

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Natalia Mesa Sierra
<b>Project Title</b>	The impacts of Tequila production on Biodiversity
<b>Application ID</b>	37495-2
<b>Date of this Report</b>	October 30 2023

**1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Bird sampling				
Bird photographic documentation				
Nocturnal biodiversity record				
Selection of 20 photographs				
Itinerant exhibition				We managed to ensure that the itinerant exhibition had a space in the five municipalities of the agave landscape (Tequila, El Arenal, Magdalena, Amatitlan and Teuchitlan), rotating through the different Tequila museums. Currently the exhibition is being presented in the municipality of El Arenal and will rotate through the other four municipalities.
Survey for exhibition visitors				Currently we already have surveys from tourist visitors to the Tequila Museum in the El Arenal municipality, however we still need to collect surveys from tourists when the exhibition is presented in the other municipalities.
Survey for local communities				
Survey for agave producers				Currently we have managed to collect surveys from 15 producers, since it has been a great challenge for them to be willing to give their opinion on the crop in general.
Workshops with local communities				A workshop has already been held with two preparatory schools in the Municipality of El Arenal and will be held in the other four municipalities in which the exhibition is presented; spaces have already been secured with authorities.

## **2. Describe the three most important outcomes of your project.**

**a).** Recognition of how the agave crop still houses diversity of birds and mammals with high conservation value: with bird sampling and camera traps we were able to obtain information on how different endemic and migratory species of birds, as well as felines such as the lynx and medium-sized mammals such as the peccary still inhabit the agave landscape area. Our results showed that although agave cultivation as such does not offer important resources, it is used by different species.

**b)** Description of the problems that local communities and producers associated with the cultivation of agave: Derived from the surveys with local communities, it becomes evident that there is a lot of uncertainty about the future of the expansion of agave cultivation. Currently the price of agave had a sharp drop in the markets, which is causing different producers to abandon them. Additionally, local communities, despite the economic impact, identify numerous problems such as contamination of water sources, deforestation and increased heat, as well as poisoning not only of the crop workers but also of vulnerable people in the communities nearby (people with strong allergies), due to the excessive and unregulated use of agrochemicals.

**c)** Collaboration with the five municipalities of the agave landscape to present the photographic exhibition in the interactive museums: Even when the different authorities exalt the economic importance of agave cultivation for their municipalities, they also recognise that regulation is needed to stop the loss of the original ecosystems. A first step towards this is to recognise the biodiversity that is still found in the landscape and that is at risk, and that was the commitment of the municipalities when accepting the presentation of the photographic exhibition that we titled "A look at the Agave Landscape". It is really gratifying that the exhibition can be visited both by tourists and by local inhabitants, who have been surprised by the species that the crop can house, as long as the different important elements of the landscape, such as the remnants of the forest, living fences and water sources.

## **3. Explain any unforeseen difficulties that arose during the project and how these were tackled.**

- Due to security issues prevalent in Jalisco, night tours are not possible. In that sense, camera traps were the best solution, even though the group of amphibians and reptiles were under sampled. However, we suffered the theft of one of them, which had to be replaced to continue with the study.
- Derived from the rapid rates of deforestation, throughout the sampling year we lost remnants of vegetation that were transformed into crops. What we sought to do in some cases was to place sampling points in other patches of vegetation.
- Associated with the multiple economic interests that exist in relation to the production of tequila, as well as the insecurity of the country, neither the producers nor the tequila regulatory council were very open in sharing

information about the extent of cultivation, the practices of management of them, nor the negative aspects that can be identified. What we sought to do to solve these information gaps was to contact producers through a network of collaborators, this to ensure their trust in sharing information, as well as the veracity of the information provided.

#### **4. Describe the involvement of local communities and how they have benefited from the project.**

Local communities were involved and benefited in different ways:

- During the bird sampling, in the times of jimación (process by which the agave is cut), there was a great interaction with the jimadores (people who have traditional knowledge for this work), as they showed great interest in the project and also shared their perceptions of the agave landscape. Likewise, thanks to these interactions it was possible to better understand the work context, as well as have a photographic record of this activity. These photographs were sent to the jimadores.
- The local community that cohabits with the agave landscape participated in the surveys we carried out. As part of the survey, it was also possible to identify environmental and health problems.
- To set up the exhibition at the Interactive Tequila Museum in El Arenal, people from the community who participate in the museum's activities supported us in the entire curation of the exhibition, as well as fine-tuning all the details for the guests.
- On the opening day of the exhibition, we received two groups from the El Arenal high school, who had a very active participation, showing great interest. Likewise, the secretary of rural development and the tourism manager of the municipality participated as part of the local authorities.
- A workshop has been held with schools in the municipality of El Arenal, in which around 50 students and two teachers participated.

#### **5. Are there any plans to continue this work?**

This work is in its developing phase; there are a lot of pending activities such as:

- Workshops with other municipalities of the agave landscape.
- Presentation of the photographic exhibition in other municipalities.
- Collaboration with universities to have discussion spaces with students and share the results obtained.

- The aim will be to generate greater interest in the conservation of the biodiversity of the agave landscape among producers and the tequila regulatory council.
- To evaluate biodiversity at different stages of agave, as well as to measure the relationship and even the effect on biodiversity of the agrochemicals used.
- Satellite imagery analyses of the landscape variables that could be related to explain the spatial biodiversity patterns that we found.
- To collaborate with other researchers to continue understanding the landscape processes that are occurring in this region.

