

## WORK PREFERENCES IN A FRUIT AND VEGETABLE AGROEXPORT REGION IN BAJA CALIFORNIA, MEXICO

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### ABSTRACT

The main objective of the study was to estimate and analyze the declared work preferences of agricultural laborers in a fruit and vegetable export production region in Baja California, Mexico. Derived from a case study, the economic value of certain benefits and work attributes inherent to agricultural work was estimated. The research was conducted in the San Quintin Valley, in the state of Baja California, an agricultural region linked to globalization due to its border proximity to the United States, and with a dominant presence of day laborers from regions of southwestern Mexico. A discrete choice experiment was designed, and 124 surveys were conducted considering relevant sociodemographic and work aspects. The findings suggest preferences for work activities at harvest time, temporary contracts, while access to medical service as a service of the production unit is the attribute that governs the choices of day laborers. In the latter case, it has been assigned an economic value of 3.9 dollars/day.

**Keywords:** willingness to pay; economic value; work conditions; agricultural employment; agricultural worker; Mexico.

### INTRODUCTION

The agricultural region of San Quintin Valley in Baja California is a fruit and vegetable production region linked to transnational capitals that is highly modernized. In addition, it has gone through important demographic, social and cultural processes related to labor in recent decades, which differentiate it from other agricultural regions in Mexico (Barrón, 2019; Velasco, Zlonlniski and Coubès, 2014; Zlonlniski, 2018).

Since 1930 the San Quintin Valley region has experienced constant transformations. In that decade the lands were expropriated and given to producers from other regions of the country, and a laconic agricultural production was activated. The Transpeninsular Highway was built in the 1970s, giving access to other regions of Baja California. This accelerated the agricultural and demographic transformation of the region. During the 1980s the agricultural surface increased rapidly due to a “boom” of extensive vegetable production and the first arrival of day laborers from states of south-southwestern Mexico, with Oaxaca and Guerrero standing out. It was not until the decade of the 1990s, period of economic openness with the North American Free Trade Agreement (NAFTA), when important changes associated to drought problems were caused which forced the region to modernize agricultural production, in addition to social and work conflicts derived

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from demographic growth that went from 4,600 to 23,400 inhabitants in 10 years and an approximate of 17 thousand temporary migrant workers who arrived annually. From the economically active population, 56% was involved in agricultural activities such as production of vine tomato, chives and Brussels sprouts (Gallardo García, 2010; Hernández Santiago, 2000; Velasco *et al.*, 2014).

At the beginning of the 21st century, in San Quintin there were already records of 97 producers and 14 active businesses with 70% of the agricultural surface. The technological change and the market trends fostered for strawberry cultivation to displace the production of vine tomato, and it would demand up to 40% of the available workforce in the valley, of which 60% lived in encampments<sup>3</sup>, while the salary was between 50 and 72 pesos MXN/day (Gallardo García, 2010). During this time irregular settlements of workers from the southwest of the country appeared. The main housing nuclei of the San Quintin Valley are located in: *Punta Colonet*, where cultivation of strawberries and vineyards predominates, and this is also where 56% of the indigenous population living in camps is grouped; *Camalú*, characterized by small agricultural fields, where workers are housed in small encampments and bunkhouse systems; *Vicente Guerrero*, which is where the highest number of workers is concentrated and the first irregular colonies emerged in this zone, which now house 52% of the total indigenous people who reside in colonies in the entire valley. Meanwhile, the government apparatus is located mainly in *San Quintín* and the presence of colonies is minimal. Finally, the highest number encampments is found in the zone of *Lázaro Cárdenas*, with the capacity to house on average 380 families of workers, in addition to the bunkhouse system; it is in this zone of the valley where 42% of the indigenous population is concentrated (Camargo Martínez, 2004; Velasco, 2007).

In the last decade 90% of the agricultural production has been based on crops of strawberry, raspberry (berries in general), tomato, onion and cucumber. The average workdays were 12 hours, with payment of 1 or 2 minimum wages in low season and up to 5 minimum wages on average in harvest season; in addition, they have collateral benefits from certifications to export crops such as berries and the higher income that these crops represent for the close to 80 thousand workers (Barrón, 2018, 2019; González-Ramírez *et al.*, 2020). Recently the organization of local day laborers has achieved an increase in the average salary from 7 to 12 dollars daily, which is equivalent to the payment for one hour of work in the United States (USA) (Bensusán and Jaloma, 2019; Salazar, 2018; Zloliniski, 2018). Facing the low income that makes it impossible to provide for a family and the high labor vulnerability of the region, the settlement of new migrant families in locations near work fields is still active, in addition to a higher diversification of their sources of income in non-agricultural activities. The children of day laborers now seek better opportunities in non-agricultural activities (Ojinaga-Camarena *et al.*, 2013; Zloliniski, 2019).

### **Work instability in the region**

The migration and settlement of workers in the fields of northwestern Mexico, as a strategy for survival, does not guarantee social and food security; however, it does provide the opportunity of obtaining income to diversify their diet, obtain goods and savings, which

in their regions of origin are impossible to reach. In regions such as the San Quintin Valley there are few agricultural fields that offer services of dining area, housing and medical attention under ideal conditions (Ortega and Castañeda, 2018; Yáñez and Camarena, 2019). In some export crops, such as table grape and even berries, international food safety regulations force the companies to offer good work and living conditions to workers during their stay, which is not generalized to other crops limited to the national market. Employment in agriculture and livestock activities usually does not have social benefits and the living and work conditions are characterized by being depressing, despite the regulatory framework of the Federal Work Law (*Ley Federal del Trabajo*, LFT) and the Social Security Law (*Ley del Seguro Social*, LSS) which seek to reduce the problems of coverage and work instability (Carton de Grammont and Lara, 2010; Haro, 2007; Lara, 2008; Montaña and Preciado, 2017). According to the Mexican Social Security Institute (*Instituto Mexicano de Seguro Social*, IMSS), a monthly average of 22,639 insured workers working in the state of Baja California was found for 2019, which implies an increase of 23% compared to the average for 2011 (IMSS, 2019).

