

# Associativity in the case of vegetable producers in the Central Valleys of Oaxaca, Mexico

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## ABSTRACT

**Objective:** To evaluate the associativity in groups of vegetable producers from six municipalities of the Central Valleys of Oaxaca, through an analysis of the attributes that are established to measure whether or not there is associativity, under the assumption that associativity is high in the analyzed communities. Economic globalization transforms the behavior of people and their values, devaluing the national identity of associative work.

**Design/methodology/approach:** The study was carried out in the region of the Central Valleys of Oaxaca, with a qualitative and quantitative approach, in two phases: the first, documentary research on the theoretical approaches of associativity; the second, with field questionnaires, for which six municipalities were selected to represent vegetable producers.

**Results:** The results show the absence of associativity in the production of vegetables.

**Limitations on study/implications:** The number of the sample is within the limitations, so by expanding the number of municipalities the probability of association would be higher.

**Findings/conclusions:** The conclusion is that the increase in productivity and income and the reduction of production costs would favor the continuity of vegetable production and associativity would be promoted with this.

**Keywords:** associativity, development, collective work.

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## INTRODUCTION

Globalization has had a drastic impact on the regularization of markets and the opening of new borders, which has transformed the way of producing, consuming, and the daily behavior of people and their values (Romero and Vera, 2012); likewise, it devalues the traditional references of national identity (Ospina, 2001). It has also led to the destruction of the rural community organization and to the loss of customs and collective work, causing the abandonment of the Mexican farmland and food shortage (Ordóñez and Rodríguez, 2008). The Mexican farmland has suffered changes that have altered the traditional rural



reality; social representations of the inhabitants are more heterogeneous, diverse and unequal compared to prior times (Fawaz, 2007). These changes have brought challenges in small-scale farmers and involve the import of foods (Reardon and Berdegué, 2002). Therefore, there is a need to seek strategies to strengthen the Mexican farmland, and in this sense, associativity is a strategy that contributes key elements to potentiate the productive activity, through internal and external factors, among them trust (Vasilica and Coba, 2017). When the decision is made to opt for associativity, the social fabric of a territory can be strengthened and consolidated, since it favors the capacities for production; however, it is necessary for associative processes to be conducted with a high level of commitment, willpower, without selfishness and with plenty of trust, in order to allow farmers to improve their quality of life (Arguello *et al.*, 2017). It is necessary for both institutions and organizations to strengthen the capacities of collective action of farmers (Lázaro and Aranda, 2019). Oaxaca is a Mexican state where associative work has been implemented and it is reflected in agricultural work, since there is biological and cultural diversity and a complex environmental heterogeneity (Ordóñez and Rodríguez, 2008). It is considered that associativity in the state of Oaxaca can function as a strategy for the successful production of vegetables, since part of the history of the state is based on collective forms of work such as the Tequio and the Guelaguetza (Maldonado, 2015). Gallicchio (2004) maintains that the production of vegetables in places with environmental diversity is beneficial, since thanks to their heterogeneity a diversity of these can be produced throughout the year, which promotes and contributes to rural development. In addition to being a starting point where territorial development is attained through associativity. Therefore, the objective of this study is to evaluate the degree of associativity in groups of vegetable producers in the Central Valleys of Oaxaca, in the municipalities of El Carrizal in Cuilapam de Guerrero, Santa María Roaló in Villa de Zaachila, San Antonino Castillo Velasco and San Pedro Mártir in Ocotlán de Morelos, Santa María Atzompa and La Ciénega, Zimatlán de Álvarez in the Central Valleys of Oaxaca, through an analysis of the attributes that are established to measure whether or not there is associativity, under the assumption that associativity is high in the communities analyzed.

## **MATERIALS AND METHODS**

The research that sustains this study has a mixed approach, supported by documentary research on theoretical approaches and concepts of associativity. According to Guerrero-Castañeda *et al.* (2016), it serves to support the explanation of a phenomenon, combining its perspectives for a broad vision and both are not complemented as methods, but rather as knowledge production. For the documentary research, indexed articles were reviewed from Web of Science, Google Academic and Scopus, Redalyc, RefSeek, Scielo, related to the theme of research giving priority to the concept of associativity, collective work and leadership. To search for information, a temporality from 1995 to 2020 was used. Likewise, a questionnaire was applied for the generation of information to evaluate the degree of associativity in agricultural vegetable producers of the six communities mentioned before. The variables considered were participation (PN), cohesion (CN), organizational climate (CO), teamwork (TE), leadership (LD), and communication (CM); in the economic, family

and social impact. The questionnaire was applied to a sample of 90 producers selected randomly by strata. In San Antonino Castillo Velasco 23 questionnaires were applied, in San Pedro Mártir 14, in El Carrizal 15, in Santa María Roaló 11, in La Ciénega 15, and in Santa María Atzompa 12. To calculate the sample size the technique of stratified random sampling was used, with a distribution proportional to the size of each municipality and the formula proposed by Badii *et al.* (2008) was applied.

