



# Melitourism Potential of Bali, Indonesia and Bicol, Philippines

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**Abstract**—Melitourism, a special entomotourism featuring stingless bees as an agritourism attraction, remains less popular and underrated in Southeast Asian countries despite its economic benefits. This study assessed the melitourism potential of Bali, Indonesia, and Bicol, Philippines, through a qualitative approach using various indicators such as environment, technology, policy, market, finance, social capital, human capital, culture, and farm tourism as foundations for a melitourism social enterprise. Identification of these indicators was based on a literature review, and these became the basis of an interview guide designed for stingless beekeepers. Findings showed that meliponiculture in Bali and Bicol offers a lot of promise for social enterprise and tourism development. The stingless beekeeping industry dominated the aspects of the market, social capital, and human capital. Farmer groups provide a support system resulting in strong social capital. Compared to Bali, Bicol is quite advanced in agritourism integration in stingless bee farms. Melitourism is a good means of engaging the public to contribute toward a conducive entrepreneurial ecosystem for stingless beekeeping. Incorporating the tourism aspect in meliponiculture is a good economic diversification strategy that would enhance farm productivity and encourage farmers to engage in ethical practices that help maintain a healthy stingless bee population both on farms and in the wild. However, to hasten farmer engagement and melitourism development, local and national governments must strengthen their policy infrastructure and support this industry.

**Keywords**— melitourism, entomotourism, stingless beekeeping, apitourism, meliponiculture.

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## INTRODUCTION

Tourism is considered one of the major economic drivers of any country. As one of the main tourism products, wildlife or nature tourism highly contributes to a country's economic growth. Bali, Indonesia, and Bicol, Philippines are perceived to have high wildlife tourism potential for it is rich in natural resources, including insects such as stingless bees. When using insects for wildlife tourism, it is referred to as entomotourism. Entomotourism is a multi-million industry that employs thousands of people and attracts millions of visitors worldwide, but it remains under-explored (Mohamad, Mohamed, and Hamdin, 2018). Likewise, the literature on entomotourism globally is limited, while in Bali and Bicol, no studies exist relative to this type of wildlife tourism. Due to the scarcity of literature indicating its capacity to boost tourism, entomotourism remains less popular and is not included in the extensive list of wildlife tourist attractions worldwide (Moorhouse et al., 2015).

Melitourism, or stingless beekeeping, is a fusion of meliponiculture and tourism. Meliponiculture is a practice of domesticating stingless bees in artificial hives for honey,

wax, and resin, which was well developed during American colonization by Spain. The concept of melitourism emerged when researchers, artisans, local cooperatives, meliponists, and the Melipona Maya Foundation in the Yucatan Peninsula of Mexico convened to discuss meliponiculture, sustainability issues, and tourism (Lemelin 2019). It is another form of tourism where visitors interact with stingless bees and are developed in Mexico with experiences ranging from spa treatments to incorporating melipona honey in medicinal, health, and beauty products and some foods and beverages (Gerosa Bellows, 2011). Vienne (2017) first examined the potential role of stingless bees in tourism from a sustainable livelihood approach. The study of Lemelin (2019) determined how tourism opportunities are integrated into meliponiculture.

Melitourism is a specialized entomotourism that utilizes stingless bees as a tourism product. Since there are stingless bees that are native and abundant in Bali and Bicol, it is logical for the government to use this natural resource for tourism purposes. Studies that would determine the essential requirements for melitourism development in these countries are necessary. Melitourism could help diversify

the nature tourism products in both countries and liven up tourism and beekeeping industries.

There is a need to conduct research and promotional activities on entomotourism to better educate the public on insects, human-insect relations, and conservation strategies. For the wider promotion of nature tourism using insects, many parties should get involved and work together for a common cause (Mohamad, Mohamed, and Hamdin, 2018). In the Philippines, Bicol has the highest number of stingless beekeepers but mostly backyard raisers whose main focus is on honey production and colony multiplication alone. Only a few farms in some provinces of Bicol, such as Camarines Sur, Camarines Norte, Albay, and Sorsogon, have tried exploring the tourism aspect of stingless beekeeping. According to Lemelin (2015), entomotourism is a highly specialized type of tourism practiced by an eccentric few operating on the recreational fringe. None is insect-focused in the list of tourism products in Bali and Bicol.

