

Confluence of social perception and environmental habitability in public spaces of indigenous communities of the Manantlán Reserve, Jalisco, Mexico

Confluencia de percepción social y habitabilidad ambiental en espacios públicos de comunidades indígenas de la Reserva de Manantlán, Jalisco, México

Confluência de percepção social e habitabilidade ambiental em espaços públicos de comunidades indígenas da Reserva Manantlán, Jalisco, México

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Dr. Arq. Francisco José Martín del Campo Saray

Universidad Autónoma de Baja California

México

arqsoluc@gmail.com

ORCID: <https://orcid.org/0000-0001-7211-5366>

Dr. Arq. Gonzalo Bojórquez Morales

Universidad Autónoma de Baja California

México

gonzalobojoquez@uabc.edu.mx

ORCID: <https://orcid.org/0000-0001-9303-9278>

Dr. Peter R. W. Gerritsen

Universidad de Guadalajara

México

peter.gerritsen@academicos.udg.mx

ORCID: <https://orcid.org/0000-0001-7542-0171>

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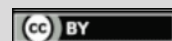
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Abstract

The social perception and environmental habitability that occurs in the public spaces of indigenous communities of the Sierra de Manantlán, Jalisco, Mexico; they refer to a sense of balance regarding the emotional and physical conditions of its inhabitants. Its social, political, cultural and customs organization mark a unique identity in its communal life. The social perception as a factor of regulation of their way of working, contributes to an efficient and supportive performance towards their own, care and respect towards the ecosystem and an organized mass intervention. The objective of the work was to evaluate the conditions of social perception and environmental habitability of inhabitants in the public spaces of Ayotitlán and Cuzalapa, Jalisco. The project refers to the mutual interaction between inhabitants of the analyzed communities, for this, interviews were carried out with key actors of the localities and information cards were applied to users on social perception and environmental habitability. Likewise, the measurement variables of the climatic conditions were carried out during the sampling stage of the cold period. Regarding the analysis of the research data, multiple linear regression was used for a Pearson association between the study variables, the meteorological and complementary variables of the applied sampling were examined. According to the results obtained, it is seen that climatic conditions affect the performance of productive activities in public spaces of the inhabitants of Ayotitlán and Cuzalapa, Jalisco, however; their social perception rooted in their beliefs and customs generates links of ecotourism and cultural dynamism, in this way; the study contributes with the municipality of both locations to obtain accurate information regarding this item and can be used for the benefit of society.

Keywords: Confluence, social perception, mutual interaction, public space, weather conditions, habitability, protected natural area, indigenous communities, ecosystem, traditions, customs.



Resumen

La percepción social y habitabilidad ambiental que se presenta en los espacios públicos de las comunidades indígenas de la Sierra de Manantlán, Jalisco, México; hacen referencia a una sensación de equilibrio respecto de las condiciones emocionales y físicas de sus habitantes. Su organización social, política, cultural y de costumbres marcan una identidad única en su vida comunitaria. La percepción social como factor de regulación de su forma de trabajar, contribuye a una actuación eficiente y solidaria con ellos mismos, al cuidado y respeto hacia el ecosistema y a una intervención masiva organizada. El objetivo del trabajo fue evaluar las condiciones de percepción social y habitabilidad ambiental de los habitantes de los espacios públicos de Ayotitlán y Cuzalapa, Jalisco. El proyecto hace referencia a la interacción mutua entre habitantes de las comunidades analizadas, para ello se realizaron entrevistas a actores clave de las localidades y se aplicaron fichas informativas a los usuarios sobre percepción social y habitabilidad ambiental. Asimismo, se realizaron variables de medición de las condiciones climáticas durante la etapa de muestreo del período frío. En cuanto al análisis de los datos de la investigación, se utilizó regresión lineal múltiple para una asociación de Pearson entre las variables de estudio, se examinaron las variables meteorológicas y complementarias del muestreo aplicado. De acuerdo a los resultados obtenidos se observa que las condiciones climáticas afectan el desempeño de actividades productivas en los espacios públicos de los habitantes de Ayotitlán y Cuzalapa, Jalisco, sin embargo; su percepción social arraigada en sus creencias y costumbres genera vínculos de ecoturismo y dinamismo cultural, de esta manera; el estudio contribuye con el municipio de ambas localidades a obtener información veraz respecto a este rubro y pueda ser utilizada en beneficio de la sociedad.

Palabras clave: Confluencia, percepción social, interacción mutua, espacio público, condiciones meteorológicas, habitabilidad, área natural protegida, comunidades indígenas, ecosistema, tradiciones, costumbres.

Resumo

La percepción social y habitabilidad ambiental que se presenta en los espacios públicos de las comunidades indígenas de la Sierra de Manantlán, Jalisco, México; hacen referencia a una sensación de equilibrio respecto de las condiciones emocionales y físicas de sus habitantes. Su organización social, política, cultural y de costumbres marcan una identidad única en su vida comunitaria. La percepción social como factor de regulación de su forma de trabajar, contribuye a una actuación eficiente y solidaria con ellos mismos, al cuidado y respeto hacia el ecosistema y a una intervención masiva organizada. El objetivo del trabajo fue evaluar las condiciones de percepción social y habitabilidad ambiental de los habitantes de los espacios públicos de Ayotitlán y Cuzalapa, Jalisco. El proyecto hace referencia a la interacción mutua entre habitantes de las comunidades analizadas, para ello se realizaron entrevistas a actores clave de las localidades y se aplicaron fichas informativas a los usuarios sobre percepción social y habitabilidad ambiental. Asimismo, se realizaron variables de medición de las condiciones climáticas durante la etapa de muestreo del período frío. En cuanto al análisis de los datos de la investigación, se utilizó regresión lineal múltiple para una asociación de Pearson entre las variables de estudio, se examinaron las variables meteorológicas y complementarias del muestreo aplicado. De acuerdo a los resultados obtenidos se observa que las condiciones climáticas afectan el desempeño de actividades productivas en los espacios públicos de los habitantes de Ayotitlán y Cuzalapa, Jalisco, sin embargo; su percepción social arraigada en sus creencias y costumbres genera vínculos de ecoturismo y dinamismo cultural, de esta manera; el estudio contribuye con el municipio de ambas localidades a obtener información veraz respecto a este rubro y pueda ser utilizada en beneficio de la sociedad.

