA
DE EXPORTACIÓN

Farmworkers in Mexico's Export Agriculture

Regional Notebook 2

The Culiacán Valley: A Divided Workforce

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The Culiacán Valley: A Divided Workforce

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Regional Notebook Series 2 The Culiacán Valley: A Divided Workforce

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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.

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Abbreviations

- AFOMAC: Asociación Pro Formación y Orientación de la Mujer. Association for the Education and Counseling of Women.
- AARC: Asociación de Agricultores de Río Culiacán. Culiacán River Agricultural Association.
- AMHPAC: Asociación Mexicana de Horticultura Protegida A.C. Mexican Association of Protected Horticulture.
- CAADES: Confederación de Asociaciones Agrícolas del Estado de Sinaloa. Confederation of Agricultural Associations of the State of Sinaloa. Confederation of Agricultural Associations of the State of Sinaloa.
- CCE: Consejo Coordinador Empresarial. Mexico's Employer's Coordination Council.
- CIESAS: Centro de Investigaciones y Estudios Superiores en Antropología Social. Center for Research and Higher Studies in Social Anthropology.
- CONEVAL: Consejo Nacional de Evaluación de la Política de Desarrollo Social. National Council for the Evaluation of Social Development Policy.
- COPARMEX: Confederación Patronal de la República Mexicana. Mexican Employers' Council.
- COVID-19: 2019 Coronavirus Disease.
- DIF: Sistema Nacional para el Desarrollo Integral de las Familias. System for the Comprehensive Development of Families.
- ENJOREX: Encuesta Nacional de Jornaleros en la Agricultura de Exportación. National Survey of Farm Workers in Mexico's Export Agriculture.
- GATT: General Agreement on Trade and Tariffs.
- IMSS: Instituto Mexicano del Seguro Social. Mexican Social Security Institute.
- INEGI: Instituto Nacional de Estadística y Geografía. National Institute of Statistics and Geography.
- INFONAVIT: Instituto del Fondo Nacional de la Vivienda para los Trabajadores. National Institute for Workers' Housing.
- INPC: Índice Nacional de Precios al Consumidor. National Consumer Price Index.
- ISEA: Instituto Sonorense de Educación para los Adultos. Sonora Government's Adult Literacy Institute.
- ISSSTE: Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado. Social Security Institute for State and Civil Service Workers.
- NGO: Organización no Gubernamental. Non-Governmental Organization.
- PAJA: Programa de Atención a Jornaleros Agrícolas, Program for the Support of Farm Laborers.
- SCIAN: Sistema de Clasificación Industrial de América del Norte. North American Industrial Classification 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.
- TLCAN-NAFTA: El Tratado de Libre Comercio de América del Norte. North American Free Trade Agreement.
- TPT: Taxis, Praxis, Telos, Evaluación y Proyectos [TPT Consultants].
- U.S.: United States of America.
- USDA: U.S. Department of Agriculture.
- USMCA: North American Free Trade 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 and across North America. 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, in 2017, undertook a reform 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 Wilson Center, TPT, 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 study of workers in Villa Juárez, on the outskirts of Culiacán. We are pleased to publish *The Culiacán Valley: A Divided Workforce*, 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, 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 the Culiacán Valley. 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 "*saliendo y pagando*" ["pay as you go" –workers, who perform day labor without any kind of formal hiring or benefits–] workers.

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Andrew I. Rudman
Director, Mexico Institute
Woodrow Wilson Center



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.

Our first regional studies focused on Southern Jalisco. This second Regional Notebook provides an in-depth look at the Culiacán Valley and its two main municipalities, Culiacán—a sprawling urban center as well as the state capital—and Navolato, its more rural neighbor. These two municipalities are the leading producers and exporters of tomatoes in Mexico.

The Culiacán Valley’s farm export economy is 100 years old, though it has boomed in recent years. Suspension of traditional subsidies to growers in the late 1980s and early 1990s led to a reorganization of production that affected workers. Specialists claim that the disappearance of most subsidies led employers to impose more flexible and insecure working conditions in order to compete with U.S. growers.

Today, the majority of farm workers in the valley come from poorer states in Western and Southern Mexico. In most states where agricultural exports are significant, over half the workers come from the same state. In this respect, Sinaloa is akin to Baja California—Regional Notebook #3—, where most workers are temporary or permanent immigrants from Southern Mexico.

The workforce consists of two different segments: one works for large export growers, earns acceptable wages—slightly less than twice the 2020 minimum wage—and is entitled to all legally mandated job benefits. The other earns about 12% less; employers avoid paying social security and other payroll tax funded benefit programs, and workers are flexibly employed and dis-employed upon demand.

The top, or formal, segment, benefited from large public-private investments on social infrastructure and services, including health clinics, child care, elementary schools, and company housing. This segment’s employment conditions comply with the law, although they are not the best in Mexico. Company housing, in particular, evolved from tin-sheet barracks in the seventies and eighties to solid, adequate lodgings in 2014–2018. In Sinaloa, we found women return to farm work in their late thirties. We believe this is due to the operation of a large network of child care centers. Social investments were channeled through the federal government’s program supporting farm workers. This program comprised numerous actions: it advised workers in their hometowns on the legality and reliability of work contracts, secured



safe transport from Southern Mexico, provided cash to workers to help them avoid debt, and partly funded the construction and operation of social infrastructure.

Our anthropological fieldwork found significant disadvantages to working in the lower segment, locally known as pay and go” [*saliendo y pagando*] workers, who perform day labor without any kind of formal hiring or benefits. This includes almost no social security affiliation, longer hours, shorter breaks, and “flexible work”, meaning workers may not be required to work full weeks, thus lowering their earnings. However, some workers prefer the immediate cash provided by informal work, although this significantly curtails their benefits and potential retirement benefits.

In 2019, the federal government suspended or cut spending on social programs aimed at protecting migrant workers and improving their recruitment, employment, and living conditions. As of 2020, the infrastructure is still there, but we encountered significant uncertainty as to who will be responsible for the provision of services. Also, far more infrastructure is needed, because export agriculture is booming. Will new workers benefit from the expansion of services? The future of such government interventions is unclear. Certainly, the town of Navolato requires significant social investment urgently, because it is growing, but service provision is significantly deficient.

The recent suspension of federal subsidies, and budget cuts to social security, healthcare, childcare and other services —which were already deficient— begs the question: Will this impact working conditions?



Map 1. Municipalities of Navolato and Culiacán, Sinaloa

I. AGRICULTURE IN THE CULIACÁN VALLEY: A HISTORY

Mexico's farm export boom, which has been particularly exponential since 2007, is often attributed to external factors, such as the North American Free Trade Agreement (NAFTA) or foreign investment. However, Mexican export agriculture has deep roots, extending back over a century as farms grew, agriculture changed, and migrant workers settled in the Culiacán Valley, Sinaloa's most important region in terms of commercial and export agriculture. The Culiacán Valley lies at the heart of one of Mexico's most prominent and most productive agricultural regions.¹ Sinaloa's foothills and coastal plains are long and fertile, having attracted foreign investment since the late 19th century when the major crops were sugar cane, cotton and chickpeas (Lara-Flores, 2012; Maya-Ambía, 2011; Revilla-López & Ortiz-Marín, 2013).² In 1905, Sinaloa's first tomatoes made the journey by boat from Culiacán and Ahome to San Francisco (Frías-Sarmiento, 2008). That effort failed. The journey was too long, and the tomatoes were not refrigerated. In 1907, however, Sinaloa's first railroad link to the US was completed, and tomato shipments started almost immediately (Frías-Sarmiento, 2008). In Culiacán Valley, we focus on Culiacán, a municipality hosting the state capital, and Navolato. Culiacán is a large, dynamic city. It owes its dynamics to agriculture, but its economy is highly diversified. Navolato, on the contrary, is mostly rural. In Navolato, the influence of agriculture is clear and direct. Other regional analyses define the Culiacán Valley as comprising eight municipalities. We focus on the core two only.

Despite various ups and downs, the region has progressively added more resources to its strengths, and has become a fresh produce —tomato, mostly—³ powerhouse. While there were a few dams by the end of the 19th century, it wasn't until the 1940s that the first large dams started to be built, followed by larger and larger dams all along the coastal plains until the 1970s.⁴ Dams are indispensable for winter crops. Since there is practically no snow on the Sierra Madre Occidental, rivers swell during the rainy season —May through September— and dry up by November. Year-round agriculture, and winter harvests especially, are dependent on irrigation water from these dams.

1 The other region is the avocado exporting region in and around Uruapan, whose exports have surpassed Sinaloa's in value in recent years. The Sinaloa export region comprises the following municipalities: Salvador Alvarado, Angostura, Mocorito, Badiraguato, Navolato, Culiacán, Elota and Cosalá (Leyva-Morales et al. 2014, p. 248).

2 A large sugar mill gave birth to Los Mochis, one of Sinaloa's largest cities today.

3 The valley makes a very significant contribution to Mexico's total maize harvest. Other crops in the valley include bell peppers and cucumbers.

4 Irrigation canals were the main water works built before the end of the 19th century. The main large infrastructure that allowed a significant expansion of the agricultural frontier were carried out from the 1940s onwards (Rodríguez-Pérez, 2005). The first dam was Sanalona, finished in 1948, the second was called Miguel Hidalgo y Costilla, and it was finished in 1956. Then came the Adolfo López Mateos or El Humaya dam, the Josefa Ortiz de Domínguez and Eustaquio Balbuena; they began operation in 1964, 1968 and 1972 (Urrea-Salazar, 2004). Today, the state of Sinaloa has 11 major dams (Sistema Nacional de Información del Agua, 2020). According to Sandoval-Cabrera (2012), growers' associations were the main beneficiaries. The author states that associations were founded as soon as the news of a new dam arrived in Sinaloa, in order to allow members to negotiate a better water supply (2012, p. 246).



Foreign investment was a major factor affecting the region at the turn of the 20th century. The region's first production and export boom took place in the 1920s. The main crops at the time were tomatoes, bell peppers, zucchinis, cucumber and eggplants. Foreign investment and the new railroad were crucial,⁵ as were the first large-scale dams and irrigation canals. At the end of the 19th century, the construction of a network of canals and pumps began to provide a push for winter harvests: "Construction of the Cañedo canal starts in 1899, and the Rosales canal is begun in 1922" (Rodríguez-Pérez, 2005, p. 60). The latter allowed for the construction of Mexico's 10th irrigation district (Urrea-Salazar, 2004, p. 30; Aguilar-Aguilar, 2006, p. 148). In spite of the advantages brought by these initiatives, growers still faced obstacles entering the U.S. market because of the protections in place, and standards set by the U.S. Department of Agriculture (USDA).

U.S. regulations and trade barriers were intended to protect growers in Florida, where peak production seasons coincided with those in Sinaloa. (Lara-Flores-Flores, 1998; Rodríguez-Pérez-Pérez, 2005; Frías-Sarmiento, 2008). The Culiacán Valley's irrigation systems became increasingly important, because they allowed Mexican exporters to complement rather than compete with Florida production. They also had to develop new tomato varieties that could meet U.S. standards (Frías-Sarmiento, 2008)⁶ and made improvements in the picking, handling and packing processes (Rodríguez-Pérez, 2005).⁷ These changes allowed Culiacán Valley's agriculture to boom. The boom required –and incentivized– producers to get organized. Starting in 1932, growers began formalizing their organizations. That same year, they founded the CAADES, a confederation intended to unite them all⁸ (Urrea-Salazar, 2004; Sandoval-Cabrera, 2012).