The formation of unionized organizations has prospered due to intensive agriculture in the northwest of the country, to settlement in localities surrounding agricultural fields and to precarious work conditions. The following stand out: *Confederación de Trabajadores Mexicanos* (CTM) and *Confederación Regional Obrera Mexicana* (CROM), and even *Central Independiente de Obreros Agrícolas y Campesinos* (CIOAC). However, these organizations have always favored agricultural businesses. In the presence of inconformity from workers over work vulnerability, the National Independent and Democratic Union of Agricultural Workers (*Sindicato Independiente Nacional y Democrático de Jornaleros Agrícolas*, SINDJA) was created, although there are still low levels of unionizing (Salazar, 2018; Zlolski, 2019). The absence of an effective representation of the interests of day laborers is a factor that explains the backwardness in work conditions (Bensusán and Jaloma, 2019; Zlolski, 2018).

The general objective of the study was to estimate the economic value of work preferences of migrant workers in the San Quintin Valley, in Baja California, Mexico, using the methodology of Discrete Choice Experiments (DCE) with the aim of finding elements for a better public policy design that improves the work conditions of agricultural workers, particularly migrants.

### **Contributions of Choice Experiments in the labor analysis of the agricultural sector**

The selection of the methodology of discrete choice experiments is based on the principle of measuring the Total Economic Value (TEV), which allows assigning monetary or economic values to non-market goods, frequently applying it to the services that natural and environmental resources give; however, their use is also present in cases such as the development of products, the willingness to participate in specific production and subsidy plans, in the imposition of taxes, in work preferences, among others. These methods are distinguished by the way of obtaining data, whether from observation (revealed preferences) such as Hedonic Prices or from direct surveys on hypothetical questions

(declared preferences) as a contingent valuation (Freeman, Herriges and Kling, 2014), the joint analysis, and the choice experiments that make multi-attributes valuations possible (Espinal and Gómez, 2011; Tudela and Leos, 2017). According to the systematic review of methodologies and trends for the analysis of work relationships within globalized production systems conducted by Kissi and Herzig (2019), the incorporation of economic valuation methods to the study of work interactions is an innovating approach that addresses jointly several of the deficiencies in the regulatory frameworks and work issues, and integrates the view of agricultural workers, contractors and production units. There are few studies that have addressed employment conditions from the perspective of agricultural workers immersed in the agroexport sector with a methodological approach of DCE. In the case of Schuster *et al.* (2019), they analyzed the work preferences of migrant workers without experience in the agroindustry of vegetable exports from Peru (in the regions of Ica and La Libertad), considering the attributes of contract, salary, treatment, training and duration of employment. They use three choice sets, including “status quo” and a mixed multi-nominal logit model. Their results showed that the treatment in the workplace is widely valued, while the duration of employment did not reveal preferences. In addition, three different groups of workers (students, land workers and migrants) were established in function of salaries, work safety and training.

Van den Broeck *et al.* (2016) analyzed the contractual preferences of 150 women without work experience within the vegetable export sector from Senegal; the experimental design has 6 attributes (type of contract, type of activity, transport, medical attention, training and salary) expressed in 12 sets of 3 alternatives plus one “No-Choice” and adjusting to a latent class model. In their results two groups are consolidated: that of empowered women showing preferences for seasonal and daily contracts, as well as for packaging activities and guarantees of free transport service; and the group with lower level of empowerment was akin to the availability of medical service, free training and transport service. Both groups had preference for being employed under some type of contractual combination.

Staelens *et al.* (2014) analyzed the effect of organizational, social, individual and demographic labor factors regarding work satisfaction in flower production in Ethiopia through an ordered Probit model, and they concluded that salary, work safety, work environment, basic medical insurance, age, education and experience explain different levels of work satisfaction. When analyzing the condition by gender, women workers felt less satisfied from salary reductions, and in the case of men the dissatisfaction happened when there are no chances for promotions and variation in work. Work safety and experience favored a higher satisfaction for women. Based on level of education, the workers with a low level showed that supervision and extra pay would generate higher satisfaction. Instead, a high education level only showed higher satisfaction with a healthy environment. They conclude that work satisfaction is higher when organizational aspects are considered, despite the prevalence of low levels of work satisfaction in the agricultural sector.

Using the methodology of discrete choice, although with a view from management of production units, Gerds (2012) evaluated the preferences of managers of conventional production farms in terms of 14 attributes of the workforce required in northeastern

Germany. These attributes were grouped into four dimensions: generic, vocational, education and sociodemographic, using an orthogonal design of 18 sets with 3 options and 4 attributes per option. Variations were found in the preferences of agricultural workers according to the type of agriculture practiced in the farm (6 significant attributes), in addition to gender (2) and education of managers (8). In the three cases the preference for male employees stands out. Both for the conventional farms and for managers with undergraduate or graduate education, their preferences agreed that a worker should have knowledge about operating machinery, with finished vocational and professional education, as well as work experience. Finally, the managers with undergraduate or graduate studies seek characteristics related with interest and reliability in their staff.

### METHODOLOGY

Data collection was conducted with the application of a direct survey divided into 2 sections: i) the first part provided data of the household and individuals on demographic characteristics, conditions of employment, and income; ii) the second consisted in the implementation of the DCE, in which the attributes regarding conditions of employment and most relevant benefits within the agricultural sector of the study region were evaluated. Surveys were applied to 124 workers in an age range of 18 to 66 years. The target population was migrant agricultural day laborers in the San Quintin Valley, Baja California.