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Introduction

The Sierra de Manantlán in the state of Jalisco, Mexico, is a region inhabited by indigenous Nahuas-Otomíes who no longer speak a native language or wear traditional clothing, except for some community ceremonies. However, a large part of its original culture still exists, which constantly evolves and manifests itself in its ceremonies, production systems, social structures, beliefs, values, among others. Most of the people who live outside the municipal capitals and industrial towns (such as the Benito Juárez de Peña Colorada people) are indigenous, descendants of the Otomi and Nahuas who inhabited this region before the Spanish conquest. This indigenous population is concentrated in five agrarian nuclei: the ejido of Ayotitlán and the indigenous communities of Cuzalapa, Chacala and Teutlán (in Jalisco) and Zacualpan (in Colima) (Tetreault y Lucio, 2011). The Sierra de Manantlán is located between the southwest of Jalisco and northern Colima. It coincides with the municipalities Jalisco of Casimiro Castillo, Cuautitlán, Tolimán and Tuxcacuesco; and in the state of Colima, with the municipalities of Comala and Minatitlán. These municipalities have a population of 74,820 people in total (INEGI, 2005). See Figure 1.



Figure 1. Location of La Sierra de Manantlán, Jalisco, Mexico.

With regard to antecedents during the second half of the 17th century, the “indian towns” were fragmented into increasingly reduced and atomized groups that identified themselves with specific localities or “subjects”. For each pre-Hispanic lordship there were up to six or more subjects that emerged in colonial times within the original jurisdiction of the first (González, 2013).

In addition, this conversion from an indigenous community to an-ejido points out Robertson (1999), not only did many indigenous people from the Sierra de Manantlán die and were persecuted, but the displacement of traditional forms of communal organization, the distribution of the land and the distribution of its surpluses. The ejido also ended with the majority that was the traditional government made up of community elders, so that they would not be bothered with the exploitation of the forest.

The previous stories imply an autonomy of the indigenous people in defending their rights, ideologies and customs. The social perception as a factor of regulation of their way of working, contributes to an efficient and supportive performance towards their own, care and respect towards the ecosystem and an organized mass intervention.

From this context, the study analyzes the importance of assessing their social perception and environmental habitability in public spaces in the communities of Ayotitlán and Cuzalapa, Jalisco, Mexico; in order to encourage mutual interaction between inhabitants, active participation and promote ecotourism. Likewise, a recovery of values and social identity towards the indigenous communities where the support of the municipal, state and federal government is promoted, as well as organizations to improve their road infrastructure, educational equipment and economic activities.

Now, after having made a tour on October 13, 2021 and knowing the context of both communities, a talk was held with personalities representative of the two places (Julia Elías Jacobo, Catarino Mancilla de Jesús, María

Ciprian Roblada, José Iván Velázquez Ruelas and Teófilo Gaviño Mendoza); in this they refer, that the inhabitants of Ayotitlán and Cuzalapa, Jalisco, feel forgotten and in a certain way marginalized by the government systems, do not receive the basic support to promote ecotourism activities, improve their agricultural productivity and cattle fattening, also They refer that there is a lack of training workshops and encourage the care of the ecosystem.

Another of the points addressed was about the aspects of research that have been generated in relation to their communities and their living spaces, they report that this type of exercise seems good to them, as long as the information collected and the results of the studies are provided to them with ethical sense, responsibility and priority. They also affirm the importance of caring for their natural reserves, because they have felt looted in the recent past by companies and the municipal government itself in deforestation and felling of trees, as well as the exploitation of natural resources and environmental damage.

By on the other hand, the indigenous people of Ayotitlán have been excellent custodians of the environment to the extent that their activism has contributed to chasing down loggers and stopping the expansion of mining activities. In this way, they have curbing the most ecologically destructive activities of the region. Finally, they can be considered excellent custodians for having promoted agroecology projects and to the extent that they have participated in the projects of conservation coordinated by the Manantlan Biosphere Reserve (Tetreault y Lucio, 2011).

For his part, Maldonado (2018) in terms of perception, mentions that one of the problems that is created when providing meteorological services to society and more specifically predictions, is the way to communicate it so that its use is the most effective. possible. It is not enough to reach high levels of technical quality, adequate communication is needed in a society that has diverse needs and aspects of receiving information.

Although the prediction is good, many of the values it provides are lost in the condition of the communication and in the use and decisions of the managers. Sometimes weather information can be good for some and not suitable for others, so the social perception will be different. It is not necessary that it provide 100% security, it is enough that it meets the expectations of the recipient and that is the key, in the perspectives that the recipient of the information puts (Ibidem, p. 265).

The author Maldonado refers to the decision-making of managers or governors in quality of the use of public space that could counteract or compromise the activities of its occupants, it is reflected that the mechanisms of action to improve this social perception are based on attending their human needs and preferences. See comments on this figure.

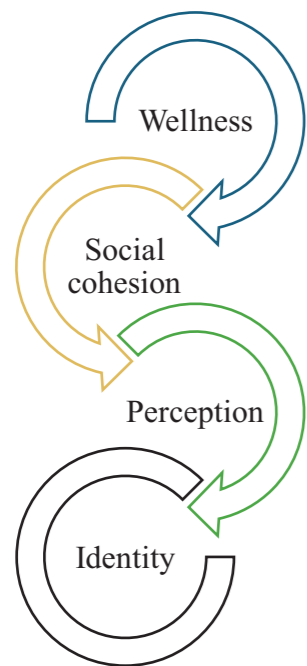


Figure 2. Factors that participate in the social perception of public space.

