

Article

Future with a Past: Future Scenarios of Development in Yucatan in *¿Qué les pasó a las abejas?*

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Abstract: Since the Green Revolution, the development of agriculture has been measured by the relation between the chemical input (fertilizers and pesticides) and yield. Other factors, such as deforestation, water pollution, biodiversity loss and the loss of human health, were not part of these calculations. With the advent of genetically modified monocrops in the 1990s, GM soy in particular, plantations took over larger surfaces of land, accelerating these negative processes on a previously unknown scale. It has become clear that if this type of agriculture persists, toxic plantations will soon consume the planet. One of the phenomena prompting this awareness in different places of the world was the death of bees. *¿Qué les pasó a las abejas?*, directed by Adriana Otero and Robín Canul, relates the environmental conflict between GM soy growers in the Yucatan Peninsula, Mexico, and Mayan beekeepers. Not long after the arrival of GM soy to Yucatan, the bees began to die. When their honey was rejected by the EU authorities due to contamination with transgenic pollen, Mayan beekeepers realized that not only their bees, but also their water and their bodies were poisoned by GM soy agriculture, while their forests were cut for new plantations. The Maya demanded that the state prohibit the planting of GM soy on their land. *¿Qué les pasó a las abejas?* is a character-driven documentary featuring leaders of the Maya beekeepers' movement, including the recipient of the Goldman Environmental Prize 2020, Leydy Pech. *Maya Land; Listening to the Bees*, my own documentary, reflects on the same environmental conflict and asks what the future would look like if bee health was considered a criterion of sustainable development. A vision of an alternative future emerges in both films through a series of interviews with Mayan beekeepers, scientists, and policy makers; bees are healthy, water is clean, and agriculture incorporates a mixture of ancient techniques and cutting-edge technologies that assist humans in rethinking their relationships with land and plants.

Keywords: Mayans; *Meliponas*; bees; Yucatan; agriculture; soy; GMOs; Mennonites; documentaries; deforestation



Citation: Beilin, Kata. 2022. Future with a Past: Future Scenarios of Development in Yucatan in *¿Qué les pasó a las abejas?* *Humanities* 11: 55. <https://doi.org/10.3390/h11020055>

Received: 31 January 2022

Accepted: 7 April 2022

Published: 14 April 2022

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1. Disclaimer as an Introduction

My road to *¿Qué les pasó a las abejas?* (Otero and Canul 2019)—the film that I analyze in this essay—begins with another film: *Sleep Dealer*, directed by Alex Rivera. The opening scenes of *Sleep Dealer* (Rivera 2008) highlight important moments in the life of a milpa-grower family in Oaxaca: tortilla making, family meals, and watering the field. In the dystopic future of the film, a huge dam has diverted the river that had once provided water for the crops. Now maize growers are forced to purchase their water from the company that built the dam. The water reservoir is surrounded by a tall wall with barb wire and cameras connected to automatic guns. As Memo and his father purchase the water, carry it to their milpa and let it out to nourish the dry soil, the father tells his son that they have lost their future. Memo laughs that this is impossible, and the father explains that the future they had lost was one with the past. Young Memo keeps turning his head considering his father's view of the world too conservative and rural. As an amateur hacker, he is drawn to the globalized world connected by technology and wants to leave his village. The film

tells the story of Memo's experience with the world that attracted him and of his return to his father's dream about "a future with a past" at the end of his learning trajectory. As the film finishes, Memo lives in a futuristic Tijuana near the US border. He has given up his job since the work based on cutting-edge technologies has disappointed him. Tijuana is still a city of sweatshops, but the futuristic sweatshops in the film are equipped with a technology that sends human energy through ducts to various work sites north of the border where this energy powers working machines.¹ This system provides to the US "what they always wanted, work force without workers." Memo has realized that this work was draining him just as the dam had drained the river in his village. In the last scene of the film, Memo, whose name means "remember," plants maize near the US border, waters it, and sees it rise. He engages with his past to bring back the future that his father had lost.

It was my fascination with Rivera's film that took me to Guelatao, Oaxaca, where I attended a native seed exchange ceremony and listened to Zapotecan leader Aldo Gonzalez's workshop about the significance of saving native varieties of maize seeds, and the threats that GM maize would pose to indigenous agriculture. It was in Guelatao where I found out about yet another similar struggle: that of Mayan beekeepers against GM soy, which was planted in three Mexican states of the Yucatan peninsula: Campeche, Yucatán, and Quintana Roo. I landed there a few weeks later to meet Mayan activists and find out about their experiences defending their livelihood and their relationship with bees, especially Mayan sacred bees, *Meliponas*. I opened my eyes wide, taken by the unusual beauty of these bees. I felt that they had hypnotized and engaged me in just a few seconds. I began taking notes and pictures and returned summer after summer to look at them and to eat their honey. I also interviewed beekeepers, activists, scientists, politicians, and Mennonite soy growers involved in the struggle. Impressed by the people and nature around me, I brought cameras and, by collaborating with film makers, Marcos Colón, Reynaldo Morales and Avi Weinstein, as well as with an entomologist, Sainath Suryanarayanan, and toxicologist, Angel Polanco, I began to work on a documentary film.