#### **6. How do you plan to share the results of your work with others?**

There will be different ways we will share the results:

- Scientific papers, the first one will be submitted by September 2024.
- Scientific disclosure: an article for a general public of the state of diversity in the region will be published in 2024.
- A guide of the avifauna of the region will be designed in order to be distributed in the different museums of the region.
- Participation in different congresses and conferences on conservation of biodiversity on the agave landscape.
- We will seek to generate spaces for the exchange of ideas with the tequila regulatory council to promote the results we obtained and generate greater awareness about the biodiversity that can still be found in the agave landscape.

#### **7. Looking ahead, what do you feel are the important next steps?**

There are numerous steps forward, the most important ones are:

- To develop a dissemination strategy of the information collected in this study for the different social actors that converge in the region, such as tourists, local inhabitants, producers, authorities. This strategy should include infographics and brochures with the species observed.
- To expand bird sampling and rotate camera traps to cover a larger area of the agave landscape in other municipalities and be able to compare the conservation status of the fauna.

- To evaluate the different landscape variables in order to generate a proposal for the minimum coverage that must be conserved, as well as the ecological corridors that must be protected.
- To contact and worked with the decision makers of the State of Jalisco and local authorities of the towns, on a forest management program to preserve and to enrich the region's diversity.
- To improve the understanding of the environmental issues by local inhabitants that live close to agave crops, in order to ensure the conservation of the forest remnant vegetation of the region.

**8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

Yes, we used the Rufford Foundation logo in two opportunities:

- As part of the introductory text of the itinerant photographic exhibition (See attached photographs).
- For the surveys we designed for visitors to the photo exhibition, for local inhabitants and producers.
- In different opportunities while we talked about the project with friends, family and with colleagues at the University where we are teaching.

**9. Provide a full list of all the members of your team and their role in the project.**

**PhD. Natalia Mesa-Sierra**

I was in charge of coordinating the project and assigning functions within it. Additionally, I was in charge of *i)* design of the surveys and analysis of their data; *ii)* support in the design of sampling with camera traps; *iii)* Review the photographs recorded in the camera traps; *iv)* Support in the selection of photos for the itinerant exhibition; *v)* Design and assembly of the exhibition; *vi)* Preparation of reports; *vii)* Design and presentation of the community workshop.

**PhD. Juan Fernando Escobar Ibañez**

Dr. Escobar's functions were: *i)* Design of bird samplings and execution of them; *ii)* Photographic record of the avifauna of the agave landscape, as well as invertebrates; *iii)* Support in the sampling design with camera traps; *iv)* Review the photographs recorded in the cameras; *v)* Design and assembly of the exhibition; *vi)* Generation of the birdlife registry database; *vii)* Design and presentation of the community workshop.

**Mariano Oseguera Reyes**

Biologist Oseguera was our field assistant, and his main functions were: *i)* support in birdlife sampling; *ii)* Completing the information in the bird records database.

**PhD. María Teresa Hernández**

Accountant for the NGO Gnósis-Naturaleza con Ciencia, who was in charge of all administrative aspects of the project.

**10. Any other comments?**

I am attaching some relevant photos:

- *Bird sampling and photographic recording*





- Inauguration of photographic exhibition

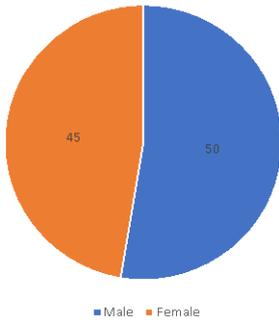




- Main results of the surveys

a.

Local inhabitants



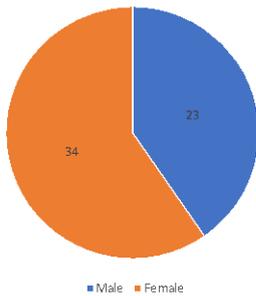
Positive of Economy	
Infrastructure increase	6
Benefits for landowners	5
Profit chain in the region	22
Jobs generated	15

Negative Environment	
Temperature increase	6
Deforestation	26
Bad smells	1
Dirty town	5
Polluted rivers	10
Indiscriminate use of agrochemicals	25

Negative Health	
Alcoholism	27
Increase of allergies	10
Dangerous fumigations	27
Air pollution	10
Tequila with traces of chemicals	11
Workers are poisoned by chemicals	15

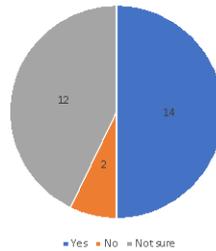
b.

Photographic exhibition visitors



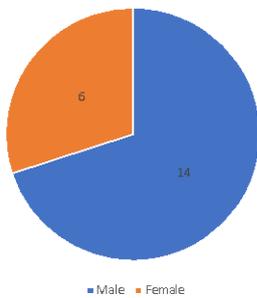
Environment	
Pollution and degradation of natural resources	6
Habitat for many species	26
Agave landscape is beautiful	1

Is the biodiversity important for the Tequila production?



c.

Tequila producers



Economy	
Crop with a high degree of uncertainty in the market	6
Benefits for landowners	5
Profit chain in the region	10
Jobs generated	15

Environment	
More regulation on deforestation rates	8
Infertile soils	6
Agave plant helps with soil moisture	2

Health	
Agave plant has medicinal properties	10
Dangerous fumigations	5
Workers are poisoned by chemicals	5

*- Workshop with a preparatory school of the municipality El Arenal*