On the other hand, in Cuzalapa, Jalisco, a study was carried out describing the experiences of a group of indigenous peasant women with rural tourism. Based on the results, the author indicates that rural populations have the ability to generate their own development models without negatively impacting their natural and cultural environments. In addition, rural populations are capable of generating alternative economic benefits that are complementary to traditional agricultural activities. In other words, the experiences of the project indicate that it is possible to develop new activities related to the endogenous potential that is available in a rural community. The reconfiguration of this potential has a positive impact on the development of rural communities (Gerritsen, 2014).

As for the definition of social perception, according to Salazar et al (2015), it is the influence of social and cultural factors in an environment, where the formation of impressions, the recognition of emotions and the mechanism of attribution participate. The social perception of public space is essential for its aesthetic perception. Public space cannot be interpreted in an aesthetic key if it has not previously been interpreted in a social key, since this is the *raison d'être* of that space. Only when society identifies and makes the use and function of a public space its own, does it begin to worry about its aesthetic dimension. But the opposite is also true: the aesthetic quality of an urban fragment as important to the city as its public space enhances its use and therefore improves its social perception (García, 2013).

Regarding the paragraph pointed out by García, the close relationship between the social perception and the aesthetic perception of the inhabitants of a public space is understood, the form of integration of ideologies and customs of a people that seeks a hegemony and roots faithful to their family traditions. of their ancestors.

Likewise, Pellitero (s/f) mentions that the perception of the urban landscape is interpreted and must be constantly adapted to nature of the urban environment, as it is also regulated by the saturation of the visual imaginary.

In relation to the concept of “habitability” as mentioned by Del Campo et al (2020), it is immersed in a changing process on a smaller or larger scale, hence the importance of integrating disciplines that allow an in-depth study of this concept, which is susceptible of the behavior of the human being in such a descriptive situation. As described above, habitability according to the OMS (2000) refers to the set of indicators of physical, social and mental development of health, safety, hygiene, comfort and privacy conditions.

The habitability is redesigned, to adapt to the new requirements of people and their lifestyle, to environments and social spaces, where it is sought to extend the minimum comfort proposed in more habitable areas. These areas must be healthy, safe for health and that encourage personal development; Unused spaces must

be eliminated and a better quality of life with access to services on an urban scale must be granted (Mues, 2011).

Also, the expression “quality of life” has been used with great emphasis both on common language and on different disciplines that they deal with studying complex economic, social, environmental, territorial and relationships that characterize society. Accessibility difficulties, deterioration of the built environment, difficulty of social relationships, poverty, social insecurity and the saturation of services are some of the problems that characterize today urban contexts, where the greatest concentration amount of resources and population (Rojas, 2011).

Therefore, habitability is established, since it must have some parameters clearly aimed at thermal, acoustic, comfort and health conditions, with which the optimal well-being of the user citizen is sought, by generating safety, protection, environmental comfort and hygiene. (Gómez and Orellana, 2021).

All these factors participate directly in the common good of the citizen, in how their integration, psychosocial and natural aspects, influence their adaptation to a climatic and contextual environment of public spaces or areas for purposes, this demonstrates the ability of human beings to promote coexistence and interaction with others, where an approach to well-being and a life model that satisfies and balances these needs is sought. See comments of figure 3.

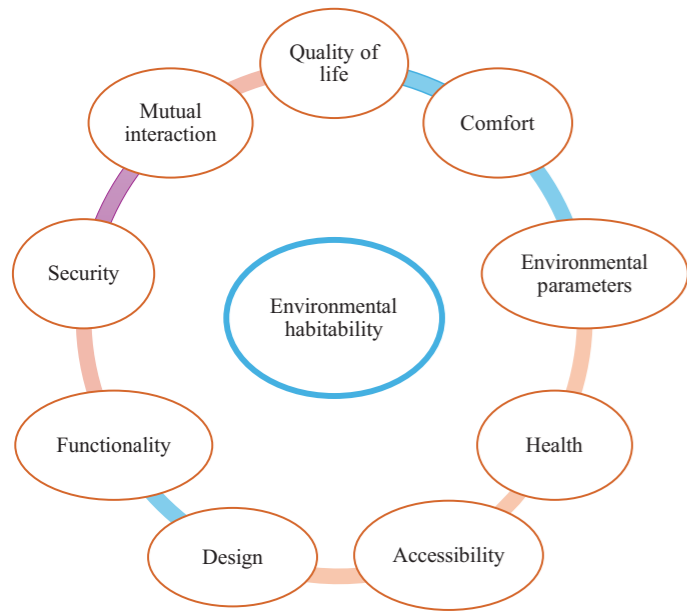


Figure 3. Environmental habitability and its integration into public space.

Another aspect is that environmental movements seek to present the issue of their interest as something that harms a group of people, whether in a very localized area, a region, a country, or worldwide. The idea is that if the effects of a problem are perceived as shared, a feeling of co-responsibility for its resolution will be created. However, it is necessary to point out that they leave aside substantial aspects in the functioning of any group, such as power relations, and very particularly at the level of indigenous

groups: misinformation and the lack of legal, as well as organizational, resources that allow them to take actions aimed at combating or reducing the consequences of climate change in their bio-cultural environment (Ortega et al., 2015).

Although there are spaces and ruptures that allow indigenous peoples to negotiate, strategies and proposals that confront, appropriate, contest or resignify those representations of otherness, where the ecological knowledge of indigenous people reconfigures environmental discourses, this text focuses mainly in the problems that these new representations associated with the environment imply in environmental and sustainable development discourses, and a critique is made of said representations, without ignoring the representation strategies of indigenous peoples (Ulloa, 2005).

