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Methodology Of Sensory Activities For The Visually Impaired: Agrotourism Inventory And Accessible Tourism Experience At The Integral Self-Sustainable Farm Of The Technical University Of Babahoyo

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Abstract

As part of the R+D+I research project entitled "Sensory Agro-tourism at the UTB integral farm: design of a guide based on the perception of the senses and promotional website" and the articulation with the project named "Tourism at the self-sustainable integral farm of the Technical University of Babahoyo for environmental education, sustainability, and inclusivity - Enjoying tourism with the eyes of the soul", a partial result of the final project is presented. The study is exploratory through a qualitative approach and was carried out between April 2022 - February 2023, with the participation of people with and without visual impairment. The objective of the study was to design the methodology for sensory activities within the Self-Sustainable Integral Farm of the UTB aimed at people with visual impairment. The main results obtained from the research are the design of the survey instrument of agricultural and livestock products for agrotourism inventory valuing the tourist landscapes for farms, farms, and ranches and the methodological proposal to design sensory agrotourism activities aimed at visually impaired people based on the perception of the senses through the stimulation of smell, touch, taste and hearing in the agricultural and agricultural landscapes that the integral farm has to provide them with a barrier-free tourist experience.

Keywords: *tourism accessibility, visually impaired, agrotourism, sensory activities, farm, farms, tourism experience, agrotourism inventory, sensory methodology*

Resumen

En el marco del proyecto de investigación I+D+I "Agroturismo sensorial en la granja integral UTB: diseño de guía basada en la percepción de los sentidos y página web promocional" y de la articulación con el proyecto de vinculación con la sociedad "Turismo en la granja integral autosustentable de la Universidad Técnica de Babahoyo con fines de educación ambiental, sostenibilidad e inclusividad - Disfrutando el turismo con los ojos del alma" se presenta un resultado parcial del proyecto final. El presente estudio es de carácter exploratorio con enfoque cualitativo y se llevó a cabo entre abril 2022 – febrero 2023, con la participación de personas con y sin discapacidad visual. El objetivo del estudio planteado fue diseñar la metodología para actividades sensoriales dentro de la Granja Integral Autosustentable de la UTB dirigida a personas con discapacidad visual. Los resultados principales obtenidos de la investigación son: El diseño del instrumento de relevamiento de productos agrícolas y pecuarios para inventario agroturístico valorando los paisajes turísticos para granjas, fincas y haciendas y la propuesta metodológica para diseñar actividades agroturísticas sensoriales dirigido a personas con discapacidad visual basado en la percepción de los sentidos mediante el estímulo del olfato, tacto, gusto y oído en los paisajes agrícola y agrarios que posee la granja integral con la finalidad de brindarles una experiencia turística sin barreras.

Palabras clave

Accesibilidad turística, discapacidad visual, agroturismo, actividades sensoriales, granja, fincas, experiencia turística, inventario agroturístico, metodología sensorial

Introduction

The World Health Organization, through the World Vision Report, published in 2020, has estimated that at least 2.2 billion people worldwide suffer from visual impairment or blindness, and also mentions that visual impairment includes moderate and severe visual impairment, and blindness (total loss of sight). Blindness can be congenital (from birth) or acquired (at any time in life). In Ecuador, it is estimated that 540,650 people have disabilities, according to data provided by the Ministry of Public Health in January 2023 (last update), figures that are increasing, and compared to the year 2022, there is an increase in the number of people with disabilities of 69,445 people, in addition to the data recorded in 2022, which was 471,205 Pcd.

According to the latest data provided by the National Council on Disability, there are 54,397 people with visual impairment at the national level, while at the provincial level (Los Ríos) there are 2,279 people who present from total blindness to moderate to severe visual impairment.

Tourism and its accessibility to enjoy it is a right that must be guaranteed to all citizens (UNWTO, 2014) although the tourist experience has always been determined by the visitor's visual perception, publications such as "The Tourist's Gaze" by sociologist John Urry in 1993 and in which he referred to the visitor's experience when performing the tourist activity, reinforced conceptual positions that considered the sense of sight vital (Qiao, et al. 2023; González Aguirre2022; Fusté Forné et al, 2015) to evaluate and enjoy a tourism experience when performing tourism activities in a destination. However, a visitor's tourism experience can be achieved through the exploration of hearing, touch, taste, smell, and not only sight, achieving an integral experience from the perspective of all the senses, through sensory activities that allow a meaningful enjoyment of the destination with equity, dignity and independence (Landeta-Bejarano et al. 2018; Darcy et al., 2009).

