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著者	ECHENIQUE-DIAZ Lazaro M., MIZOTA Koji
雑誌名	宮城教育大学環境教育研究紀要
巻	21
ページ	53-59
発行年	2019-03
URL	<a href="http://id.nii.ac.jp/1138/00000891/">http://id.nii.ac.jp/1138/00000891/</a>

# Stingless Bee Keeping as an Occupational Hobby and Sustainable Agrotourism in Cuba: A Case Study

Lazaro M. ECHENIQUE-DIAZ\* and Koji MIZOTA\*

**Abstract:** The development of tourism as one of the strongest economic sectors in Cuba during the last 3 decades has traditionally focused on beach tourism and in a least extend rural tourism. More recently, however, sustainable agriculture has been gathering attention and rural Agrotourism has emerged as a result. Stingless beekeeping is an agricultural practice that has been neglected in these transformations of the Cuban economy. Here, however, we review a successful case where the use of stingless bees initially kept as a hobby has allowed traditional farmlands to gradually shift to more sustainable agricultural practices while at the same time offering touristic opportunities not available elsewhere in the region around them.

**Keywords:** stingless bees, agrotourism, occupational hobby, Cuba

## Introduction

After the dawn of the Cuban Revolution in 1959, the country's strategy for economic and social development didn't consider tourism as key to the future of its economic growth. After the fall of the Socialist block in the 1990's, however, Cuba started to adopt tourism as one of the basic elements of its economic strategy, and within a few years became a flourishing touristic destination. Consequently by early 2000's, the sector had multiplied its gross income in the island nation by eight-fold (Gutierrez and Gancedo 2002). Nowadays, tourism in Cuba represents one of the most important pillars of its economy.

Being the largest island in the West Indies, Cuba has large extensions of sandy beaches, which has allowed the country to develop one of the most important beach-tourism destinations in the Caribbean, although it has also invested into smaller scale rural tourism in the countryside. These tourism modalities are basically developed and managed by the Cuban government in collaboration with foreign investments. However, since

ordinary Cubans were allowed to start small, family-owned pensions and restaurants during the mid 1990s, the whole island became virtually accessible to tourists of all kinds, including most importantly, low budget tourists that couldn't previously afford the price of state owned beach resorts (Nelson *et al.* 2009).

Agrotourism is a modality of rural tourism (Leco *et al.* 2013) that has become increasingly popular in Cuba as a result of this transformation, and has for the most part focused on the now world-famous reputation Cuba has for organic farming that resulted not from environmentally sound policies, but as a consequence of the decades long US embargo on the island (Pretty and Hine 2001, Levins 2002). In this regard, agrotourism in Cuba represents thus a form of tourism closer to the fundamentals of traditional farming communities, and is key in the generation of income while also contributing to the revitalization of Cuban agriculture, which suffered tremendously after the collapse of the Soviet Union (Vera *et al.* 1997).

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\* Research Institute for Teacher Training and Development, Miyagi University of Education

In the past decades, successful projects of agroecotourisms in the buffer zones of National Parks and other nature conservation areas, such as Viñales National Park and Sierra del Rosario Biosphere Reserve, has shown that the synergy between government and small, privately-managed farms on the vicinity or within conservation areas has been successful. Pristine, iconic remnants of Cuban nature attract many tourists, and in places where the Cuban government has allowed it, local farmers have access to these tourists, selling them their products and offering the opportunity to experience the Cuban rural lifestyle.

One of the most important elements of the agrotourism model in Cuba is “sustainability” . Given the recent history of agricultural collapse and revival in the country, sustainable agriculture has become the priority and this implies that income generation should be maximized while creating an environment of self investment, with minimum to non intervention by the government. In his regard, farmers are encouraged to seek cooperative and innovative ways to merge with the practices of organic farming (Ortiz *et al.* 2016).

Beekeeping is an agricultural practice that has been also positively affected by the transition to sustainable farming in Cuba. This practice, however, has not been affected by tourism trends in the island because the Cuban government subsidize this activity and bee keepers in turn sell their honey production to state owned cooperatives. This mainly relates to Apiculture.