The development of melitourism sites in Bali and Bicol, in addition to the current list of tourist spots is expected to boost further and continuously fuel the economy of these areas in the next years to come. Literature showed that there is a promise in entomotourism ventures (Boileau & Russell, 2018; Schlegel, Breuer, & Rupf, 2015). It could help improve the socio-economic status of local communities participating in nature tourism. In ensuring sustainable development of entomotourism, important factors such as a serious commitment, proper coordination among stakeholders, provision of incentives and funds by the government, and efficient implementation of related laws and policies need to be considered (Mohamad, Mohamed, & Hamdin, 2018).

Generally, the study assessed the resource potentials of Bali and Bicol as necessary inputs to the development of a meliponiculture social enterprise model. Specifically, it aimed to: (1) assess the technology and legal aspects of meliponiculture; and (2) determine the human capital, cultural, and agritourism practices and resources in melitourism; and (3) determine the socio-economic access of stingless beekeepers in both countries.

## MATERIALS AND METHODS

An exploratory interview was first conducted to assess the melitourism components in Bali and Bicol, anchored on the six domains of the Isenberg Entrepreneurship Ecosystem model. These domains, necessary for creating a virtuous cycle conducive to entrepreneurial development, include policy, finance, culture, support, human capital, and market (Isenberg, 2011). Based on a literature review, other components were integrated to conform with the attributes associated with stingless beekeeping in rural communities. The melitourism development indicators necessary to formulate an assessment tool based on environmental, technological, socio-economic, tourism, and governance aspects were pre-developed using the modified framework. The modified framework consists of ecology, technology, policy, human capital, culture, tourism, finance, market, and social capital. The formulation of the interview guide was based on these

components. Interviews were conducted online or in-person face-to-face in Bali and Bicol's four regencies and provinces. The regencies in Bali, namely: Badung, Bangli, Tabanan, and Karangasem, were chosen based on the number of domesticated stingless bee colonies in these areas. On the other hand, the provinces in Bicol, namely: Camarines Sur, Camarines Norte, Albay and Sorsogon were selected based on the number of active stingless beekeepers. Bali and Bicol's key players in the stingless beekeeping industry participated in the interview. Forty and 10 stingless beekeepers from Bali and Bicol, respectively, served as respondents. The research was conducted from August to October 2020.

## RESULTS AND DISCUSSIONS

### *Technological and Legal Aspects of Stingless Beekeeping in Bicol and Bali*

**Ecological Requirements.** The viability and sustainability of a meliponiculture endeavor depend on environmental factors such as melliferous plants, climate, and stock source. The beekeepers from Bali and Bicol share the same thoughts as what an ideal meliponary is. A meliponary is an area where stingless bees are domesticated.

Dense and diverse vegetation that serves as a source of nectar, pollen, propolis and water for the bees are necessary to have fast-growing, healthy colonies. All the beekeepers interviewed in Bali and Bicol agreed that the abundance of melliferous resources is central to the viability of meliponiculture for the availability of food is among the factors that prevent bees from absconding as a "hunger swarm" and migrating over many kilometers in search of better nectar and pollen sources (Bernhard & Clauss, 1991). The availability of bee food plants affects the frequency of harvest, quantity, and even quality of hive products (i.e., honey and propolis). The most abundant floral resources for stingless bees are wedding flowers and coffee in Bali and coconut in Bicol. The flowers of coconut give a year-round supply of food for the bees.

Another important factor to consider in meliponiculture is climatic suitability. Bicol and Bali have a similar climate highly favorable for stingless beekeeping. Both countries have a tropical, warm, and human climate year-round with two main distinctive seasons: dry and wet. Such a particular climate is conducive to the normal growth and development of the bees (Dantas, 2016).