As a complement, indigenous movements are formed by struggles for identity and need to open a space for survival within national politics, and in the environment

economic and social. The agrarian and ethnic movements conscious of the struggle for identity, begin to establish their demands as rights land rights, or educational rights (Vargas, 2005).

Habitability in public spaces is related to the basic conditions of habitability: displacement, attraction, well-being of public space and its proximity to goods and services. Its function is to contribute to the improvement of the quality of life of its inhabitants, articulating itself with functions derived from commerce, citizen protest, art, play and entertainment, sports, religiosity and the expressions of the different social movements. "The habitability of public spaces encompasses three important concepts: equity, social cohesion and social inclusion", Thus, sustainable urban development includes elements that affect habitability, the dimensions of the environment, mobility, inclusion and urban opportunities (Nephew, 2015).

Habitability loss is increasingly recognized as an important dimension of climate risk assessment and one with complex

linkages to migration. Most habitability assessments, like climate risk assessments more generally, are based on "top-down" approaches that apply quantitative models using uniform methodologies and generalizable assumptions at global and regional scales, privileging physical sciences over social science-informed understandings of local vulnerability and adaptive capacity (Horton et al., 2021).

Regarding the aforementioned, it is proposed that the study allow the inhabitants of the indigenous communities to know the effects of meteorological conditions (air temperature, solar radiation, relative humidity and wind speed) on their sensation of environmental habitability, their assistance- permanence in public spaces and their social perception as a collective group.

The objective of this study was to evaluate the level of social perception and environmental habitability for indigenous communities in public spaces in the Sierra de Manantlán, Jalisco, Mexico.

Materials and methods

For the study, a mixed qualitative, exploratory approach was used, with a quasi-experimental and cross-sectional basis. The development of the research required a set of parameters that evaluated indicators of social perception and environmental habitability of users in public spaces. The places of application were the communities of Ayotitlán and Cuzalapa, Jalisco. A description of them follows.

Ayotitlán is located in the Sierra Madre Occidental region, with latitude 19°29'47"N and longitude 104°10'23"W, with a temperate-subhumid climate, the average maximum temperature is 32°C, the average minimum is 9°C and the average annual temperature is 21°C with average annual rainfall of 1,300 mm, an altitude of 944 m a.s.l. and average relative humidity of 65% (Institute of Statistical and Geographical Information of Jalisco, 2018).

In the case of Cuzalapa, Jalisco, its climate is temperate-subhumid, with an average maximum temperature of 33°C, an average minimum of 11°C, average annual temperature of 22°C, average annual rainfall of 1,300 mm, altitude of 653 m a.s.l. and average relative humidity of 68%. The distance between both locations is approximately 15.3 km and they border the municipalities of Casimiro Castillo, Autlán, Cihuatlán, La Huerta, Tolimán, Tuxcacuesco, in the state of Jalisco; Minatitlán and Manzanillo in the state of Colima (Institute of Statistical and Geographic Information of Jalisco, 2018). See figure 4, 5 and 6.

As a clarification, it is commented that the study does not analyze the public space itself, but rather analyzes the conditions of social perception and environmental habitability of the occupants of these spaces, therefore, no emphasis is placed on a detailed description of the public spaces of Ayotitlán and Cuzalapa, Jalisco.

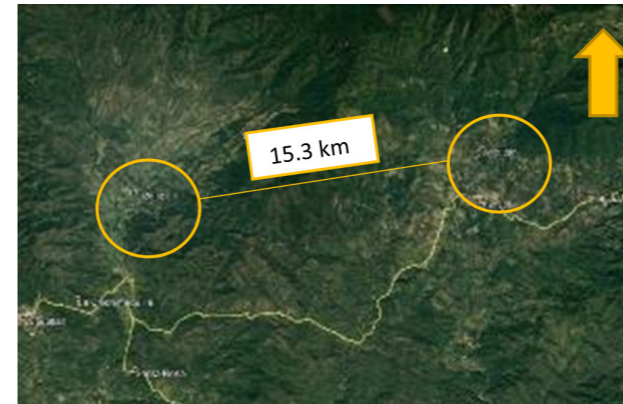


Figure 4, 5 and 6. Location of Ayotitlán and Cuzalapa, Jalisco.

The places of application for sampling were public spaces. The public space of Ayotitlán, Jalisco, has the coordinates of 19°28'11.97"N and 104°11'03.12"W with a perimeter of 125 m² and an approximate area of 890 m² with an altitude of 944 m a.s.l. Its surrounding area is pedestrianized and has residential and commercial areas with a type of vernacular architecture construction. There is only one public space in this rural town. See figure 7, 8, 9 and 10.

Regarding the public space of Cuzalapa, Jalisco, it has the coordinates of 19°29'49.38"N and 104°18'58.68"W with a perimeter of 180 m² and an approximate area of 1,979 m² with an altitude of 646 m. a.s.l. Its surrounding area is made up of two-way roads and it has residential and commercial areas with a mixed construction typology of vernacular and modern architecture. There is only one public space in this rural town. See figure 11 and 12.

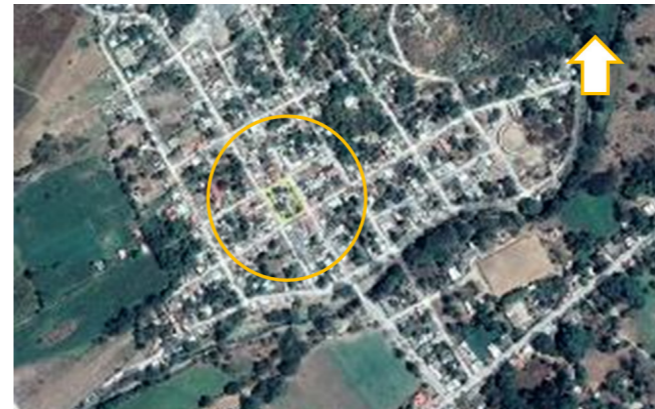


Figure 7 and 8. Location of public space in Ayotitlán, Jalisco.

