

## Final Evaluation Report

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We ask all grant recipients to complete a project evaluation that helps us to gauge the success of your project. This must be sent in **MS Word and not PDF format**. We understand that projects often do not follow the predicted course but knowledge of your experiences is valuable to us and others who may be undertaking similar work – remember that negative experiences are just as valuable as positive ones if they help others to learn from them.

**Please DO NOT fill in and submit this form until the project has been completed.**

Complete the form in English. Note that the information may be edited before posting on our website.

Please email this report to [jane@rufford.org](mailto:jane@rufford.org).

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Your Details	
<b>Full Name</b>	ERICLES CHARLES DA SILVA MELO
<b>Project Title</b>	STINGLESS BEES IN THE CAATINGA: SUSTAINABLE MANAGEMENT AND ENVIRONMENTAL EDUCATION
<b>Application ID</b>	41998-1
<b>Date of this Report</b>	17/09/2025

**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
Establish partnerships with third parties				<p>The project's objectives were fully achieved, representing a significant advancement in strengthening and expanding the project's initiatives. Collaborations were consolidated with several institutions, including: Espaço ASA, ABELHA, Instituto Serra Grande, the Beekeepers and Meliponiculturists Association of Serra Talhada, "EREM Methódio de Godoy Lima", "EREM Professor Adauto de Carvalho", and "ETE Clóvis Nogueira Alves". These partnerships were essential for facilitating knowledge exchange, providing field support, and engaging local communities.</p>
Establish partnerships with government public authorities				<p>The initiative was successfully implemented, strengthening institutional coordination and the execution of its planned activities. In the municipality of Serra Talhada, selected for the project interventions, dialogues and collaborations were established with representatives of the local public authorities, including the mayor and the municipal secretariats of environment and education. These partnerships were fundamental to ensuring the project's feasibility, facilitating access to and engagement with municipal schools, and promoting integrated activities in public spaces.</p>

Partnerships with Stingless beekeepers			<p>Throughout the project's activities, strong connections were established and consolidated with approximately 40 stingless beekeepers (meliponiculturists) distributed across various localities within the Pajeú river basin region, which currently encompasses 27 municipalities. These partners played a fundamental role in data collection by enabling the completion of interviews. These interviews contributed to understanding management practices, the challenges faced in the activity, and the diversity of managed species. Furthermore, this collaboration facilitated a valuable exchange of knowledge between scientific understanding and traditional practices, thereby strengthening the participatory and community-based dimension of the research.</p>
Environmental education actions			<p>Environmental education initiatives constituted a foundational pillar of the project. To expand upon the training and awareness-raising activities initiated during previous visits, three educational institutions were selected for program development: EREM Methodio de Godoy Lima and EREM Professor Adauto de Carvalho, both providing secondary education, and the Clóvis Nogueira Alves State Technical School (ETE), which involved students from the technical program in Agronomy.</p> <p>As the project gained visibility and recognition within the region, additional schools expressed interest</p>

			<p>and were integrated into the proposed activities. This included the Easy English School, where a science and technology exhibition was conducted. To date, a total of five educational institutions have been engaged, directly reaching an estimated audience of 400 students and educators.</p> <p>The activities comprised debates, workshops, and interactive sessions addressing themes such as biodiversity conservation, the ecological importance of stingless bees, and sustainable practices. The diversity of the participating audiences necessitated and facilitated the adaptation of content to suit varying educational levels and prior knowledge.</p>
Main products			<p>The project's objectives were successfully accomplished. A series of materials and initiatives were developed and delivered to reinforce the impact and sustainability of the proposed actions.</p> <p>Among the principal outcomes, the environmental education activities conducted across various schools and with diverse audiences, including communities traditionally marginalized by public authorities, are particularly noteworthy. These activities contributed significantly to the democratization of knowledge and the strengthening of socio-environmental awareness.</p> <p>Another key output was the creation of</p>