Bali and Bicol are blessed with native stingless bees of high utility for beekeeping. Feral or unmanaged colonies of *Tetragonula laeviceps* and *Tetragonula biroii* in Bali and Bicol, respectively. Native bees do not disrupt the local natural ecosystem. They are also resistant to pests and diseases, unlike the imported European honeybees, *Apis mellifera*. The natural stock source of stingless bees in both areas is abundant, giving each country a sheer advantage.

The safety and accessibility of the meliponary are the other factors that the beekeepers in Balinese and Bicolano beekeepers likewise consider significant. According to them, the farm should be accessible to any

means of transportation, especially when the farm is intended for tourism. The area should also be safe from pests and secured from inclement weather and theft. For Balinese beekeepers, elevation is also considered in selecting a good meliponary site.

**Technology/Cultural Management.** Differences and similarities have been noted among Balinese and Bicolano beekeepers regarding species being raised, hive design being used, and management practices being done.

Stingless bees are locally known as "klanceng" in Bali. The most commonly used species for meliponiculture is *T. laeviceps*, which is native and abundantly found in the area. This species has cluster-type broods and relatively bigger honey and pollen pots than *T. biroi*. Some of the colonies of *T. laeviceps* are found in their original hives (e.g., bamboo and coconut trunk), while others are kept in wooden boxes. Keeping stingless bee colonies in wooden boxes is a modern practice in Bali. The beekeepers showed no particular preference to any of these hive types for meliponiculture.

In Bicol, stingless bees are referred to as "kiwot," "kiyot," or "lukot" in local dialects. The only stingless bee species used for commercial meliponiculture in Bicol and even in the Philippines is *T. biroi*. Wild populations of this species are abundant in the provinces of Bicol, Quezon, and Laguna. Although other stingless bee species are present, Bicolano beekeepers prefer raising it for several good reasons. Unlike *T. laeviceps*, *T. biroi* constructs its brood spirally and relatively smaller food pots. The Bicolano beekeepers use different materials in keeping the colonies, such as coconut shells, earthen pots, and concrete and wooden boxes. However, the most commonly used hives are coconut shells and wooden boxes. The preference on what hive design to use depends on the intended purpose of the beekeeper. The purpose may be for hive product production, pollination, or colony reproduction.

Bicolano beekeepers do not practice supplemental or maintenance feeding using sugar solution even during dearth periods as *T. biroi* does not require since they store surplus pollen throughout the year. These beekeepers keep the floral diversity in their meliponaries high by planting more melliferous plants to avoid bee food scarcity.

Beekeepers from Bali harvest honey three to four times annually. In Bicol, harvesting is done 2-3 times a year only. Most of the meliponaries in Bali are located near native forest areas with a higher density of botanically relevant species. Native forest areas are the most important source of large-scale 'honey flows,' which refers to honey production from one predominant melliferous resource concentrated over a single flowering cycle's relatively short time frame (Gill, 1996). A commercial beekeeper will typically access up to six different 'flows' to produce the annual honey crop. Also, native forest areas are a rich source of pollen that is vital to the health of any honeybee colony and central to the 'conditioning' of hives before or following managed crop pollination activities.

**Policy Infrastructure and Support.** In the Philippines, there is no clear-cut policy at the national government, local government, or even communal levels that specifically extends support to the stingless beekeepers. Hilmi et al. (2019) stated that meliponiculture related trades

tend to be underplayed in both policy and planning. To date, the government has done nothing to assess and quantify the contribution of meliponiculture to the country's economic growth.

Beekeepers from Bali and Bicol do not know the Code of Beekeeping Practices (CBP). In the Philippines, there is an existing Philippine National Standard (PNS) for Code of Good Beekeeping Practices developed by the Technical Working Group organized by the Bureau of Agriculture and Fisheries Standards through the Department of Agriculture Special Order No. 178, series of 2016 (PNS/BAFS 186, 2016). This code sets out the general principles of good practice and minimum requirements in the commercial or backyard apiaries or meliponaries, and honey hunting intended for the production of honey, royal jelly, beeswax, pollen, and propolis applies to all species of bees. Specifically, the CBP sets the guidelines on the stock source, apiary/meliponary location, hive material/design, hive products harvesting, and management practices.

