CENTRAL COAST BEEKEEPERS NEWSLETTER

May, 2025

NEXT MEETING May 15, 2025

Important Notice: Our meetings are now the third Thursday of the month, usually at the Newport OSU Extension Office. Please see the schedule on page 3 for dates and locations.

PRESIDENT'S MESSAGE

By Jeremy Egolf

The weather is a perennially dull subject of barber shop conversation, but a matter of (well, near) life and death for gardeners, beekeepers, and all those folks involved with allied human outdoor activities, be it excavating, logging, fishing, guiding old growth nature walks, campsite hosting, and here on the Central Coast, the farmer here and there. At our place, we installed a few packages from Henry Storch May 7th and the kids we've seen performing their orientation dances have their choice of nectar from the flourishing apple blossoms and the overwintered brassicas in full bloom their indoor buddies are building up comb with alacrity.

A reminder that Henry's nucs are expected Friday, May 16th, the day after our CCBA meeting. As always, we welcome feedback on your new colonies, since quality of the product is important to us all.

On the perennial subjects of the tropilaelaps mite and the heavy losses of colonies since last spring, we've seen no recent solid news or insights on how to handle these challenges. However, we note that BeeFit Beekeeping has a good overview of the problem, including the possibility that the growers will find other processors for pollinating; also, for those who lack ready access to the American Bee Journal, there is a good description of the hypothesis that a "New" virus is responsible. https://www.youtube.com/watch?v=Eelf07i3ESA Dewey Caron will be reporting what is known of local bee losses at this week's meeting.

Regarding the Oregon neonicotinoid bill, HB 2679: The original bill would have banned neonics for residential use, but allowed it for licensed agricultural uses. An amendment proposed by the Oregon Farm Bureau would have restricted residential use but not required licenses for agriculture. The bill did not find enough support in the House committee, and we are now past the deadline for bills to advance.

Finally, in the world of urban beekeeping, we have this from Len Larsen of the Oregon Master Beekeeping Program:

Some of you may have seen the recent article in the Willamette Week titled **"Should Portland Ban Beekeeping: *Adding hundreds of thousands of honeybees into a previously balanced residential environment disrupts it substantially*".** Although the article focuses on Portland, this is a topic that affects all of us as beekeepers. Many people have questions about how honey bees interact with our native bee population. This is a complex and tricky topic, and a lot of claims are made without conclusive evidence. OSU will be submitting an article in response.

Read the original article here: https://www.wweek.com/news/2025/05/07/should-portland-ban-backyard-beekeeping/

For some background on this topic, you can check out Two Bees in a Podcast: **Episode 198: Honey Bees, Native Bees, and Updates with Dr. Melathopoulos**

We look forward to seeing you this Thursday, May 15.

The Year's Program -

Meetings are 1:30 p.m. Thursdays, usually at the OSU Extension office in Newport, except the June meeting, planned for the Waldport OSU Extension Office.

May 15 - Dewey Caron, "Swarming and Supering"

June 19 - Lincoln County Master Beekeepers, "Pollinator Gardening" (Waldport Extension Office)

July 17 - Ramesh Sagili, "Current Research"

August - Summer break, no meeting

Sept 18 - Charlie Vanden Heuvel, "Hive Inspections."

Oct 16 - To be arranged.

November 20 - Officer Elections, Plans for 2026

Newly Published Scientific Review Finds Numerous Impacts To Insects From Wireless Radiation and Non-Ionizing EMFs

Teton Village, WY (November 29, 2023) – A systematic review and metaanalysis of studies on the biological effects to insects of non-ionizing electromagnetic fields, including cell tower and Wi-Fi radiation, was published in the journal *Reviews on Environmental Health* finding the "vast majority of studies found effects, generally harmful ones" with toxic effects such as impacts to reproduction and immune health occurring at legally allowed exposure levels.

The study entitled "Biological effects of electromagnetic fields on insects: a systematic review and meta-analysis" was authored by Alain Thill Marie-Claire Cammaerts and Alfonso Balmori.

The study considered 185 papers on the effects of EMF on insects, and 145 studies on insect magnetic sensing published since 1980. The researchers caution on rising levels of non-ionizing EMFs as a factor in the worldwide insect decline stating:

> *Based on an assessment of the overall study situation on insects, we must warn against a careless deployment of further mobile telephony infrastructure, as harmful effects on insect populations would be likely, especially if interactions with other noxious agents are taken into account (including high-voltage power lines and artificial lighting). This might lead to further declines of already dwindling populations of pollinators, and would thereby entail costs for humanity.*

Regarding sources of non-ionizing electromagnetic fields (EMFs) in the environment such as cell towers, 5G/4G, cell phones and Wi-Fi networks the researchers concluded that "the existence of consistent results from numerous studies conducted by various research groups using various protocols make an irrefutable case for adverse effects."