			<p>a continuing education course on the sustainable management of stingless bees, designed for training professionals and developing knowledge multipliers. The proposal sought to integrate scientific and local knowledge, fostering a dialogue that is accessible and applicable to local realities.</p> <p>To support this training, an e-book compiling theoretical and practical content for meliponiculturists was produced, integrating scientific knowledge with popular experience. This material is currently in its final editorial stage and will be published shortly.</p> <p>Furthermore, additional didactic materials were developed for the community, such as informational brochures and educational cards, aiming to broaden the dissemination of information on sustainable practices, stingless bee management, and environmental conservation.</p>
Courses			<p>This objective was fully achieved, representing one of the project's most significant initiatives in terms of technical training and the promotion of sustainable knowledge.</p> <p>A dedicated training course on stingless beekeeping was successfully organized and implemented, with an emphasis on sustainable practices adapted to the local context. The course involved approximately 40 participants, including farmers, students, teachers, and members of</p>

			<p>the involved communities. The training covered both theoretical and practical aspects of meliponiculture, fostering a productive exchange of knowledge between participants and the technical team. By strengthening the local productive chain, the initiative also stimulated the emergence of new knowledge multipliers, who are now equipped to disseminate the acquired expertise within their own networks and territories.</p> <p>Due to a specific request from the partner association, the training course was offered exclusively in a face-to-face format. This decision considered the local reality of the participants, as a significant proportion of producers live in rural areas with limited or unstable internet access. Therefore, the in-person approach was considered the most effective strategy to ensure broad participation, knowledge exchange, and practical engagement. No online training course or recorded video materials were developed during this phase of the project.</p> <p>Regarding gender participation, efforts were made to encourage the inclusion of women throughout the project. During field expeditions, we identified and engaged a group of women already involved in meliponiculture and extended invitations to individuals without prior experience to participate in the training course. As a result, women represented 39.39% of the participants, while men accounted for 60.61%.</p>
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			<p>Although female participation did not exceed 50%, this level of engagement is considered highly relevant given the traditionally male-dominated and patriarchal nature of this activity in the region.</p> <p>Learning evaluation questionnaires were applied during the intervention and again at the end of the face-to-face training to assess participant performance, knowledge acquisition, and overall course effectiveness. These data are currently being compiled and analyzed and will form the basis of a scientific article planned for submission in 2026. A follow-up visit to the association for reassessment approximately six months after the intervention was initially planned; however, the high logistical and financial costs of an in-person return currently limit this possibility. As an alternative, the team is evaluating the feasibility of conducting a remote self-assessment with participants to monitor longer-term impacts of the training.</p>
<p>Promoting UN sustainability goals</p>			<p>The project successfully addressed and achieved the following objectives aligned with the Sustainable Development Goals (SDGs):</p> <p>It directly targeted SDG 10 (Reduced Inequalities) by actively including traditionally marginalized communities in its environmental education and capacity-building initiatives. The project also directly supports SDG 15 (Life on Land) through its focus on conserving stingless bee biodiversity, promoting sustainable management</p>