CAADES became a key instrument in the growers' strength for a number of reasons. It presented a united front when confronting the Mexican government to avoid or minimize the impact of agrarian reform; it allowed formal, independent funding to growers; it facilitated the purchase of inputs –seeds, fertilizers, etc.– and modern machinery. Through the powerful Confederación Nacional de Productores de Hortalizas, CNPH [National Confederation of Horticultural Producers], affiliated to the official party, it controlled who planted what for two decades. Finally, it coordinated sales (Sandoval-Cabrera, 2012, p. 243). This, in turn, allowed regional growers to become independent from U.S. investors who had fostered development but controlled exports. Sinaloa growers' autonomy allowed them to operate exports directly through commissions and organizations set up by them.⁹ Starting in 1930, capital accumulation

5 Railroad cars were first refrigerated at this time (Sandoval-Cabrera, 2012).

6 According to Frías-Sarmiento, there were two major categories for tomato quality depending on their size, color, form and texture (2008): "fancy" and second-rate.

7 Rodríguez-Pérez-Pérez (2005) points out that new packing techniques in 1932 were a key factor in the increased employment of skilled women. She shows packing installations are mostly staffed by women.

8 CAADES was created as a syndicate bringing together the vast majority of growers in Sinaloa, through the grower associations that had already been founded at the time (Urrea-Salazar, 2004, p. 47). The associations in question are: Río Fuerte Horticultural Growers' Association, Río Sinaloa Horticultural Growers' Association, Horticultural Growers of the Río Culiacán agricultural region, and Río Elota Vegetable Growers' Association (Urrea-Salazar, 2004).

9 They include a regulation committee for the sale of fresh vegetables, a commission for research and defense of vegetables, and the services for fresh tomato certification (Urrea-Salazar, 2004).



allowed for the creation of regional banks specializing in export agriculture (Sandoval-Cabrera, 2012, p.243). According to Frías-Sarmiento, CAADES functioned as a safeguard against foreign control of Sinaloa's agriculture (2008, p.19). Today, CAADES is based in Culiacán, the state capital, and works closely with all 11 regional growers' associations and the state government.

Exports slumped in 1933. According to Frías-Sarmiento (2008), this was due to two main factors: The Great Recession is one. Secondly, the Mexican government focused its attention on agrarian reform. Agrarian reform led large growers to panic. Many sold their properties before the government announced its stance on the issue of land tenure in the region (Frías-Sarmiento, 2008, p. 81). In addition, the birth of farm worker unions supported by the government led foreign investors to divest from their land in favor of providing finance to Mexican growers (Rodríguez-Pérez, 2005, p. 61).

Although irrigation systems allowed Sinaloa production to avoid competing with Florida, the relationship with Florida has been confrontational. With the water from the dams, Sinaloa can produce year-round. However, Florida can also now produce year-round thanks to technological advances. The tomato market has not grown as much as others —such as avocado—, meaning competition is fierce, with lawsuits and dumping accusations a constant issue. Sinaloa towns in the coastal plains grew from the late 19th century onwards, and agricultural growth and farm exports were key to urban growth. Mazatlán, Los Mochis, Culiacán, and other smaller towns expanded along with agriculture.

Agricultural modernization proceeded in stages. Analysts identify a series of technological development phases marked by mechanization —1940s—, fertilizers, greenhouses and the separation of seedlings and fruit cultivation, staking tomatoes, introducing conveyor belts in packing houses, improved seeds and pest control substances —recently, biological pest control—, drip irrigation and nutrition, among others (Lara-Flores, 1998; Rodríguez-Pérez, 2005; Sandoval-Cabrera, 2012). Simultaneously, the agricultural frontier also kept expanding thanks to more and larger dams. Planted acreage grew, as did demand for labor (Revilla-López & Ortiz-Marín, 2013)

While production and exports stagnated during the Great Depression, by 1940 growth had resumed as the U.S. entered the Second World War and farm labor became scarce in the United States (Frías-Sarmiento, 2008). Production and employment growth continued apace during the 1950s and 1960s, partly because the Cuban embargo provided another push.

A further watershed occurred in the late 1980s and early 1990s. Analysts blame these events for a downgrading of labor conditions. When Mexico joined the General Agreement on Trade and Tariffs (GATT), it was forced to abandon its farm subsidy structure, and growers started competing more keenly for lower profits. According to Becerra-Pedraza et al. (2008) saving on labor costs became paramount when prices and profits fell due to lower subsidies. Until 1990, the CNPH had the right to authorize planting, harvesting and transportation of vegetables. They lost that authority with the reforms of the early 1990s (Avendaño-Ruiz & Schwentesius-Rindermann, 2004). These authors view the rise of a highly segmented labor market, including significant indigenous and child labor, as a consequence of dismantling the old protected structure that included a closed market, subsidies, allowing growers to decide who could grow tomatoes and in what quantities, and finally, low-cost credit. By 1993, the



changes had taken place, and growers had to find new sources of profits. These authors believe lowering labor costs was part of the answer.

We bring this overview of Culiacán's agricultural history to a close with an analysis of the most recent trends in production and value. The Culiacán Valley produces 1/3 of the total farm production in Sinaloa.¹⁰ Although the land surface devoted to agriculture has diminished slightly, value has risen by 59% in ten years. This is due both to crop changes—moving away from sugar cane and maize—and to the rise, and increasing productivity, of high-value crops. Productivity by volume has risen by 17% in 10 years, while value per hectare has risen by 64%. Maize still absorbs the majority of all farmland, but vegetables have expanded. Vegetables require large amounts of labor during the picking season. The total value of crops such as tomatoes, cucumbers and green chili has risen significantly. This is mostly because these crops are aimed at an export market that demands high quality and is willing to pay for it. In addition to high quality standards for the vegetables themselves, growers have adopted international certifications asserting that they abide by Mexican labor law and comply with major international agreements on the treatment of workers. These certificates should be reflected in workers' labor and living standards.

Table 1. Value of Agricultural Production in Millions of Pesos,* and Participation of Culiacan Valley in the State of Sinaloa (%), 2010, 2015, and 2020

Indicator	2010	2015	2020 ¹
Value of Production in Sinaloa	39,897.54	45,551.06	56,794.40
Value of Production in Culiacán Valley	11,622.42	15,834.56	18,531.97
% Participation of Culiacán Valley in Sinaloa.	29%	35%	33%

Source: Authors' elaboration with data on agricultural production for 2010, 2015, and 2020 from the SIAP.

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

¹ The data provided by the SIAP for 2020 are preliminary and are subject to revision.

¹⁰ By "The Culiacán Valley" we refer to the municipalities of Culiacán and Navolato only. Other administrative divisions in the state of Sinaloa comprise as many as eight municipalities.



Table 2. Agricultural Production* in the Culiacán Valley in the State of Sinaloa, 2010, 2015, and 2020**

		Planting Area (hectare)	Production in Thousands of Tons	Production Value (millions of pesos)	Value per Planting Hectare (thousands of pesos)
Culiacán Valley	2010	278,012	3,769.95	11,622.42	91.68
	2015	298,100.53	3,907.63	16,058.26	115.01
	2020	247,666.41	3,883.79	18,531.97	153.54

Source: Authors' elaboration with data on agricultural production for 2010, 2015, and 2020 from the SIAP.

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

** The data provided by the SIAP for 2020 are preliminary and are subject to revision.

Table 3. Agricultural Production* of the Major Crops in Culiacán Valley, Sinaloa, 2010, 2015, and 2020**

Crops	2010			2015			2020		
	Planting Area (hectare)	Production in Thousands of Tons	Production Value (millions of pesos)	Planting Area (hectare)	Production in Thousands of Tons	Production Value (millions of pesos)	Planting Area (hectare)	Production in Thousands of Tons	Production Value (millions of pesos)
Eggplant	886	56.83	479.96	2,040.75	148.1	1,071.00	1,237	96.84	994.48
Green Chile	3,005	178.85	694.04	3,332	195.79	1,526.05	2,065	178.21	2,212.27
Corn Grain	156,360	1,616.47	5,079.91	182,359	1,822.02	7,308.84	178,709.24	1,877.57	6,556.50
Cucumber	1,949	122.6	416.26	4,027.5	330.96	1,886.11	2,317	304.31	2,296.93
Tomato	4,629	400.9	2,777.99	6,233	534.32	2,450.64	4,676	417.67	5,317.44
Total	166,829	2,375.65	9,448.16	197,992.25	3,031.19	14,242.64	189,004.24	2,874.6	17,377.63

Source: Authors' elaboration with data on agricultural production for 2010, 2015, and 2020 from the SIAP.

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

** The data provided by the SIAP for 2020 are preliminary and are subject to revision.

In summary, the Culiacán Valley's agricultural progression towards higher total output has continued during the most recent past. Maize and sugar cane are retreating, and high-value added and labor-intensive horticultural products are increasing both in productivity and in acreage. This would seem to point at more demand for workers. The next section shows this is not necessarily the case. If both statements are correct, and value is increasing faster than employment, then it would follow that labor productivity is increasing also.



II. POPULATION DYNAMICS

The literature on labor market segmentation dates from the 1960s. Authors like Reich et al. (1973), Edwards (1979), Gordon et al. (1982) and others state that labor markets are divided into tiers, with specific subclasses of workers in each one of them. Workers have fought to gain rights and higher wages for centuries. As new products and services are produced, and workers try to organize themselves, some kinds of work are performed in spaces where some of these rights and better earnings have been secured, while others are left to the rest of the workers who compete for the rest of the jobs, where these advantages are absent. There is no technical reason why jobs are segmented. It is a matter of defining spaces where more or fewer rights are granted, as work is negotiated in different sectors and companies. What does happen is that workers belonging to the upper tiers of the working class secure the better jobs. Thus, in the U.S. white workers in the Midwest occupy most of the job positions guaranteeing a middle-class life –or close to it– while African Americans, Latinos and various other immigrant populations compete for the rest of the jobs. In the 1970s, migrant workers were recognized as occupying the bottommost tier of the labor market in industrial countries (Piore, 1979). Although Mexico is not an industrial country, migrant farm workers have also traditionally been at the bottom of the occupational structure.

In the Culiacán Valley, the reforms referred to in the previous section have prompted employers to embark on a struggle for labor flexibility, according to Lara-Flores (2001), Revilla-López & Ortiz-Marín (2013), and others. These authors consider flexibility in a double sense. Firstly, employers have become able to employ and dis-employ large numbers of workers as the season or the market dictates. In doing so, they shift some of the market risks on to the workers. For this kind of flexibility, it is extremely convenient to have workers living in proximity to the farms. Transporting them from Mexico's South East would be costly and inefficient. Secondly, employers now rotate workers between different occupations as required. They label this as "qualitative" flexibility, which means multitasking, the exact opposite of Taylorism, where workers specialized in one task. At the same time, employers allocate the better jobs to some workers, and leave the rest to those with lower social standing (whether by sex, ethnicity, age or schooling). This hierarchical classification defines some jobs as skilled and others as unskilled (Lara-Flores 1995; Rodríguez-Pérez, 2005; Becerra-Pedraza et al., 2007; Becerra-Pedraza et al., 2008; Revilla-López & Ortiz-Marín, 2013).

According to the literature assessing the quality of jobs one or two decades ago, in the Culiacán Valley, the better jobs tend to go to the local non-indigenous or white males, while the hardest jobs –picking and tending to the plants in the sun, or during the evening and early morning hours in the winter– are left to indigenous workers, a large number of women, and children. A key aspect of this kind of segmentation, according to these authors, lies in the devaluation of the work carried out by women, children, teenagers and indigenous groups. We will test this hypothesis in this section.



First, however, we will examine the impact of agricultural development –already analyzed– on immigration and population structure. By 1974, farming in the Culiacán Valley had expanded and employed 100,000 migrant farm workers, according to CAADES (Posadas-Segura, 2009). Fifty-five thousand came from the mountains of Sinaloa itself, and 45,000 from central and southern Mexican states. By 1985, CAADES and the same author estimated migrant employment to be 150,000, tracing workers' origins to Michoacán, Zacatecas and Southern Mexico. The Instituto Nacional de Estadística y Geografía (INEGI) [National Institute of Statistics and Geography] Population Census shows a fall in total agricultural employment between 2000 and 2010, with a modest rise for 2020. Total jobs expanded by about 1% per year during the latest decade. However, there is a significant change in the percentage of women. It more than doubles. In fact, in the final section, we will see that women make up more than 50% of the labor force for this area's export agriculture.