In the research design, the most relevant attributes regarding the conditions of employment were considered and the ones that are essential to address the study objective were selected; this restriction is imposed due to the impossibility of being able to compare a large number of attributes at the same time. After a theoretical and empirical review of labor markets and conditions of employment in the agricultural sector of the region, the attributes that are viable to be included are listed (Table 1).

The attribute type of contract describes the duration of the work period: 1) daily contract; 2) temporary contract for 3 to 5 months; 3) annual contract; and 4) working without contract. The daily salary is a monetary attribute expressed in Mexican pesos; four levels were selected and a minimum wage of \$175/day (\$9.2 US dollars) was taken as a basis, which corresponds to the geographical zone of the country. The third attribute of work activity has three levels according to the location of the activity within the process of production, harvest and packaging; these levels are differentiated by the type of workforce, income, and exposure to unfavorable atmospheric conditions. In the fourth and fifth attributes, they refer to services that the employer unit can provide, and which tend to be relevant for workers; the first of them describes access to medical services, whether provided by the company or paid by the worker; meanwhile, access to housing is represented by three levels: 1) encampments, 2) bunkhouses, and 3) own residences. The sixth and last attribute expresses the willingness and importance of being a member of a union.

With the purpose of valuing the effects of their own on the decision of an individual to choose their preferred alternative within a choice set (declared preference) a factorial design was applied to determine the total number of possible combinations. This resulted in a total of 576 possibilities ( $4^2 \times 3^2 \times 2^2$ ). Given the impossibility of considering all the

**Table 1.** Coding of the levels of each attribute with *effect coding*.

| Attributes        | Attribute levels         | Coding                 |
|-------------------|--------------------------|------------------------|
| Type of contract  | None (Base level)        | TC1=-1; TC2=-1; TC3=-1 |
|                   | Daily                    | TC1=1; TC2=0; TC3=0    |
|                   | Temporary                | TC1=0; TC2=1; TC3=0    |
|                   | Annual                   | TC1=0; TC2=0; TC3=1    |
| Salary / day      | \$175                    | Continuous variable    |
|                   | \$250                    |                        |
|                   | \$325                    |                        |
|                   | \$400                    |                        |
| Work activity     | Field work (Basic level) | A1=-1; A2=-1           |
|                   | Packing                  | A1=1; A2=0             |
|                   | Cut/harvest              | A1=0; A2=1             |
| Access to housing | Own house (Basic level)  | V1=-1; V2=-1           |
|                   | Camp                     | V1=1; V2=0             |
|                   | Quarantine               | V1=0; V2=1             |
| Medical service   | Own account (Base level) | -1                     |
|                   | Yes: Company             | 1                      |
| Unionized         | No (Base level)          | -1                     |
|                   | Yes                      | 1                      |

Note: for a clearer idea of the codification method, see Bech & Gyrd-Hansen (2005).  
 Source: prepared by the authors.

alternatives, a fractionated orthogonal factorial design with two blocks was used, generated with the SPSS software (Tudela and Leos, 2017); the selection of choice sets was reduced to 8 combinations per block (Table 2).

The methodology proposed by Street, Burgess and Louviere (2005) was used to determine that the number of options in each choice set is of three, and to specify the combinations of the levels of attributes of the new alternatives. With that, the descriptive design of the choice cards and the codification of the attributes to value with *effects codes* (Table 1). With the three choice options and their respective systematization, 16 different cards were done corresponding to the valuation scenarios of the choice experiment, which served for the conformation of the database (Table 3).

The cultural and linguistic part between the population of study and the interviewer was considered in the implementation. At the beginning of the experiment, the purpose and procedure of the study was communicated; each individual was presented with eight choice cards and with a time period limited to 30 minutes to select the options that favored them the most. In addition to the options sets, questions were also presented to survey respondents about the employment in vegetable export companie.

### Econometric model

A mixed logit model was used (Fischer and Wollni, 2018; Tudela and Leos, 2017), under the assumption that day laborers have individual preferences for the different attributes that represent adequate working conditions (through which they maximized their

**Table 2.** Orthogonal factorial design of the first set of combinations.

| Group | Card | Contract  | Salary | Activity   | Housing    | Doctor  | Union |
|-------|------|-----------|--------|------------|------------|---------|-------|
| G1    | 2    | Daily     | 400    | Packing    | No         | Company | Yes   |
| G1    | 3    | Temporary | 325    | Field work | Quarantine | Company | Yes   |
| G1    | 4    | None      | 175    | Field work | No         | No      | No    |
| G1    | 5    | Annual    | 175    | Field work | Camp       | Company | Yes   |
| G1    | 6    | Temporary | 400    | Harvest    | Camp       | No      | No    |
| G1    | 11   | None      | 250    | Harvest    | No         | Company | Yes   |
| G1    | 13   | Daily     | 325    | Field work | No         | No      | No    |
| G1    | 15   | Annual    | 250    | Packing    | Quarantine | No      | No    |
| G2    | 1    | Daily     | 175    | Harvest    | Quarantine | No      | Yes   |
| G2    | 7    | Temporary | 175    | Packing    | No         | Company | No    |
| G2    | 8    | Annual    | 400    | Field work | No         | No      | Yes   |
| G2    | 9    | None      | 400    | Field work | Quarantine | Company | No    |
| G2    | 10   | None      | 325    | Packing    | Camp       | No      | Yes   |
| G2    | 12   | Daily     | 250    | Field work | Camp       | Company | No    |
| G2    | 14   | Temporary | 250    | Field work | No         | No      | Yes   |
| G2    | 16   | Annual    | 325    | Harvest    | No         | Company | No    |

Source: prepared by the authors.

utility expressed as work wellbeing). This type of models account for the heterogeneity of the non-observable preferences among survey respondents, and they do not assume independence of irrelevant alternatives; that is, that the reason of the choice probabilities ( $P_{ik}/P_{jk}$ ) depends on all the data, including the attributes of the alternatives that are not  $i$  or  $j$  (Hensher and Greene, 2003; Powers and Xie, 1999; Train K., 2009).