Meliponiculture (or stingless bee keeping), on the other hand, is still in its infancy in Cuba, and although a few relative large producers exist (see Genaro and Loriga 2018 for details), their activity is not directly related to agrotourism. By far, stingless beekeeping in Cuba remains an occupational hobby, where keepers maintain the hives while dedicating most of their time to a different job. Therefore, Meliponiculture in Cuba is

mainly maintained by the private interest of bee keepers rather than economic incentives, and the general trend from the government has been that of favoring Apiculture due to the revenues this practice implies in comparison with the less lucrative (given low production volume) practice of Meliponiculture.

In contrast to the trends stated above, there are several reasons to advocate for Meliponiculture and agroecotourism in Cuba, as exemplified by successful cases in Asia (Kunasekaran *et al.* 2018), where local farmers have developed a market to attract tourists offering a variety of services including environmental education, experiencing Meliponiculture, and ecotourism, all based on the ecological services that stingless bees provide as multifloral pollinators. Moreover, as health tourism is soaring in Cuba, the health benefits of the honey from *Melipona beecheii* (studied in detail in Alvarez-Suárez *et al.* 2018), the single species of stingless bee found in Cuba, brings an additional value to Agrotourism. The honey from *M. beecheii* is traditionally regarded as medicinal in Cuba, used in alignments such as diabetes, burns, cataracts, and stomach infection of *Helicobacter pylori*. It is also rich in antioxidants and amino acids, and can be regarded as a natural dietary supplement that is increasingly gaining attention in the international market, but still poorly known in Cuba.

In the present paper we describe a case study in a rural community in Cuba where local farmers had developed a mutually beneficial collaboration with an enthusiastic amateur stingless beekeeper without the government intervention, and discuss the implications this collaboration has on the sustainability of agrotourism in the community as a whole, and the prospects of further developing Meliponiculture in Cuba.

### Study site

The community in focus (named Pio Cua) is a rural settlement in the Popular Council of Australia, Jagüey Grande municipality, Matanzas province, Cuba (about 150

km east of Havana). The community borders with Zapata Swamp National Park, the largest wetland in the insular Caribbean (Echenique-Diaz 1998), and has an estimated population of 585 inhabitants (EcuRed 2019) (Fig. 1). To the south of this community (about 5 km away) lies the town of Jagüey Grande, a popular stop for tourist visiting Zapata Swamp National Park. The only touristic attraction in this community is a large cenote or collapsed cave and a government-managed restaurant. The place, however, lacks the attractiveness of nearby spots such as Zapata

Swamp National Park and therefore is poorly visited by non-national tourists.

Most residents in this community work in services-related government jobs. However, many also have their own small patches of land (leased from the government) where they practice subsistence agriculture. Some traditional farmers in the community that for years have managed relatively large patches of land, have recently shifted to the production of tropical fruits, mainly because of the demand for these agricultural products