Table 4. Total Jobs in Agricultural Work in Sinaloa 2000-2020

	Total	%	Men	%	Women	%
2000¹	184,365	100	144,372	78	39,993	22
2010²	110,413	100	99,286	90	11,127	10
2020³	122,158	100	94,938	78	27,220	22

Source: Estimated by Elisa Martínez and Diana Haidé López, with INEGI data.

¹ Economic sector, as per the SCIAN. It includes agriculture, cattle, forestry, fishing and hunting. Includes only employees, workers, farm workers and unskilled helpers.

² Economic sector, as per the SCIAN. It includes agriculture, cattle, forestry, fishing and hunting. Includes only employees, workers, farm workers and unskilled helpers.

³ Economic sector, as per the SINCO (2019). It only includes employees, workers, farmworkers and paid helpers.

Table 5. Total Jobs in Agricultural Work in the Culiacán Valley 2000-2020

	2000 ¹			2010 ²			2020 ³		
	Total	Men	Women	Total	Men	Women	Total	Men	Women
Culiacán	36,230	26,592	9,638	13,716	12,505	1,211	16,103	12,480	3,623
Navolato	27,364	19,038	8,326	13,359	10,656	2,703	16,921	11,146	5,775
Total	63,594	45,630	17,964	27,075	23,161	3,914	33,024	23,626	9,398

Source: Estimated by Elisa Martínez and Diana Haidé López, with Instituto Nacional de Estadística y Geografía, INEGI [National Institute of Statistics and Geography] data.

¹ Economic sector, as per the SCIAN. It includes agriculture, cattle, forestry, fishing and hunting. Includes only employees, workers, farm workers and unskilled helpers.

² Economic sector, as per the SCIAN. It includes agriculture, cattle, forestry, fishing and hunting. Includes only employees, workers, farm workers and unskilled helpers.

³ Economic sector, as per the SINCO (2019). It only includes employees, workers, farmworkers and paid helpers.



In 2020, AARC¹¹ estimated there were 142,000 farm workers in the Culiacán Valley, most of them migrants. It would certainly seem that the census is undercounting farm workers in the valley, since the database of the Instituto Mexicano del Seguro Social (IMSS) [Mexican Social Security Institute], records over 28,000 farm workers affiliated to the IMSS in Culiacán alone. In any case, increased production comes from productivity improvements: mechanization, technological advances in greenhouse management, and by extending the growing season. In other words, employment for farm workers has become less seasonal and more permanent, but the labor force has not expanded. Immigration from other states fell markedly from 2000 to 2010, and only rose modestly in 2020. Conversely, return migration from the U.S. rose in 2010 —after the Great Recession— and dropped markedly in 2020. Workers are not flowing to Sinaloa as they once did.

Table 6. Immigration: Population Five Years Old and Over Living Elsewhere Five Years Prior to Census

Municipality	2000	2000	2000	2010	2010	2010	2020	2020	2020
	Residence in the Same State 5 Years Before	Residence in Another State 5 Years Before	Residence in Another Country 5 Years Before	Residence in the Same State 5 Years Before	Residence in Another State 5 Years Before	Residence in Another Country 5 Years Before	Residence in the Same State 5 Years Before	Residence in Another State 5 Years Before	Residence in Another Country 5 Years Before
Culiacán	622,330	30,118	2,413	740,252	20,329	6,997 ¹	894,955	23,561	3,055 ³
Navolato	110,993	15,463	174	117,259	3,288	686 ²	128,725	7,386	235 ⁴
Total	733,323	45,581	2,587	857,511	23,617	7,683	1,023,680	30,947	3,290

Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the the 2020 Census of Population Housing, INEGI.

¹ Of the total number of residents living in another country, 6,752 lived in the United States.

² Of the total number of residents living in another country, 645 lived in the United States.

³ Of the total number of residents living in another country, 2,411 lived in the United States.

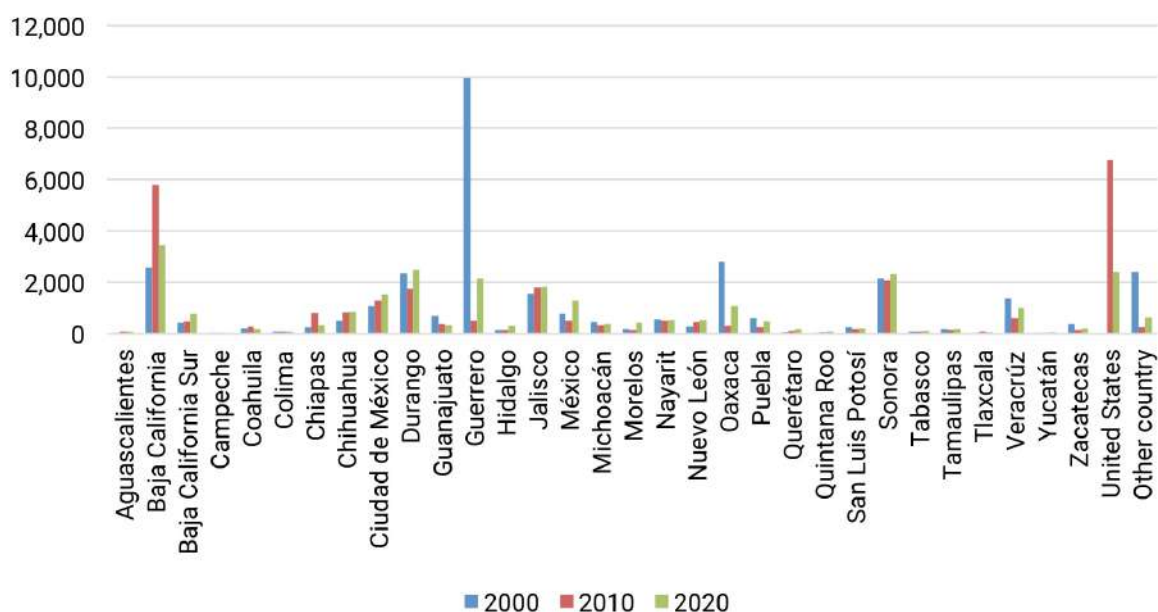
⁴ Of the total number of residents living in another country, 203 lived in the United States.

Immigration, especially from Guerrero, Oaxaca and other states in Mexico's South East, played a key role in the growth of both Culiacán and Navolato in the year 2000. By 2010, immigration had fallen very markedly, although there was a significant number of migrants returning from the U.S. Finally, in 2020, immigration maintained a relatively low profile. It would seem that the recent increase in production and total value has not produced a large inflow of workers.

11 Interview with AARC executive, January 29th, 2020.

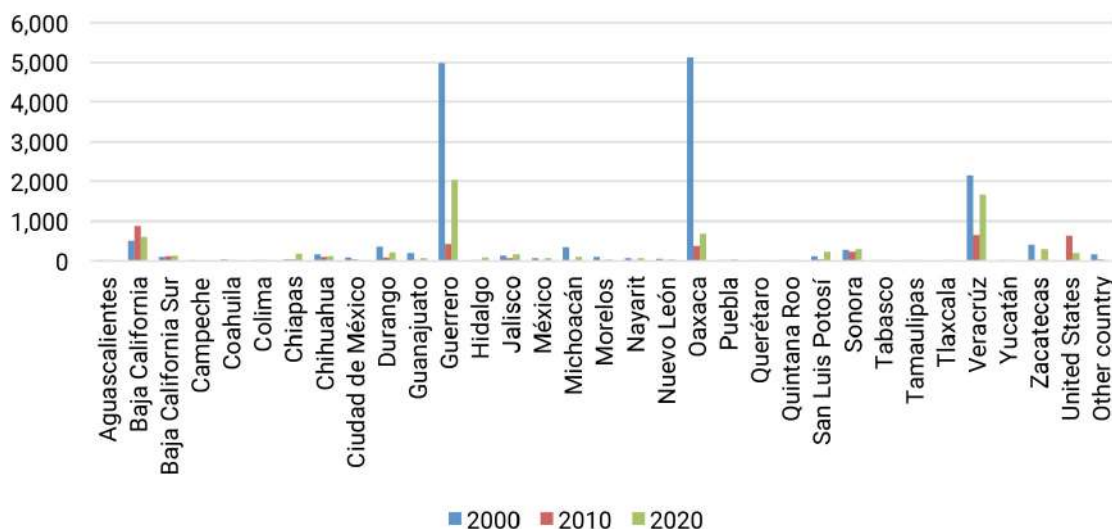


Figure 1. Main Places of Residence Five Years Prior to Census in Culiacán
Years Prior to Census



Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the the 2020 Census of Population Housing, INEGI.

Figure 2. Main Places of Residence Five Years Prior to Census in Culiacán
Years Prior to Census



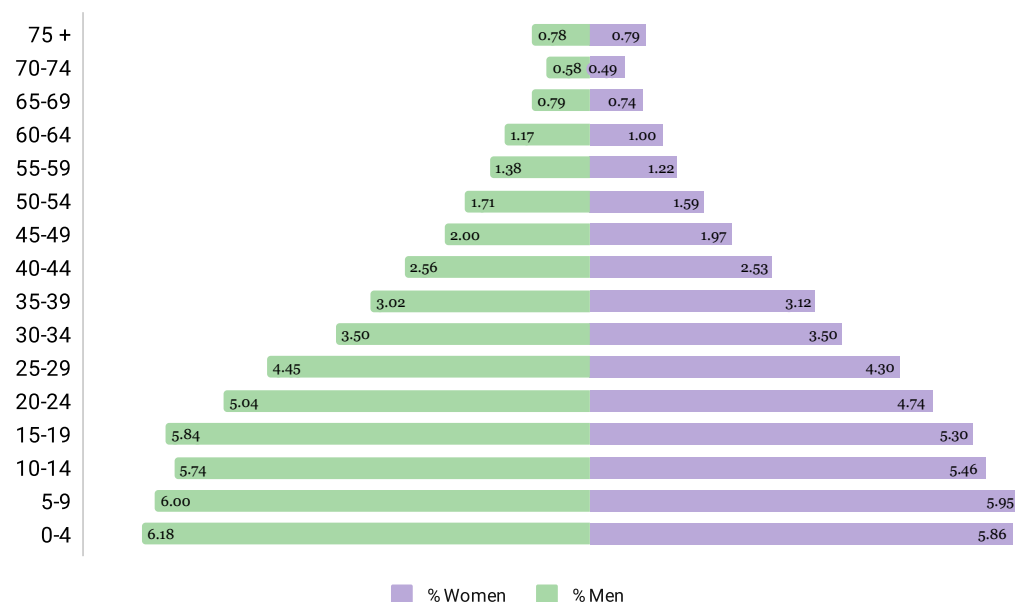
Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the the 2020 Census of Population Housing, INEGI.



At the same time, we independently explored the valley's largest farm worker city, Villa Juárez, where the population oscillates between 20,000 and 60,000, depending on the season.¹² While some workers in Villa Juárez have steady jobs and enjoy job benefits, many do not. They are called "*saliendo y pagando*" [pay as you leave] workers, who can be hired for one day only, similar to street corner laborers in the U.S. These workers congregate in specific spots in Villa Juárez at 5 am, where they are hired and returned at about 5 pm. In order to better understand the farmworker labor market in Culiacán, we focused on these workers in Villa Juárez. Villa Juárez is in Navolato, the mostly rural municipality bordering Culiacán. We interviewed two contrasting types of workers in Villa Juárez: formal workers sampled from various associations' rosters and employer payrolls, and mostly informal workers we detected through snowball techniques.

The following figures show the age structure of Navolato's population.