The utility ( $U_{ij}$ ) associated with each alternative  $j$  that each individual  $i$  evaluates in the choice situation  $k$  is represented through a utility expression of the general form (McFadden, 1974):

$$U_{ijk} = V(Z_{ijk}, X_{ijk}) + \varepsilon_{ijk}$$

$U_{ij}$  has a determinist component  $V$ , which depends on the attributes of the alternatives  $Z_{ijk}$  (Table 1) and the socioeconomic characteristics of the individual  $X_{ijk}$ , plus  $\varepsilon_{ijk}$  which contains non-observed heterogeneity between individuals and alternatives. The probability of the mixed logit model for this utility function is expressed as:

$$P(Y_{ijk} = 1) = \int \frac{e^{V(Z_{ijk}, X_{ijk})\beta}}{\sum_{j=1}^J e^{V(Z_{ijk}, X_{ijk})\beta}} f(\beta) d\beta$$

where  $Y_{ijk}$  is the choice variable of individual  $i$  for alternative  $j$  in the choice situation  $k$ ,  $Y_{ijk} = 1$  when selecting the alternative, which otherwise takes the value of 0.  $f(\beta)$  is the density function for the random parameters  $\beta$ . The observable component of ( $v_{ij}$ ) of  $U_{ij}$  is expressed linearly as:

**Table 3.** Example of the combination of attribute levels for the given choice sets, in each interviewed group.

| G1 ID2*          | ALTERNATIVES |           |            |
|------------------|--------------|-----------|------------|
| ATTRIBUTES       | Option A     | Option B  | Option C   |
| Type of contract | Daily        | Temporary | Annual     |
| Daily income     | \$400        | \$250     | \$325      |
| Type of activity | Packing      | Harvest   | Field work |
| Housing Service  | No           | Camp      | Quarantine |
| Medical service  | Yes          | No        | Yes        |
| Unionized        | Yes          | No        | No         |
| Your choice      |              |           |            |

| G2 ID8*          | ALTERNATIVES |            |            |
|------------------|--------------|------------|------------|
| ATTRIBUTES       | Option A     | Option B   | Option C   |
| Type of contract | Annual       | Ninguno    | Annual     |
| Daily income     | \$325        | \$175      | \$250      |
| Type of activity | Harvest      | Field work | Packing    |
| Housing Service  | No           | Camp       | Quarantine |
| Medical service  | Yes          | No         | Yes        |
| Unionized        | No           | Yes        | Yes        |
| Your choice      |              |            |            |

Note: \*G indicates the group in which the ID card was presented.  
 Source: prepared by the authors.

$$v_{ij} = \alpha_j + \beta_1 Z_1 + \beta_2 Z_2 + \dots + \beta_6 Z_6 + \delta_i (X_i * \alpha_j)$$

$\alpha$  is a constant defined for each alternative,  $\beta_i$  is the coefficient of utility for the explicative variable  $Z_i$ ,  $\delta_i$  is the vector of coefficients associated to the socioeconomic variables  $X_i$ . Therefore, the probability of selecting the alternative  $h$  is expressed as:

$$\Pr(ih) = \frac{e^{[\alpha_h + \beta_1 Z_1 + \beta_2 Z_2 + \dots + \beta_6 Z_6 + \delta_i (X_i * \alpha_h)]}}{\sum_i e^{[\alpha_j + \beta_1 Z_1 + \beta_2 Z_2 + \dots + \beta_6 Z_6 + \delta_i (X_j * \alpha_j)]}}$$

When interpreting the mixed logit result, the statistical significance of the coefficients indicates whether the levels of the attributes influence the selections, while the size of the coefficient indicates the relative importance of one level of attribute to another. The inclusion of the attribute of profits allows calculating the Willingness to Pay (WTP) by the changes in the levels of attributes established (Birol and Koundouri, 2008). The WTP was estimated as the rate between the value of a specific level of attribute and the negative value of profits, through the preferences estimated in the mixed logit model of principal effects (Tudela and Leos, 2017).

## RESULTS AND DISCUSSION

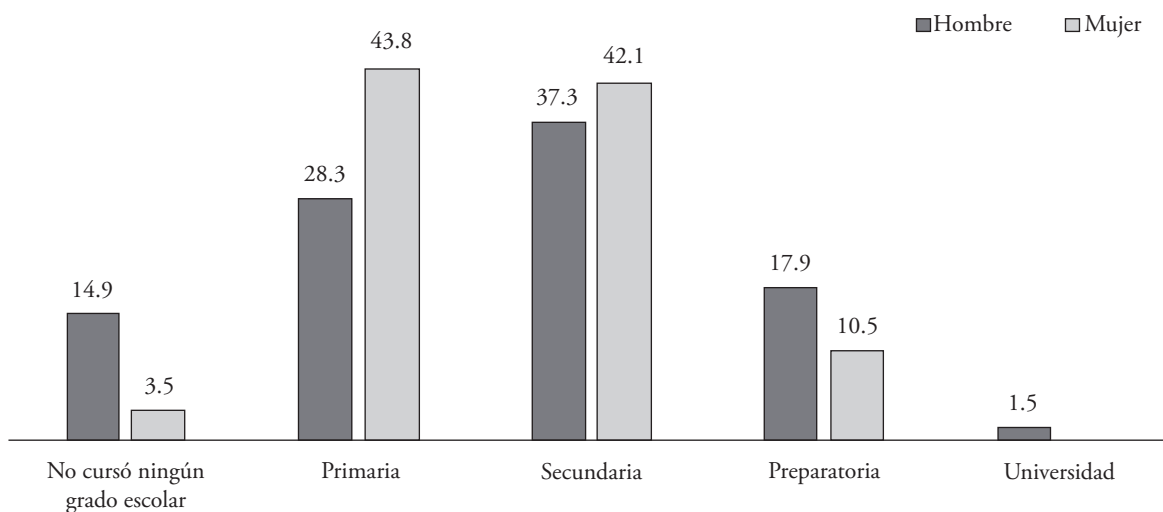
### Sociodemographic and work description

The population studied in the San Quintin Valley is composed mostly by migrants from the states of Oaxaca, Guerrero, Veracruz and Chiapas and in lower proportion from Sinaloa and Sonora, in a migratory process that has been happening approximately for 40 years. The interview respondents have an average age of 33 years, 38% have Primary school education, while 50% reached some grade of Secondary school, and 28% had High School level, in the case of day laborers.