Figure 9 and 10. Physical context of public space in Ayotitlán, Jalisco.

Figure 11 and 12. Location of public space in Cuzalapa, Jalisco.

Figure 13 and 14. Physical context of public space in Cuzalapa, Jalisco.

One of the data collection instruments that were used were interviews with key informants to contextualize the opinions of users about the public space, including people who live around the object of study in the four cardinal points, who had knowledge about the history of public space and availability to participate in the study.

The topics that were addressed in this instrument about public space were the following;

- **Section one:** General data of the interviewees.
- **Section two:** Construction, maintenance, remodeling and improvement.
- **Section three:** Visit, use and care of users.
- **Section four:** Presence and absence of commercial activities.
- **Section five:** Environmental conditions related to public space.

Now, having reviewed the bioclimatic diagnosis of comfort hours for the population of Ayotitlán and Cuzalapa, Jalisco and the analysis of study areas, the sampling was designed to be deterministic with inhabitants of public spaces and ages between 12 and 75 years old. If they were older, they were registered in a special group. According to the ISO 7730 (2006) standard, some conditions were suggested for the interviewees, such as: that they did not suffer from neurological or cardiovascular diseases, lactating or pregnant women. However, for research purposes and purposes of encouraging the mutual interaction of communities in public spaces, these characteristics were omitted.

Information cards for inhabitants containing the conditions of the public space, social perception, environmental habitability, meteorological and complementary variables for the sampling period were applied. Being an

exploratory and qualitative study, the representativeness of the sampling was obtained with the association of responses from inhabitants between the variables of social perception and environmental habitability in public spaces of indigenous communities.

The support staff was made up of two people and a server responsible for the investigation, the dynamics established that they work as a team to carry out an adequate operation of the sampling and the interview of the inhabitants of the indigenous communities. A member of the team was in charge of the questionnaire and measurement of weight and height; and the other member located 1.5 to 2 m away from the interviewee as established by the Standard of the World Meteorological Organization (2014) carried out the measurement of thermal environment variables (grey globe temperature, dry bulb temperature, bulb temperature). humidity, relative humidity, solar radiation and wind speed) and the complementary variables (air quality, illuminance and noise level).



Figure 15, 16, 17 and 18. Sampling for inhabitants of public spaces in Ayotitlán and Cuzalapa, Jalisco.

For his part, another member of the work team, simultaneously with the application of questionnaires, made a record in a personal log with measurement every 15 minutes in the public space of the aforementioned variables. The sampling application schedule was carried out from 8:00 a.m. to 8:00 p.m. with interview intervals for the inhabitants of both communities of four hours per day, during a week for the cold period and was scheduled for the last fortnight of the month. January 2022. See figures 14, 15, 16 and 17.

About the design of the information certificates in the environmental habitability section, it was developed based on the following regulations:

Revised and analyzed standard
<p>ISO7730:2006 Ergonomics of the thermal environment. Analytical determination and interpretation of thermal comfort by calculating PMV and PPD indices and local thermal comfort criteria</p>
<p>ISO10551:2019 Effect of the thermal environment with the use of subjective judgment scales</p>
<p>ISO7726:2002 Ergonomics of the thermal environment - measuring instruments for physical quantities</p>
<p>ANSI/ASHRAE 55:2020 Thermal environmental conditions for human occupation Hydrographic technical standards for surface wind measurement and processing</p>
<p>ISO 9060:2018 Solar energy</p>
<p>Mexican Official Standard NOM-015-STPS-2001 High or low thermal conditions, safety and hygiene conditions</p>
<p>Mexican Official Standard NOM-025-STPS-2008 Lighting conditions in work centers</p>
<p>Official Mexican Standard NOM-013-ENER-2013 Energy efficiency for street lighting systems</p>
<p>Mexican Official Standard NOM-AA-62-1994 Acoustics - determination of ambient noise levels</p>
<p>Mexican Official Standard NOM-172-SEMARNAT-2019 Guidelines for obtaining and communicating the air quality index and health risks</p>

Table 1. Revised and analyzed regulations for the design of environmental habitability information certificates.

For the assembly of the measuring instruments, they were placed on two tripods at a height of 1.30 m with respect to the ground level and the location of the meteorological station was in a representative area of the space, in an area free of trees and constructions near the measurement point, also, the measurement instruments were placed 1.5 to 2 m away from the inhabitant at the time of the interview, recommendation of the Standard of the World Meteorological Organization (2014) in order to correctly estimate the variables thermal environment and complementary.

To obtain the records of environmental habitability variables, the measurement instruments used were the following:

Two thermal stress meters (mca. Extech, mod. HT30), two digital anemometers (mca. Extech, mod. 407113), two tripods (mca. Amazon´s Choice, mod. WT3111H), two solar radiation meters (mca. . PCE Instruments, mod. SPM1), two digital psychrometers (mca. Extech, mod. RH401), two data

loggers (DataLogger mca. Extech, mod. RHT10), two digital sound level meters (mca. Extech, mod. 407730), two digital lux meters (mca. Extech, mod. HD400), two air quality meters (mca. Extech, mod. CO10) and a weather station (mca. Logia, mod. LOWSC510SWB). See figure 18.

For the emptying of data, the Windows Microsoft Excel program was used and the file was named BaseDatosHabitabilidadAmbientaPercepciónSocial, the support staff was trained and it was requested that those who captured data were not the same folios of the cards that applied; in this way, one member read and encrypted the card and the other recorded the data, once the information was emptied, it was transferred to the statistical program SPSS Version 25 from IBM.

For data analysis, multiple linear regression was performed with meteorological and ordinal variables, obtaining these data Pearson's correlation coefficient was used, since the coefficients in this type of correlation are the numerical term that reveals the degree of linear relationship that exists between quantitative or interval and ordinal variables, and are the data that contributed directly to the study of social perception and environmental habitability of inhabitants of indigenous communities.