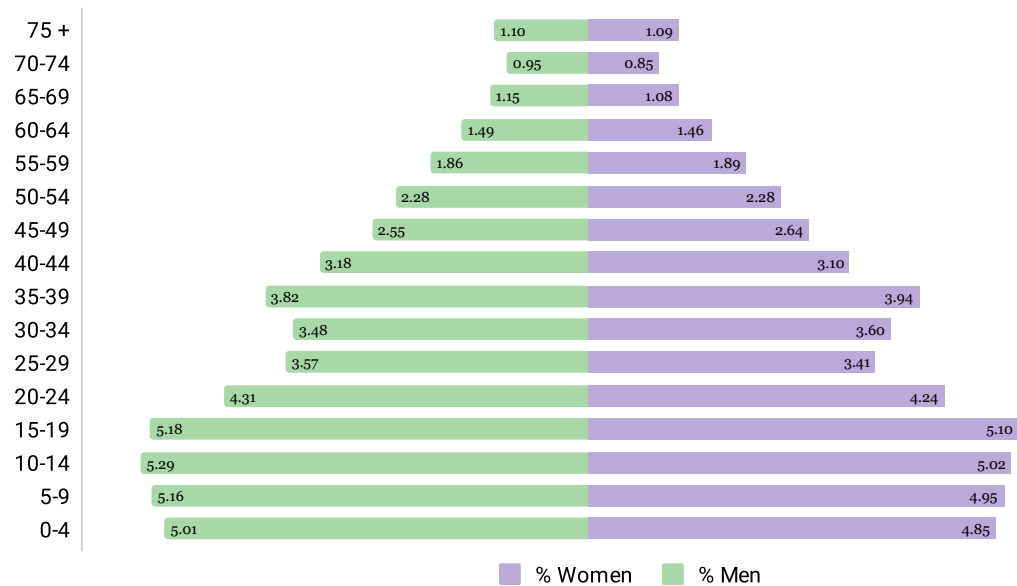
Figure 3. Population Pyramid by Percentage for the Municipality of Navolato, 2000



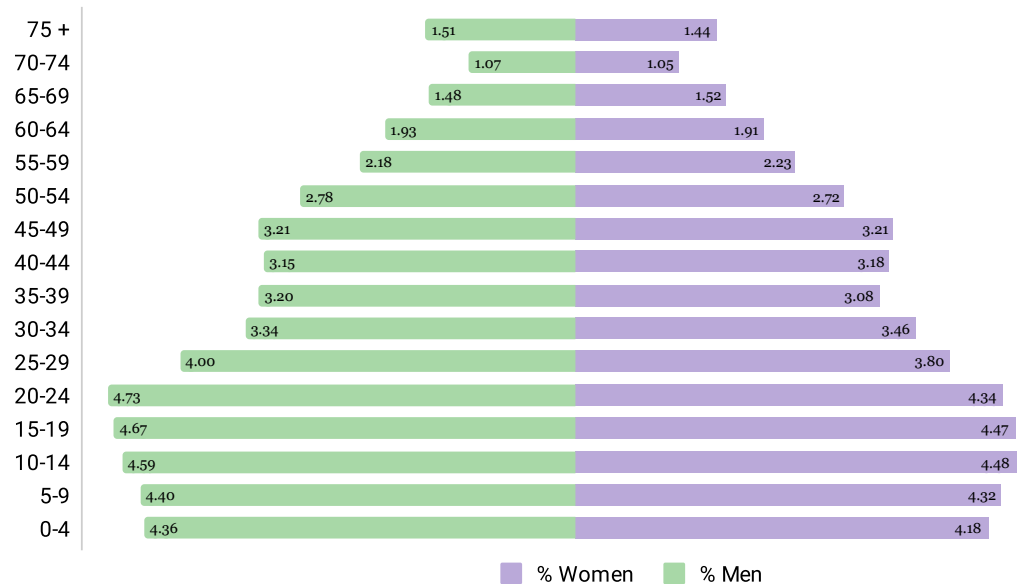
Source: Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI.

¹² Villa Juárez population figures are derived from social workers and labor rights from NGOs we interviewed in the city itself. We are very grateful to the Universidad Autónoma de Sinaloa and to the Social Service School in particular for their support for our survey, in both the association-based random sample and the analytical sample in Villa Juárez. And we are also very grateful to the Abogados Indígenas del Noroeste [Indigenous Lawyers of Northwestern Mexico], an NGO specializing in the defense of indigenous workers, for their help in our first visit in Villa Juárez.



Figure 4. Population Population Pyramid by Percentage for the Municipality of Navolato, 2010

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

Figure 5. Population Pyramid by Percentage for the Municipality of Navolato, 2020

Source: Authors' elaboration with data from the 2020 Census of Population and Housing, INEGI.



Since the population of Culiacán is overwhelmingly urban and its economy is highly diversified, we focus on Navolato, whose demographic and economic dynamics are unquestionably due to large-scale agriculture. The three pyramids above show that in 2000 the population was quite young and there were a number of new families and children under the age of 10. This was due to the large number of new arrivals from Mexico's Southeast settling in the area at that time. By 2010, when, as we saw earlier, immigration decreased substantially, there were fewer young children as a proportion of the total. This trend is confirmed by the data for 2020. In other words, it would seem that families are either having fewer children or there is greater seasonal migration of workers whose families remain elsewhere. According to our sources, both of these interpretations are accurate. Finally, the population that began settling 20 years ago is aging very rapidly. In 2000, only 3.3% of the men, and 2.9% of the women, were over 60 years old. By 2020, these percentages had doubled to 6% and 5.9% respectively. While this is the tendency nationwide, the change is happening in Navolato faster than in other places in Mexico. Although a number of these older persons still work, they require pensions. In the Culiacán Valley, sixteen percent of all informal farm workers, and twelve percent of all formal workers, are over the age of 50. In the absence of pensions, older persons who don't work exacerbate poverty in their households. Since social security registration is a relatively new phenomenon, access to contributive pensions among them is quite low. Evidently, a major operation is required to provide non-contributive pensions to these older adults from the programs expanded under President López Obrador's administration.

In fact, the relative proportion of the population considered to be in the prime age for farm work —20-39 years old— has fallen slightly in spite of the fact that there are fewer young children. This is due to the increase in older persons. The demographic —and economic— dependency rate is larger now than in the year 2000, due to aging.



III. URBAN DEVELOPMENT AND HOUSING

Increasing demand for workers did not only trigger labor migration flows, it spurred the creation of large farm worker settlements for those who decided to stay in Sinaloa instead of returning to Mexico's Southeast every year.¹³

This is the case for Villa Juárez, a large town that began to develop during the 1980s as a community of workers arriving from Oaxaca and Guerrero mostly (Ortiz-Marín, 2013). Farm work explains its history. Farm workers' family dwellings, company lodging and government-managed worker housing comprise most of the town. Commerce is geared towards them, and social services have begun to be offered in the town. This has put stress on both Navolato's municipal government and the state government. Living conditions have improved in Villa Juárez over the past few years, but they should still be of concern to anyone involved in agriculture or in public welfare, including the Government and growers' associations.

Ortiz-Marín (2013) provides an account of the life of Juan López, a Triqui¹⁴ who founded the Frente de Unificación de Lucha Triqui [Front for Triqui United Struggle]. In the account, Ortiz-Marín explains how workers founded Villa Juárez as they sought a place where they could build their own houses. Juan López founded the Front in 2002 in order to secure land for Triquis who came every year to Sinaloa. Today, Villa Juárez comprises 50 neighborhoods or colonias inhabited by workers from many different Mexican states and indigenous groups. Besides their own family homes, these neighborhoods host what is locally known as "*cuarterías*" ["roomeries" or tenements], concrete buildings divided into small rooms, which are rented out by private landlords to families or groups of workers. Farm workers arriving from Mexico's Southeast have the option of living in company housing in the fields, or of renting a room in Villa Juárez. Although tenements vary in terms of their infrastructure and quality, they are all quite similar.

The following four photos depict workers' housing on one large formal firm farm and in Villa Juárez. Housing in both settings has been developed over time, with some improvised solutions, though in both cases it has been upgraded. In both scenarios, one family sleeps in a room averaging about 12 by 10 feet. In Villa Juárez, our researchers Omar Stabridis and Elisa A. Martínez talked to farm workers cooking outside with bits of wood collected from piles of waste wood from fences. In the last photo, large blankets cover the entrance to workers' sleeping quarters. Families use these blankets to gain privacy in a corridor in front of their room, thus enlarging their home.

On the formal firm farm, the area in front of the workers' housing is clean. In some of the housing in Villa Juárez there is a considerable amount of trash. Nevertheless, there is

13 Velasco et al., (2014) show that independent settlements allowed workers to acquire a degree of autonomy, since they were no longer subject to the controls imposed upon them in company housing. In addition, settlers organized themselves to successfully push for urban and social services.

14 Triquis are an ethnic group originally from Oaxaca. There are large numbers of Triqui Indians working in Sinaloa and in Baja California. They used to migrate seasonally first to Sinaloa and then to Baja, to return to Oaxaca at the end of the peak season in June, in order to plant their plots during the rainy season—which starts in June—. This migration circuit is no longer as significant as it once was, although there are still thousands of indigenous Mexicans moving from Mexico's Southeast to the Northwest, and back, every year.



sanitation in both Villa Juárez and the formal firm housing. The formal firm secured several subsidies from the ex-Secretariat of Social Development to improve workers' housing and used this funding to place cement roofs over rooms, to improve sanitation and to build a childcare center, a school, and a health clinic. On this farm, housing is provided free of charge, in spite of the fact that some workers now live there year-round. In Villa Juárez, most workers pay for their housing. The ones we interviewed pay 150 pesos per week, or 30 dollars per month.

Photograph 1. Workers' Housing at a Large Grower's Headquarters



Author: Agustín Escobar Latapí. Photograph taken on 01/30/2020 of formal firm housing, Sinaloa, México. All rights reserved.



Photograph 2. Workers' Housing at a Large Grower's Headquarters



Author: Elisa Martínez Rubio. Photograph taken on 03/18/2020 of a formal firm's housing, Sinaloa, México. All rights reserved.

Photograph 3. Workers' Housing in Villa Juárez, Sinaloa.



Author: Elisa Martínez Rubio. Photograph taken on 03/19/2020 of a tenement in Las Amapas neighborhood in Villa Juárez, Sinaloa, México. All rights reserved.



Photograph 4. Workers' Housing in Villa Juárez, Sinaloa.



Author: Elisa Martínez Rubio. Photograph taken on 03/19/2020 of a tenement belonging to the municipality in Villa Juárez, Sinaloa. All rights reserved.

Overall, in material terms, the differences between workers' housing in Villa Juárez and in company housing are apparent in cooking arrangements. Workers in company housing own their furniture and their quarters are clean, fully furnished and cared for, while worker housing in Villa Juárez tends to be less clean, more crowded, and in worse conditions overall. Conditions vary, however. In one housing complex, there was a basketball court and an elementary school at the back of the housing unit.

Housing for most workers in the Culiacán Valley has evolved from being very unsatisfactory temporary worker housing, whether provided by the growers or built by the workers themselves. Employers are required by law to provide housing and one meal per day to temporary migrant workers. Casual laborers, on the other hand, pay for their own housing in Villa Juárez, and there is no labor law requirement in that kind of arrangement. Therefore, we expect formal workers to enjoy significantly better conditions than workers in Villa Juárez.

Both according to the literature describing housing conditions in the valley and to workers' testimonies, housing has improved markedly. In 2010, they had deplorable living quarters, with walls and roofs made of corrugated metal sheets or tarred cardboard (Ortiz-Marín, 2013). There were no adequate spaces for mealtimes, nor any recreational areas, both of which have now become common both in company housing in the fields and in Villa Juárez.