As I recorded interviews, and filmed the bees, I found out that a professional team lead by Robin Canul and Adriana Otero was also making a documentary film about the Mayan beekeepers struggle to save their bees. This film, titled *¿Que les pasó a las abejas?* (What Happened to the Bees?) was released in 2019. I watched it several times, I taught it in my classes and this article not only analyzes it, but also expresses my deep admiration for the film, its directors, and the protagonists that share my passion. My film, *Maya Land: Listening to the Bees* (Beilin and Weinstein 2022) is now almost finished. To an extent, it tells the same story as Otero and Canul's documentary, but there are a few moments where the films differ and supplement each other. In my article below, I will focus on how the debate about the future of the Mayan world emerges in *¿Qué les pasó a las abejas?*, and I add some complementary reflections derived from my own film.

2. Beekeeping Is about Future

¿Qué les pasó a las abejas? is a character-driven documentary that represents the views and interests of the Mayan beekeepers from Hopelchén, Campeche. As documentary films critic Chanan (2007) explains, fiction movies inherited narrative paradigms of the 19th century novel and "appeal directly to the spectators' emotional and sentimental life, their private subjectivity—even when dealing with historical and political subjects. Documentary, on the other hand speaks to the viewer as citizen" (16) and it is "a battleground for social and political truth" (23). Chanan argues that documentary films are always politically engaged and often those who make them work in the spirit of advocacy. In his opinion, it is much easier to write a book than to make a documentary because making a film involves many unusual hardships: raising funding, obtaining, and dragging heavy equipment, risking health by hanging out for hours in the heat, being bitten by mosquitoes, and spending months or even years slicing footage and putting it together into a film. This kind of labor is only undertaken if one really cares about the issues, and caring often comes with strong views. *¿Qué les pasó a las abejas?* is this kind of documentary. It conveys a love for

the bees, respect for the beekeepers and the hope that they can continue their interspecies relation into the future; the same applies to my documentary, *Maya Land; Listening to the Bees*.

Both documentaries tell the story of the conflict that erupted between Mayan beekeepers and the Mexican government, fomented by the planting of genetically modified (GM) soy in the Yucatan peninsula. The conflict was triggered by the European Union's rejection of Mexican honey exports due to unacceptable levels of GM pollen in 2011. This caused significant economic losses for the beekeepers of Yucatan, most of whom are of Maya ethnicity. The diagnosed contamination of their honey woke up beekeepers to reflect on the state of their world. They linked the growing of GM soy to deforestation, water contamination, and damage to human and bee health. They saw soy plantations as a not-consulted-and-unwanted development taking place on their land. They appealed to the state authorities, asking for GM soy be forbidden on the basis of their "right to culture," guaranteed by the Mexican constitution. After several years of struggle, the permission to plant GM soy was revoked. Both documentaries contain in-depth interviews that explore the complexities found within this conflict. The Mayas are concerned not only with *Apis mellifera* bees that produce honey for exports, but also the sacred *Melipona* stingless bees, who are dependent on the forests cut under the GM soy, as well as their *milpas*, the subsistence form of polyculture grown in the forest. The Mayan people are also worried about the toxic flow of pesticides and the sewage from the fields, which are seeping into the underground water basin, threatening their health and contaminating their sacred cenotes. Overall, the Mayas see industrial agriculture as a continuation of centuries of colonization. They realize that unless they mobilize their cultural knowledge and react to these threats, their livelihood, heritage, and memory will become collateral damage.

The main characters of *¿Qué les pasó a las abejas?* are Gustavo Huchín and Leydy Pech, leaders of the protests against planting GM soy on Mayan territory. The story of the struggle is told in the activists' own words as the camera follows them in their daily routines, meeting their family members and entering their kitchens and gardens. The film ends with a conversation between both leaders as they reflect on the state of their world and on their future. Most of the action takes place in Campeche, but some scenes are recorded in Argentina. Gustavo Huchín travels there to meet an Argentinian activist, Fabian Tomasi whose health was destroyed by the pesticides he had administered to the GM soy. The dialogues between Tomasi and Huchín serve to compare the Argentinean and Mexican situations with regard to GM soy. Tomasi highlights the strength of indigenous resistance in Mexico to achieve a more positive outcome in a struggle that he feels has been lost in Argentina.