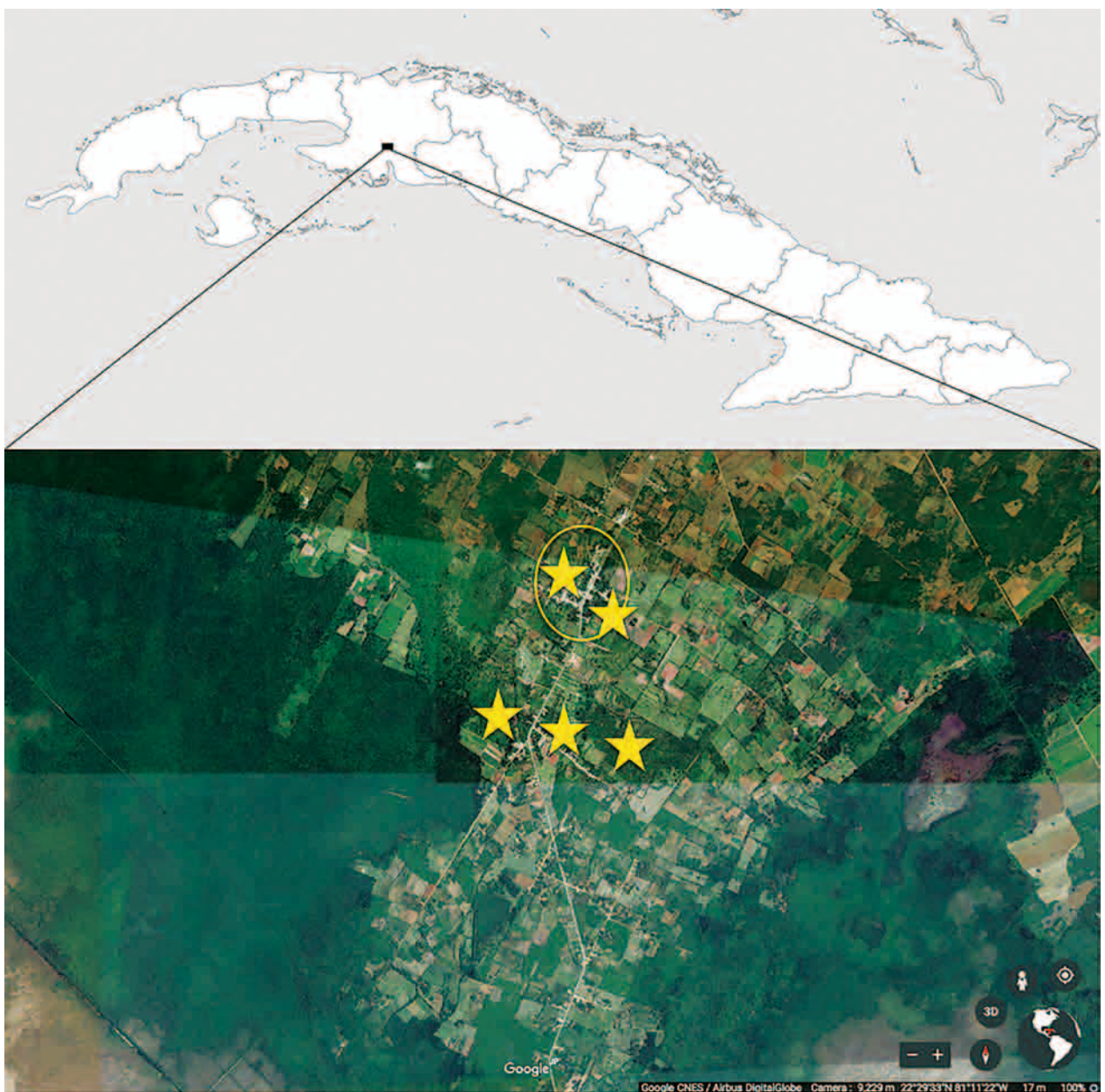


Figure 1: The Pio Cua community in Cuba. The yellow circle is drawn around the community and the yellow stars represent the areas where the stingless bees are kept.

from privately owned restaurants and pensions in larger cities as far as Havana, the country's capital. For the aim of this study, we visited two of these large farms as well as the sites where *Melipona* bees are kept. These two farms were selected because with the transition to fruit production, they also started a pension business for tourists in transit to other touristic destinations.

### Stingless beekeeping in Pio Cua in Agricultural Farmlands

A resident of the community in focus has for nearly 20 years kept several *Melipona* hives as a hobby. Initially, this stingless bee keeper kept the bees in logs extracted from their natural habitat, but eventually started to transfer these to boxes of his own design. By trial and error, he came to a design very similar to what Genaro and Loriga (2018) define as Rational Box UTOB). We were allowed to check the meticulously kept records of this bee keeper and confirm that his design has some distinctive features, particularly his records of hive health and box size. Over the years, he has come to manage 200 plus hives distributed over several areas within and around the Pio Cua community (Fig. 2). In recent years, however, newly developed fruit farmlands called his attention as potential places where he could keep some of the hives and after consulting with farm owners, a very successful collaboration started.