It is pointed out that the correlation matrix between variables of environmental habitability and users' social perception of public space were calculated using the statistical program and the results of the study are presented in tables.

Results

Next, the cold period results stage is described, obtaining 102 user information cards, where the study places were the public spaces of Ayotitlán and Cuzalapa, Jalisco; For this, the initial information was organized for its presentation in tables by inhabitant items and social perception that

corresponds to: place of application, sex, experience in the locality, time living in the locality, place of origin, level of metabolic activity, position during the interview, clothing, permanence at the time of the interview, access to the public space, shape of the public space, dimension of the public space, circulation of the public space, vegetation of the public space, furniture of the public space, possible growth of the public space, improvement of the public space, interaction between users of the public space, commercial activity in the public space, frequency of visits to the public space, days of visits to the public space, hours of visits to the public space, assistance to the public space, company to the public space and reason for visiting the public space.

Regarding the surveyed users, the number of men was slightly higher than women, but there was a good participation of both communities for the sampling carried out. Regarding the place of origin of the interviewees, there was an important domain of Ayotitlán and Cuzalapa, Jalisco, in relation to the other

entities, this part opposes the absent people who work in other places of the state or the country. Regarding the highest percentage of permanence of the interviewees in the public space, it corresponded to the first item, approaching 5 deciles, this showed that the users do not appreciate staying in this place as attractive.

In what corresponds to access to public space, people expressed the highest percentage in the category of regular with 4 deciles, this situation favors adjustments or adaptations to these places for universal accessibility. Regarding the shape of the space, most of the interviewees considered it good followed by the regular, a situation that is urgent for the inhabitants who stated that they like the shape regardless of its dimensions.

Regarding the vegetation of the sampling areas, the users reported that the category of bad is the one with the highest frequency, this indicator reported the little vegetation cover coupled with the lack of care and maintenance of public spaces. Regarding the interaction

of the users in the space, it can be seen that the majority of the interviewees considered it good and regular, in this way, socialization is optimal and allows an approach that fosters family coexistence.

About the commercial activity to be developed inside the public space, people considered it as good for the most part and recommended it as part of the social interaction between its inhabitants. Regarding the reason for visiting, the factor of socialization was the most recurrent by the interviewees, followed by the indicator of coexistence and tradition-custom with 42% of the answers obtained in this area.

Next, some Pearson Correlation tables are presented between the variables of inhabitant, conditions of the public space, environmental and complementary. Each one had a diverse representativeness according to the statistical factors and they are exposed in a concise way.

Regarding the variables related to the thermal sensation of the inhabitant, the variables of vegetation and furniture in the public space turned out to be the most significant in this area with a moderate level of correlation, followed by the variables of vegetation with the interaction between users of the public space. public space with a correlation level of weak. See table 2.

Table 2. Thermal sensation associated with variables of the public space.

		Thermal sensation of the interviewee	Vegetation of the public space	Furniture of the public space	Visiting hours to the public space	Improvement of public space	Interaction between users of public space
Thermal sensation of the interviewee	Pearson correlation	1	.064	.164	-.028	.072	-.007
	Sig. (bilateral)		.523	.100	.780	.472	.944
	N	102	102	102	102	102	102
Vegetation of the public space	Pearson correlation	.064	1	.657**	-.013	.148	.484**
	Sig. (bilateral)	.523		.000	.898	.138	.000
	N	102	102	102	102	102	102
Furniture of the public space	Pearson correlation	.164	.657**	1	-.045	.065	.462**
	Sig. (bilateral)	.100	.000		.654	.519	.000
	N	102	102	102	102	102	102
Visiting hours to the public space	Pearson correlation	-.028	-.013	-.045	1	-.051	-.155
	Sig. (bilateral)	.780	.898	.654		.614	.120
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	.072	.148	.065	-.051	1	.062
	Sig. (bilateral)	.472	.138	.519	.614		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	-.007	.484**	.462**	-.155	.062	1
	Sig. (bilateral)	.944	.000	.000	.120	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the variables related to the sensation of humidity, it was found that there is a level of significance between the vegetation and the shape of the public space with a weak correlation, likewise, with the variables of shape and the interaction between users of the public space with a weak level correlation. See table 3.

Table 3. Sensation of humidity associated with variables of public space.

		Sensation of humidity of the interviewee	Vegetation of the public space	Form of public space	Visiting hours to the public space	Improvement of public space	Interaction between users of public space
Sensation of humidity of the interviewee	Pearson correlation	1	.175	-.014	.034	-.010	.140
	Sig. (bilateral)		.078	.890	.731	.919	.162
	N	102	102	102	102	102	102
Vegetation of the public space	Pearson correlation	.175	1	.292**	-.013	.148	.484**
	Sig. (bilateral)	.078		.003	.898	.138	.000
	N	102	102	102	102	102	102
Form of public space	Pearson correlation	-.014	.292**	1	-.069	.150	.361**
	Sig. (bilateral)	.890	.003		.490	.132	.000
	N	102	102	102	102	102	102
Visiting hours to the public space	Pearson correlation	.034	-.013	-.069	1	-.051	-.155
	Sig. (bilateral)	.731	.898	.490		.614	.120
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	-.010	.148	.150	-.051	1	.062
	Sig. (bilateral)	.919	.138	.132	.614		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	.140	.484**	.361**	-.155	.062	1
	Sig. (bilateral)	.162	.000	.000	.120	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the study variables related to the sensation of wind, it was found that there is a level of significance between various variables, but the ones with the highest correlation in this area were vegetation with the dimension of public space at a moderate level with a positive linear trend. See table 4.

Table 4. Sensation of wind associated with variables of public space.