Some of the conversations in the film seem staged; however, the director, Otero, explains that this was not the case. The monologues and dialogues between Gustavo Huchín, his father, and his wife, and the concluding conversation between Gustavo and Leydy Pech emerged naturally after the directors of the film suggested to the actors the themes to discuss. These themes were originally selected by the beekeeper activists themselves. The reflections of the characters are authentic, if not entirely spontaneous, which pushes the documentary into the realm of self-ethnography, which is preferred to traditional ethnography by documentaries with decolonial frameworks. Postcolonial studies problematized the framework of ethnographic depictions of native people by white directors as subservient to the colonial knowledge structure where "white" scientific subjectivity objectifies the peoples it films and analyzes (Shohat and Stam 2014; Griffiths 1999). Otero and Canul avoid this structure. In *¿Qué les pasó a las abejas?*, the story is told by the protagonists themselves, the Mayan beekeepers Huchín and Pech. There is no voiceover.

In a personal communication, Otero told me that before the script was written, Huchín and Pech, as well as other members of the beekeeper community, were asked to provide concepts that, in their view, should appear in the film. Among the most important ideas, Mayan beekeepers evoked: "destruction", "bee death", "corruption", and "injustice". The directors also introduced other concepts that emerged from the initial conversations

with the beekeepers. These were: “Mennonites”, “glyphosate”, “environmental impact”, “cultural shock”, “GMOs” and “development”. Otero’s main idea, in her words, was to show that “pesticides are destroying bees, cultural patrimony and the environment”. However, the monologues and dialogues of Huchín and Pech moved in the direction of different possible future developments.

¿Que les pasó a las abejas? first establishes Huchín’s point of view as he drives his truck down the road through fields and toward the forest where he keeps his beehives. The inspiring music composed by Alberto Palomo Torres signals a movement towards a mystery, and the buzzing of bees can be heard in the background. This superimposition of the sounds of nature and music brings our attention to the entanglements amongst human and nonhuman life that are so notable in beekeeping. Right before the music stops the buzzing becomes stronger, and as the truck advances, we begin to hear the noise of the metal buckets loaded in the back that jump up and down hitting each other on the rough road. In the following sequence, we observe Gustavo and his helper, both dressed in white beekeeping suits, navigate the misty forest. They open the hives and are please to share that there is a lot of honey.

The bees they are working with are *Apis*, European bees. Since the escape of aggressive African bees from a laboratory in Brazil in the 90s that, moving north, reached Yucatán and mixed with the local *Apis* bees, beekeeping has become risky. As a result, after the so-called Africanization, people began to keep their hives in the forest, far away from houses.

During the beginning sequences of the film, we only hear short exchanges about the hives, honey, and the tools. Gustavo begins his narration after this somewhat poetic introduction, while the camera follows him back into his house and his backyard. He talks about his relationship with bees, claiming to understand them when they tell him things. He has worked with bees for the last 40 years and he feels deeply satisfied when he cares for them. He says that when he works with the bees he is “in a family” with them. “I feel even happier with them than when I work my *milpa* field,” he adds.

Gustavo lives with his elderly father who used to keep bees himself. As Gustavo helps his father to button up his shirt, the father remembers that in the past he had had sixty or even eighty *hobones* (tree logs) with bees, and that he also loved working with them. It should be noted that Gustavo’s father kept *Melipona* bees, which are indigenous to the region and very important to Mayan culture. In Gustavo’s father’s times, people did not use sugar to sweeten food, but only honey, which in the old man’s opinion, is much healthier.

The Mayas co-evolved with *Meliponas* and ate *Melipona* honey. Mayan people built their houses in the forests in the places where they discovered the presence of *Meliponas* because they believed that the bees’ proximity guaranteed prosperity. This indeed could have been the case since the medicinal and nutritional properties of the *Melipona* honey improved the Mayas’ health. Honey is not just a sweetener, as some may think today. It is a live substance containing various vital nourishments and sugars that are already partially digested by the bees and hence easily assimilated by the human body. *Melipona* honey was for centuries one of the most important sources of nutrition and medicine.

Gustavo’s father describes the tree logs that he remembers, drawing them with his arms in the air as if to touch them. As he speaks, the camera lens moves around the backyard as if looking for the tree logs, but they are no longer there. While the camera does not encounter bees, it stops instead on chickens and turkeys, implying that the relationship that Mayas had with the bees extends to other living beings with whom they cohabitate.