#### *Human Capital, Cultural, and Agritourism Resources of Bali and Bicol*

**Human Capital.** Farmers from both Bicol and Bali feel that successful beekeeping does not require formal education. Both opine that interest and passion are the primary factors (Table 1). Bicolano farmers further think that management skills are equally important, while Balinese farmers view willingness, commitment, and market demand as other factors. They differ in opinion regarding the need for basic training, with Bicolano farmers finding it important while their Balinese counterparts feel it is unnecessary. A study in Malaysia shows that the production of stingless bee farmers reflected the level of technology and skills training that they received from extension agents (Isah et al., 2019; Carroll & Kinsella, 2013), which supports Bicolano's practice of undergoing training first before the business venture.

Table 1. Comparative summary of the melitourism potential of Bali, Indonesia and Bicol, Philippines using various resource indicators.

MELITOURISM DEVELOPMENT INDICATORS	STUDY SITES	
	Bali	Bicol
<i>Ecology</i>		
Native stingless bees (SBs) are abundant	√	√
Floral resources are abundant and diverse	√	√
Stingless bee farms are less susceptible to natural calamities (e.g. typhoons)	√	×
<i>Technology</i>		
Native SBs are utilized for beekeeping	√	√
Beekeepers use diverse hive designs and beekeeping practices	×	√
<i>Policy</i>		
Policies/regulations on quality and price standardization; zoning of beekeeping areas; code of good beekeeping practices; colony trade; and feral colony hunting exist	×	×
<i>Market</i>		
Demand for SB honey is very high	√	√
SB honey is sold at a premium price	√	√
SB honey consumers are educated (i.e. professionals, middle & upper class market)	√	√
<i>Finance</i>		
Minimal investment is required for stingless beekeeping	√	√
Government is supportive of beekeeping as a community enterprise	√	×
Beekeepers do not rely solely on beekeeping for income	√	√
<i>Social Capital</i>		
Social media is used for resource sharing/gaining financial and information access	√	√
<i>Culture</i>		
Stingless beekeeping is a big part of their culture	×	×
Family support is integral to the success of beekeepers	√	√
Community support to beekeeping industry is evident	√	√
<i>Human Capital</i>		
Passion and interest are considered most important for successful beekeeping than formal education	√	√
Motivating factors for engaging in stingless beekeeping are income, health, and pollination benefits	√	√
<i>Agritourism</i>		
Farm tourism faces no difficulties with accessibility, infrastructure, and trained tourism personnel	×	×
Tourism is integrated in beekeeping	×	√

Legend: Check (√) means present/existent; Cross (×) means absent/non-existent.

Both agree that farmers should need basic technical and practical beekeeping knowledge as well as marketing/selling skills. They obtain these skills from experts and experienced beekeepers and enhance them through online sources. Balinese farmers prefer to use YouTube, while Bicolano beekeepers prefer interactively asking or browsing Facebook pages dedicated to beekeeping. Bicolano farmers additionally feel that they need records keeping and basic accounting knowledge. Balinese are not into product development or manufacturing secondary products like honey-based ointment and soap, etc., while their Bicolano counterparts think it is important.

While both cite income as the primary motivation, Bicolano farmers venture specifically into meliponine because they either had the opportunity to attend training conducted by an academic institution or grew up in an area where stingless bees are endemic or both. Balinese farmers opted for honeybees as they help pollinate crops.

At least 300 colonies with production every three months in Bali are enough to sustain a household. In Bicol, around 300 colonies are only enough to cover the basics. For a Bicolano family of five members, a farmer should have at least 500 colonies to meet the family's basic needs and provide for the children's education.