Women have better access to basic education, because men start their work life in agricultural fields at a young age to contribute to the family income. However, the situation is inverted in the population that had access to High School; now it is the women who take on the responsibility of taking care of younger siblings and even participate in household chores, because the mother is incorporated to the Employer Units (Figure 1).

Of the population, 37% belongs to some ethnic group, of which 55% are men; from these ethnic groups, 38% shows interest for migrating to the USA; in contrast with the 45% of workers who do not belong to an ethnic group who have intentions of migrating. Another relevant aspect is that, among this group of migrants, 54% studied Secondary school, and 66% of the possible migrants are even married. This situation shows a selective process in international migration. Some work schemes in companies that produce berries allow workers to attain work visas, and to work for the same companies in the USA, which expands their possibilities of migrating and thus substantially improves their salaries.

From the characteristics of the labor market in the agroexport companies and the high levels of competitiveness, it is common to find day laborers who work in precarious conditions. In the San Quintin Valley, 41% of the day laborers do not have a work contract to back up their work; however, 28% of them do not find any use for it and consider that having



Source: prepared by the authors based on data from the field work surveys.  
**Figure 1.** Education level of day laborers (*percentages per gender*).

a contract is counter-productive to their interests because in the short term the possibility of changing to another company that offers a better salary is restricted. The average work seniority of a day laborer is 23 months; however, there is high work instability that agrees with the high demand for workforce of agricultural businesses in this region. To resolve this workforce requirement, it is estimated that agricultural and packaging companies hire nearly 25 thousands workers from other states in the country, to cover their requirements during harvesting seasons and they tend to stay 3 to 4 months.

Regarding social defenselessness, harassment, and work violence, women are the ones that suffer it most, although the proportion of unionized women laborers (44%) is higher than men's (40%). In the theme of unions, 17% said that they were affiliated to one, and another 24% are unaware their belonging to one of the union organizations in the region, while 59% are not connected to one; the low level of participation is explained because 66% of the agricultural workers consider that unions have an awful performance, but 81% ignore their functions.

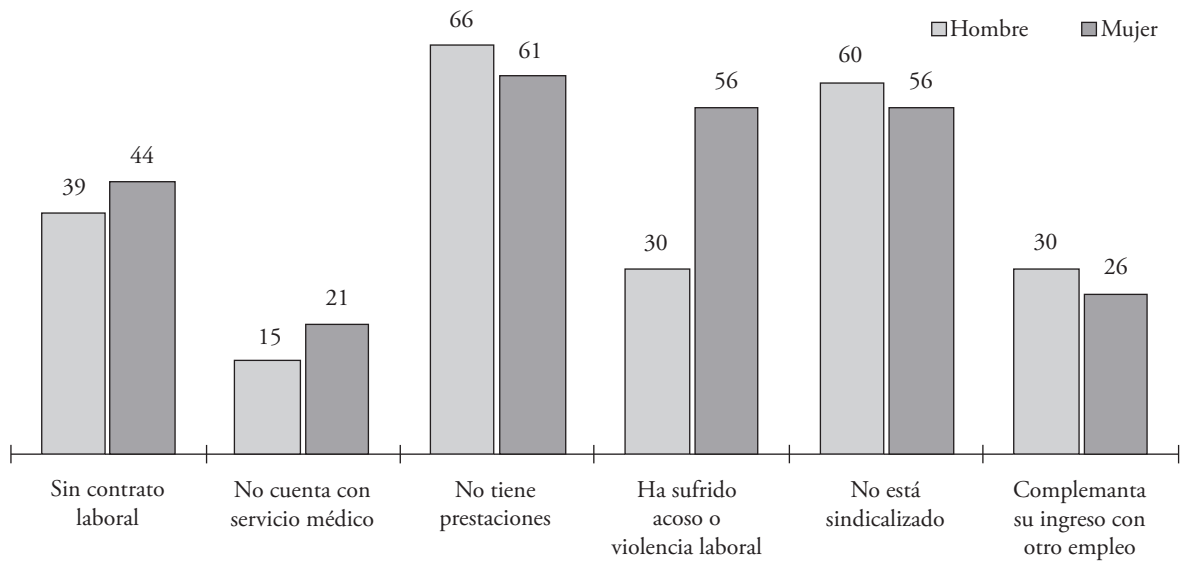
Another important indicator is the percentage of people who have a job or secondary economic activity, and 28% of the agricultural workers do, which implies that their main income is insufficient to cover the basic needs of the family nucleus (Figure 2). In fact, 70% consider that their salary is lower than the one they would get in another company; women are more discontent because they consider their income to be lower than men's. The salary level is a fundamental element for day laborers; in the region during the low production season the average pay per day is \$13 US dollars; however, agricultural workers in the region consider that a just salary ought to reach \$17.2 US dollars. The segmentation of work by gender is manifested even in the salary difference that on average is equivalent to \$3 US dollars. This condition is heightened during the harvesting season of December-May, because work flexibility is accentuated, the workdays increase from 2 to 4 hours, the salary is paid by the piece which allows workers to attain income of up to \$237 US dollars per week.

Finally, in the issue of housing an improvement was observed with regards to the moment of arrival to the San Quintin Valley; presently, 59.6% live in their own home or one that is a loan; and even the dependency on companies from access to housing was reduced by 27 percentage points (Figure 3).