			<p>practices, and raising awareness about the importance of pollinators for ecosystem health.</p> <p>Furthermore, based on the activities conducted, the project made significant contributions to several other SDGs:</p> <p>SDG 4 (Quality Education): Through the development and execution of formal training courses, workshops, and the creation of accessible educational materials (e-book, brochures, cards) for diverse audiences.</p> <p>SDG 12 (Responsible Consumption and Production): By promoting sustainable meliponiculture practices that support local livelihoods while ensuring the responsible use of natural resources.</p> <p>SDG 13 (Climate Action): Through educational activities highlighting the role of healthy ecosystems and biodiversity in resilience, and by promoting sustainable agricultural practices.</p> <p>SDG 17 (Partnerships for the Goals): By consolidating robust collaborations with a wide range of stakeholders, including local governments, educational institutions, non-profits, and community associations.</p> <p>The environmental education actions, the inclusion of traditionally marginalized communities, the promotion of sustainable stingless</p>
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			<p>beekeeping practices, and the strengthening of inter-institutional partnerships clearly demonstrate the project's strong alignment with the 2030 Agenda, reinforcing its commitment to fair, participatory, and environmentally responsible development.</p>
<p>Scientific          Dissemination</p>			<p>The project's findings and experiences were presented at several seminars, congresses, and scientific events, where they were shared with the academic and technical community, thereby significantly expanding the project's reach and impact.</p> <p>Among the key outputs developed, the publication of the e-book "Stingless Bees of the Caatinga: Sustainable Meliponiculture and Environmental Education" stands out, fulfilling a critical role in facilitating accessible and applied scientific dissemination.</p> <p>An active profile is maintained on social media (@projetomelica), which is used to share project updates, photographs, educational content, and records of field activities.</p> <p>Furthermore, two manuscripts intended for scientific publication are currently in preparation and are expected to be submitted in the coming months. These concerted efforts underscore the project's steadfast commitment to the production and democratization of knowledge, targeting both formal academic spheres and the involved communities directly.</p>

<p>Visits to other locations to map beekeeping</p>			<p>Expansion into other areas for the scaling of project activities is currently underway, with a focus on identifying new demands and opportunities for engagement. The growing recognition of the project within the region has resulted in invitations from additional associations and institutions interested in our involvement. This has enabled an extension of the project's reach beyond initially planned locations. These visits aim to map the current state of stingless beekeeping across different territories in the sertão of Pernambuco, as well as to assess the feasibility of offering new training courses focused on the sustainable management of stingless bees.</p>
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**2. Describe the three most important outcomes of your project.**

**Integration of scientific and traditional knowledge through education and training**

One of the most significant outcomes of the project was the collaborative development of a continuing education course on sustainable stingless beekeeping. The course was created in direct response to needs expressed by interviewed groups, through a participatory process that integrated academic knowledge with local practices. This process yielded an e-book, currently in its final editorial stages, which serves as a training resource and contributes to the capacity building of new professionals and knowledge multipliers. The entire endeavor was enriched by direct exchange between researchers and traditional meliponiculturists, resulting in an environment of mutual and respectful learning.

**Environmental education and inclusion in historically neglected areas**

The project successfully implemented environmental education initiatives in schools and communities traditionally marginalized by public authorities. By engaging over 400 students across five educational institutions, the project played a key role in raising awareness of biodiversity, sustainability, and agroecological practices. These efforts made significant contributions to local empowerment, social inclusion, and the advancement of related Sustainable Development Goals (SDGs), particularly those focusing on quality education, reduced inequalities, and environmental protection.

### **Development of Educational and Outreach Resources**

To amplify the project's reach and impact, a comprehensive suite of educational and outreach materials was developed. This collection included: Informational Brochures: Containing concise information on the ecological importance of stingless bees, the principles of sustainable meliponiculture, and key conservation challenges. Illustrated Flashcards: Designed for pedagogical support, these cards visually and attractively present different bee species, their morphological characteristics, and behavioral particularities. Educational Games: Such as an interactive board game where participants assume the role of meliponiculturists, making strategic decisions to overcome challenges. This playful tool was instrumental in reinforcing the presented concepts in a memorable and engaging manner. These materials were conceived for use in direct training activities as well as for the autonomous dissemination of knowledge, serving as a lasting legacy of the project.

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

One of the primary challenges encountered during the project involved the complexity of financial and administrative procedures. As the project's budget was managed through the bank account of a partner NGO, significant bureaucratic obstacles related to the procurement of materials and services were encountered.

The procurement processes required multiple stages of quotations, documentation, and approvals, which extended the initially projected timelines for the execution of certain activities. This resulted in delays in the delivery of essential resources, impacting the project's schedule.

To address these difficulties, communication with the administrative team of the partner organization was strengthened through frequent meetings, and more efficient internal planning strategies were implemented. By anticipating needs and consolidating requests, the delays were minimized, ensuring the successful completion of all planned activities.