Table 7. Type of Housing, Villa Juárez and Formal Firm Workers

Villa Juárez Workers			
Type of Housing	Local	Settled Immigrant	Temporary Migrant
Own House	39	24	11
Warehouse	2	3	7
Ranch	0	0	0
Worker Housing / Inn	18	32	144
Other	0	0	0
<i>Total</i>	59	59	162
Formal Firm Workers¹			
Type of Housing	Local	Settled Immigrant	Temporary Migrant
Own House	3,273	820	888
Warehouse	6	0	120
Ranch	92	0	0
Worker Housing / Inn	8,411	5,487	18,636
Other	184	0	0
<i>Total</i>	11,966	6,307	19,644

Source: ENJOREX, survey of farm workers in Mexico's export agriculture, 2020.

¹ The Formal Worker Sample has been expanded to include total workforce for the firm in question. Authors' elaboration with data from the 12th General Census of Population and Housing (2000), INEGI; the 2010 Census of Population Housing, INEGI and the the 2020 Census of Population Housing, INEGI.

Unlike other states in Central and Western Mexico, even among “locals”, living in one's own house is a rare occurrence. Both among formal and informal Villa Juárez workers, worker housing is the most common dwelling for workers. The difference lies in how workers access housing. For formal-sector workers, housing is provided by the firms. On the contrary, in Villa Juárez, workers pay to rent a room where they live, sometimes with their children. Some of this housing in Villa Juárez was built by the municipality and was highly subsidized.

One of these “roomeries” or tenements is the one managed by the municipality. Unlike private tenements, it includes a ball court and a childcare unit. Nevertheless, it looks worn and seems to lack maintenance and supervision. Workers complain that if they skip a month's rent their lavatory keys are taken away. Also, the lavatories break, and it often takes managers weeks to fix them. Conditions in company housing are normally better. The social worker in charge of housing at one of them explained how they have a full-time person to take care of maintenance and repairs. She also explained that they are constantly updating their training to comply with government and buyers' increasingly demanding standards. This tenement includes daycare, and elementary-age schoolchildren are transported by the company to the closest elementary school.



The quality of housing varies significantly. Company housing imposes strict rules on workers, and they are relatively isolated. It is quite impractical for them to go to town to shop. However, large exporters, the Mexican government and U.S. retailers demand that housing meets certain conditions. On the other hand, housing operated privately by landlords lacks adequate infrastructure, and supervision is minimal. In the case of the municipality's tenement, as mentioned earlier, for some reason maintenance has fallen behind recently.

Table 8. Housing Services for Villa Juárez, and Formal Workers

N Stats	Villa Juárez Workers 247		Formal Firm Workers¹ 38,029	
	Mean	Standard Dev.	Mean	Standard Dev.
Running Water	0.93	0.26	0.90	0.30
Concrete or Tile Floor	0.98	0.13	0.99	0.11
Concrete Roof	0.97	0.18	0.90	0.31
Concrete or Brick Walls	0.99	0.10	0.97	0.17
Electricity	0.99	0.08	0.99	0.08
Sewage or Septic Tank	0.91	0.28	0.95	0.22
Land Line	0.10	0.31	0.04	0.19
Gas Stove	0.87	0.34	0.96	0.20
Wood Stove	0.27	0.44	0.06	0.24
Refrigerator	0.31	0.46	0.49	0.50
Washing Machine	0.14	0.35	0.19	0.39
Blender	0.57	0.50	0.63	0.48
Television	0.64	0.48	0.65	0.48

Source: ENJOEX, survey of farm workers in Mexico's export agriculture, 2020.

¹ The Formal Worker Sample has been expanded to include total workforce in the firm in question.



IV. THE WORKFORCE

In this final section, we begin by explaining what the controversy has been regarding the benefits farm workers should enjoy. Farm workers were long considered “atypical” workers, and therefore employers were not required to provide the benefits enjoyed by urban or manufacturing workers. Nevertheless, today they are considered equal to other workers, and employers are required to provide all benefits, although a few exceptions have been made when it comes to farm employers hiring casual workers. Next, we analyze the current working conditions experienced by farm workers in the Culiacán Valley to ascertain the quality of their jobs, and to explore the idea that this is a highly segmented labor market, as previous analyses assert. Finally, we analyze recent changes in poverty levels in both municipalities.

By law, Mexican workers must have social security. The IMSS¹⁵ was founded in 1943 and its benefits include protection from risks at work, illnesses and maternity, disability and life insurance, retirement and old age, and childcare and social services. In the past, farm workers did not have access to social security in any form. In 1990, growers and the IMSS agreed to provide workers with a special program, intended to provide healthcare only –no retirement or other benefits– to farm workers, through auxiliary health units in company lodging. Companies built basic clinics, and IMSS provided the doctors.

In 1995, the social security law was modified to mandate full coverage for farm workers. Growers argued that social security contributions were too high and the services provided were lacking or deficient. By 1998, the government decreed farm workers’ social security contributions would be subsidized for six years, until 2004. In 2005, growers again complained that services for farm workers were still insufficient and they received a subsidy for the construction of childcare facilities and healthcare clinics.

IMSS contributions are supposed to cover various funds and insurance packages. Without subsidies, contributions amount to at least 20% of wages, though they come closer to 23% for farm workers.¹⁶ They are set to increase gradually between 2021-2029. Growers have been unhappy with IMSS for a long time, arguing that the services it provides are either non-existent or not worth what employers and workers pay. However, IMSS has refused to enter into new agreements like the one they had in Sinaloa, where the doctors were paid for by IMSS and employers built and maintained the clinics.

Currently, growers and their workers can benefit from the provisions of a 2018 presidential decree declaring that farm employers and their workers should only pay IMSS contributions up to a maximum daily wage equivalent to just under US\$10 nationwide, or US\$12.50 along the

15 Public sector workers are mostly affiliated to the Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE) [Social Security Institute for State and Civil Service Workers], a Social Security institute for public servants only. An increasing share of public sector workers, however, is hired through outsourcing, thus limiting social security among public sector workers, and increasing coverage of public sector workers through private social security.

16 We discussed social security with an expert who said that after looking at social security contributions in Mexican agriculture, growers seem to pay social security on the basis of the minimum wage to minimize their cost.



U.S. border. This decree effectively lowers the contributions of higher-paying employers during the peak season. It also benefits those legally defined as casual workers —those employed a maximum of 27 weeks per year—. Smaller employers paying lower wages, and the fees for all workers working continually for over 27 weeks, do not enjoy the same treatment. Furthermore, the decree does nothing to improve services to the workers, which is the main problem as of time of writing.

The Consejo Coordinador Empresarial (CCE) [Mexico's Employer's Coordination Council] and the Confederación Patronal de la República Mexicana (COPARMEX) [Mexican Employers' Council] lobbied for a reform of the retirement system. Congress approved the reform in July 2020. The reform increases employers' retirement contributions gradually, from 5.15% to 13.87% of wages over a period of eight years. This increase will substantially diminish the time required to arrive at the amount necessary for retirement, from 1,250 weeks of effective contributions, to 750 weeks —or just under 15 years—. Most farm workers in general still lack access to social security, but those in the export sector are affiliated. Provided they continue to be enrolled in social security, this reform will make it much easier for them to retire. The minimum social security pension would then be topped up by Mexico's universal, non-contributive pension, roughly equal to 65 dollars per month.

Although Culiacán is a large city, Table 9 shows that farming is the largest single contributor to the valley's social security institute. Navolato, on the contrary, is essentially a rural municipality. Total social security employment in agriculture multiplied by a factor of 8 in 20 years; that is a 700% increase. The data for Navolato shows that arguments stating the reason for social security facilities being scarce in rural areas is because formal employment is urban, are not true. In Navolato, agriculture is by far the most important reason to have IMSS facilities (Table 10).



Table 9. Workers Affiliated to Social Security by Economic Activity in Culiacán, 2000, 2010, and 2020

Economic Activities	N and % of total					
	2000	%	2010	%	2020	%
Agriculture	5,867	4.9%	11,277	6.5%	28,630	11%
Food Manufacturing	7,954	6.6%	9,199	5.3%	19,854	7.6%
Construction of Buildings and Civil Engineering Works	10,524	8.7%	14,093	8.2%	14,251	5.5%
Trading of Food, Beverages and Tobacco Products	5,651	4.7%	8,913	5.2%	14,630	5.6%
Sale of Clothing and Other Articles for Personal Use	5,430	4.5%	6,900	4.0%	9,102	3.5%
Self-Service Stores and Specialized Department Stores	10,365	8.6%	17,717	10.2%	27,162	10.4%
Trading of Commodities, Materials and Auxiliaries	4,715	3.9%	6,507	3.8%	9,446	3.6%
Ground Transportation	3,135	2.6%	3,470	2.0%	5,088	2%
Financial and insurance Services (banks, finance companies, insurance companies, etc.)	1,096	0.9%	3,023	1.7%	6,972	2.7%
Professional and Technical Services	7,903	6.6%	16,902	9.8%	24,520	9.4%
Preparation and Service of Food and Beverages	3,961	3.3%	5,735	3.3%	7,427	2.9%
Personal Home and Miscellaneous Services	4,980	4.1%	5,969	3.5%	9,096	3.5%
Teaching, Scientific Research and Cultural Promotion Services	7,171	5.9%	11,825	6.8%	16,785	6.5%
Public Administration and Social Security Services	9,264	7.7%	11,520	6.7%	14,462	5.6%
Other Economic Activities	32,537	27%	39,860	23%	52,640	20.2%
Total	120,553	100%	172,910	100%	260,065	100%

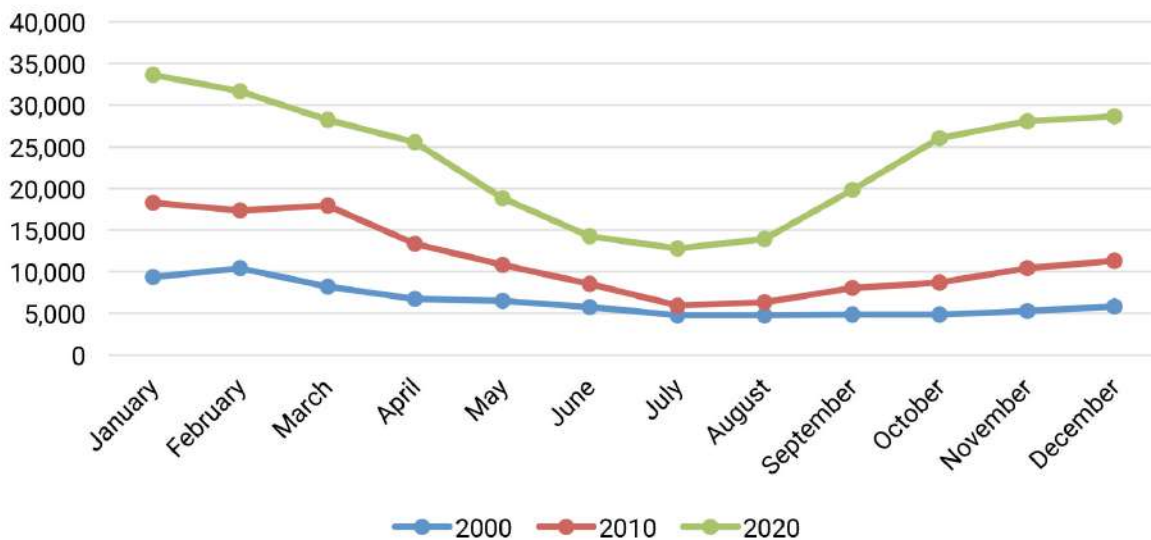
Source: Authors' elaboration with data from the IMSS open databases for December 2000, 2010, and 2020.