### **Specific work preferences**

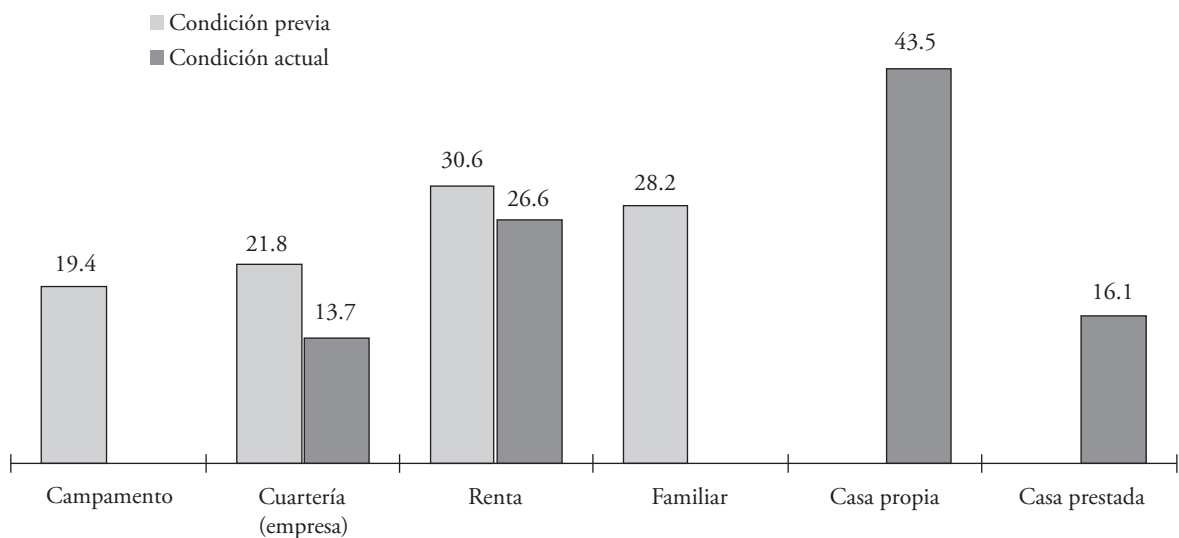
Table 4 shows the estimations of the mixed logit model and some basic statistics about their goodness of fit. Through the contrast of the likelihood rate (*log-likelihood*), between the restricted and final model, it is proved that at least one of the coefficients of the logit regression is different from zero and therefore an acceptable specification of the model. The R<sup>2</sup>-McFaden values, although low, reveal that the estimations have a moderate adjustment (Liao and McGee, 2003).

According to the DCE results, there is variability in the contract schemes, where day laborers prefer to be employed in companies that offer temporary (1.36 more times) or annual (1.25 more times) contracts rather than working without any type of agreement;



Source: prepared by the authors based on data from the fieldwork surveys.  
**Figure 2.** Characteristics of employment for workers (percentages per characteristic).

that is, in the search for employment the possibility of having work stability is valued more, which allows them to gain access to services and benefits, although in particular the medical service, in contrast with agricultural workers from Peru who did not reveal a clear preference on the durability of employment (Schuster *et al.*, 2019). In the studies conducted by Abraham *et al.* (2013) and Fagnäs and Pelkonen (2012) about preferences



Source: prepared by the authors based on data from the fieldwork surveys.  
**Figure 3.** Types of access to housing (percentages per type of condition).

**Table 4.** Econometric estimates of the random effects model.

| Variables   | Random parameters |                | Variables | Non-random parameters |                |
|---|-------------------|----------------|-----------|-----------------------|----------------|
|   | $\beta$           | Standard error |           | $\beta$               | Standard error |
| Daily contract (C1) <sup>1</sup>                  | -0.114            | 0.117          | Age1      | 0.0129**              | 0.005          |
| Temporal contract (C2) <sup>1</sup>               | 0.313**           | 0.139          | Gender1   | 0.145                 | 0.221          |
| Annual contract (C3) <sup>1</sup>                 | 0.224*            | 0.124          | Ethnic 1  | 0.115                 | 0.235          |
| Packaging activity (A1) <sup>2</sup>              | -0.175**          | 0.081          | Age2      | 0.0126**              | 0.005          |
| Activity in Cut/Harvest (A2) <sup>2</sup>         | 0.229**           | 0.092          | Gender2   | 0.128                 | 0.222          |
| Housing in camp (V1) <sup>3</sup>                 | -0.187**          | 0.077          | Ethnic 2  | 0.283                 | 0.244          |
| Tenement housing (V2) <sup>3</sup>                | 0.138*            | 0.073          |           |                       |                |
| Medical service (by the Company) (M) <sup>4</sup> | 0.556***          | 0.084          |           |                       |                |
| Unionized (SIN) <sup>5</sup>                      | 0.048             | 0.053          |           |                       |                |
| Daily salary                                      | 0.008***          | 0.001          |           |                       |                |
| Log-likelihood                                    | -925.722          |                |           |                       |                |
| R <sup>2</sup> -McFaden                           | 0.1505            |                |           |                       |                |
| AIC/n   | 1.91              |                |           |                       |                |

Note: Coefficients estimated and statistically relevant are indicated with \*  $p \leq 0.1$ , \*\*  $p \leq 0.05$ , \*\*\*  $p \leq 0.01$ .

Base categories/attributes: <sup>1</sup>Without contract; <sup>2</sup>Field activity; <sup>3</sup>Housing of their own; <sup>4</sup>Medical service on their own; <sup>5</sup>Non-unionized.