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

The engagement of local communities was central to the development and success of the project. Partnerships were established with approximately 40 meliponiculturists, whose knowledge and practical experience were instrumental in shaping both the content of the training programs and the scientific understanding of meliponiculture in the region through interviews and collaborative meetings.

Community members actively participated in all proposed activities. The project reached over 400 individuals, including students, farmers, and educators, many from groups historically marginalized by public policy. By involving schools, local associations, and municipal institutions, the project created spaces for dialogue, learning, and empowerment.

The principal benefits for the communities included:

- Access to high-quality training on sustainable stingless beekeeping practices;
- Inclusion in environmental education programs that integrated scientific and traditional knowledge;
- Strengthened collaborative networks and partnerships with local institutions;
- Empowerment through participation in decision-making processes and knowledge exchange;
- Increased visibility and recognition of their traditional knowledge and practices.

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

The project funded by the Rufford Foundation was conducted in conjunction with my Master's research, which focused on evaluating the diversity of mites associated with stingless bee species in the Caatinga. During field expeditions, frequent colony losses caused by agricultural pesticide contamination were observed. In December 2024, I successfully defended my Master's thesis and submitted a PhD research proposal entitled "Ecotoxicological Effects of Pesticides on the Native Brazilian Stingless Bee *Melipona scutellaris* (Apidae: Meliponini)", for which I was selected.

I am currently pursuing my doctoral studies and, with continued support from Rufford, intend to further investigate stingless bee species in the Caatinga. This will allow for the expansion of the project's original objectives and its extension to additional localities. Furthermore, I have received numerous requests from leaders of local associations to offer the stingless beekeeping course in their communities, underscoring the project's success and practical applicability.

We remain committed to deepening research on stingless bees in the region, aiming to mitigate human-bee conflicts and promote the conservation of these species. We believe that a project dedicated to bee protection contributes not only to the conservation of local biodiversity but also to the balanced functioning of the entire ecosystem. Through our engagement with local community members, we have recognized the project's significance for both bees and people.

Throughout the project's development, we have identified multiple areas for intervention—including education, economics, health and well-being, environment, and public policy—to improve human-bee relationships in the region. Therefore, our objective is to sustainably continue stingless bee conservation efforts in the Caatinga

by expanding the number of knowledge disseminators and strengthening conservation networks.

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

A multifaceted dissemination strategy was developed to share the outcomes of our work with both academic and non-academic audiences, ensuring broad accessibility and impact. As previously mentioned, our e-book is in its final editorial review stage and will be published shortly.

Data collected during field expeditions are currently being analyzed, and two scientific outreach articles are in preparation. These articles will present the project's socio-environmental results and contribute to discussions on pollinator conservation in the Caatinga biome. It is noteworthy that this project produced the first comprehensive assessment of meliponiculture practices in the sertão of Pernambuco, providing valuable insights into local realities, challenges, and opportunities.

Regarding public engagement and academic outreach, the project was represented at the Environmental Congress held in Recife (Pernambuco), where we offered a short course entitled: "Bees at Risk: Science, Community, and Public Policies for Conservation in Times of Climate Change." The course addressed how native bees can serve as central elements in environmental conservation strategies.

Additionally, the project's results will be presented at the XXX Brazilian Congress of Entomology in 2026, sharing data and experiences with the national scientific community as part of the Rufford Foundation-funded initiative.

An active social media presence is maintained (@projetomelica), through which project updates, photographs, educational content, and records of activities are shared. Frequent communication is also sustained via local community groups and messaging applications, ensuring that residents of involved areas remain informed and engaged.

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

Building upon the project's established foundation, the following strategic objectives have been defined to guide future activities:

- A. Strengthen partnerships with stingless beekeepers (meliponiculturists) across the Caatinga region in additional municipalities, engaging NGOs, meliponiculturist associations, and rural workers' unions. These collaborations are essential for amplifying the project's impact and ensuring the long-term sustainability of local initiatives.