The next sequence begins as we see the inside of a log with *Melipona* bees through a compartment shot. We observe how the log is opened, and the face of a woman appears in the opening. We look at her from the point of view of the bees. The face belongs to the second leading character of the film, Leydy Pech, who works with *Meliponas*.

This memorable and revealing moment of the film when we see Leydy’s face, as if summoned by the *Melipona* bee community, evokes the historical and symbiotic coevolution of the Mayan people with these forest bees. *Melipona beecheii*, or in Maya, *Xunan Kaab*,

have been kept by the Mayas for over three thousand years (Villanueva-Gutiérrez et al. 2013), and they were considered sacred. One of the most important Mayan Gods, *Ah Muzen Kaab*, is a *Melipona* Bee. He brings to the Mayan world the gift of pollination that makes life possible. If the *Meliponas* move away from a house, this is a bad omen for the family. According to researchers, *Meliponas* have prompted the development of Mayan civilization in various ways. Brazilian ecologist, Koedam (2019), hypothesizes that meliponiculture was responsible for the invention of Mayan writing since it was necessary to take notes about which logs were opened and the state of the brood. Mayan beekeepers often say that their people have learned community skills from these bees. This historical context, evoked by Gustavo's father and by Leydy in *¿Qué les pasó a las abejas?*, is developed in more detail in my documentary, *Maya Land; Listening to the Bees*.

Spanish colonizers attempted to destroy the cult of the bee god by destroying his statues, but they never managed to completely eradicate it. Meliponiculture decreased in the times of colonization, as plantations of sisal and sugar led to progressive deforestation. It suffered even more during and after the half-century-long Mayan rebellion, known as the War of Castes (1847–1901). As the rebellion fell, a great percentage of the Mayan population escaped to less-developed parts of the peninsula, leaving their logs with *Meliponas* behind. Later in the twentieth century, *Apis*, European bees were brought to the area. The local governments thought of taking advantage of the Mayas' historically established beekeeping skills by beginning rural development initiatives with this new mode of beekeeping in this area. The government provided aid to Mayan communities and in return asked that the communities adopted a commodity-oriented model of producing industrial-grade *Apis* honey to export it to already established international markets (Calkins 1974).

As apiculture became the prime source of income for Yucatec Mayans, as we see in the opening scenes of the film with Gustavo, it slowly replaced *meliponiculture* (Muñoz 2016). As we can see in the following sequence with Leydy, however, *meliponiculture* was never fully displaced and it persisted at relatively low levels in Yucatec Maya communities, who used the cash generated from selling *Apis* honey to continue keeping *Melipona* bees in traditional ways (Weaver and Weaver 1981). While apiculture was a market-oriented activity and source of income, *meliponiculture* was a non-profit and sacred activity that was a source of cultural meaning. Similar to the case of Leydy, men often took care of the more aggressive *Apis* bees, while woman took care of the *Meliponas*. Leydy reflects: "I realized that the bees are a lot like women, that they are a lot like me. They are vulnerable, they are delicate. They don't sting, but they are hard workers, they are very picky . . . It was then when I started to identify with the bees . . .".

As Leydy talks, the camera shows the log from the outside, zooming in on a tiny hole through which a single *Melipona* bee exits and flies away. We are taken again into the interior of the log, this time from the perspective of Leydy as she instructs her son. Their concentrated faces appear in the following reverse shot. These exchanges and reversals of subjective shots between the bees and the humans reflect their reciprocal relationship and relational identities. As Gustavo Huchín established earlier, the bees are indeed part of the multigenerational and multispecies Mayan family. In my own research in Yucatan, I heard *meliponiculturists* often refer to bees as "mi gente" (my people). Chim (2017), a *meliponiculturist* from Tulum insisted that "*Meliponas* are Mayas".

In her monologue, Leydy establishes a relationship between beekeeping, and a future with a past akin to Rivera's *Sleep Dealer*. She says that the work that her community does is to bring back *Meliponas*, protect them, and to pass to her children all the knowledge of Mayan *meliponiculture* that she has acquired from her grandfather, mother, and from other elders of the community for the future. Leydy reflects that when she collects her honey, she feels very happy that the spring has arrived, that a year has passed and that there is honey. That moment of happiness gives her strength to tackle struggles in the future regarding the following years of honey harvest. We can observe that the relationship with nature, and for Leydy in particular, with the bees, guarantees a future that ensures the return of the harvest, gifts of life, and the joy of tasting honey. She connects ancient Mayan interspecies relations

with *Meliponas* to her future-oriented initiative of relearning and reviving *meliponiculture* and with the transforming role of women in the struggle for cultural and environmental survival:

We wanted to do something different. If the men are working with the bees here in this town, they are organizing the beekeepers, why shouldn't we women also work in something different, other than the work we do around the house, like tending to the animals and cleaning, housework. So, then we said, let's go and work with "Xunan Kaab," stingless bees, that's the way that they are known. And we started building the dream when I got the idea . . .