Source: prepared by the authors.

in the content of work contracts both for professors in India and for the unemployed in Germany, they agree in the affinity for employment that offer work stability. The preference for the temporality of employment responds to the workers being in a region with a rather dynamic work market, which sometimes allows them to change jobs if better opportunities in other companies emerge. On the other hand, it is related with the traditional role of women in childcare and the household, and in the case of men they are associated to the search for higher income. Meanwhile *et al.* (2010) and Van den Broeck *et al.* (2016) indicate that this type of decisions are empowerment mechanisms for agricultural workers in the presence of the work relaxation process imposed by the large agroexport companies.

Regarding the preferences declared in the type of activity, it was found that the preference is 1.25 more times for performing tasks of cutting and harvesting than general field tasks, although they prefer general activities over jobs in the area of packaging (1.19 times). This hierarchy reflects the possibilities of obtaining higher income; in the case of the harvest, the payment system managed is by the piece, which allows both men and women workers to earn \$35 to \$50 US dollars per day. This happens particularly in the harvesting seasons of December-April and presently in the cultivation of berries. This situation contrasts with the findings by Van den Broeck *et al.* (2016), in the sense that decisions about what type of activity to perform is centered on the theme of empowerment.

As consequence of the occupational segregation by gender, age group and ethnicity, origin, among others, work mobility has been limited; in the case of the packaging activities, they have been relegated as last choice, although the salary is higher and the physical exertion is lower due to exposure to meteorological conditions regarding field work, because they are tasks that require certain levels of skill and training for their adequate execution that

workers do not have. These results agree with preference analyses conducted by Staelens *et al.* (2014) about workers in flower production in Ethiopia, since both men and workers with a high educational level showed higher inconformity from not having access to better positions or salaries. In this regard, Gerds (2012) found evidence of gender discrimination in the preferences of employers whether by type of production of the farms managed or education of managers.

In the issue of housing there is also variability in the preferences; the day laborers prefer 1.2 times more that the companies do not offer them housing to living in encampments, but they prefer having access to a housing scheme in bunkhouses compared to not having any type of offer (this is 1.4 times more). This plot has been documented in past decades, when the encampments established within the lands that are property of the companies were the main type of housing, and characterized by extremely deplorable conditions (Velasco *et al.*, 2014). Presently this system was reduced and the companies that still house day laborers and their families in encampments are few (Figure 3).

This decrease is due in part to the emergence of colonies in the vicinity of the Transpeninsular Highway, where workers have built their house and even rent (bunkhouse) rooms; therefore, the connection of agricultural companies with the awful service in encampments has been reduced, and this has allowed gaining flexibility in the workplace choice (Barrón, 1997). Another factor that contributed was the need to guarantee for themselves the freedom of mobility and to demand better opportunities for the wellbeing of workers and their families.

Since 1954, social security was made extensive to agricultural workers, although with more limitations than benefits; 40 years later, they are recognized as subjects of full rights to guarantee the total coverage of medical services from the Mexican Social Security Institute (IMSS). By the year 2005, modifications were incorporated in the SSL that limited the differences between temporary and permanent field workers to a work period of 27 weeks, although still with many scarcities so that temporary workers would be deserving of other benefits such as payment for productivity (Rivera, 2006).

A key part in the struggle over work rights of day laborers is access to medical services given by the employer or company; in this case, there is a preference of 1.7 more times for working in places where access to medical service is guaranteed, compared to the companies that lack such a service. In San Quintin the companies offer this service to the workers, through passes to be looked after at IMSS; however, in words by the General Secretary of the Union SINDJA, Lorenzo Rodríguez "...there is a discretionary practice in the delivery of passes to be looked after by IMSS, which are given in exchange for favors, or denying the passes as a way of retaliation ...". However, there are few companies that have doctors or clinics within the cultivation fields, to provide the service. A similar behavior in the preferences was found in the Peruvian workforce (Schuster *et al.*, 2019) and in Senegalese women with low levels of empowerment (Van den Broeck *et al.*, 2016), while in Ethiopia the workers that are best prepared preferred having a job with a healthy environment and in the case of women, work safety was essential (Staelens *et al.*, 2014).

There is currently a recognition of the low levels of incorporation of workers to the IMSS, despite the continuous negotiation of the public policy in the SSL to incorporate the agricultural worker to the coverage scheme, since the approach has been directed to workers of the industrial sector, due to their importance as a motor of one of the most important sectors of the national economy (Rivera, 2006).

International certifications to trade and export agricultural products have also played a transcendental role in improving the work conditions and the access to services of agricultural workers, specifically for those who work in large fruit and vegetable companies (Hawkins and Torres-Tovar, 2019), although the effect could be confused with the actions taken by companies with social responsibility. However, Oya *et al.* (2018) in their review study concluded that international certifications do not improve the income of agricultural workers, although there are positive effects for the production units. In fact, the government, through regulatory frameworks such as the LFT or assistance programs such as the now-discontinued Program for Attention to Agricultural Day Laborers and agencies that execute the norms such as the STPS or the Ministry of Social Development (now Ministry of Welfare), has achieved substantial changes. On the contrary, the companies are not obligated to guarantee access to social security or stable employment, or to generate means that allow the reproduction of their workforce.

The advancement of the agroindustry and, in general, the regions where companies with foreign capital have intensified the process of land concentration, have imposed schemes for social-labor connection that weaken the social fabric and organizational practices, among them union organization. However, despite the changes that took place with the work protests of the year 2015 in the entire San Quintin Valley and the emergence of new unions, the bad image of these union organizations persists, due to ill management and insufficient connection with their unionized members who in many cases never actually know their representatives, and they are even not informed of the fees that are deducted from their weekly payment (Bensusán and Jaloma, 2019; Murayama and Gómez, 2015); this context explains the indifference between being unionized or not.