Key Findings From the Review

- **The Majority of Studies:** The majority of studies on insects found effects compared those that did not find effects. The review evaluated 185 papers and 145 studies published since 1980.

- **Numerous Biological Effects**: The review documented a range of effects including impacts to reproductive capacity, development, metabolism, behavior, orientation and memory. Oxidative stress and DNA damage were found.
- **Caution for 5G**: Insects are uniquely vulnerable to higher frequencies (5G and new networks) due to their smaller size.
- **Government Limits Do Not Protect :** Effects to insects wee found at levels well below ICNIRP and FCC limits. The basis for these outdated limits (that heat is the only harm) has "been proven false"
- **Duration of Exposure Impacts Effects:** Experiments using cell phones found effects within 10 min of irradiation, whereas field experiments at cell towers/base stations found harmful effects usually after several weeks or months. Field studies on insects, birds and pine trees around cellular towers point to chronic detrimental effects even at legally allowed power levels.

The paper refers to earlier published reviews on flora and fauna by Levitt et al 2022, Cucurachi et al 2013 and Balmori 2021 as well as the mechanisms for toxicity described by Panagopoulos et al., 2021 which explains how EMFs can first cause oxidative stress, leading to defective transposon silencing, causing chromosomal aberrations and DNA damage, which finally causes reduced reproductive capacity.

Devra Davis PhD, MPH, President of Environmental Health Trust stated, "the researchers conclude that the biological effects of non-thermal EMF on insects are 'clearly proven' in the laboratory. Although more field data is needed, they state that the current body of scientific evidence 'warrants increasing the threat level' of environmental EMF to insects. We must act now."

"Pollinators must be protected. This study found toxic effects on insects at radiation levels that are considered safe for humans. The continued use of irrelevant U.S. FCC and ICNIRP limits is reckless," continued Theodora Scarato, Executive Director of Environmental Health Trust .

Scientific citation: Thill A, Cammaerts MC, Balmori A. Biological effects of electromagnetic fields on insects: a systematic review and meta-analysis. Rev Environ Health. 2023 Nov 23

The Bee, the Flower, and the Electric Field: Electric Ecology and Aerial Electroreception

Dominic Clarke, Erica Morley , Daniel Robert, J Comp Physiol A Neuroethol Sens Neural Behav Physiol. 2017 Jun 24;203(9):737–748. doi: 10.1007/s00359-017-1176-6

Abstract

Bees and flowering plants have a long-standing and remarkable co-evolutionary history. Flowers and bees evolved traits that enable pollination, a process that is as important to plants as it is for pollinating insects. From the sensory ecological viewpoint, bee–flower interactions rely on senses such as vision, olfaction, humidity sensing, and touch. Recently, another sensory modality has been unveiled; the detection of the weak electrostatic field that arises between a flower and a bee. Here, we present our latest understanding of how these electric interactions arise and how they contribute to pollination and electroreception. Finite-element modelling and experimental evidence offer new insights into how these interactions are organised and how they can be further studied. Focussing on pollen transfer, we deconstruct some of the salient features of the three ingredients that enable electrostatic interactions, namely the atmospheric electric field, the capacity of bees to accumulate positive charge, and the propensity of plants to be relatively negatively charged. This article also aims at highlighting areas in need of further investigation, where more research is required to better understand the mechanisms of electrostatic interactions and aerial electroreception.

For more on the study, see https://pmc.ncbi.nlm.nih.gov/articles/PMC5599473/

Purdue Researchers Study Spiral Honeycombs for Sustainable Manufacturing Insights

by: Phil Sanchez (WISHTV.COM)

Posted: May 8, 2025 / 08:25 PM EST / Updated: May 8, 2025 / 08:25 PM EST

WEST LAFAYETTE, Ind. (WISH) — Australian stingless bees are providing unexpected inspiration for engineers and designers, thanks to their uniquely structured honeycombs that defy traditional vertical layouts and could inform future sustainable manufacturing methods.