### A case for stingless beekeeping as an occupational hobby and the development of agrotourism

In interviews made to farmland owners and workers during multiple visits from 2014 to 2017, subjects described an increase in the number of tourists that stay longer in these farmlands, mainly due to their interest in the rural environment these places provide, making a case for agrotourism in contrast to the more classical tourism that attract foreigners to this region. Subjects also describe the benefits of having *Melipona* bee hives in their farmlands, describing an increase in fruit

production, although there is no data to confirm this latter assertion. Similarly, farm owners perceive the presence of *Melipona* bees in their farmlands as beneficial because it appeals to the conformity of sustainable and organic agriculture. Besides, stingless bees are an additional attraction to tourist given their remarkable tameness and differences with the European bee *Apis mellifera*. Tourist are usually given a tour of the farms and can work with trained workers opening the hive boxes and extracting honey (Fig. 3). The bee keeper in contrast, receives extra income for the revenues provided by the stingless bees, and train farm owners and workers on the management of the hives.

This collaboration is still working at a small scale, but it has triggered a change in perception among local farmers who now see their farms not only as areas of food production but also as touristic destination that can provide a new kind of rural tourism, agrotourism. It has also encouraged the local stingless beekeeper to continue expanding his passion for *Melipona* bees without necessarily becoming a professional beekeeper. In this model of agrotourism, education of local farm owners has been a key factor, and more farmers appear to be interested in having stingless bees in their farms. Although organic agriculture seems to be the general case in Cuba, pesticides imported from countries such as China with which Cuba maintains a friendly relationship, are more frequently used, especially in areas where production needs to be maximized to meet the demands of tourism. Given the susceptibility of bees to pesticides, farmers that agree to having stingless bee hives in their farms also need to reduce or eliminate any use of chemicals in their farmlands, making the system a more ecologically friendly one, which in turn appeals more to tourist seeking a different kind of tourism in rural Cuba. These factors can drive attention to farms incorporating Meliponiculture in their activities with the potential to create a market for agrotourism to flourish in Cuba.

This case study points to a potential direction for developing Meliponiculture in Cuba other than the



incentives that selling the honey to the government could imply. Lower volumes of honey production and a still not well established international market for stingless bee honey is still a problem worldwide. In turn, the use of *Melipona beecheii* as pollinators rather than simply honey producing organisms, paired with the health benefits of its honey and interesting life history, provided ample opportunities for environmental education to take place in these farmlands. Tourists, however, shouldn't be the only targets and outreach activities to attract attention to

this still poorly know bee from school children in nearby communities would increase the impact of this new kind of agrotourism.

### Acknowledgements

The authors wish to thank the residents of Pio Cua community for allowing us to wander through their community making informal interviews. We are also indebted to the enthusiastic beekeeper that inspired this study, Mr. Leonel and his wife Anita, for sharing their



Figure 2: Top-left: *Melipona beecheii* hives placed in a farmland field of guaba fruits for touristic uses. Top-right: Placing *M. beecheii* hives around in a farmland. Bottom-left: Traditional stingless bee honey extraction using sterilized syringes. Bottom-right: *M. beecheii* hives kept for honey production at different locations around Pio Cua community.





Figure 3: Top-left: *Melipona beecheii* boxes being prepared to distribute across farmlands around Pio Cua community. Top-right and bottom-left: Sharing the experience of stingless bee honey extraction. Bottom-right: Teaching children in the community about stingless bees and their roles as pollinators.

experiences with us, and to their family for the warmth they showed during our stay with them. Last, we express our gratitude to the farmland owners and workers for sharing their opinions. This work was supported by JSPS KAKENHI Grant Number 16H03051 and 16H05655.

### Disclaimer

This study represents the sole opinion of the authors and although not included herein, is the result of several years studying different cases of stingless beekeeping in Cuba.

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