**Culture.** Farmers in both areas observe few indigenous beekeeping practices as it seems that beekeeping is not a big part of both Bicolano and Balinese culture. Vit et al. (2013) stated that while many societies have been

foraging honey across centuries, very few indigenous cultures have developed the practice of meliponiculture (Vit et al., 2013 c.f Lemelin, 2019). The use of coconut husk/shell as housing and the avoidance of harvesting/splitting colonies during rainy days/seasons are indigenous practices of Bicolano farmers. Although smoking is a prevalent practice among hunters in Bicol, the farmers do not employ this unsustainable practice because it spells certain death for the bees. This practice is noteworthy as the Food and Agriculture Organization (FAO) stated in a 2013 report that there is a global decline in wild and domesticated pollinators, including bees.

On the other hand, using coconut wood, bamboo, and wood from other sources forms part of Balinese beekeepers' indigenous practices. The two areas have in common the use of local materials as housing for the bees. Although not intentional, this practice helps manage waste materials on the farm, boosting its sustainability practices.

In contrast, a large percentage (64%) of Kenyan farmers use traditional practices that range from attracting bees to eliminating pests harmful to stingless bees (Carroll & Kinsella, 2013). Bicolano and Balinese farmers may consider this as the same report claims that these Kenyan farmers who applied traditional knowledge harvested more honey and produced more hives than their compatriots who did not.

Residents of communities in Bicol acknowledge that meliponiculture is profitable despite having misconceptions about the bees, such as that they are dirty, harmful, and difficult to raise. Local communities in Bali also deem it as very profitable.

Family is central to the success of meliponine in both areas, with family members providing support and, in some instances, involvement in day-to-day beekeeping activities. A supportive family and supportive community serve as the cultural component that aids in making beekeeping a successful enterprise in both Bicol and Bali.

**Agritourism.** Agritourism is developing organically in Bicolano farms mainly because of people's curiosity over stingless bees spurred by the community's word-of-mouth. Social media is also instrumental in increasing tourist awareness. There was a case wherein listing a farm on the regional Department of Tourism website increased visitors. Farm tourism faces difficulties with accessibility, lack of infrastructure, and lack of trained tourism personnel, which echoes a study that found that the absence of capital and qualified labor are among the challenges in developing agritourism in Hawaii (Yu & Spencer, 2020). On the other hand, Balinese beekeepers have not started on agritourism yet.

#### *Socio-Economic Access of Stingless Beekeepers in Bali and Bicol*

**Financial Access.** The stingless beekeeping industry in the Bicol Region is not a high capital venture for two reasons: Firstly, the cost of stingless bee colonies is relatively cheaper than the other species. A strong colony of stingless bees costs an average of about 31 USD, while that of the *Apis mellifera* and *A. cerana* species costs 200 USD

and 140 USD, respectively. The low-cost factor has attracted the beekeepers to start their apiary at several colonies they can easily invest and manage. Secondly, no beekeeper has started many colonies because there is not enough supply of stingless bee colonies. The beekeepers source their colonies from hunters who are dependent on their ability to replicate and the available hives in the trees. In Bali, the average initial investment for stingless beekeeping is 1,056 USD. Since the start-up fund is at a minimal cost, all beekeepers we interviewed both in Bali and Bicol started their apiary using their capital. In Bicol, they find beekeeping as a risky business venture; hence, borrowing is not an option for them at the initial stage. They did not attempt to borrow capital from banks or microfinance institutions because of beekeeping risk factors. They relate those banks do not often provide loan capital to agricultural production like beekeeping. However, in Bali, the government fully supports beekeeping as a community enterprise. They have windows for financial support towards rural development. This difference may be attributed to the level of vulnerability of the Philippines to extreme climate events such as typhoons. The Philippines faces the western Pacific, exposing it to intense storm landfalls (Vergano, 2013). Hence, agricultural investment is put at a higher risk in the Philippines than in Indonesia.