Researchers at Purdue University are studying the bees' spiraling, disc-shaped combs — structures built primarily from wax and tree resin — which reveal a complex, layered architecture. The honeycombs, typically found in trees, spiral upward like ramps with precision-engineered support pillars that add strength and flexibility. "What is amazing about this is they actually make vertical pillars creating structural support between the discs, believe it or not," said Nikhilesh Chawla, Purdue's Ransburg Professor in Materials Engineering. "The bees recycle comb materials and use a spiral construction to efficiently build and maintain temperature stability. We can learn so much from their intelligent and multifunctional approaches to manufacturing."

Chawla, an expert in four-dimensional materials science, is using advanced 4D imaging — a combination of 3D X-ray microscopy and time-lapse analysis — to study the honeycombs without damaging them. Hives brought from Australia over the summer are offering researchers an unprecedented look at the bees' microstructures.

Nicole Balog, a graduate student working with Chawla, noted that the stingless bees mix wax with tree resin to construct their combs — a contrast to the all-wax combs typically found in North American hives. "So, there's a lot of questions that we have with the resin," Balog said. "How much are they adding to the wax? Does it change based on the location of the hive, the time of year, or other environmental factors?"

Understanding those material choices could lead to new applications in fields such as additive manufacturing and structural engineering. Chawla's earlier research on U.S. honeycombs in 2022 found that bees sometimes use porous, cheese-like structures to conserve material while maintaining strength. The Purdue team is collaborating with Brock Harpur, associate professor of entomology at the Purdue Bee Lab, and Ros Gloag, a senior lecturer at the University of Sydney.

The bees' behavior — tearing down cells at the bottom of the hive as eggs hatch and building new layers above — offers insights into reconfigurable, space-saving designs. Researchers say such dynamic, spiral-based construction could help shape the future of building and product design. There is potential to learn from these reconfigurable structures they build and even the spiral, ramplike structures," Chawla said.

A New Way to Study Bees

By Christina Martin, I&M Research Scientist and Communication Specialist, National Park Service

April 2025 , Minute Man National Historical Park

A golden sweat bee (*Augochlorella aurata*) foraging on a daisy.(NPS / Christina Martin)

The National Park Service (NPS) is on a mission to deepen its understanding of the bees living in parks. Traditional survey methods require significant time, specialized expertise, and the collection of specimens from their natural habitats for species-level identification. With limited bee specialists available and a growing need for efficient, cost-effective methods, the NPS sought an alternative approach.

The NPS Inventory and Monitoring Division took on this challenge. They assembled a team of researchers and bee experts to develop new bee inventory methods at Minute Man National Historical Park (NHP). As a small yet ecologically significant site, it provided an ideal testing ground for this future NPS-wide initiative.

But how can this research continue with so few bee experts? The answer: engage non-experts. However, this presented another challenge—how do you train individuals with no prior experience to identify bees when there are so many species? Massachusetts alone is home to nearly 400 species, and across the U.S., there are about 4,000. To simplify the process, the team's bee specialists grouped local species into categories that non-experts could learn to recognize. Instead of identifying every species, they focused on key traits such as color, size, and shape.

The team created 9 main categories and 41 subcategories to encompass the bee species found at Minute Man NHP throughout the spring, summer, and fall. While these categories do not always provide species-level identification, they still offer valuable insights into the diversity of bees in the park.

Once training was complete, it was time to put the non-experts' skills to the test. Equipped with insect nets, vials, cameras, and datasheets, they surveyed bees across the park. Conducting surveys weekly or biweekly, they recorded which bees were present, their locations, and the flowers they visited. Their accuracy was periodically assessed using iNaturalist, a community science platform where users share and identify species observations.

A bee surveyor learns identification techniques from specialists during a training session. NPS

The data collected will help Minute Man NHP resource managers better understand the park's bee populations and inform conservation efforts. This project marks just the beginning. The NPS hopes to expand these new survey methods to more parks, enabling researchers across the country to collect important information. By doing so, parks can help protect these essential pollinators and their habitats for generations to come.