Table 10. Workers Affiliated to Social Security by Economic Activity in Navolato, 2000, 2010 and 2020

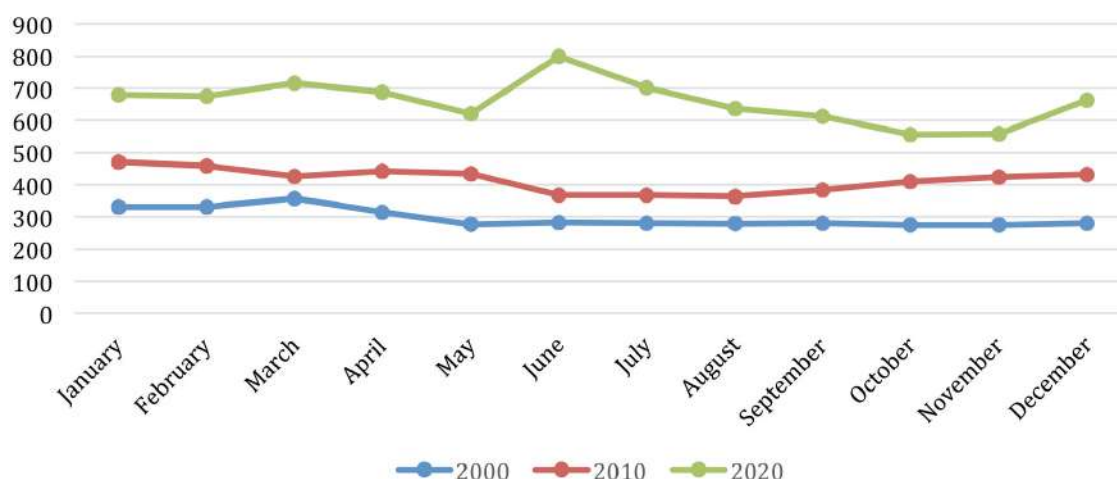
Economic Activities	N and % of total		2010	%	2020	%
	2000	%				
Agriculture	1,524	21.1%	5,467	47.4%	12,964	65.1%
Fishing	1,311	18.1%	122	1.1%	332	1.7%
Food Manufacturing	585	8.1%	509	4.4%	369	1.9%
Construction of Buildings and Civil Engineering Works	469	6.5%	583	5.1%	466	2.3%
Trading of Food, Beverages and Tobacco Products	403	5.6%	575	5%	661	3.3%
Trading of Commodities, Materials and Auxiliaries	294	4.1%	382	3.3%	385	1.9%
Public Administration and Social Security Services	862	11.9%	1,051	9.1%	1,423	7.1%
Other Economic Activities	1,786	24.6%	2,833	24.6	3,316	16.7%
Total	7,234	100%	11,522	100%	19,916	100%

Source: Authors' elaboration with data from the IMSS open databases for December 2000, 2010, and 2020.

Figure 6. Agricultural Workers With Access to Social Security in Culiacán, 2000, 2010, and 2020

Source: Authors' elaboration with data from the IMSS open databases for December 2000, 2010, and 2020.



Figure 7. Agricultural Workers With Access to Social Security in Navolato, 2000, 2010, and 2020

Source: Authors' elaboration with data from the IMSS open databases for December 2000, 2010, and 2020.

In spite of contradictions between the INEGI Population Census and the IMSS's own administrative records, our analysis and the above tables and figures show that worker affiliation is growing rapidly. If the total number of farm workers is falling, as would seem clear from the census, then the obvious conclusion is that social security coverage has been rising significantly. This analysis also shows that seasonal variations are much more marked in Culiacán than in Navolato. Either only permanent workers are affiliated in Navolato, or casual and seasonal workers are bussed in from Culiacán. In any case, an increasing number of farm workers are affiliated to IMSS.

The other significant job benefit package is the housing fund, Instituto del Fondo Nacional de la Vivienda para los Trabajadores (INFONAVIT) [National Institute for Workers' Housing], which is another 5% contribution from the employer and a much smaller one from the worker. Even more than with IMSS, farm workers stand very little chance of accessing these funds because contributions are made only as long as they are employed, they have only recently started to contribute, and because there are no purchase or house improvement plans suited to their income levels in the towns and villages close to export farms. Altogether, IMSS and the housing fund should provide a fairly comprehensive benefit package. The problem is that workers who are not employed formally year-round may never make enough contributions to arrive at a well-funded retirement or a house facilitated by INFONAVIT. An effort was made to design low-income housing at the turn of the millennium, but that initiative was not successful. A welcome change in INFONAVIT's byelaws in 2020 mandated that workers be allowed to access their savings and loans balance with INFONAVIT to buy any kind of housing they choose. Nevertheless, an employer in Baja California complains that workers at his company are automatically refused access to their savings or a housing loan at INFONAVIT. Housing



fund officials have told him farm workers don't qualify for loans because INFONAVIT cannot be guaranteed that farm workers will continue to contribute, and therefore defaulting on payments is very likely.

Other services provided to workers also have a long history. Growers fund a series of mobile clinics through an associated healthcare foundation managed by the growers' association, a series of mobile clinics. While services in these clinics are restricted, they do regular check-ups, consultations, and work on prevention programs (Rodríguez-Pérez, 2005). Growers arrived at specific agreements with the federal government. The Programa de Atención a Jornaleros Agrícolas, PAJA [Program for the Protection of Farm Workers] made significant contributions to infrastructure. The government also helped fund private foundations, such as Profamilia de Jornaleros. In turn, they funded education, health, nutrition and sports infrastructure. They included healthcare, co-funding for childcare centers and schools, and the construction, maintenance and expansion of worker housing. These schemes meant living conditions and services for workers improved over time. In 2020, however, there was a significant impasse. The government has decided to stop funding infrastructure and other improvements, and the future of improvements for workers is uncertain. No one could have predicted the pandemic and how sales slumped from March until May, for example. Large losses could mean some of these services might not be funded. In the Culiacán Valley, services for farm workers and their families were supported in 2018 by the state government's family welfare office Sistema Nacional para el Desarrollo Integral de las Familias (DIF) [System for the Comprehensive Development of Families], or by organizations such as Asociación Pro Formación y Orientación de la Mujer (AFOMAC) [Association for the Education and Counseling of Women] and the aforementioned Profamilia de Jornaleros. The DIF also sponsored a program to attract children into school and away from farm work. This program consisted of a supply of dry goods, canned fish and oil, and school meals to farm worker families whose children aged six to 14 years old attended school.¹⁷ The state government's adult literacy program of the Instituto Sonorense de Educación para los Adultos, ISEA [Sonora Government's Adult Literacy Institute] also implemented a program fostering literacy and basic education among adults, and among children who have quit school.¹⁸ Substantive cuts in the federal contributions to state and municipal expenditures mean the entire system, which was subject to improvement but provided a number of valuable services, is in jeopardy since 2020.

There were a number of labor studies in Sinaloa between 1995 and 2013 (Lara-Flores, 1995; Rodríguez-Pérez, 2005; Becerra-Pedraza et al., 2007; Becerra-Pedraza et al., 2008; Revilla-López & Ortiz-Marín, 2013). They agreed that the farm labor market in Sinaloa was precarious and highly segmented. Some specialists argued that segmentation took place according to ethnicity, others that gender and age were the crucial markers dividing workers by earnings and working conditions. These authors also address the practice of hiring entire families and paying one wage; that is, one adult in a family is hired but his spouse and children are expected to work for no additional pay. According to these authors, children, indigenous workers and women are tasked with the lowest-paid, most precarious and dangerous occupations, while

17 <http://dif.sinaloa.gob.mx/p/sgc-direccion-de-asistencia-alimentaria-y-social>

18 <https://www.iseasinaloa.gob.mx/jornaleros-agricolas>



natives to the valley work indoors in packing or as supervisors. All of these studies were carried out before the Mexican government, the Human Rights Commission, and buyers, insisted that working and living conditions had to comply with the law.

According to our analysis of official employment surveys from 2005 onwards, farm worker pay and working conditions have improved noticeably in Sinaloa and in Mexico. We now turn to a detailed analysis of the working conditions of farmworkers in the Culiacán valley, including workers employed by large, registered export growers and workers living in Valle de Juárez where, as explained above, we found many people working precariously. In 2019 and 2020 we conducted a random, stratified survey designed to interview workers in companies employing over 38,000 workers in Sinaloa, and over 83,000 workers nationally. In Sinaloa these workers worked for growers affiliated to AARC and CAADES.

The questions in our survey, which follow closely the questions asked in Mexico's census and in the National Household Income and Expenditure Survey, found no stark contrast in social terms between formal and mostly informal workers living in Villa Juárez. Over 90% of the housing includes a reasonably robust construction and essential services. The questionnaire did not register overcrowding, but by Mexican standards overcrowding is common for both kinds of workers because they live in worker housing where, before the COVID-19 pandemic, we sometimes found bunk beds for 8 persons in one large room. Some workers spoke about having even more workers per room. Again, before the pandemic, we found a large trailer with 12 beds and little ventilation in one field in Jalisco. The protocols in place since the pandemic established there should be fewer workers per room.

Perhaps the only notable difference between company housing on company land and the tenements workers rent on their own has to do with the presence of a wood stove, or a "*comal*" as it is called in Mexico. Although Mexicans in general prefer the taste of food prepared on a wood stove, the smoke is very toxic, particularly for women who are most exposed, when it is located inside living quarters. We saw a number of people preparing their food on small fires outside their dwelling in Villa Juárez, but not in company housing—the pictures above show colorful tanks containing cooking gas—. More than a quarter of the informal workers report having a wood stove. This is significant not only for the aforementioned health risk, but also because they tend to be used by the very poor who can't afford a gas stove or, even if they bought a stove, they wouldn't spend on gas and would instead send their children to collect wood for cooking.

Housing for workers is a salient feature of the Sinaloa worker landscape because most of the workers are migrants. Both among Villa Juárez workers and among those in our formal firm sample, over 50% of the workers report they are seasonal migrants; another 20% report being settled or permanent migrants, and a minority say they were born locally. Since commercial agriculture in the Culiacán Valley is quite old, and workers have been migrating here for about 70 years, a number of the locals descend from immigrants from the South.

Both the workers in Villa Juárez and those in company housing report acceptable housing conditions. Nevertheless, there are significant differences among the various kinds of housing. From the point of view of segmentation, workers in private short-term tenements in Villa Juárez are worst-off because they have to pay for their rooms and the services are much



worse. However, settled workers who have successfully bought a plot of land and built a house are gradually better off and free to choose employers, which is impossible for those in company housing —unless they agree to move out—. All of this is in addition to the segmentation arising from the work and pay conditions themselves.

Table 11. Migration Status for Workers in the Culiacán Valley

Migration Status	Villa Juárez sample	Formal Firm Farmworkers ¹
Local	59	11,966
Settled Immigrant	59	6,307
Temporary Migrant	162	19,644
<i>Total</i>	280	37,917

Source: ENJOREX, survey of farm workers in Mexico's export agriculture, 2020.

¹ The Formal Worker Sample has been expanded to total workforce in the firm in question.

When visiting firms in the Culiacán Valley, the contrast with other export agriculture regions in the states of Jalisco, Michoacán and Guanajuato is remarkable. The settlement pattern is very specific to this valley. Perhaps because there were no significant local settlements before export agriculture took off in the late 1940s, the housing was custom-built to house migrant workers. However, as is evident in Villa Juárez, migrant workers have also built their own towns. These towns are now sizable —like Villa Juárez—, and the relationship with the municipal government has evolved towards normalization —with the provision of municipal services—. Nevertheless, Villa Juárez is still noticeably a town that is not populated by locals. In one firm, the human relations manager told us they were proud some families have been living in housing provided by the company for 40 years. Perhaps, the other Mexican region where this settlement pattern is prevalent is Baja California, where agriculture developed far away from pre-existing towns.

Therefore, there are differences in the type of settlement according to the migration status of workers. Differences between formal and informal workers become substantial gaps when comparing working conditions. The following tables examine these differences. “Firm workers” are workers chosen at random from associations’ rosters first, and then by our interviewers. We chose firms at random, and the association in question then contacted the firm for authorization to interview their workers. Once in the field, our interviewers, not the employers, chose workers for interviews. Our sample represents 38,000 formal firm workers, or approximately 30% of all farm workers in the Culiacán Valley. In other words, this is a random stratified sample of formal firm workers.