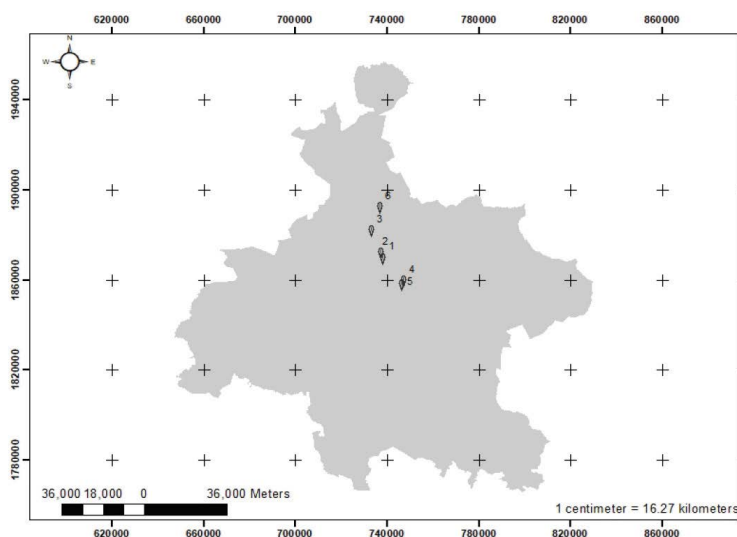
$$n = (z^2 pq) / d^2$$

Where: *n*: Population size; *z*: Value of tabulated *z*; *p* and *q*: Probabilities of success and failure; *d*: Coefficient of reliability.

The statistical analysis of the information was carried out with Duncan’s multiple range technique with reliability of 90%. The percentage values obtained from a binomial distribution were transformed by the arcsine function to fulfill with the assumptions of homoscedasticity and independence of errors (Vázquez *et al.*, 2017).

## RESULTS AND DISCUSSION

The research that sustains the study was carried out in the region of Central Valleys of the state of Oaxaca, in five municipalities that produce vegetables: El Carrizal, Cuilapam de Guerrero, Santa María Roaló, Villa de Zaachila, San Antonino Castillo Velasco, San Pedro Mártir, Ocotlán de Morelos, Santa María Atzompa and La Ciénega, Zimatlán de Álvarez. The selection criteria were the representativeness that they have on vegetable production and the proximity with the capital of Oaxaca, where they generally trade their products (Figure 1).



### Simbology

1. Agencia del Carrizal, Cuilapam de Guerrero.
2. Agencia de Santa María Roaló, Trinidad Zaachila
3. Municipio de San Antonino Castillo Velasco, Ocotlán.
4. La Ciénega, Zimatlán
5. Municipio de Santa María Atzompa.
6. Municipio de San Pedro Mártir, Ocotlán.

### Vegetables

1. Mexican husk tomato (*Physalis ixocarpa*)
2. Chile de agua (*Capsicum annum* L.).
3. Green bean (*Phaseolus vulgaris* L.)
4. Pumpkin (*Curcubita pepo*).
5. Coriander (*Coriandrum sativum*)

Source: Own elaboration.

**Figure 1.** Localities of study in the Central Valleys of Oaxaca and the main vegetables they produce. Source: Prepared by the authors.