Beekeeping Helps Villagers Tend Coastal Forests in Thai Mangrove Hotspot

Carolyn Cowan 18 Jun 2024

[Note: for a related brief video, see: https://www.youtube.com/watch?v=fECegwwyVp4]

- *Community-led approaches to mangrove restoration are increasingly recognized as more effective than many state- or market-driven initiatives in terms of both ecological and economic outcomes.*
- *Nestled within southern Thailand's mangrove-rich but fast-developing Phang Nga Bay, the village of Ban Nai Nang has developed a mangrove conservation model based on beekeeping.*
- *By rearing colonies of native honey bees and stingless bees that are important pollinators of local mangrove trees, the villagers earn money from honey sales, which in turn fund their community mangrove conservation efforts.*
- *Since they began their beekeeping and conservation activities, they've observed signs of rejuvenation in their local mangrove forests and are now helping neighboring villages to follow their conservation model through training and mentorship.*

BAN NAI NANG, Thailand — Carefully prying open the lid of a wooden bee box, Ali Madwang gazes intently into the cavity as sunlight illuminates the scene within. A hubbub of tiny bustling black bees hover and crawl over scores of thumb-sized, bulbous cells, each glistening with dark treacle-like honey. "I have seen how bees collaborate as a unified group, helping each other take care of the hive," Ali tells Mongabay during a visit to the

village of Ban Nai Nang in southern Thailand's Krabi province. As the secretary of the Ban Nai Nang community enterprise group, Ali helps to manage bee hives in the village of 1,700 inhabitants nestled on a mangrove-lined backwater at the edge of the Andaman Sea's picturesque Phang Nga Bay.

The village fishing pier overlooks dense mangrove forests that sustain local fish and shellfish harvesting, and provide habitat for threatened species, including otters, marine turtles, dugongs and sharks, not to mention their vital carbon storage capacity. Artisanal fishing boats putter up and down the sun-dappled waterway, while white egrets stalk brown-camouflaged mudskippers that slip and slide across the mangrove flats.

For Ali, growing up in the coastal village meant mangroves were always part of his life. But he says he truly began to appreciate the interconnected relationship between village life and the surrounding natural ecosystems when his community developed a close relationship with bees as a way of galvanizing support for mangrove conservation. "Mangrove forests and bees are the way of life of the Ban Nai Nang community," Ali says. "We are connected with the mangrove forest … villagers go to find food in the mangroves, such as shrimp, shellfish, crabs and fish."

More than 600 hectares (1,500 acres) of the local mangroves are managed as a community forest by the villagers of Ban Nai Nang. While the villagers derive most of their income from rubber and oil palm smallholdings and artisanal fishing, the mangroves are at the heart of their community education and ecotourism pursuits.

Ban Nai Nang's early beekeeping work was supported through a partnership with Mangrove Action Project (MAP), a U.S.-based conservation nonprofit operating in Thailand at the time. Together, the villagers and MAP identified an opportunity in the bees that flourish in the nearby mangrove forests: beekeeping provides a source of supplementary income and an incentive to preserve the mangrove forests. The villagers earn a small income from the honey they harvest, while boosting the natural regeneration of the mangroves through the bees' pollination services. This has in turn created more fish habitat among the tangle of mangrove roots, where the shellfish and shrimp that the community depend on flourish.

While the Ban Nai Nang community has earned a reputation in Thailand as a pioneer of its sustainable beekeeping-mangrove conservation model, it's by no means alone in its grassroots approach to mangrove preservation. Communities in other parts of Thailand, from fast-eroding shorelines along the Gulf of Thailand to the tourism hub of Phang Nga Bay are doing their bit too. Initiatives include the use of bamboo poles to prevent land erosion and stabilize mangroves; plastic waste cleanups; campaigning against destructive

fishing practices and marina developments; and leveraging culinary and firefly ecotourism to promote mangrove conservation. An expanding body of research shows that such community-led conservation models often outperform state-led or market-driven approaches in terms of both ecological and economic outcomes. These are significant accolades, given the rising private sector interest in large-scale carbon credit projects, which are often based on monoculture tree-planting approaches and heavily criticized by conservationists as false climate solutions that enable companies to continue polluting.

Ali Madwang surveys the local mangroves in Ban Nai Nang. Image by Carolyn Cowan/Mongabay.

Ban Nai Nang lies on a mangrove-lined backwater that meets southern Thailand's dramatic Phang Nga Bay. Image by Carolyn Cowan/Mongabay.

Grassroots mobilization

Recognition of the importance of mangroves has not always been so prevalent in Thailand. Located at the intersection of land and sea, mangroves are often subject to poorly defined legal protections and governance frameworks. As a result, they've fallen through the cracks in the past. Between the 1960s and mid-1990s, pressure from urbanization and port infrastructure, coupled with government policies that encouraged investors to develop charcoal and tin mining concessions and expand shrimp farms along coastlines, led to a halving of the area of mangrove forest in Thailand. Mangrove coverage dropped from roughly 352,000 hectares in 1961 to less than 160,000 hectares by 1996 (870,000 to 395,400 acres).