"Studies on tourism, for the most part, have been negligent in the limited inclusion of experiences lived by marginalized people in society" (Kastenholz et al., 2015, cited in Gillovic et al., 2021, p. 155), and among the few studies in this regard, a greater interest in accessibility in the physical sense is perceived, leaving aside other types of disability that do not have to do with reduced mobility (Olaya et al., 2022). Despite the efforts of international organizations and academia to include universal design in tourism services, products, and environments through inclusive and barrier-free tourism, the design of comprehensive experiences in recreational and leisure activities that would undoubtedly improve the quality of life of people with permanent or temporary disabilities, as well as of all residents and visitors, has not been consolidated.

In Ecuador, the 2008 Constitution and the ministerial agreement 2020-047 mention people with disabilities and senior citizens, among other groups, as vulnerable and priority groups; however, Annex 1: Public Policy on Accessible Tourism 2030 of the aforementioned ministerial agreement is not publicly accessible in digital media or institutional web of the Ministry of Tourism, which hinders its "mandatory application and enforcement at the national level" (textual quote taken from the ministerial agreement 2020 -047). As a consequence, Annex 1 cited in the ministerial agreement 2020 -047 at the end of this study is a document unknown by the academia and the competent institutions of planning, management, and local tourism development. Therefore, the scope of the document is unknown, as well as the guidelines for tourism accessibility that cities should achieve as a minimum requirement in the management of tourist destinations in the country.

Therefore, the main interest of this study, especially in the country, is to contribute significantly to the literature related to the research line of inclusive tourism, tourism accessibility, and visual impairment. The general objective is to design the methodology of sensory activities within the Self-Sustainable Integral Farm of the UTB aimed at people with visual impairment, to serve as a base instrument for the design of integral experiences in agrotourism activities carried out in farms, haciendas, ranches, or open areas for recreation.

Materials and Methods

The research is exploratory in nature with a qualitative approach and was conducted between April 2022 and February 2023. This study had three phases: the design of instruments for data collection for the agrotourism inventory of the farm, the design of sensory agrotourism activities collecting opinions and criteria of people with and without visual impairment, and finally, to validate and obtain greater reliability to the designed methodology, a simulation of the implementation of sensory activities applied in the self-sustainable integral farm UTB was carried out.

Given the difficulty of motivating the participation of visually impaired people, the Student Welfare Department of the Technical University of Babahoyo supported the active inclusion of seven enrolled students who have the CONADIS visual disability card; as for people without disabilities, three teachers specialized in Tourism and seven students of the Tourism Career of the same institution participated.

Table 1. Phases, Procedure, and expected results

| Phases | Procedure | Results |
|------------------|--|--|
| Inventory Design | <ol style="list-style-type: none"> 1. Define instrument 2. Data collection using a designed instrument. | Application of the survey instrument for agricultural and livestock products for agrotourism inventory valuing tourism landscapes for farms, estates, and ranches. |
| Activity Design | <ol style="list-style-type: none"> 1. Assess the potential of sensory agrotourism activities. 2. To identify sensory agro-tourism activities based on the opinions and criteria of visually impaired people. | Agro-tourism sensory activities are designed with the participation of beneficiaries. |
| Simulation | <ol style="list-style-type: none"> 1. Simulation of the sensory agro-tourism activities proposed to people with and without disabilities. 2. Final evaluation of the sensory agro-tourism activities. | Validation and reliability of the designed methodology. |

Source: Authors.

Study Area

The study was conducted at the Self-Sustainable Integrated Farm of the Technical University of Babahoyo, the farm is located at kilometer 5.7 on the road to Montalvo. The purpose of this space is to complement the activities of the practical learning component of the students of the Technical University of Babahoyo. Among the learning-teaching activities that the students carry out are: short-cycle and perennial agricultural production activities, livestock production management, agro-industrial processes, and activities related to agro-tourism guidance.