All beekeepers shared the same background when they started their businesses. They do not rely solely on beekeeping. They have other livelihoods such as planting other crops or sources of income such as employment. Beekeeping takes months before they can harvest honey; hence, there must be other income sources for the household while waiting. This practice may protect them from the risks accompanying the nature of beekeeping since their productivity depends on climatic conditions and the number of food sources in their environment. The driving force of the beekeepers is not income but the benefits they get when they produce honey. Their immediate goal was to develop more colonies before they could commercially sell honey. One beekeeper narrated that she only started with 50 colonies. After five years, she was able to produce 3,500 colonies and is currently commercially selling honey.

**Market Potential.** Meliponine honey, or the honey produced by stingless bees, is not difficult to sell. There are already pre-arranged buyers even before the honey is harvested. Meliponine honey is stored naturally in cerumen pots, making them more beneficial than honey from other bee species (Abd Jalil, Kasmuri, & Hadi, 2017). A comparative study of stingless bee honey with European honey showed that meliponine honey has more therapeutic properties than *A. mellifera* honey (Zulkhairi Amin et al., 2018). Beekeepers recounted that honey is very easy to sell because there is always a shortage of pure honey in the market. Due to their small size, stingless bees do not produce large quantities compared to *Apis* species. Hence, they are less efficient in terms of productivity. Beekeepers reported that a colony of stingless bees could only generate one kilogram of honey annually. Due to scarcity issues and therapeutic properties, meliponine honey is priced higher than *Apis* honey. One-liter honey is sold at 30 USD, while *Apis* honey is priced at 20 USD.

The market for meliponine honey is generally educated, which means that they know the honey produced by stingless bees. The premium pricing of meliponine honey makes it more attractive to the upper-class market who advocate for healthy and natural products. Meliponine honey is more expensive in Bali than in Bicol.

With the limited supply at the farm level, beekeepers could not serve around 50 to 90 percent of their target market. They need to strike a balance between supply and demand. They could not fully harvest the honey produced by the stingless bees to steer clear of exploiting the bees' capacity to produce more honey at the expense of the workers.

**Social Capital.** Beekeepers from Bali and Bicol have strong social capital. Social capital refers to an individual or group's sympathy towards one another resulting in a desirable outcome or benefit. Mutual beneficial interactions resulting from their fundamental commonalities create social capital (Robison, Schmidt, & Siles 2002). The common factor observed among them is the underlying passion for bees and honey. All beekeepers have joined stingless beekeepers' associations in social media interactions. The network they have created became a means to express their beliefs, practices, values, and lifestyles. It also appears that the beekeepers belong to one organization that tends to support each other through an exchange of practices, technology, market information, and plans. Beekeepers revealed that the groups and networks augmented their skills, resulting in an entrepreneurial advantage. The group became a motivation factor for the beekeepers when things were not going according to their plans. In some cases, this social capital manifests the ability to create another livelihood asset such as financial access. Diverse opportunities were recreated and shared in their groups, leading to research grants, access to technologies, financial resources, and market sharing.

## CONCLUSIONS

A total of 20 qualitative indicators distributed among the nine components necessary for social enterprise development were used to assess and compare the melitourism potential of Bali and Bicol. Both countries have shown 15 strong and nine weak points in these areas.

While Bicol is more advanced than Bali in integrating tourism at stingless bee farms, high vulnerability to natural calamities and lukewarm support from the local and national governments may hinder the expected growth of the stingless beekeeping industry in the former if not addressed properly. Nevertheless, it is noteworthy that both countries' markets, social capital, and human capital showed promising results.

Generally, Bali and Bicol offer an indicative potential for melitourism. However, both countries must improve their policy infrastructure, farm tourism facilities, and workforce to push forward. These improvements are important for melitourism to develop and flourish as it is a

good means to educate the public toward a conducive entrepreneurial ecosystem for stingless beekeeping.

The study attempted to identify qualitative indicators to describe the potential towards the development of melitourism in Bali and Bicol. It may further explore in testing the indicators in wider scale to determine the fitness of the model. Furthermore, in-depth studies that would quantify the economic benefits of melitourism may be considered for use as justification in policy recommendations to the concerned authorities and agencies of the government.

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