Suthee Pankawan, president of the Ban Nai Nang community enterprise group, says around 80% of the mangroves around the village had been lost by the mid-1990s. He recalls how magnificently fertile the ecosystems were prior to the wave of destruction. "When I picture what I saw when I was a kid, the trees were very big: some of the *Rhizophora* trees grew so large that a person couldn't wrap their arms around them!"

Following major protests by coastal communities over their deteriorating quality of life and a growing grassroots movement to protect and restore coastal areas, the government halted granting coastal concessions and began a state-led campaign of mangrove restoration in the mid-1990s.

Suthee Pankawan, president of the Ban Nai Nang community enterprise group. Image by Carolyn Cowan/Mongabay.

The combined efforts of communities and state effectively halted the mangroves' trajectory of decline. Thailand now has 248,400 hectares (613,800 acres) of mangrove, according to UNESCO figures.

Although Ban Nai Nang made an earnest attempt to align with the state-led restoration efforts, it experienced mixed success, Suthee says. The approach, which focused on planting monocultures of *Rhizophora* seedlings on bare coastal ground, failed in many places, especially in abandoned shrimp ponds that proved too wet for seedlings to survive.

Galvanizing local support for mangrove conservation was also a major challenge at the time, Suthee recalls. He says the turning point in people's awareness of the importance of mangroves was the 2004 Indian Ocean tsunami. Although the tsunami hit the coastline around Ban Nai Nang, it only damaged fishing equipment; there was no loss of life here, even as the disaster killed nearly a quarter of a million people across much of the Indian Ocean shoreline. The protective function of the remnant mangrove forest was plainly clear.

"When the tsunami came, I went to watch it at the pier," Suthee says. "I heard the tsunami coming. It was very loud. It was as if the mangrove forest was about to collapse. When it ended, we found the damage was only to the boats and fishing gear. Before the tsunami occurred, it was difficult to convince [people] and raise awareness about conservation. Some people even saw mangrove forests as useless forests with no benefits. Nowadays, people in the community see the importance of mangrove forests and everyone wants to work together to preserve and restore the mangrove forest."

The community beekeeping center in Ban Nai Nang village. Image by Carolyn Cowan/Mongabay.

Shrimp fishers from Ban Nai Nang in Phang Nga Bay. Image by Carolyn Cowan/Mongabay.

A sweet partnership

Newly engaged and enthusiastic to restore the mangroves in the aftermath of the tsunami, the villagers teamed up with the Mangrove Action Project. MAP was beginning to trial new mangrove restoration techniques founded on ecological principles developed over decades of research in Florida in the U.S. With the Ban Nai Nang community keen to explore methods beyond planting of monoculture seedlings planting, the timing was right for a long-term partnership to bloom.

Ban Nai Nang became one of the first communities MAP engaged with to develop its community-based ecological mangrove restoration (CBEMR) methods that are now implemented around the world. Jim Enright, former Asia coordinator for MAP, which operated in Thailand between 2000 and 2018, says CBEMR is a way of restoring mangroves while simultaneously respecting and valuing the contribution of communities who have stewarded the ecosystems for generations. It's an approach that bears stark contrast to the government restoration efforts that have received criticism for marginalizing community involvement in favor of private sector investors and tree-planting targets.

Enright says the residents of Ban Nai Nang were ideal partners. Due to their commitment to their community mangrove forest, it was clear that any conservation gains would be safeguarded into the future. "They were already managing the mangrove forest themselves," he says, "and because of that involvement, they've always been very protective of the forest from any possible outside threats."

The CBEMR approach takes advantage of the natural fertility and resilience of mangrove ecosystems to self-restore. “Mangroves produce lots of seeds, like other trees do, and so if conditions are suitable, mangroves will naturally regenerate,” Enright says. “When that happens, we have more natural and biodiverse forests.” Although the natural recovery process can initially be a little slower than direct tree-planting methods, Enright says that over the longer term, a fertile and healthy forest develops.

Two conditions must be met to kick-start the natural regeneration. First, favorable hydrological conditions must be restored. This could take the form of relandscaping the shoreline so that tides don’t drown the new seedlings. Second, there must be a natural source of mangrove seeds and seedlings nearby, such as mature stands of trees that can reseed the area. As Enright puts it: “Fix the problem that’s preventing the ecosystem from self-restoring, and then allow nature to take its course.”