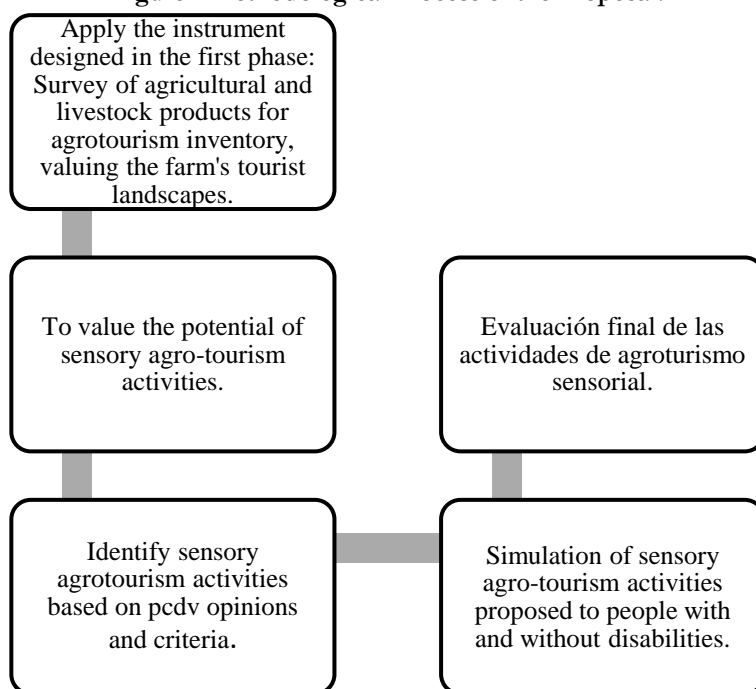
Figure 1. Location of the Self-Sustainable Integrated Farm of the Universidad Técnica de Babahoyo.



Results

The methodology of sensory activities for visually impaired people responds to the needs of potential visitors or residents, considering the criteria of visually impaired people and tourism specialists belonging to the academy. This methodology can be applied in farms, farms, estates, or open areas for recreation and is intended to serve as a basic tool for the design of comprehensive experiences in inclusive agro-tourism activities.

Figure 1 Methodological Process of the Proposal.



Source: Own elaboration. The methodological process developed between April 2022 - February 2023.

The first step in the design methodology of sensory activities aimed at visually impaired people is based on the perception of the senses through the stimulation of smell, touch, and hearing in the agricultural and agricultural landscapes of the farm to

provide a barrier-free tourism experience, was the application of the instrument to inventory the agricultural and livestock elements of the farm to identify agrotourism circuits within the farm. The following are the data obtained in the instrument designed.

Table 2 Survey instrument for agricultural and livestock products for agrotourism inventory valuing tourist landscapes for farms, estates, and farmsteads.

| | |
|--|--|
| Name of Survey Technician: | <i>Name of data collector</i> |
| Name of Facilitator/Farmer: | Name of person providing the information Mr. Publio Contreras Pazmiño |
| Age of facilitator/farmer: | 57 years |
| Assigned name of the survey site: | Self-sustainable Integral Farm of the Universidad Técnica de Babahoyo |
| 1. Size and distance | |
| 1.1. Extension (km ²) | 60 hectare |
| 1.2. Unproductive land (km ²) | In constant production |
| 1.3. Distance between the main cities (km ²) | 20 minutes (10.2 km) |
| Background of the Productive Land. | |
| 2.1. is this a former mining area? | Yes, it used to be an old exploitation zone, there was a hacienda called San Pablo and they had a sugar cane plantation. |
| 2.2 Have you had flooding problems? | The farm is located in a flood zone because it is surrounded by the Babahoyo River. |
| 2.3 Type of Production: Mixed/Organic/Organic/Conventional | Production is mostly organic but conventional production is also used. It is mixed. |
| 2.4 Faculties operating on the sustainable farm for learning - teaching: | FACIAG (All the careers of the faculty) FCJSE (Tourism Career) |

| 3. Landscape Agricultural | Features | | Total of crops | Hectares | Observation |
|---------------------------|--|--|----------------|----------|-------------------------------------|
| | Type of production and Surface dedicated to: | | | | |
| | 3.1. Fruits | | 13 | 1½ H | The field has living barriers. |
| | 3.2. Vegetables | | 14 | 2 H | The field has living barriers. |
| | 3.3. Greenhouse-grown vegetables | | - | | |
| | 3.4. Dried pulses | | 1 | 50h | |
| | 3.5. Cereals | | 2 | 20h | The field has live barriers. |
| | 3.6 Forage | | 4 | 45h | The field has a ditch as a barrier. |
| | 3.7 Corn | | 1 | 5h | The field has a ditch as a barrier. |
| | 3.8 Cocoa | | 1 | 2h | |
| | 3.9 Banana | | 1 | 2h | |
| | 3.10 Rice | | 1 | 1h | |