- B. Develop a new initiative focused on sustainable meliponiculture within a protected area of the Caatinga, specifically in the Catimbau National Park. This project aims to map the use of stingless bees (for subsistence, product commercialization, and as a conservation strategy) and offer training courses on the conservation of these bees to local residents. We seek to establish a dialogue with a national biodiversity conservation project focused on the Caatinga.
- C. Expand the project's geographical coverage to include new municipalities that still contain fragments of Caatinga vegetation, enabling a more comprehensive understanding of regional challenges and opportunities.
- D. Organize new iterations of the "Sustainable Meliponiculture in the Caatinga" course, specifically tailored for stingless beekeepers living in rural zones distant from the state capital, thereby enhancing access to technical knowledge and sustainable practices.
- E. Promote an itinerant symposium entitled "Stingless Bee Conservation," to be presented at universities. The event aims to increase ecological awareness and engage undergraduate and graduate Biology students in pollinator conservation efforts.
- F. Conduct educational activities in public schools located in rural zones of Pernambuco, such as interactive exhibitions and awareness campaigns on the risks faced by native stingless bees, promoting environmental education among children and adolescents.
- G. Participate in the *XXX Brazilian Congress of Entomology (2026)*, presenting the results and lessons learned from the Rufford-funded project to the scientific community.
- H. Secure funding and logistical support for field expeditions related to ongoing doctoral research.

**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?**

All the materials we produce and disseminate include the Rufford Foundation logo and further research carried out by the institution. Throughout the project we produced booklets, posters, presentations, photos and T-shirts, all of which contained The Rufford Foundation logo.

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

The successful execution of this project relied on the invaluable contributions of the following individuals:

**Dr. Simão Dias de Vasconcelos Filho**, Full Professor at the Federal University of Pernambuco (UFPE), played an essential role in project management, data collection, partnership coordination, and research expansion. He provided significant

input during scientific discussions, reviewed educational materials, and supervised the associated Master's thesis.

**Dr. Ailton Torres Carvalho**, Associate Professor at the Federal Rural University of the Semi-Arid Region (UFERSA), contributed to the project from its conceptualization, providing theoretical foundation and structural support for its activities. A nationally recognized expert on stingless bees, his involvement was crucial for the project's scientific recognition.

**Dr. Henrique Rafael Pontes Ferreira**, Biologist with a PhD in Animal Biology from UFPE, actively participated in field expeditions, community interviews, data collection and organization, as well as the development of educational content.

**Eduardo Luiz Bezerra de Melo Filho**, Biologist, made significant contributions throughout all project stages, including active field participation, data sorting, educational activities, and the preparation of technical reports.

**Hanna Cavalcanti Montarroyos Rodrigues Lima**, Biologist, contributed to the development of educational materials, the implementation of educational activities, and the organization of project events.

**Rhuan Da Silva Barros**, Biologist, participated in the creation of educational content, community engagement activities, and event logistics and coordination.

## 10. Any other comments?

Despite the numerous challenges encountered during the execution of Project Melica—particularly those related to logistics, bureaucratic procedures, and operations within areas historically neglected by public authorities—we successfully compiled and produced significant information regarding meliponiculture in the sertão of Pernambuco. At the project's outset, limited understanding existed of local practices, the diversity of native species utilized, or the sociocultural role of stingless beekeeping in the region.

Today, Project Melica has become a prominent initiative promoting native bee conservation and environmental education in the semi-arid region. We have positioned sertão meliponiculture at the forefront of scientific and policy discussions, while directly engaging traditional communities, local associations, and academic institutions.

The project has actively contributed to filling knowledge gaps concerning threats faced by native bees, such as pesticide use, climate change, and habitat loss. We have also raised awareness of the potential of meliponiculture as a tool for sustainable

livelihood and environmental conservation. These advances were only possible through the fundamental support of the Rufford Foundation. We are profoundly grateful for this opportunity, for the trust placed in our work, and for the learning generated through this transformative experience.

**ANNEX – Financial Report**  
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