In 1995, Leydy founded the largely female Koolel-Kab collective that popularized *Melipona* beekeeping as an alternative to the logging enterprises that were destroying Mayan forests. Koolel-Kab established a 5000-hectare community forest to promote Mayan customs and land rights. Elders provided organic beekeeping education, and the younger members of the collective proposed policies to stop deforestation. For fifteen years, the collective advocated for wellbeing by reviving the relationship between people, bees, and their forests, and by providing new income from honey and various elaborate *Melipona*-honey-derived products, such as soaps, creams, and cataract medicine. Most importantly, as Leydy explains, the conservation of bees allowed for the conservation of forests and all of the diverse species of plants and animals that have lived there for thousands of years but were now threatened with extinction. *Meliponas* have become what [Verissimo et al. \(2011\)](#) call "flagship species," one that attracts attention and facilitates the conservation of its ecosystems.

3. A Future without the Past Is Short Term

Things seemed to be going well until the beginning of the 21st century, when the *Apis* bees slowly began to die or disappear and did not find their way back to their hives. Then, in 2011, Mayan *Apis* honey was rejected by European Union authorities at the Yucatan port of Progreso due to unacceptable levels of genetically engineered pollen.² First, the beekeepers did not know what that meant. They were not aware that the European Union, prompted by growing distrust in GMO products in Europe, had decided to more carefully measure levels of transgenic substances in honey. As a result, Yucatec honey was not accepted for export. Searching for answers, the Mayan beekeepers realized that, over the preceding ten years, genetically modified soy plantations had proliferated around their beehives where forests had previously grown, also destroying the habitat of *Meliponas*, which were announced as a species in danger of extinction ([Villanueva-Gutiérrez et al. 2005, 2013, 2014](#)).

The forests had been cut by Mennonite farmers who moved to Mayan land from northern Mexico and now received subsidies from the local authorities to produce GM soy. Mennonites came to Campeche from northern Mexico. In the 1980s, Old Colony Mennonites in Durango began to experience land shortages and started searching for new colonies. In the 1990s, Campeche's colonies grew as even larger numbers of Mennonites left the northern states in fear of growing persecutions from drug cartels that targeted their communities.³ In Campeche and Quintana Roo, Mennonites' relationships with Mayas are limited to employment and commerce. Mennonites employ Mayas in their fields for manual labor, and they also distribute pesticides and GM seeds to Mayan communities. Intermarriage between Mayas and Mennonites is extremely rare and punishable with expulsion in Mennonite communities, and the social lives of both communities are separate. The second part of *Maya Land* features two interviews with Mennonite farmers with varying degree of environmental awareness. One of the farmers, Johan Berge, from the settlement of Salamanca, himself a beekeeper, does not connect his bee losses with the abundant use of pesticides on the surrounding plantations. The other farmer, Frantz Martins from Yanón, is fully aware of the detrimental effects of pesticides on health and searches for ways to start fully agroecological plantations.

In the twelfth minute of *¿Qué les pasó a las abejas?*, to the sound of disquieting music, we are presented with a metonymic chain of images of smoke, sparks and flames to deplore the fires and mourn the Mayan forests that they consume. Fires are often produced on purpose to clear land for agricultural plantations. Indeed, deforestation is one of the most prominent motives of the film; it returns later in various striking drone shots, and always with dramatic music that summons international viewers to solidarize with the Mayan beekeepers' struggle. The first brief sequence focused on fire introduces the story of conflict that irrupted into Yucatán peninsula between the Mayan beekeepers and the Mexican Government, also involving the Mennonite immigrant communities. Gustavo recounts it in the following way:

In the past, until ten years ago, there was excellent honey production. I remember very well that during those years, I would end up with 40 to 45 barrels of honey. But then, it started decreasing. Why is the production decreasing? Some say that it is because of the African bee. And other say it's because of the climate change. And in reality . . . we did not realize, and it was all around us. The deforestation, we knew it was happening there, that there was a great amount of forest cut under the genetically modified soy. And what is that? Well, that's the bean that Mennonites brought, they plant it over there, but is it harmful or not?