| 4. Landscape Agrarian | Features | | SI | NO | Unidades |
|-----------------------|---|--|----|----|---|
| | Type of production and Surface area dedicated to: | | | | |
| | 4.1 Cattle | | X | | 3 |
| | 4.2. Goats | | X | | 2 |
| | 4. 3 Sheep | | X | | 2 |
| | 4.4. Equine Cattle | | X | | 5 |
| | 4.5. Poultry Laying Hens | | X | | Each cycle produces between 50 to 100. |
| | 4.6 Poultry Quail | | X | | Each cycle produces between 50 to 100. |
| | 4.7 Rabbit farming | | X | | Between 20 to 50. It is not produced continuously. |
| | 4.8 Production of Guinea pigs | | X | | Between 20 to 50. It is not produced continuously. |
| | 4.9 Beekeeping | | | x | |
| | 4.10 Fish farming | | X | | the capacity of the pond for fry is approximately 5000. |

| 5. Agricultural Products Detail. | | | | | |
|----------------------------------|-------------------------|-----------|--------------|--------|---------------------|
| Common name | Scientific name | Cycle | Harvest Time | Uses | Production Quantity |
| Breadfruit | Artocarpus altilis | Short | 5 months | Edible | Unlimited |
| Papaya | Carica papaya | Perennial | 5 months | Edible | |
| Pitajaya | Selenicereus Updates | Perennial | 3 months | Edible | 10-12 per bush. |
| Sapote | Pouteria sapota | Short | 3 years | Edible | |
| Guava | Psidium guajava | Short | 2 months | Edible | 3 to 4 fruits per |
| Cherry | Prunus subg. Cerasus | Corto | 3 months | Edible | branch |
| Pechiche | Vitex gigantea | Corto | 3 months | Edible | Unlimited |
| Avocado | Persea americana | Short | 4 years | Edible | |
| Nicaragua | Averrhoa | Perennial | 3 months | Edible | Unlimited |
| Orange | Citrus X sinensis | Perennial | 3 years | Edible | |
| Araza | Eugenia stipitate | Perennial | 2 years | Edible | Unlimited |
| Pomarrosa | Syzygium jambos | Perennial | 5 years | Edible | Unlimited |
| Soursop | Annona muricata | Perennial | 16-25 months | Edible | Unlimited |

6. Detail of Medicinal and Aromatic Plants.

| Common name | Scientific name | Cycle | Crop detail | Harvest Time | Observation |
|-------------------|------------------------|-----------------------|-------------------|---------------------|--|
| Turmeric | palillo o turmeric | Continuous production | Organically grown | 9 months | Edible and medicinal |
| Paico | Dysphania ambrosioides | Continuous production | Organically grown | 2 months | Medicinal |
| Insulin | Costus Igneus | Continuous production | Organically grown | 25 days from | Medicinal |
| Oregano | Origanum vulgare | Continuous production | Organically grown | Sowing | Edible and medicinal |
| Caña Brava | Arundo donax | Continuous production | Organically grown | 1 year and | Medicinal |
| Ginger | Zingiber officinale | Continuous production | Organically grown | Half | Edible and medicinal |
| Lemon verbena | Aloysia citrodora | Continuous production | Organically grown | 8 months | Medicinal |
| Dead Rose | Tagetes erecta | Continuous production | Organically grown | 5 months | Medicinal |
| Ruda de gallinazo | Ruta graveolens | Continuous production | Organically grown | 2 months | Medicinal uses and curative applications |
| Air leaf | Bryophyllum pinnatum | Continuous production | Organically grown | 1 month | Edible and medicinal |
| Castille rue | Ruta graveolens | Continuous production | Organically grown | 1 month | Medicinal |
| Insulin | Costus Igneus | Continuous production | Organically grown | 25 days from sowing | Medicinal |
| Dulcamara | Solanum dulcamara | Continuous production | Organically grown | Sowing | Medicinal |
| Aloe Vera | Aloe | Continuous production | Organically grown | 1 month | Medicinal, facial facial |
| Peppermint | Mentha spicata | Continuous production | Organically grown | 2 months | Edible and medicinal |
| Basil | Ocimum basilicum | Continuous production | Organically grown | 25 days | Edible and medicinal |