		Wind sensation of the interviewee	Vegetation of the public space	Circulation of public space	Dimension of public space	Improvement of public space	Interaction between users of public space
Wind sensation of the interviewee	Pearson correlation	1	-.255**	-.161	-.280**	.032	-.171
	Sig. (bilateral)		.010	.107	.004	.750	.086
	N	102	102	102	102	102	102
Vegetation of the public space	Pearson correlation	-.255**	1	.395**	.530**	.148	.484**
	Sig. (bilateral)	.010		.000	.000	.138	.000
	N	102	102	102	102	102	102
Circulation of public space	Pearson correlation	-.161	.395**	1	.363**	.113	.389**
	Sig. (bilateral)	.107	.000		.000	.259	.000
	N	102	102	102	102	102	102
Dimension of public space	Pearson correlation	-.280**	.530**	.363**	1	.184	.378**
	Sig. (bilateral)	.004	.000	.000		.064	.000
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	.032	.148	.113	.184	1	.062
	Sig. (bilateral)	.750	.138	.259	.064		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	-.171	.484**	.389**	.378**	.062	1
	Sig. (bilateral)	.086	.000	.000	.000	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the variables related to the sensation of noise level, the only one that had a level of significance was vegetation at a weak level and with a linear trend of positive association. See table 5.

Table 5. Sensation of noise level associated with variables of the public space.

		Noise level sensation of the interviewee	Vegetation of the public space	Dimension of public space	Form of public space	Improvement of public space	Interaction between users of public space
Noise level sensation of the interviewee	Pearson correlation	1	.195*	-.022	-.076	-.007	.175
	Sig. (bilateral)		.049	.830	.449	.948	.079
	N	102	102	102	102	102	102
Vegetation of the public space	Pearson correlation	.195*	1	.530**	.292**	.148	.484**
	Sig. (bilateral)	.049		.000	.003	.138	.000
	N	102	102	102	102	102	102
Dimension of public space	Pearson correlation	-.022	.530**	1	.359**	.184	.378**
	Sig. (bilateral)	.830	.000		.000	.064	.000
	N	102	102	102	102	102	102
Form of public space	Pearson correlation	-.076	.292**	.359**	1	.150	.361**
	Sig. (bilateral)	.449	.003	.000		.132	.000
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	-.007	.148	.184	.150	1	.062
	Sig. (bilateral)	.948	.138	.064	.132		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	.175	.484**	.378**	.361**	.062	1
	Sig. (bilateral)	.079	.000	.000	.000	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the variables of the public space related to the sensation of illuminance, it was found that the shape, dimension and improvement of the public space present a level of significance with a positive linear trend and a weak degree of association. See table 6.

Table 6. Sensation of illuminance level associated with variables of the public space.

		Sensation of illuminance of the interviewee	Form of public space	Dimension of public space	Visiting hours to the public space	Improvement of public space	Interaction between users of public space
Sensation of illuminance of the interviewee	Pearson correlation	1	.204 [*]	.292 ^{**}	-.015	.251 [*]	-.139
	Sig. (bilateral)		.040	.003	.879	.011	.165
	N	102	102	102	102	102	102
Form of public space	Pearson correlation	.204 [*]	1	.359 ^{**}	-.069	.150	.361 ^{**}
	Sig. (bilateral)	.040		.000	.490	.132	.000
	N	102	102	102	102	102	102
Dimension of public space	Pearson correlation	.292 ^{**}	.359 ^{**}	1	-.068	.184	.378 ^{**}
	Sig. (bilateral)	.003	.000		.499	.064	.000
	N	102	102	102	102	102	102
Visiting hours to the public space	Pearson correlation	-.015	-.069	-.068	1	-.051	-.155
	Sig. (bilateral)	.879	.490	.499		.614	.120
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	.251 [*]	.150	.184	-.051	1	.062
	Sig. (bilateral)	.011	.132	.064	.614		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	-.139	.361 ^{**}	.378 ^{**}	-.155	.062	1
	Sig. (bilateral)	.165	.000	.000	.120	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the variables of the public space related to the sensation of air quality, it was recorded that the only one that had a level of significance was the circulation of the public space with a positive linear trend and a degree of association of a weak level. See table 7.

Table 7. Sensation of air quality associated with variables of public space.

		Interviewee's air quality sensation	Vegetation of the public space	Circulation of public space	Improvement of public space	Interaction between users of public space
Interviewee's air quality Sensation	Pearson correlation	1	-.177	.241 [*]	.140	.056
	Sig. (bilateral)		.075	.015	.161	.574
	N	102	102	102	102	102
Vegetation of the public space	Pearson correlation	-.177	1	.395 ^{**}	.148	.484 ^{**}
	Sig. (bilateral)	.075		.000	.138	.000
	N	102	102	102	102	102
Circulation of public space	Pearson correlation	.241 [*]	.395 ^{**}	1	.113	.389 ^{**}
	Sig. (bilateral)	.015	.000		.259	.000
	N	102	102	102	102	102
Improvement of public space	Pearson correlation	.140	.148	.113	1	.062
	Sig. (bilateral)	.161	.138	.259		.537
	N	102	102	102	102	102
Interaction between users of public space	Pearson correlation	.056	.484 ^{**}	.389 ^{**}	.062	1
	Sig. (bilateral)	.574	.000	.000	.537	
	N	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Regarding the variables of the public space related to the sensation of solar radiation of the interviewee, it was found that there is no level of significance between any of them, therefore, there is no linear association between the variables analyzed. See table 8.

Table 8. Sensation of solar radiation associated with variables of public space.