Ban Nai Nang village nestled among the forest and plantations, and a CBEMR mangrove restoration site in the foreground. Image by Carolyn Cowan/Mongabay

Together, the community and MAP selected some small sites to trial the technique in Ban Nai Nang’s community-managed mangrove forest, mostly abandoned shrimp ponds, and set about restoring the hydrology and topography of each site. While some areas began to regenerate with tiny seedlings, they found that other sites had been too heavily impacted by prior development — they were just too wet for mangroves to thrive.

In the sites that could be restored, trees began to take root naturally, and today many of them now reach more than 6 meters (20 feet) skyward. The sites have a diverse mix of species in differently aged stands. Compared to nearby stands of even-aged mangrove monoculture, the legacy of government-led tree-planting programs, the ramshackle CBEMR plots look much more natural and inviting for local wildlife.

One key aspect of the long-term vision of CBEMR is ensuring additional income streams for local villagers that are contingent on the preservation of the mangrove ecosystem and that reduce their economic dependence on livelihoods that have historically been linked to deforestation, such as monoculture plantations and shrimp aquaculture.

As a local leader, Suthee says he's very aware of the need for livelihood incentives when it comes to conservation work. People in the village lead busy lives of hard labor, he says. "We found that focusing on conservation work alone and building awareness is not enough. We believe there is a need to have income as an incentive, then sustainability will follow."

The village collectively decided on harvesting and selling honey from keeping bees, since they'd long noticed the abundance of bees in the mangrove forests. "When we visited the mangrove forest, we noticed that three types of insects help with pollination: honeybees, stingless bees and ladybugs," Suthee says. "[We] thought it would be great if we could achieve the goal of supporting the conservation team and helping mangrove pollination by the bees at the same time."

A community-based ecological mangrove restoration site near the village. Image by Carolyn Cowan/Mongabay.

Navigating a narrow mangrove channel in Krabi province, Thailand. Image by Carolyn Cowan/Mongabay.

Honey production drives conservation motivation

At the community beekeeping center just behind Suthee's house, the air is thick with the sound of chirring cicadas and a barely perceptible, but ever-present, hum of bees. Colorful timber boxes of every shape and size line a network of pathways that crisscross a garden canopy of fruit trees.

Ban Nai Nang village has roughly 1,200 beehives, with 32 families involved in the beekeeping activities as members of the beekeeping and conservation group. Members either help with the village beekeeping center or house hives in their own gardens. At first, the group focused on the Asian honey bee (*Apis cerana*), a large-bodied species that occurs in the wild locally, before later branching out into keeping nearly a dozen species of native stingless bees that are much smaller in size.

When they began, Suthee and his fellow villagers knew very little about bees: "We knew nothing about how to trap bees, the types of bees, the structure of bee hives," he says. With MAP's assistance, they attended courses at the Thailand Apiculture Training Center in Chumphon province and gathered experience as they went along, sharing knowledge with each other and learning by trial and error.

In addition to linking the village with apiculture training opportunities, MAP supported their initial forays into beekeeping by providing woodworking equipment with which to build the bee boxes, and supplying packaging, processing and marketing materials for the honey produced.

In 2020, the village produced more than 177 liters (47 gallons) of honey, collectively earning $8,250 from the raw honey and processed products, such as shampoo, soap, lotions, balms and sweets, that they sell to hotels in Krabi and Phuket and to visiting tourists. They also manufacture and sell beehives and starter bee colonies to nearby communities. In this way, each family can make 3,000 baht ($82) per month, according to Suthee.

Although this amount might not seem like a lot, Suthee says it's a substantial supplement to primary incomes derived from farming and fishing. The average resident of Ban Nai Nang earned an annual income of $1,400 (51,600 baht), according to data compiled by MAP in 2020.

Honey-based soaps, balms and lotions sold by the village beekeeping group. Image by Carolyn Cowan/Mongabay.

The supplementary income from honey sales has provided a valuable safety net for village residents in the past. A crash in the price of rubber and palm oil nearly a decade ago devastated every family in the village, according to Ali. It was the money from the beekeeping project that helped to tide the community through the challenging period. As Ali describes it, the community was "saved by bees."

Ten percent of the honey profits are invested back into a community conservation fund to support mangrove protection efforts and environmental initiatives collectively chosen by the villagers. Projects include boat trips to collect garbage from local beaches and mangrove areas, improved waste disposal facilities within the village, and training to learn how to add value to their honey products. The fund also provides social security to villagers in need.