Before we were dominating our world, it was ours. But when the article 27 of agricultural law was modified, some parts of Ejidos were confiscated and reassigned.⁴

So, our ejido is less now. And all the land in our state that used to be Maya territory, was sold by the Government to big companies or to the Mennonites. And because here in the South-East the soil is so fertile, they purchase the land now that they are able to do so.

As we hear Gustavo's words, the camera again establishes his point of view through the windshield of his truck and then follows him at home and through his *milpa* field as he plants maize. This sequence ends in the same way that it started, with images of fire and deforestation, this time filmed by a fast-travelling drone that traces burnt out spaces of forests still covered with the white of fresh ashes. The disquieting mood of the musical background acquires dramatic mourning tonalities. Then, on the road, we see a Maya milpa grower who walks home carrying his tools. At his back, several tractors emerge and follow him. The tractors appear to increase in size as they approach and pass by the Maya man until they occupy the entire screen at the end of the sequence. These images remind the viewers of the uneven power dynamic between the Mayan people and industrial agriculture, which threatens a complete take-over by machines and the destruction of the forests and Mayas. Gustavo comments again: "These are forests that we have conserved for hundreds of years if not thousands. They come and buy these forests and they bring in machinery, bulldozers to tear down all the trees of the forest, and the animals that live in the area are either killed or leave".

We remember how Leydy talked about the harvest of honey that every year gives her strength to continue life and trust the future; however, the loss of the forests will destroy this future. Leydy laments that the forests were burnt and that the lands that were naturally hilly were flattened to grow more crops which led to floods in times of rain. To avoid a loss of crops, GM soy growers built absorption wells that diverted water contaminated with pesticides into the underground basin. In Yucatán, the lime rock surface does not provide sufficient filtration, and as a result, the underground water ended up containing toxic amounts of pesticides. Various rural families still drink unfiltered water, but even filtration is unable to remove all the toxins. Angel Polanco's research, featured in *Maya Land*, discovered glyphosate in the urine, blood and even breast milk of Mayan women. Leydy, aware of these results, mentions them in *¿Qué les pasó a las abejas?* while she talks about the water issues. Later in this film, in the closing conversation with Gustavo, she also

expresses her preoccupation over the growing rates of illness in the area. Yucatán has the highest rates of cervical cancer in Mexico (Polanco and Beilin 2019a, 2019b).⁵

The prosperity offered by the GM soy to its growers is achieved with the help of the pesticides at the expense of human health. This prosperity creates a sanitary catastrophe, and illness shortens the lifespan of those who share the land with this crop. This reflection is highlighted in the film when Gustavo travels to Argentina to meet Fabián Tomasi, an activist who exposed the toxic nature of Argentinian agricultural accomplishments.

In Argentina, GM soy began to replace traditional cattle-based agriculture in 1996. By 2009, it had taken almost half of all agricultural land (Aizen et al. 2009). GM soy seeds are offered to farmers accompanied with the pesticide Roundup. The seedlings of soy need to be fumigated with Roundup, whose main ingredient, glyphosate, kills all the plants, insects, and often all animals around GM soy, giving this crop all the space to develop since genetic modifications make soy resistant to the glyphosate. This seed pesticide package requires additional specific technologies, such as agricultural machines for planting, fumigation, and harvest. These technologies have transformed rural life in Argentina. To maximize profit, soy is planted on huge areas of land, where it benefits from technologies controlled by very few workers. For this reason, small and medium farms have been either sold or rented by their owners to soy growers who moved to the cities. The connection between the land and farmers has been broken.

Most of those who decided to buy or rent land and plant GM soy needed to take large loans. To pay off these loans in the years that followed, they had to obtain a maximum yield in the shortest possible time. This was achieved by maximizing fertilizers and pesticides and by planting GM soy twice a year, which precipitates the loss of the nutrients in the soil. The rural culture has disappeared and been substituted with agri-business culture, which is centered in small prosperous towns servicing the large plantations of GM soy that spread around like a “green desert.” The direct, sensorial relationship between people, plants and farm animals, characteristic of rural culture, has been substituted with a relation between people and technology. Technology now mediates between farmers and the fields.⁶

Indeed, soy farmers became more affluent. Tomasi’s house that we see on screen seems to be of considerably higher standards than the houses of Gustavo and Leydy. But as the modest harvest was replaced with the profitable yield, year after year, toxic substances accumulated in the tissues of the growers’ bodies and caused illnesses. In 2015, when I lead research there, Argentina was the country with the largest usage of pesticides per capita in the world (Ávila Vázquez 2014). In the northern part of the country, the population of the towns surrounded by soy plantations was exposed to unheard-of quantities of Roundup. In 2014, these areas had five times more cases of cancer than the less-agricultural south (Ávila Vázquez 2015). Based on Medardo Ávila Vázquez’s research, inhabitants of these prosperous little soy towns also suffer from birth defects, asthma, and other auto-immune diseases. The closer to the soy people live or work, the more they seemed to be affected.