### **Context of analysis**

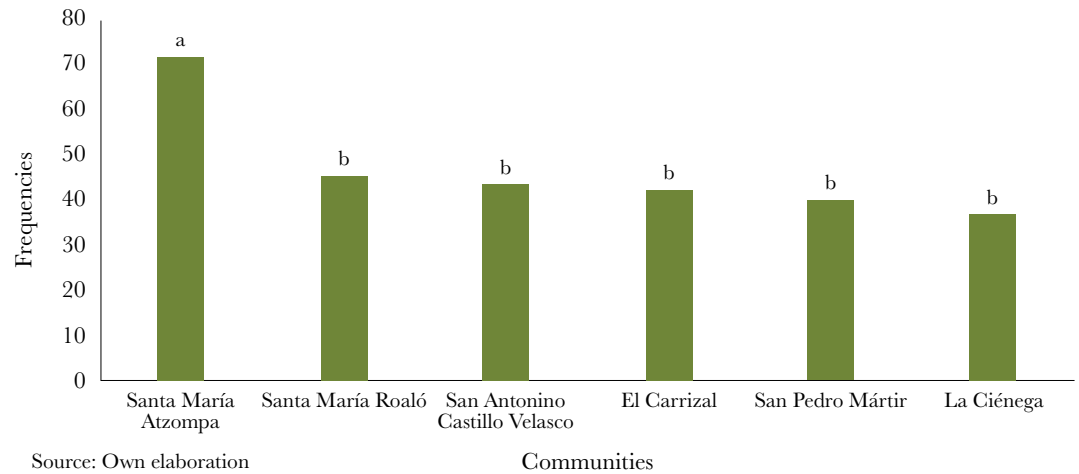
Associativity in the vegetable sphere of the Central Valleys of Oaxaca can be explained by the contrast of the agricultural sector in other regions of the state of Oaxaca, which are devoted to perennial species such as coffee, mango, avocado, maguey, papaya, banana, among others. These are in regions with absence of frequent climate phenomena such as frosts, hailstorms, and droughts, or else, they are recovered in case of facing them; in addition, the behavior of the offer and the demand does not fluctuate so drastically in these regions, because they are traded with added value by companies devoted to agroindustry, which ensures their permanence in the market. On the contrary, in the Central Valleys of Oaxaca the presence of adverse physical (hailstorms, reduction of water tables and frosts) and biological (pests) factors is frequent in the production of vegetables, in addition to socioeconomic aspects related to the agricultural policies of the agriculture and livestock sector, among other factors (low educational level, high degree of marginalization). Specifically, vegetable producers highlight that the horticultural activity is limited fundamentally by physical, biological, technological, and socioeconomic factors. Among the physical factors, they mentioned the reduction of water tables, since vegetable production requires irrigation; they also mention problems of alkalinity and salinity of water for irrigation, and occasional hailstorms and frosts. Regarding the biological problems, they expressed the constant presence of pest insects, diseases in crops, and competition with other plant species over water, light and nutrients. To face this situation, they mention that they depend on the acquisition of agrichemicals, since their production model is based on technology inherited from the green revolution.

It is in the socioeconomic aspect where producers make decisions about how, when, where, why and what for, a particular species will be planted. The farmers recognize the need for technical assistance, frequently expressing the neglect from government agencies for many years, and that they have even presented problems of intoxication from the ill use and management of agrichemicals. This, in addition to the fact that vegetable species are of short cycle, which makes them more vulnerable to suffer the effects from physical and biological factors, combined with the absence of government support with regards to the technical assistance for agriculture.

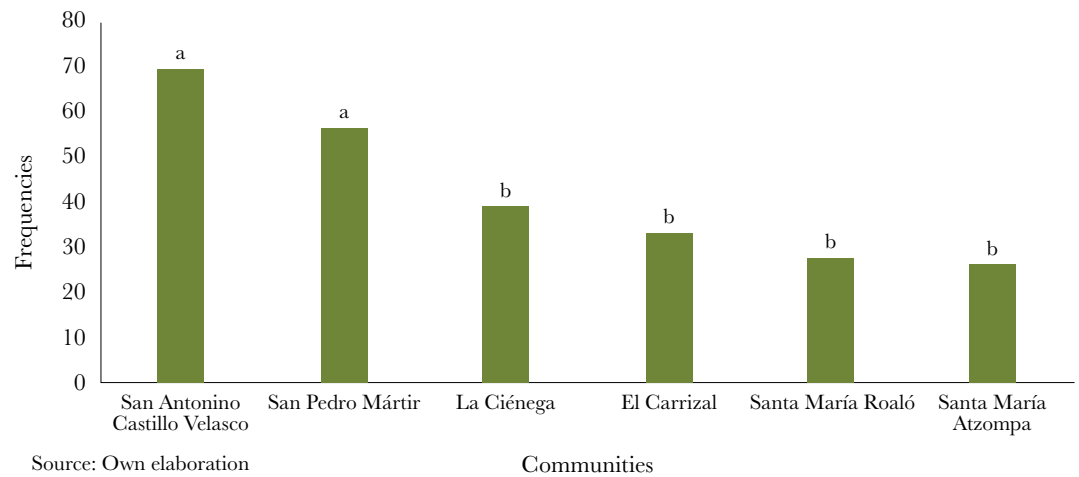
### **Analysis of the current situation of associativity**