7. Use of fertilizers used in agricultural production.

| Type of fertilizer | Fertilizers Used | Used Pesticides |
|--------------------|---|---|
| Organic | Compost, rock phosphate, Bocashi, Manure Tea. | Garlic, chili, lemon and onion extracts. Guanto and kidney tomato |
| Conventional | Urea | Mancozeb |

| | Tourism Valuation | | | |
|--|--|---------|-----------|--|
| | Activities | Current | Potential | Observation |
| Recreational tourism activities of the site according to agrarian, agricultural and rural landscapes | Learn about farm animal husbandry | x | | Activity is carried out with students at present |
| | Learn about fish farming | x | | Activity is carried out with students at present |
| | Participate in farm animal husbandry activities | x | | Activity is carried out with students at present |
| | Learn about planting fruits, vegetables, etc | x | | Activity is carried out with students at present |
| | Learn about medicinal and aromatic plants. | x | | Activity is carried out with students at present |
| | Participate in the planting and harvesting of agricultural products. | x | | Activity is carried out with students at present |
| | To learn about the elaboration of organic fertilizers. | | X | |
| | Learn and participate in chocolate making. | | X | |
| | Learn and participate in cheese making. | | X | |
| | To learn and participate in the elaboration of flour. | x | | Activity is carried out with students |
| | Learn and participate in the elaboration of jams. | x | | Activity is carried out with students |
| | Participate in cycling activities. | x | | Activity is carried out with students |
| | Hiking on the farm. | x | | Activity is carried out with students |
| | Hiking through fruit trees area | | X | |
| | Rural photography | x | | Activity is carried out with students |
| | Inclusive agrotourism guide | | X | |
| | Learn how to make accessible agrotourism scripts. | | X | |

Source: Result of field research in the application of the instrument designed for this purpose.

The inventory of livestock and agricultural products and current and potential agritourism activities was obtained from the survey using the instrument designed to collect information from the integral farm, which is the primary information for assessing the potential for sensory agritourism activities. To determine the evaluation of the potential for sensory agro-tourism activities, the following criteria were established: accessibility on arrival at the site, proximity between circuits, sensory elements in the agro-tourism activity identified in each zone of the integral farm.

Table 3 Assessment Table of Agro-tourism Activities with Sensory Potential

| Criteria Activity | Accessibility | | Proximity | | Sensoriality | |
|--|---------------|----|-----------|----|--------------|----|
| | SI | NO | SI | NO | SI | NO |
| Learning about farm animal husbandry. | | x | | x | X | |
| Learn about fish farming. | x | | x | | X | |
| Participate in farm animal breeding activities. | | x | | x | X | |
| To learn about planting fruits, vegetables, etc. | | x | | x | X | |
| Learning about medicinal and aromatic plants. | x | | x | | X | |
| Participate in the planting and harvesting of agricultural products. | | x | | x | X | |
| Learn about the elaboration of organic fertilizers. | | x | | x | X | |
| Learn and participate in the elaboration of chocolate. | | x | | x | X | |
| Learn and participate in the elaboration of cheese. | | x | | x | X | |
| Learn and participate in the elaboration of flour. | | x | | x | X | |
| Learn and participate in the elaboration of jams. | | x | | x | X | |
| Participate in bike walking activities. | x | | .x | | X | |
| Hiking on the farm. | | x | .x | | X | |
| Hiking in the fruit tree area. | x | | x | | X | |
| Rural photography | | X | .x | | | x |

The application of Table 3 showed that the activities that could be carried out at the Integral Self-Sustainable Farm at present, based on the criteria of accessibility and sensoriality, were the following agrotourism recreational activities:

- Learn about fish farming.
- Learn about medicinal and aromatic plants.
- Participate in cycling activities.
- Hiking through an area of fruit trees.

Once the agro-tourism activities with sensory potential that could be carried out on the farm under the current conditions were defined, a map of the areas where the sensory agro-tourism activities could be carried out was drawn up.

Figure 3 Map of the Agro-tourism Sensory Activities Trail.



Once the route for the "Path of sensory agro-tourism activities" was identified, the activities were designed by collecting opinions and criteria from visually impaired people. The seven students with disabilities and authors of the research project who participated in the process of designing the activities walked the proposed route in order to jointly elaborate the activities for each point visited, to ensure anonymity, each participant was assigned a number; however, in the photographs if they authorized the publication, the following are the sensory activities for each sense, relating textually the opinions and criteria of the participants:

Table 4. Design of sensory agrotourism activities based on the opinions and criteria of visually impaired persons.