Fabian Tomasi serviced planes that fumigated Roundup over the plantations without proper protection, and as a result, he contracted severe toxic polyneuropathy. His body became deformed and he lost half of his weight, decreasing from 90 to only 45 kilograms due to the illness. After realizing that his suffering was caused by the pesticides that rained on him from the fumigating planes, Tomasi used his deformed body to campaign against GM soy economy, warning others that, in the future, they may suffer like him. Tomasi died prematurely in 2018 at the age of 53, just a year before *¿Qué pasó a las abejas?* was released and soon after his interview with Huchín. The film is devoted to his memory.

In the conversation with Huchín in the film, the sickened activist expresses pessimism about the future and warns his Mexican friend, “I do not want to kill your morale, but this is a one-way street. I don’t think that there is much possibility that man solves it in time.” But later in the conversation he suggests that the Mayan people can possibly put up more of a fight than the Argentinian people who faced GM soy first, still ignorant of the dangers that it brought.⁷ Tomasi says goodbye, wishing Huchín: “be as strong as the pyramids that you still have”.

Back in Hopelchén, in my favorite scene in the film, Gustavo and his wife talk in the kitchen as she heats up tortillas while he cuts onions. They are talking about the consultations. After the Mayan beekeepers presented the Mexican Supreme Court with a petition to stop the planting of GM soy, accompanied with 63 thousand signatures of Mexican citizens who supported them to save the future of the Mayan forests, the Government ordered a series of consultations with the Mayan people.⁸ In the kitchen scene, Gustavo tells his wife that he is not sure what time he will be back home because it is hard to tell how long the consultations will last. We can perceive the tension that the husband and wife feel as she tells him to be careful and not to respond when he is attacked or offended by the Mennonites. Even though Mennonites should not be there, the Mayas assume that they will be present at the consultation site in Hopelchén, since they are afraid of how the decision may affect their livelihood; the GM soy is their most important crop. Gustavo says something that contrasts again with the future scenarios that each of these ethnic groups works for through their different relations with the land and agricultural technologies:

Gustavo: They say that soybeans make more money, but they don't realize that they are killing bees and butterflies. Besides, they are getting sick.

Gustavo's wife: They don't think about the damage they are doing to their children.

Gustavo: Some day they will understand, but who knows when.

The conversation between Huchín and Tomasi in Argentina, and this subsequent conversation in the kitchen between Huchín and his wife posit two more important questions. Will the time come when knowledge will make people abandon the practices that harm the land? And will it be too late when it does? In the film *Maya Land: Listening to the Bees*, we interview a Mennonite farmer, Franz Martins, who, after having realized that pesticides are hurting his and his family's health, decided to start an agroecological production. This Mennonite farmer has a vision of the problem that is closer to the Mayan beekeepers than to GM soy growers of his own ethnicity:

When liquids are recommended for such and such a problem, when we begin to apply them, they smell foul, and it feels like you're going to vomit and more. We even felt ill. And there were people who vomited and needed to look for help. Those engineers who are dedicated to selling pesticides, they are the winners in this game. And we do not know any better, so we try the pesticides, we spend a lot of money, we take risks, and sometimes it seems to be good for us, but ultimately, over time, the toxicity becomes more and more risky.

As a first step in moving away from the chemicals, Franz and his friends constructed a machine to mix organic fertilizer, *bokashi*, based on the drawings that they found on the Internet, making it possible to extend an agroecological model to a larger surface of land. Slowly, he has discontinued using pesticides. By 2021, a group of activists funded by a honey exporter, Federico Berrón, managed to extend an agroecological model for 400 hectares of Mennonite plantations. Even if this seems to be a drop in the ocean, it shows that Mennonite presence could be less problematic for Mayan culture and the environment if it renounced pesticide-based industrial agriculture and respected local forests. Promoting this kind of thinking, while difficult, reduces the confrontation between the Mayas and the Mennonites.⁹

The footage filmed during a consultation between the Mayas and the Government in Otero and Canul's documentary highlights exchanges between the Mennonites and Mayas that consider the significance of the past for the future. Mennonite farmers claim that they have the same rights as the Mayas to decide what they want to do on the land that they own because they are Mexican citizens. The Mayas respond, however, that they have lived in Yucatán for thousands of years, and their long-grown relationship with the land, in other words their indigeneity, gives them priority in deciding on models for development. From the ethical and political point of view, this is a crucial debate. As the voices of the

film indicate, the idea that everyone should be free to do what they want on their land is simplistic. Leydy explains that bees, and other pollinators fly freely for many miles as they search for pollen, and there is no way to contain them. Systemic environmental changes do not respect property lines. Everyone's ways of life are entangled. When thinking about this socio-environmental conflict, perhaps the most important question is how much influence the past should have on future designs.