Regarding associativity, the surveys showed that there are 15 projects and active initiatives in the rural sphere of the region of the Central Valleys of Oaxaca to produce vegetables, with activities developed in the rural sphere that range from transformation of raw materials, management of certified forests, exploitation and conservation of wildlife, ecotourism, among others, called rural social enterprises (Hernández *et al.*, 2018). Regarding the variables of associativity analyzed, Figure 2 and Figure 3 show that for the number and volume of vegetables produced, San Antonino and San Pedro Mártir presented the highest values.

The educational level in the community of Atzompa presented higher schooling because it was found in the metropolitan zone of the city of Oaxaca, compared to the five other municipalities located in the rural zone and with greater educational



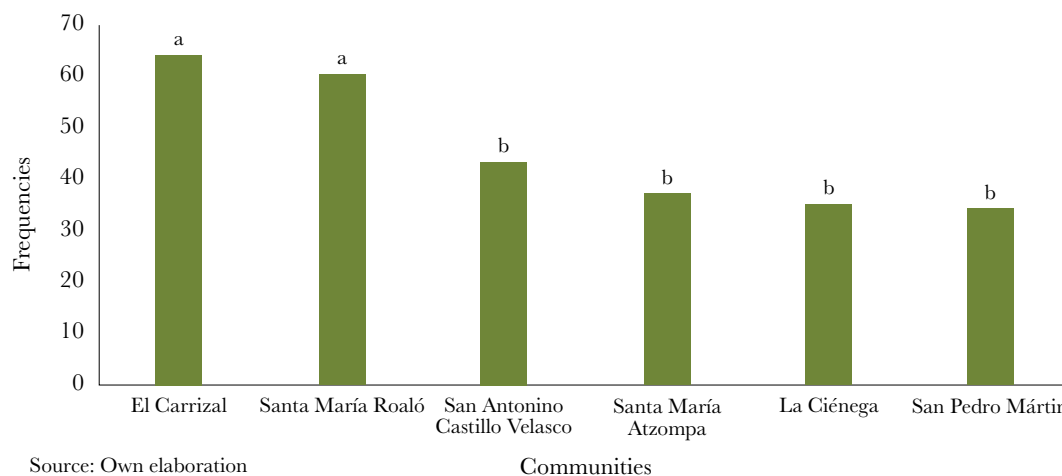
**Figure 2.** Educational level in the communities. Source: Prepared by the authors.



**Figure 3.** Vegetables cultivated in each community. Source: Prepared by the authors.

backwardness. With regards to family participation, it was found that the communities of Santa María Roaló and El Carrizal show more family integration for work (Figure 4), while San Antonino Castillo Velasco, San Pedro Martír, La Ciénega and Santa María Atzompa resort more to hiring workforce since the species cultivated and the continuous production require it.

Table 1 shows the behavior of the variables related with the associativity of the communities studied, with a greater significance found in the socioeconomic variables related to vegetable production. The variables that were significant were: other crops (OTROCULT), years in agriculture (AÑOAGRI), place of sale (LUVENT), profitability of the vegetables (RENHOR), requirement for workforce (REQOBRA), activity in which hiring workforce is required (ACTCONTRA), how many laborers they hire (JORNALES), and volume of production in tons (VOLPRO).



Source: Own elaboration  
Communities  
**Figure 3.** Family participation in the farmland. Source: Prepared by the authors.

**Table 1.** Analysis of the variables studied. Source: Prepared by the authors.

Source of variation	Model	*Error	Total Adjusted	Coeff. of Var.
DF	5	84	89	
OTROCULT	4796.14397**	383.87238		43.06079
AÑOAGRI	1498.82384*	610.29025		54.29462
LUVENT	5428.49084**	349.95293		41.11435
RENHOR	4339.83840**	339.58105		40.50049
REQOBRA	715.53557**	225.53360		33.00610
ACTCONTRA	3662.80324**	313.28552		38.90082
JORNALES	729.11349*	226.49920		33.07668
INTEASOCI	215.48644 <sup>ns</sup>	623.60200		54.88357
CATTIERRA	836.76584 <sup>ns</sup>	615.28180		54.51621
VOLPRO	3487.94729**	416.38409		44.84723
OTRACTI	712.82906 <sup>ns</sup>	531.65303		50.67605
VENINDI	678.56366 <sup>ns</sup>	306.75216		38.49306