| Trail Area | Agrotourism Activities | Description of activities |
|----------------|--|---|
| Tilapia Zone | Learning about Fish Farming. | <ul style="list-style-type: none"> • Touch: In this area, there are pools of fry pools of different sizes. Participant 1 mentioned that the activity of being able to have a container to put her hand in seemed like an interesting idea and that the tingling sensation generated laughter. Participants 2 and 3 agreed that this activity should be done after listening descriptively to the characteristics of tilapia and their fry. Participants 5 and 6 mentioned that they prefer to visit only one pond and not tour the nine ponds at the site. Participant 7 expressed that she did not like the idea of putting her hand in the pond, but suggested that when explaining the tilapia in its adult state, a dead fish should be present to touch its scales or make a model to determine its weight and texture, although she liked the idea of the dead fish better. • Smell: Unanimously, participants mentioned that they can easily smell the feed eaten by the fry. • Taste: Participants 2 and 6 mentioned that while talking about adult tilapia, it is possible to taste a few bites of grilled tilapia. • Hearing: Participants 3 and 5 mention that the ponds generate noise when water falls into them. Participants 1 and 7 mention that when guiding, the tour guide should communicate each movement in advance and tell them the location of everything by telling them from left to right where each person or object is located. |
| Zona de Vivero | Aprender sobre plantas medicinales y aromáticas. | <ul style="list-style-type: none"> • Touch: In this area there are medicinal and aromatic plants. Participant 1 mentions that on the trail the blind person is better directed if he/she walks half a step behind the guide, so that when he/she perceives the movements up or down, he/she has time to imitate them, she also describes. Participant 2 mentions that as |

- soon as the path starts with touch, it is done by walking and that it would be interesting to place different textures on the path, for example, sparkling stones, granite, grass, dry leaves with dirt but without holes and free of humidity. Participant 3 also noted that the path could have pavers made of recycled material such as glass. Participant 4 mentioned that for medicinal plants it is important to describe the shape of the leaf whether it is cylindrical, oval or round. Participant 5 mentions that the texture of the plant is important to describe if it has a thorn, if it is hairy, if it is rough, if it is slippery or smooth. He mentions that touching leaves and plants is a form of interaction.
- Smell: Participant 6 mentioned that smelling each medicinal plant is a pleasant sensation, that there are some that have sweet and spicy smells. Participant 7 mentioned that it would be interesting to be able to have aromatic flowers in the nursery.
 - Taste: Participants unanimously mentioned that a variety of aromatic water can be offered with the same plants as the site.
 - Hearing: 1 and 4 mentioned that they heard the birds at the site that this sound was very pleasant and that they would like a description of the birds that usually go to the site to recognize their whistles.
 - Touch: Participant 3 mentions that in the fruit growing area they would like to feel the trunk, leaf of the tree, even hug the tree to perceive if it is wide, thin or thick, touch the fruits and try as much as they can to take the fruit with their hands from the tree. That they prefer fruits that are easy to pick and find. The texture and shape should be described in detail. Participant 4 says not to be afraid to mention the colors of the fruits because for those who have a high percentage of disability, they like to imagine the color of the fruit.
 - Smell: Participant 7 mentions that there are trees that have strong scents such as orange and lemon, which she liked to smell.
 - Taste: Participant 5 said that tasting the fruits is the best thing about the trail. Participant 1 said that you can taste jams made from fruits native to the province.
 - Hearing: Participants 2 and 6 mentioned that they also heard birds, and that it was pleasant to hear the sound of the dry leaves on the trees, and that they also heard a trickle of water and that this sound was pleasant.
- Zona de Senderismo por Fruticultura Participar en actividades de ciclo paseos.
- For this activity, there were 2 tandem bicycles (two-person) that are part of the linkage project articulated to the research project. For the use of the bicycle only 2 people with disabilities participated, accompanied by the guides who handled the bicycles so that people with disabilities could express their opinions about this activity: Participants 2 and 3 are two brothers with disabilities who voluntarily got on a bicycle for the first time in their lives. Their opinions were as follows:
 - ✓ Participant 2: I liked to feel for the first time a sense of freedom to feel the wind, even as I heard the wind, but it was tiring to move because obviously I was pedaling too.
 - ✓ Participant 3: I think that between one point to another within the trail there should be an exclusive place to pedal the bicycle because I heard cars or motorcycles and that scared me; although if you ask me if this activity should be included I say yes because for anyone to ride a bicycle is surely easy but I never could, nor knew how it was and then to experience it was exciting.

Source: Field work and meeting between students with disabilities and project authors.