The other sample includes Villa Juárez workers, who are mostly casual workers or day laborers. They are mostly, but not entirely, informal. They were located using residential criteria:



we knew the farm workers living in Villa Juárez suffered much worse working conditions, and we looked for them, with the help of a local labor law NGO.¹⁹ Although a few have contracts and work for a single employer, most do not. This sample is not expanded because there is no sampling frame to provide an expansion number. We believe they account for about 10% of Mexico's entire export agriculture work force, but there is no reliable expansion factor. If the casual workers are added, we believe the sample accounts for about 40% of the total workers in the Culiacán Valley.

19 Abogados Indígenas del Noroeste.



V. WORKING CONDITIONS

The first question is whether or not formal “firm workers” represent a socially less vulnerable group, as opposed to casual, “pay as you leave” day laborers. Table 12 shows that the differences between these two groups, in social terms, are not marked. The percentage of women is the same, age is the same, the percentage speaking an indigenous language is the same. The two groups differ in two respects. Among the day laborers, there are more workers at age extremes: below 18—a very small group—and over 50. In spite of a reasonably large number of interviews with informal workers, we found no evidence of the aforementioned “family employment”, where one member gets hired and all the family works. All our workers were hired individually, even if they were underage. It is well known that formal firms do not hire underage workers, and that they tend to layoff older workers. Underage workers are banned by law and their presence has been diminishing consistently over the past ten years. Unlike what researchers found 10 or more years ago, child labor has almost disappeared at formal firms, though we did find a few cases:

Among the workers we interviewed, some stated their underage children also worked in the fields. Berenice, a 37-year-old woman who arrived from Guerrero 3 years prior to the interview, lives with her three offspring in one of the rooms rented from the municipality. The room costs them US\$7.50 per week. Two of her three children, aged 17 and 16, also work in one of the fields in the valley. They quit school. One finished seventh grade, the other sixth grade only. When they arrived from Guerrero, they had to work because their mother’s wages were not sufficient to support the entire family. All three now work as “pay as you leave” workers. Nevertheless, they work in the same firm every day. They were recruited by a contractor. None of them has a contract or any job benefits. The contractor pays them. He deducts their daily transport to and from the fields, and pays each one approximately US\$12.00 per working day, from 7 am to 2 p.m. They get no food breaks. In order to eat, they have to wait till they leave the job and arrive back home. (Elisa Martínez, field diary, March 26th, 2020).

There is no inequality in terms of education, but the distribution among formal and informal workers is different: among formal workers there is a higher percentage of workers with no schooling, but also more workers with schooling beyond ninth grade. There are no grounds in this table to assert that formal firm workers are drawn from a relatively privileged stratum. This contradicts the notion that the labor market is segmented along the lines of gender, age, schooling, or ethnicity. Both kinds of workers are socially and ethnically similar.



Table 12. Worker Characteristics According to Type of Labor Relationship,
Culiacán Valley, 2019, and 2020 (%)

"Pay as You Leave" Workers	Number (unexpanded)	% Women	Age	% Under 16 Years Old	% Under 18 Years Old	% 50 Years Old or More	% Never Attended School	% Attended Grade 10 or Higher	% Speaking Indigenous Language	% Married / United
%	247	48	34.36	1	4	16	12	27	27	70
Std. Dev		0.50	13.88	0.11	0.19	0.37	0.33	0.45	0.45	0.44
Firm Workers ¹	Number (expanded)									
%	38,029	48	33.9	0	1	12	17	37	28	77
Std. Dev		0.50	11.92	0.06	0.07	0.32	0.38	0.48	0.45	0.42

Source: ENJOREX, survey of farm workers in Mexico's export agriculture, 2020.

Table 13. Villa Juárez: Worker Characteristics According to Migration Category
Culiacán, 2019, and 2020 (%)

Migration category	Workers N (%)	Stats	% Women	Age	Under 16	Under 18	Over 50	No Schooling	Ninth Grade or More	Speaks Indigenous Language	Married / United
Local	59 (21.07)	Mean	0.49	34.4 9	0.02	0.03	0.19	0.12	0.37	0.03	0.61
Settled Immigrant	59 (21.07)	Mean	0.46	42.2 7	0.00	0.00	0.32	0.15	0.20	0.32	0.78
Temporary Migrant	162 (57.88)	Mean	0.48	31.4 3	0.01	0.05	0.09	0.11	0.26	0.33	0.70
Total	280 (100)	Mean	0.48	34. 36	0.01	0.04	0.16	0.12	0.27	0.27	0.70

Source: ENJOREX, survey of farm workers in Mexico's export agriculture.



Table 14. Villa Juárez: Worker Characteristics According to Migration Category
Culiacán, 2019, and 2020 (%)

Migration category	Workers N (%) ¹	Stats	% Women	Age	Under 16	Under 18	Over 50	No Schooling	Ninth Grade or More	Speaks Indigenous Language	Married / United
Local	11,966 (31.5)	Mean	0.42	35.55	0.01	0.01	0.16	0.07	0.47	0.00	0.70
Settled Immigrant	6,307 (16.7)	Mean	0.50	35.19	0.00	0.00	0.13	0.18	0.38	0.25	0.84
Temporary Migrant	19,644 (51.8)	Mean	0.51	32.42	0.00	0.00	0.09	0.23	0.31	0.45	0.79
Total	37,917 (100)	Mean	0.48	33.87	0.00	0.01	0.12	0.17	0.37	0.28	0.77

Source: ENJOEX, survey of farm workers in Mexico's export agriculture.

¹ With weights

As the older literature states, formal firms tend to draw more heavily from local populations, and casual employers rely more on temporary migrants, although the proportions are not too different. Formal firm workers show higher percentages at the extremes of school attainment. Settled immigrants are much older than average among day laborers, which corresponds neatly with our findings relating to the age structure in Navolato, and this category is more heavily indigenous. The proportion of indigenous language speakers is much larger among formal firm, temporary migrant workers. In some respects, it would seem formal firm workers are drawn from a slightly higher social stratum, but not in others.

An altogether different story arises when we address working conditions. Day laborers and formal firm workers show a stark contrast in terms of job benefits. The following tables separate workers according to their migration category.

Table 15. Villa Juárez Workers: Access to Job Benefits
Culiacán, 2019, and 2020

Migration Category	N	Stats	Year-End Bonus	Social Security Health	Private Health	Social Security Child Care	Other Federal Child Care	Other Public Child Care	Private Child Care	Signed Contract	Paid Sick Leave
Local	58	Mean	0.09	0.07	0.00	0.00	0.00	0.00	0.00	0.10	0.21
Settled Immigrant	59	Mean	0.08	0.12	0.02	0.00	0.02	0.00	0.00	0.24	0.18
Temporary Migrant	162	Mean	0.06	0.05	0.01	0.01	0.00	0.01	0.00	0.17	0.27
Total	279	Mean	0.07	0.07	0.01	0.00	0.00	0.00	0.00	0.17	0.24

Source: ENJOEX, survey of farm workers in Mexico's export agriculture.



Table 16. Formal Firm Workers: Access to Job Benefits. Culiacán, 2019, and 2020

Migration Category	N ¹	Stats	Year-End Bonus	Social Security Health	Private Health	Social Security Child Care	Other Federal Child Care	Other Public Child Care	Private Child Care	Signed Contract	Paid Sick Leave
Local	11,620	Mean	0.84	0.91	0.03	0.10	0.01	0.00	0.47	0.71	0.33
Settled	6,170	Mean	0.97	0.94	0.04	0.12	0.02	0.00	0.61	0.67	0.40
Immigrant											
Temporary	18,559	Mean	0.79	0.91	0.05	0.11	0.01	0.01	0.58	0.66	0.27
Migrant											
Total	36,349	Mean	0.84	0.91	0.04	0.11	0.01	0.00	0.55	0.68	0.31

Source: ENJOREX, survey of farm workers in Mexico's export agriculture.

¹ Expanded

"Pay as you leave" workers enjoy extremely few job benefits. At best, a minority have a signed job contract and paid sick leave, but most have no benefits. These conditions are worse than those we found among casual workers in 2019 in Jalisco, San Luis Potosí and Michoacán. Among these other workers, there were just under half with job benefits.

Segmentation can easily divide a family, further strengthening the notion that we are not dealing with separate social strata among farm workers. Alondra is an 18-year-old girl from Veracruz. She arrived in Sinaloa when she was five years old with her mother who worked in the tomato fields. Today, mother and daughter work on tomato fields, in different firms. Both were hired by contractors, but the mother is formally hired, has a contract and social security, while Alondra does not have a contract in spite of the fact that she has worked at the same firm for over five months as a "pay as you leave" worker. She has no benefits and her wages are lower than her mother's. The week before the interview, the mother was paid 48 dollars, and the daughter only received between 15 and 20.²⁰ In addition, the mother gets a full meal for one dollar per day. Alondra has to take her meal to work and heat it up herself. Both live in one of the rooms in the tenement managed by the municipality, together with Alondra's two sisters and daughter. The room costs them US\$7.50 per week. They bought a gas stove top because the tenement provides no cooking facilities. They placed it just outside their room's door, a space they have covered with a large blanket to afford them some privacy while they cook, eat or meet with neighbors. The enclosed room measures approximately 10 by 13 feet, and is shared by the five women. The space covered by the blanket is slightly smaller (Elisa Martínez, field diary, March 26th, 2020).

²⁰ Both Alondra and her mother's wages are lower than average for the random sample of formal workers and the analytical sample of informal workers. Alondra did not work a full week. Unfortunately, we don't know if they worked full days or a full week. In any case, this is precisely the point: "pay as you leave" workers are treated flexibly, as explained before, so that, even if they don't change employers, they can be called to work for only some days, and not others. This lowers their earnings.



Formal firm workers report almost universal social security coverage in terms of health services. Temporary migrants have the lowest benefits, but even they report over 90% Social Security coverage in health services. As in other Mexican states, the coverage of social security childcare is very low, in spite of the fact that social security contributions include it. What sets the Culiacán Valley apart from other Mexican regions is the high percentage of workers reporting access to private childcare. This is typically provided directly by large employers or by charities working with support from employer associations. It explains at least in part why women's participation in paid work rose markedly from 2010 to 2020.

In this sense, Sinaloa is remarkable among all the various regions we studied because of the significant gap between these two kinds of workers in terms of working conditions. In other regions, work conditions could be aligned along various continuums. In Sinaloa, they are opposites.

It is worth exploring whether these differences are echoed in wage levels. These tables show wages for workers according to their labor relationship and their migration category.

Table 17. Formal Firm Workers: Access to Job Benefits. Culiacán, 2019, and 2020
Pesos (dollars)

			Villa Juárez	Formal Firm Workers	
Migration Category	Stats	N	Monthly Wages	N ¹	Monthly Wages
Local	Mean	57	5,299.08	11,848	6,729.46
	Standard		(265)		(337)
	Dev.		1,898.27		3,409.50
Permanent Immigrant	Mean	58	5,072.15	6,342	6,243.50
	Standard		(254)		(312)
	Dev.		1,797.10		2,167.93
Temporary Migrant	Mean	158	5,869.92	19,677	6,075.61
	Standard		(294)		(303.8)
	Dev.		2,002.78		1,908.32
<i>Total</i>	Mean	273	5,581.25	37,867	6,308.48
	Standard		(279)		(315)
	Dev.		1,963.23		2,530.46

Source: ENJOREX, survey of farm workers in Mexico's export agriculture.

¹ With weights



As could be expected, formal workers earn considerably more (12%) than day laborers. Wage hierarchies, however, are different for each type of labor relationship. Locals are the top earners among formal workers, but they are close to the bottom of earnings among day laborers. Their wages in formal firms vary widely. Among the Villa Juárez group, temporary migrants are the top earners, but they are at the bottom in formal firms. This could mean they work very long hours as day laborers. Some day laborers in Villa Juárez told our interviewers that they were not granted time for lunch, and had to hide behind plants to get a bite or else they didn't eat anything from 7 am to 4 pm. This suggests their work is very intensive, and therefore their earnings are not too far below those in formal firms because day laborers work much harder. This poses a significant health risk for them. Put differently, it would seem from their testimony that they work much harder than formal firm workers, and that their hourly earnings are far below formal workers.