OTROCULT=Other crops, AÑOAGRI=Years in agriculture, LUVENT=Place of sale, RENHOR=Profitability of the vegetables, REQOBRA=Requirement for workforce, ACTCONTRA=Activity in which hiring workforce is required, JORNALES=How many laborers they hire, INTEASOCI=Interest in participating in an associative way, CATTIERRA=Amount of land available, VOLPRO=Production volume in tons, OTRACTI=Other activities carried out besides agriculture, VENINDI=Advantages of individual work. \*significant, \*\*highly significant, ns=non-significant. Regarding the most representative variables of associativity, such as interest in participating in an associative way (INTEASOCI), it does not present significance, which reflects the lack of interest over the associative way to produce vegetables, since this activity is developed individually, which does not happen with the variables of the socioeconomic context that showed greater significance in the production.

Concerning the assumption of the article that a high associativity would be expected in the communities analyzed, it is rejected because the statistical results show an absence of statistical significance in the variables that promote associativity among vegetable producers. The agricultural sector is considered of great importance in the country; it

provides basic foods to Mexican families and generates many jobs. However, many small-scale farmers present problems to become associated, for teamwork and in their ability to relate with others. State that farmers need to put aside their individualism, the null participation, and the lack of trust to become associated. And with this, to attain opportunities that strengthen their competitiveness to become integrated to trade their products, since this way they could cut out the intermediary and appropriate their own value chain (Rivas *et al.*, 2018). There is a need for commitment, participation, and an attitude of leadership to organize the producers to improve their processes and their capacity for production, teamwork, way of thinking and values, which are attitudes that the members must adopt to fulfill their objectives. In the communities analyzed, despite their tradition to cooperate traditionally as it happens with the Tequio and the Guelaguetza for public festivities, in agricultural production associativity is still not understood as something that tends to contribute to the creation of strategies to strengthen development and growth by improving processes that give added value to the products, which also provides attributes that contribute to their development. Therefore, it can be said that it is necessary to change paradigms and consider the contribution of the attributes that give organizations soundness, and consider that productivity, reliability, stability, and equity between all the members are of utmost importance for the integration. They maintain that the level of trust between members, the transparency and their participation contribute to associativity, the same as they mention that democracy, honesty, equality, equity, and participation of the members are a basic complement to achievement the objectives (Barrera *et al.*, 2016). This considers that commitment, leadership, effort, discipline, and teamwork are also judged as attributes that complement associativity and agree that attributes such as leadership, respect, transparency, and self-sufficiency do (Callejas, 2017; Melo 2017; Del Carmen and Malueños 2018). The research that sustains this study also analyzed other members who participate in associativity, since it is not just small-scale producers who participate, but also intermediaries, government, and some organizations, which somehow favor this relationship of rural associativity. It was observed that the problems of association between small-scale producers are generated due to the lack of attributes between them, the lack of communication, and the support both from government and non-government organizations; such is the case of this study where from a total of 90 producers from six different localities, none declared or showed that they were associated (Graph 1). This is because although the sector and the commercialization of their products demand it to improve their quality of life, they have not had the willingness to become associated.

## CONCLUSIONS

The absence of associative schemes in vegetable production is also due to the socioeconomic problems linked to marginalization and social backwardness that prevail in the six communities studied from the region of Central Valleys of Oaxaca, since the overriding urgency of covering basic human needs makes them seek other alternatives for subsistence. Other factors are physical and biological, since given the characteristics of traditional agriculture in the state, these do not allow their development from the constant exposure to natural phenomena, which is why small-scale producers do not have the capacity

to withstand productive risks, due to the marginal yields they obtain, which at the same time is reflected in the high costs of inputs used in agricultural production in Oaxaca. This also contributes to the lack of support and policies for agriculture and livestock production from the federal and state governments, according to the conditions of the smallholding, represented in basic backing to produce species of annual cycle. In conclusion, there is no associativity in the communities of the vegetable producers analyzed, which, if it were to exist, would favor the reduction of their production costs, as well as the increase of their productivity and income, and would likewise counteract the lack of public backing for their activity.

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