It’s vital to have even a small income to sustain the conservation work, Suthee says. Long working hours are common in the village; Suthee himself rises at 3 a.m. every day to begin his rubber-tapping rounds, and the life of local fishers is no less laborious. It’s therefore important to be able to offer people something in exchange for their time spent protecting surrounding ecosystems and improving the village environment. “In the past, there was no such fund and we relied on budgets from different agencies,” Suthee says. “Raising our own funds for activities allows us to create sustainability in community-led conservation initiatives.”

The benefits of the beekeeping extend far beyond economics. By pollinating the local mangrove forests, the bees are boosting the fertility and diversity of mangrove species in the area. They also pollinate local fruit orchards and forest gardens where householders grow mangoes, jackfruit, durian and other types of fruit trees alongside medicinal and culinary herbs, contributing to diversified and nutritious local diets. The honey itself also tastes great, according to Suthee. Derived from mangrove trees whose roots are steeped in seawater, they honey has a natural hint of sea salt, he says.

Suthee has also observed noticeable gains in the fertility of the local mangroves, which he attributes to the pollination services of the bees. “We’ve been observing the changes and the impacts on nature,” he says. “We observed that since we started the beekeeping, it has helped some types of mangrove plants, such as Xylocarpus, which previously had produced only a few flowers and fruit, but now it produces a lot of fruit … This is the way of creating more forests without having to plant them.”

A stingless bee hive in Ban Nai Nang. A 250 ml bottle of stingless bee honey can sell for $20 and given the bees don’t present a hazard to visiting tourists, they are easier for the community to manage than larger-bodied bees. Image by Carolyn Cowan/Mongabay.

Ban Nai Nang beekeeping group are exploring the potential in stingless bees, which produce comparatively less honey, but it can be harvested year-round (compared to once a year for the Asian honey bee), and sells for a far higher price due to its reported medicinal qualities. Image by budak via Flickr (CC BY-NC-ND 2.0).

The honey-conservation cycle continues

The community is now training local schools and other villages on how to follow its beekeeping-mangrove conservation model. On the day of Mongabay's visit, Suthee and Ali were preparing to receive a community group from the nearby island of Koh Lanta.

To date, they've provided training for 15 community groups from eight districts in Krabi province, with plans to expand to four more communities later this year. After the initial training, representatives of Ban Nai Nang follow up with nascent initiatives to evaluate their results and offer advice on aspects such as marketing strategies and setting up conservation funds. This learning model is effective as villagers trust the experience of their peers more readily than they do guidance from officials or academic trainers. "We try to convince people [of the] obvious relationship: If you want to get money from the bees, you have to protect the bees' resource," Suthee says.

 T

he community sell honey, honey-based products and bee hives to nearby communities, hotels and tourists. Image by Carolyn Cowan/Mongabay.

But it isn't all smooth sailing in Ban Nai Nang. Village residents face challenges from waterway pollution from upstream palm oil and sugar refineries, and are increasingly concerned about how the impacts of climate change will affect their coastal livelihoods.

Besides community education, the beekeeping group's future is focused on adding value to its honey products through training in handicrafts and improving its ecotourism and sustainable agriculture practices. All 32 members of the apiculture and conservation group have agreed not to use chemical fertilizers, herbicides and pesticides on their land, for instance, out of respect for the bees.

The group says it also wants to improve its engagement with tourists and visitors by cultivating the IT literacy and English language skills of the village youth. Getting more young people involved is key, Ali says. "We believe whatever we as adults initiate now [is] for the next generation too. Young people can carry on beekeeping and mangrove conservation practices continuously for their future." With the future in mind, Ali is now helping to build a shop in the village where they plan to sell their honey products to local residents, wholesale buyers and visiting tourists.

Beneath the canopy of fruit trees that shade the Ban Nai Nang beekeeping center, Ali and Suthee continue their rounds to check the condition of the beehives. They pry open one of the hives and hoot with delight at the abundance of tiny honey-bearing cells within.

“When I go into the mangrove forest and see the trees that are plentiful, I feel happy and my heart is full,” Ali says. “Seeing the trees that have grown beautifully makes us proud of ourselves.”

Carolyn Cowan is a staff writer for Mongabay. Follow her on , @CarolynCowan11.

Banner image: Ali Madwang and Suthee Pankawan of the Ban Nai Nang community enterprise group check on stingless bee hives at the village’s community-managed beekeeping center. Image by Carolyn Cowan/Mongabay.