The following table 4 summarizes the use of the senses by sensory agritourism activity designed for each of them:

Table 5 Use of senses by recreational activity at the Self-Sustainable Integrated Farm.

| Senses / Agrotourism Activities | Touch | Taste | Smell | Hearing |
|--|-------|-------|-------|---------|
| Learn about medicinal and aromatic plants. | X | x | X | x |
| Learning about Fish Farming. | X | x | X | x |
| Hiking through fruit trees area | X | x | X | x |
| Participate in cycling activities. | X | | X | x |

Once the sensory activities were determined for each site to be visited, the simulation of the sensory agro-tourism activities proposed to people with and without disabilities was carried out: For this purpose, 7 people without disabilities were invited to participate, students of the Tourism Career and 3 specialist teachers of Tourism of the same career who lived the experience blindfolded and performed the same activities of people with visual disabilities, this simulation activity was part of the articulation with the linkage project "Tourism in the Self-Sustainable Integral Farm of the Technical University of Babahoyo for environmental education, sustainability and inclusivity "Enjoying tourism with the eyes of the soul"; the tour guides of the people who participated in the simulation as "visitors of the Integral Farm" were seventh semester students of the Career. For the tour of the Integral Self-Sustainable Farm, the seventh-level students guided each participant in a personalized way; a total of 17 people carried out the sensory activities. For the operation of the agrotourism sensory circuit, the groups were divided into three groups: Group A: 1 teacher, 2 people with disabilities, and 2 people without disabilities. Total 5 participants and 5 sensory activity guides. Group B: 1 teacher, 3 people with disabilities, and 2 people without disabilities. Total 6 participants and 6 sensory activity guides. Group C: 1 teacher, 2 people with disabilities, and 3 people without disabilities. Total 6 participants and 6 sensory activity guides.

Photographic Record of the Simulation Process

Figure 6 Sense of touch in the fruit orchard area.



Figure 5 Sensory Activity in the Tilapias Area.



Figure 4 Tandem bicycle ride



Figure 7. Sensory Activity in Fruit Tree Area.



Once the tour of the Integral Farm was completed with all the participants, a meeting was held with all of them and they gave an evaluation of the activities carried out, as well as suggestions that were taken into account for the next phase of the R+D+I research project "Sensory Agro-tourism at the UTB integral farm: design of a guide based on the perception of the senses and a promotional web page". The group of participants who carried out the simulation in order to evaluate the activity consisted of a total of 17 people: 7 with mild to severe visual impairment, 5 were male and 2 were female, all with the National Council on Disabilities card, an institution that evaluates the degree of disability and grants certification. Among the non-disabled, 5 were female and 5 were male. The minimum age of the participants was 18 years old, while the oldest person was 38 years old. Table 5 below presents the evaluation of the sensory experience designed through agro-tourism activities at the UTB Integral Self-Sustainable Farm. To evaluate the activity carried out, 5 was considered as the maximum score assigned as an indicator of satisfaction with respect to the activity developed and 1 as the minimum score, an indicator of displeasure with the sensory agritourism activity designed; each participant was assigned a number and acronym to ensure the criteria of reliability and anonymity at the time of evaluation:

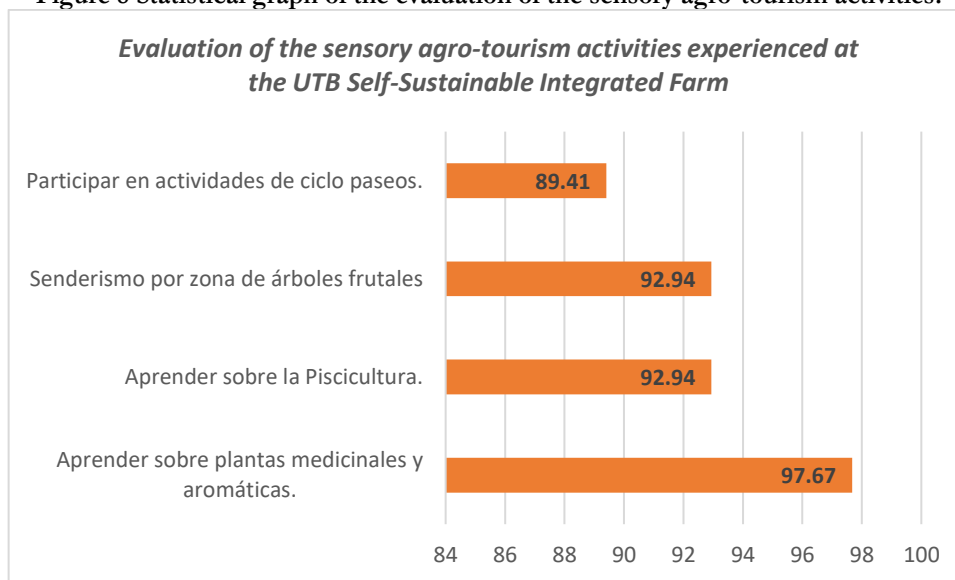
- **Pcdv:** Visually impaired person
- **Pax sin Disc.:** Person without visual impairment
- **Pax esp. Tur:** Tourism Specialist