The result of the estimation of the parameter associated to the salary is consistent with the economic theory and implies that the willingness to accept a temporary or annual work contract increases with regards to the salary offered. Although its utility is marginal, since the preferences indicate that the day laborers seek better income, but would also be willing to work for low salaries only in the case of having the medical service guaranteed, which in the opinion of survey respondents is the most important factor within their preferences, as is reflected by the magnitude of the coefficient of the model estimated, due to the scarcity and the restrictions to gain access to the public service provided by government authorities. Finally, regarding the socioeconomic characteristics, only age was significant, which indicates a direct relationship; that is, as they get older, the indirect utility that is perceived because of improvements in work conditions will be higher, because physical capacities are lost and the risk of suffering accidents continues to be present, since the day laborers continue to perform the same activities despite the increase in age. Both the gender variable and belonging to any ethnic group were not statistically relevant, although the

labor segmentation that persists in the region and which have been developed during the whole process of settlement of the San Quintin Valley, as an effect of the attraction of export agriculture practiced in this region (Barrón, 2019; Velasco *et al.*, 2014).

Table 5 shows the willingness to pay, which measures how much salary an individual would be willing to give for improvement in characteristics of the job, or else, the value that the worker would have to be compensated for from particularities of the job that are not desired. The willingness to pay of survey respondents for a temporary contract was \$2.2 dollars/day, for an annual contract they would be willing to pay \$1.6 dollars/day. To take on a job in harvesting activities, a day laborer would be willing to pay up to \$1.6 dollars/day, but if they were offered a job in the packaging area they would have to offer a compensation of \$1.2 dollars/day. In the case of housing, an agricultural worker would be willing to pay up to \$0.96 dollars/day for living in a bunkhouse scheme, compared to the housing condition in an encampment where they would have to be offered a compensation of \$1.3 dollars/day. Regarding medical insurance, a worker would pay \$3.9 dollars/day to have access to such a service, which evidences the importance of this benefit for workers in San Quintin.

### CONCLUSIONS

In this study a choice experiment was conducted with the aim of evaluating the preferences for work conditions of migrant agricultural day laborers in one of the most important agroexport regions of the country. Within the San Quintin Valley the fruit and vegetable export sector is the main contributor to employment creation; by improving the availability and transparency of work contracts and considering the preferences of workers, the sector can contribute importantly to rural development. This is a pioneering study in the analysis of work preferences for agricultural day laborers in Mexico.

The DCE methodology is an ideal tool to assign monetary values to the preferences of agricultural day laborers. However, there should be caution in the findings, because day laborers have scarce knowledge of their work rights, they are immersed in a dynamic labor

**Table 5.** Estimates of willingness to pay in dollars per day (WTP).

| Variable                             | DAP<br>(dollars/day) | I of C to 95% |       |
|--------------------------------------|----------------------|---------------|-------|
|                                      |                      | Lower         | Upper |
| Daily contract (C1)                  | -0.80                | -1.60         | 0.00  |
| Temporal contract (C2)               | 2.20**               | 1.33          | 3.07  |
| Annual contract (C3)                 | 1.57**               | 0.80          | 2.34  |
| Packaging activity (A1)              | -1.23**              | -1.77         | -0.69 |
| Activity in Cut/Harvest (A2)         | 1.61***              | 1.03          | 2.19  |
| Housing in camp (V1)                 | -1.31***             | -1.82         | -0.80 |
| Tenement housing (V2)                | 0.97*                | 0.47          | 1.48  |
| Medical service (by the company) (M) | 3.90***              | 3.45          | 4.36  |
| Unionized (SIN)                      | 0.34                 | -0.03         | 0.71  |

Note: Significant estimated values are indicated with \*  $p \leq 0.1$ , \*\*  $p \leq 0.05$ , \*\*\*  $p \leq 0.01$ ; exchange rate \$18.73 dollars. Source: prepared by the authors.

market, and they are not used to making complex hypothetical decisions. In general, the day laborers assigned higher economic value to medical attention, even above the legal importance that work contracts have due to costs and the difficult access to health services, and to the large distances between the main population nuclei with services in the region of San Quintin. Therefore, it is necessary to ease access to quality medical attention in the communities; to incentivize agricultural companies to have private services that tend to their workers. Meanwhile, for those production units that are incapable of providing such a service, a proposal must be negotiated to reduce the bureaucracy for workers to be looked after in clinics administered by the State.

Among agricultural workers there is an inclination to subordinate to longer workdays and to activities that are more exhausting to increase their income, in addition to occupational segregation and restricted work mobility, which does not allow gaining access to activities in other more qualified processes than agroindustry. With the aim of counteracting this situation, human capital and the worker-union integration should be improved, which implies that the State should continue to invest in the access to education.

The current productive model causes changes in the ways in which workers are organized, to seek more social and legal support in non-unionized organizations; the historical ill practices of union organizations in San Quintin are a cause for the emergence of new unions and at the same time of the indifference facing the utility that they represent.

Women workers are still vulnerable workforce in face of the high levels of work flexibility, specifically for those with low educational levels, scarce access to information, scarce decision power, and high risk of living in extremely poor conditions.

It is fundamental to continue with evaluations of the employment conditions from the perspective of both workers and production units; particularly in a social and economically dynamic environment, where the constant and substantial demand for workforce is giving day laborers advantages and benefits.

Future studies should address the question about the effects in the short and long term in the empowerment of day laborers and the agricultural labor market, because of the current government's wager on programs such as *Producción para el Bienestar*, *Sembrando Vida*, *Precios de Garantía*, among other development projects and programs focused on education that would increase the opportunity cost of migrating. Another question that arises is: Which is the effect of epidemiological contingencies such as the one caused by Covid-19 in the standards of social security and contractual benefits given by employers? In what magnitude would labor preferences of workers change?

#### NOTAS

<sup>3</sup>*he encampments* are property of the companies, far from populated zones; they are wards of rooms with walls and sheet roofs, dirt floor; they tend to lack basic services such as water and electricity, and have overcrowding problems. *The bunkhouses* are small and precarious rooms, built in the colonies of migrants, but with better services; this way, the companies separate themselves from certain responsibilities and the workers acquire greater freedom and independence.

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