VI. POVERTY

Mexico's official poverty measurement was designed by an independent body, Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL) [National Council for the Evaluation of Social Development Policy].²¹ CONEVAL estimates poverty at a municipal level every five years. Poverty estimates for 2010 and 2015 should shed light on the relationship between recent trends in agriculture and municipal poverty levels. The relationship should be particularly clear in the municipality of Navolato, where agriculture is by far the largest economic activity and the largest employment sector. Although the relationship is less direct in Culiacán, agriculture has an impact on the urban economy, as said earlier, since a large portion of the banks, transport, commerce, business tourism and other sectors are dependent on it.

Extreme poverty has fallen both in Culiacán and in Navolato. Both extreme and total poverty levels fell in Culiacán by a great amount. In Navolato, only extreme poverty fell. Total poverty is stagnant, but the number of poor persons increased due to population growth. In Jalisco, we also found that extreme poverty has fallen very significantly —by more than 50%— with the growth of agricultural employment, and thanks also to wage raises since 2015. This is a positive finding.

Incomes have improved in both municipalities: the share of the “income-vulnerable population” —that fraction of the population with an income below the well-being line, but with no deprivations—, and the population with poverty-level income has fallen in both municipalities. However, other dimensions of Mexico's poverty measurement, such as those relating to substantive deprivations, have worsened. Housing quality and overcrowding, lack of basic services in dwellings, school attendance, social security and food insecurity were worse in 2015 than in 2010.

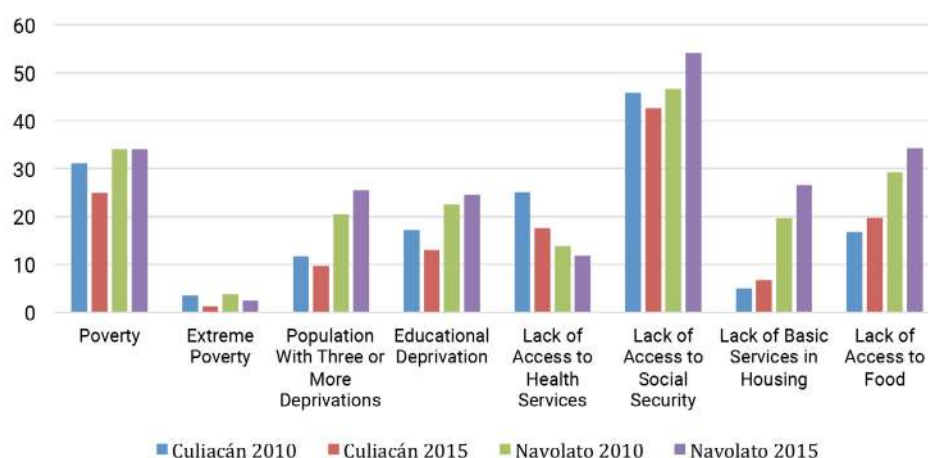
The following indicators have worsened modestly —by one to three percentage points— in Culiacán: quality of construction and overcrowding, access to basic services, and access to food. The same deprivations have worsened in Navolato, but by greater amounts —between two and eight percentage points—. Access to social security, in particular, should be of concern, since agriculture is the main employer in that municipality.

The contrast between income poverty, which has fallen, and rising qualitative deprivations shows that although job options and incomes have risen, the general population's living conditions have not improved. We find a contradiction between this finding and our analysis of both census data and social security administrative records. Both show significant increases in social security affiliation from 2010 to 2020. Poverty rates for 2020 will be released later in July 2021. They should match the administrative records we analyzed previously, and show an increase in social security registration. Still, general access to urban and social services are issues requiring attention.

21 CONEVAL is a “constitutionally autonomous” government body.



Figure 8. Poverty in the Culiacan Valley, Sinaloa, México, 2010 - 2015
Selected Indicators %



Source: Authors' elaboration based on CONEVAL's dynamic outcome public use data from the municipal measurement for 2010, and 2015.

Table 18. Multidimensional Poverty in Culiacán, Sinaloa, 2010, and 2015

Indicators	%		Number of people		Average social deprivation	
	2010	2015	2010	2015	2010	2015
Multidimensional Poverty						
Population in Multidimensional Poverty Situation	31.2	24.9	272,524	236,469	2.0	1.8
Population in Moderate Multidimensional Poverty	27.8	23.6	242,296	224,780	1.8	1.8
Population in Extreme Multidimensional Poverty	3.5	1.2	30,228	11,689	3.5	3.4
Vulnerable Population due to Social Deprivation	29.9	35.4	260,784	336,774	1.7	1.7
Vulnerable Population by Income	9.1	5.7	79,049	54,667	-	-
Non-poor and Non-vulnerable Population	29.8	34.0	259,870	323,545	-	-
Social Deprivation						
Population With at Least One Social Deprivation	61.1	60.2	533,309	573,243	1.9	1.8
Population With at Least Three Social Deprivations	11.7	9.6	101,798	91,811	3.4	3.4
Indicators of Social Deprivation						
Educational Gap	17.1	13.0	149,348	123,240	2.2	2.2
Access to Health Services	25.0	17.6	218,184	167,767	2.4	2.4
Access to Social Security	45.9	42.6	399,975	405,741	2.1	2.0
Quality and Space in Housing	5.1	6.0	44,508	56,875	3.2	2.7
Access to Basic Services in Housing	4.9	6.8	42,454	64,416	3.3	2.9
Access to Food	16.8	19.8	146,936	188,433	2.6	2.1
Welfare						
Population Below the Well-being Line	40.3	30.6	351,573	291,136	1.6	1.5
Population Below the Minimum Well-being Line	12.0	5.0	104,957	47,357	1.9	1.8

Source: Authors' elaboration based on CONEVAL's dynamic outcome public use data from the municipal measurement for 2010, and 2015.



Table 19. Multidimensional Poverty in Navolato, Sinaloa, 2010, and 2015

Indicators	%		Number of people		Average social deprivation	
	2010	2015	2010	2015	2010	2015
Multidimensional Poverty						
Population in Multidimensional Poverty Situation	34.0	34.0	47,697	58,694	2.1	2.2
Population in Moderate Multidimensional Poverty	30.2	31.6	42,307	54,594	1.9	2.1
Population in Extreme Multidimensional Poverty	3.8	2.4	5,390	4,101	3.6	3.6
Vulnerable Population due to Social Deprivation	38.2	45.2	53,645	78,154	1.8	2.1
Vulnerable Population by Income	7.2	4.7	10,146	8,145	-	-
Non-poor and Non-vulnerable Population	20.5	16.1	28,778	27,775	-	-
Social Deprivation						
Population With at Least One Social Deprivation	72.3	79.2	101,342	136,848	2.0	2.1
Population With at Least Three Social Deprivations	20.5	25.5	28,753	44,050	3.5	3.5
Indicators of Social Deprivation						
Educational Gap	22.5	24.6	31,537	42,518	2.4	2.8
Access to Health Services	13.8	11.8	19,331	20,466	3.1	3.2
Access to Social Security	46.7	54.1	65,486	93,455	2.2	2.4
Quality and Space in Housing	11.3	16.7	15,780	28,866	3.3	3.3
Access to Basic Services in Housing	19.7	26.5	27,648	45,725	2.8	3.0
Access to Food	29.2	34.3	40,976	59,306	2.7	2.5
Welfare						
Population With Risk Below the Well-being Line	41.2	38.7	57,843	66,839	1.8	1.9
Population with an Income Below the Minimum Welfare Line	10.8	6.8	15,148	11,748	2.0	2.1

Source: Authors' elaboration based on CONEVAL's dynamic outcome public use data from the municipal measurement for 2010, and 2015.



FINAL REMARKS

We undertook the case study and the survey in the Culiacán Valley just before the pandemic led growers to intensify their preventive measures and to close their firms and their workers' lodgings to outsiders. It confirms and further elaborates on what we found in our stratified random survey in 2019. The vast majority of formal workers enjoy wages at least twice as high as the new –and much higher– minimum wage, and they have been affiliated to all legal benefits because both employers and workers are paying social security and housing contributions, in addition to those benefits coming directly from the employer, such as a yearly bonus.

Significant uncertainty surrounds the future of their benefits, from housing to childcare to on-site medical care. The subsidies provided by the federal government in the past for the construction, improvement and staffing of these services have been cancelled, and at this time it is unclear if and how these services will continue to be provided. Two positive changes that should help improve workers' living standards in their old age are: the 2020 retirement reform, which should provide pensions to workers not employed full time in formal jobs, and the rise in non-contributive pensions decreed by President López Obrador. This should add a formal pension to older persons' non-contributive pension scheme, which has been substantially increased by Mexico's federal government. Nevertheless, a viable solution to the provision of other services has to be found. We fear employers may shift to informal labor relations if there is no solution.

Finally, we confirm that there is a segmented labor market in the valley. Villa Juárez workers normally access jobs that are much worse than those of the formal firm workers we interviewed in the valley's largest firms. The net wage gap doesn't seem like much (12%) but, when that is combined with longer hours and no benefits, it is clear the gap is very large in terms of the quality of working conditions. This kind of segmentation accounts for the wage gaps according to ethnicity and gender, which we confirmed in our study. However, we did not find the kind of stark contrasts that previous authors have depicted in their studies. It could be that "standard" –higher tier– jobs have become more important, or that inspections have lowered the number of labor violations.

Although the jobs are segmented, the worker population is not. In other words, we found similar compositions in the formal and informal samples we interviewed. In other words, and contrary to what previous studies had found, we did not find that white non-indigenous natives of Sinaloa were systematically employed in the better jobs. For example, while it is true that there is a larger proportion of formal workers with high school education or higher, it is also true the proportion of workers with no schooling is larger among the same group. Even so, Villa Juárez is clearly a town that was founded by indigenous Mexicans from the Southeast, and these workers are mostly informal, meaning the social segmentation of the workforce can still be seen in some respects.



Conditions in the “formal” worker sample are quite comparable with those of other formal workers in Mexico, whether in export agriculture or in export manufacturing. In this sense, the gap between rural and urban jobs has closed to a very significant extent.

The place and role of informal workers in Mexico’s commercial and export agriculture is a major topic, and one that needs to be tackled for Mexico to improve the working and living conditions of farm workers in general. In these regional studies we explore how and why growers resort to informal labor

Worker settlements like Villa Juárez also demand urgent attention. These settlements will continue to expand because export agriculture is growing. However, rural municipalities are ill-equipped to plan these settlements and to implement actions that ensure they offer satisfactory services and living conditions. They have fallen in between the cracks of Mexican urban development law because, on the one hand, growers are not responsible for the living conditions of non-migrant workers, while on the other, municipalities cannot supply what is required. Access to work for their inhabitants also needs reform. Recruitment can’t be left in the hands of contractors who don’t comply with the law.

Finally, extreme poverty is falling in the Culiacán Valley, and this seems to be closely related to rising wages, since the workforce itself is not growing substantially. When full poverty measurements are released for 2020, we will be able to assess if the positive findings relating to social security coverage are replicated in a falling number of substantive deprivations.

A medium-term solution has been proposed by the federal government, as it strongly stated that export farm jobs must “go to the workers” in the Southeast. This is a good idea in principle, but even in such cases, the locations favored by export growers in the Southeast will witness a rapid increase in the need for new housing and infrastructure: the problem may be lessened but not solved altogether.

A major improvement in the system providing services to workers must be devised and implemented. Because of recent changes, workers are receiving less and less benefits, even when they are paid for. Mexico’s poorest and most vulnerable workers deserve effective access to labor rights.



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