Table 6 Summary of Evaluation of the sensory agro-tourism activities experienced at the UTB Self-Sustainable Integrated Farm.

| Activities | Learning about medicinal and aromatic plants. | Learning about Fish Farming. | Hiking through fruit trees area | Participate in cycling activities |
|---------------------|---|------------------------------|---------------------------------|-----------------------------------|
| Participants | | | | |
| Pcdv 1 | 5 | 5 | 5 | 4 |
| Pcdv 2 | 5 | 5 | 5 | 5 |
| Pcdv 3 | 5 | 5 | 5 | 4 |
| Pcdv 4 | 5 | 5 | 3 | 5 |
| Pcdv 5 | 5 | 5 | 5 | 5 |
| Pcdv 6 | 5 | 5 | 4 | 5 |
| Pcdv 7 | 5 | 2 | 5 | 3 |
| Pax with no Disc 1 | 5 | 4 | 5 | 5 |
| Pax with no Disc 2 | 5 | 4 | 5 | 5 |
| Pax with no Disc 3 | 5 | 5 | 4 | 5 |
| Pax with no Disc 4 | 4 | 5 | 5 | 3 |
| Pax with no Disc 5 | 5 | 5 | 5 | 4 |
| Pax with no Disc 6 | 5 | 5 | 5 | 4 |
| Pax with no Disc 7 | 5 | 5 | 3 | 5 |
| Pax esp. Tur 1 | 4 | 4 | 5 | 5 |
| Pax esp. Tur 2 | 5 | 5 | 5 | 5 |
| Pax esp. Tur 3 | 5 | 5 | 5 | 4 |
| Punctuation | 97.67 | 92.94 | 92.94 | 89.41 |

Source: Project authors.

Figure 8 Statistical graph of the evaluation of the sensory agro-tourism activities.



Discussion

The results of this study demonstrate the methodology for the design of sensory experiences in farms, ranches or open spaces through agrotourism activities with elements of the site, considering the concept of inclusion as a transversal axis in each phase of the study, with visually impaired people being the co-creators of the design of sensory activities. This document is the first step in the creation of an inclusive agrotourism guide based on the perception of the senses, as this methodology contributes significantly to the subsequent design of descriptive scripts for people with visual impairment.

In this sense, the results achieved in the study are supported by previous research such as those carried out by authors like Guanghui Qiao, et al. (2023) and Kastenholz et al. (2015), studies that analyzed the importance of making recreational activities accessible and how to achieve a deep tourism experience in people with visual impairment is necessary sensoriality in the practice of tourism activity through the use of the other senses in the absence of sight.

The authors Zajadacz & Lubarska (2019) mention the importance of safe outdoor places for people with visual impairment, having adequate signage with a Braille system, varying surface and width, as well as considering key places that emanate sounds that serve as stimuli for the sense of hearing, this study cited supports the research result as within the methodology designed people with disabilities mentioned these aspects relevant to them, therefore validates the importance that the present study has counted as co-creators to the main beneficiaries.

Conclusions

This methodology designed with the participation of the criteria and opinions of the direct beneficiaries (visually impaired people) outlines a step-by-step procedure to create sensory agro-tourism activities based on the perception of the senses: smell, taste, touch, and hearing.

Another main contribution is the design of the survey instrument for agricultural and livestock products for agrotourism inventory valuing tourist landscapes for farms and ranches.

A highlight of this study is that through the valuation of agrotourism activities with sensory potential, it was possible to define the route of the trail for sensory activities at the UTB self-sustainable integral farm. The recreational activities of greatest interest are: learning about fish farming, medicinal and aromatic plants, cycle rides (tandem bicycles), and hiking through fruit tree zones.

Finally, this methodology provides a useful tool for people who plan, manage, and design inclusive tourism products or services, as it provides the basis for the design of sensory agrotourism activities in haciendas, farms, and farmsteads.

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