Citations:

Kongkeaw, C., Kittitornkool, J., Vandergeest, P., & Kittiwatanawong, K. (2019). Explaining success in community based mangrove management: Four coastal communities along the Andaman Sea, Thailand. Ocean & Coastal Management, 178, 104822. doi:10.1016/j.ocecoaman.2019.104822

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High Fertilizer Use Halves Numbers of Pollinators, World's Longest Study Finds

Even average use of nitrogen fertilizers cut flower numbers fivefold and halved pollinating insects

Phoebe Weston (The Guardian.Org)

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Using high levels of common fertilizers on grassland halves pollinator numbers and drastically reduces the number of flowers, research from the world's longest-running ecological experiment has found. Increasing the amount of nitrogen, potassium and phosphorus doused on agricultural grassland reduced flower numbers fivefold and halved the number of pollinating insects, according to the paper by the University of Sussex and Rothamsted Research.

Bees were most affected – there were over nine times more of them in chemical-free plots compared with those with the highest levels of fertilizer, according to the paper, published in the journal npj Biodiversity. The lead researcher, Sussex University's Dr Nicholas Balfour, said: "As you increase fertilizers, pollinator numbers decrease – that's the direct link that to our knowledge has never been shown before.

"It's having a drastic effect on flowers and insects. The knock-on effect goes right up the food chain," he said. This is primarily because fertilizers create conditions that allow fast-growing grasses to dominate, crowding out other grasses and flowers. It is generally assumed that having a greater diversity of flowers leads to a greater diversity of pollinators, which often have specialist requirements in terms of the blooms they like to visit.

Grassland at the site of one of the long-term experiments in Rothamsted, Hertfordshire. Photograph: Juliet Ferguson/Alamy

The research was done in Rothamsted, Hertfordshire, on strips of grassland called Park Grass, which have been studied since 1856.

The average use of fertilizer on grassland in the UK is about 100kg for every hectare. The highest amount in the experiment was 144kg a hectare, to which the greatest pollinator declines (of 50% or more) were linked. Even land spread with the average amount, however, had 42% fewer pollinators and five-fold fewer flowers than land with none. The results were most pronounced on plots treated with nitrogen, the most widely used type of fertilizer. Researchers found that plots treated with a fertilizer mix excluding nitrogen maintained a relatively high number of pollinators and flowers.

Almost all grassland in the UK is “improved” – meaning it is fertilized to some degree. Only 1% to 2% of grasslands in the UK are high-quality species-rich habitats, according to the study. Nationally, the UK has lost 97% of wildflower meadows since the 1930s, and studies have shown a widespread decline in numbers of pollinating insects.

Researchers also measured the productivity of each grassland plot by weighing the amount of hay produced at the end of the season. They counted pollinators such as bees, hoverflies, butterflies, wasps and flies across 18 strips of land subject to different fertilizer treatments.

Over the past decade the demand for agricultural fertilizer has increased. Prof Francis Ratnieks, an entomologist at Sussex University, said: “I visited Park Grass many years ago and realised the unique opportunity it provided to study the effect of fertilizing grasslands on wildflowers and bees.

Farmers face a dilemma: to get more flowering plant species and pollinators, the land needs to be less fertile, which reduces yields. Photograph: Nigel Francis/Alamy

"Considering the current focus on fertilizer use, and the substantial declines in pollinator numbers over recent years, this study could not have come at a better time, as we seek to understand how landowners can best help bees and other pollinators through open grassland areas," he said.

This study illustrates the problem farmers face: to get more flowering plant species and pollinators, the land needs to be less fertile, which reduces yields. "Our most important and challenging finding is the existence of a trade-off between flower and pollinator diversity and grassland yield," researchers state in the study. They highlight the need for financial incentives in the UK and EU to support biodiversity-friendly farming practices.

Balfour said: "While reduced yields aren't typically thought of as a good thing, reducing grassland production intensity has the potential to realise many of the benefits of multifunctional landscape." These include benefiting pollinators, improved soil health, better air quality and more resilience to extreme weather events.

Dr Philip Donkersley, a senior researcher in ecology and evolution at Lancaster University, who was not involved in the study, said: "What is interesting and novel here is the time frames. Normally, our studies on this last four to five years. This is approaching 150 years of applying chemical and organic fertilizers, and therefore much more reflective of what has been happening on British farms."

Club Information and Contacts

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