		Sensation of solar radiation of the interviewee	Vegetation of the public space	Furniture of the public space	Visiting hours to the public space	Improvement of public space	Interaction between users of public space
Sensation of solar radiation of the interviewee	Pearson correlation	1	-.017	.069	.045	-.101	-.084
	Sig. (bilateral)		.862	.491	.652	.313	.403
	N	102	102	102	102	102	102
Vegetation of the public space	Pearson correlation	-.017	1	.657**	-.013	.148	.484**
	Sig. (bilateral)	.862		.000	.898	.138	.000
	N	102	102	102	102	102	102
Furniture of the public space	Pearson correlation	.069	.657**	1	-.045	.065	.462**
	Sig. (bilateral)	.491	.000		.654	.519	.000
	N	102	102	102	102	102	102
Visiting hours to the public space	Pearson correlation	.045	-.013	-.045	1	-.051	-.155
	Sig. (bilateral)	.652	.898	.654		.614	.120
	N	102	102	102	102	102	102
Improvement of public space	Pearson correlation	-.101	.148	.065	-.051	1	.062
	Sig. (bilateral)	.313	.138	.519	.614		.537
	N	102	102	102	102	102	102
Interaction between users of public space	Pearson correlation	-.084	.484**	.462**	-.155	.062	1
	Sig. (bilateral)	.403	.000	.000	.120	.537	
	N	102	102	102	102	102	102

** The correlation is significant at level 0.01 (bilateral).

Conclusion and discussion

Based on the results obtained, it is pointed out that the conditions of the public spaces studied are seen to be deteriorated by the meteorological factors that have occurred in the last decade in relation to 2022, some of the key informants of the Ayotitlán community report that there is a lack of support of the municipality of Cuautitlán for the improvement of public spaces so that a better coexistence and social interaction between its inhabitants is generated, with regard to what was mentioned by key informants of the community of Cuzalapa, most of them believed that as of the year 2010 the public space has better maintenance and care of its green areas, however, they reported that since the provision of internet to the town, the inhabitants no longer regularly attend the public space, only when there is an important event, the celebration of Masses on Saturdays and weekends that are more familiar. Regarding the interaction of users in the space, it can be seen that most of the interviewees considered it good and

regular for both periods, in this way; socialization is optimal and allows an approach that encourages family life.

Regarding the thermal sensation of the cold period sampling, the neither hot nor cold scale was taken as the most frequent indicator corresponding to 4 deciles, this variable indicated the degree of acceptance of temperature by users during the sampling application hours. Regarding the sensation of humidity, the interviewees stated the moderate scale as the most frequent, however, in the cold period this variable is less conditioned than in the summer by the rainfall factor. Regarding the sensation of wind, people reported the scale of little in 4 deciles followed by nothing, this factor shows the lack of natural ventilation in the sampling areas and is a condition that affects the degree of well-being of the users. Regarding the sensation of solar radiation manifested by the users, the low radiation indicator was the most frequent and serves as an indicator of tolerance in this sense by the interviewees.

Regarding the sensation of noise level, the inhabitants reported the scale of little in 2 quartiles, a situation that

reflects the tranquility of the two study areas during the sampling hours and promotes social coexistence. Regarding the sensation of illuminance of the inhabitants, the moderate scale turned out to be the highest corresponding to 4 deciles of the total sampling, this indicated that the users appreciate the lighting in public spaces as adequate, but according to the records of the luxmeter after 7 pm the illuminance was deficient with respect to the criteria of the competent regulations. Regarding the sensation of air quality of the users, the highest scales were quite, moderate and medium; in this way, it is considered that the public spaces analyzed in the cold period had a satisfactory degree of this variable.

Regarding the environmental variables that are related to the thermal sensation of the user, only the relative humidity and wind speed did not have a level of significance, in contrast, the dry bulb temperature, the globe temperature, the temperature of wet bulb and solar radiation, turned out to be of positive linear trend and with a weak and moderate degree of association. Associated with the sensation of humidity, it was recorded that none had a level of significance, or degree of linear association between the group of variables analyzed. Regarding the crossing with the user's sensation of wind, it was recorded that the only variable that had a level of significance was the wind speed, likewise, the highest correlation between environmental variables was the dry bulb temperature with the globe temperature. gray with a degree of association of strong level. The association with the sensation of solar radiation of the inhabitant was recorded, resulting in a significance level with a positive linear trend and a weak and moderate degree of association, however, the only variable that did not register a significance level was relative humidity.

Regarding the relationship of the complementary variables with the sensation of noise level of the inhabitant, it is pointed out that a level of significance was not registered between them, which assumes that there is no degree of linear association in this area for the study variables.

Regarding the variables of sensation of illuminance of the inhabitant, the level of significance was illuminance and solar radiation with a weak positive degree of association between the variables analyzed. Regarding the relationship with the sensation of air quality of the user, none of them registered a level of significance, therefore, there is no degree of linear association between the group of variables analyzed.

The discussion that derives from the research work that is presented, is linked between the confluence of social perception and environmental habitability of the inhabitants of public spaces of indigenous communities of the Sierra de Manantlán in Jalisco, Mexico. It is suggested to continue its work with other indigenous communities as a means of informing social advocacy, where full respect for these communities is fostered and programs for the development and strengthening of mutual interaction, ecotourism and productive activities are promoted, as well as an exclusive improvement of their public spaces in

terms of furniture and vegetation for the benefit of their society.

To close this section and according to the results obtained from this study, it is suggested to the Government of Cuautitlán, Jalisco, to improve the public space of Ayotitlán in terms of furniture, equipment and vegetation, since it is in poor condition and people refer that a remodeling is urgent, another aspect is to promote support for ecotourism and social dynamics of Cuzalapa and Ayotitlán; as well as the management of resources for cultural and sports activities and the delivery of workshops on social integration and care for the environment.

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Author contribution:

Dr. Arch. Francisco José Martín del Campo Saray

Conceptualization, Principal investigator, Research, Methodology, Manuscript Preparation, Manuscript Writing.

Dr. Arch. Gonzalo Bojórquez Morales

Formal Analysis of the Work or Project, planning, supervision, manuscript review and editing.

Dr. Peter R. W. Gerritsen

Formal analysis of the work or project, Planning, Supervision, Review and editing of the manuscript.

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