Francisco Rosado May, Professor of the Mayan Intercultural University, located in the town José María Morelos in Quintana Roo, has reflected a lot on this question. Rosado May reminds us that 80% of the natural resources and most biodiverse areas in Mexico, and in general in Latin America, are in hands of indigenous communities (Rosado-May 2016). This is because indigenous communities "have developed over centuries highly sophisticated systems of knowledge" with a focus on biodiversity (77). To secure the conservation of biodiverse ecosystems, Rosado May suggests, indigenous traditional ecological knowledges (TEK), or as he calls it elsewhere, "bioculturality" (Burford et al. 2012), should constitute a significant component in education and policy making. This consideration of past indigenous developments would allow a sustainable future to be constructed: a future with a past.

4. Future with a Past: The World According to Bees

Before the advent of industrial agriculture, farmers took care of their land because it was believed that it had to sustain various generations. Their future and the future of their children depended on this care. Current developments in industrial and GMO-based rural economy prompt a culture with a short-term future. The desire is to extract maximum profit from the fields in the shortest time possible while the price of certain crops on international markets remains high. This short-term future lacks the past in the sense that agricultural strategies are based on completely new technologies, and they break with most of the precautions learned during previous centuries. Proper timing was important for agricultural knowledge in the past. Old Mayan books taught not to harvest honey before the arrival of the spring, and to let the soil rest and recover after a few years of planting. While food was grown elsewhere, the forest took over the old field until, 35 years later, it was burnt out for the *milpa* again. These cycles made long-term planning necessary. In fact, planning involved various generations of the family and community members connected by the land that they administered together.

Nowadays, it is not necessary to let the land rest, as phosphorous and nitrogen fertilizers remedy the loss of minerals. However, in the long term they damage the health of the ecosystem as these substances flow into the subterranean waters, lakes, and oceans. To expedite the harvest, the chemical input in today's industrial agricultures is so high that soils and water become toxic, damaging the health of various organisms that are part of the ecosystem, including humans. The Argentinean experience has shown the world the suffering caused by excessive chemical input. Increasing the pace of production shortened the lives of various humans who lived near land planted with GM soy. In Yucatán, the Mayan relationship with bees prompted resistance to this model. *¿Qué les pasó a las abejas?* and *Maya Land* show the incompatibility of industrial pesticide-driven agriculture with the Mayan culture of the land.

Quee les pasó a las abejas? begins during the season of milpa planting and it ends when the maize is harvested. In the final scenes of the film, Gustavo picks up mature cobs and throws them into a plastic basket. Now is the time for the final reflections. Gustavo understands that the struggle of his community is not just about the bees, but rather about the health and culture of the people and the Mayan territory. He realizes that the industrial agriculture in the region threatens everything. Leydy reflects on the struggle that triumphed in 2017 when SENASICA revoke permits to plant GM soy¹⁰:

The government has, let's say, a model that here in Campeche there are soybeans, the African palm, sorghum, and who knows how many more will be brought over. But I also believe that if we continue allowing this it will continue to be

implemented. I believe that this experience with soy has made us question all of that. We ask ourselves now, we are analyzing. We are saying: It's true! Why doesn't it rain? Why is the drought prolonged? Why are there more plagues? Why am I producing less honey? Why can't I grow my native corn? Why do I have to buy tortillas when I can produce them? All of this is making us once again rethink this and say: the more decisions we make, the stronger we stay as community, and the more we'll change for the better. There won't be any changes if we don't start from the beginning with ourselves. All of what they have put in our heads we have to question at this point and determine whether it is working or not. If it isn't then we must recognize that and reimagine how we want it. So that way we can redesign our own development model.

Leydy's monologue about the community struggle that gave her faith in the future is accompanied by images of the *Meliponas* moving harmoniously inside a log. This superposition of Leydy's words and these images remind us that the ancient Mayas believed that they learned their community virtues from these bees. Now this sacred interspecies relationship has again prompted learning and mediated the struggle of the Mayan people for their land and their way of life. Leydy calls on her community to question everything that they were made believe and determine if present conditions work for them or not. She suggests looking back at their culture and past "from the beginning", so that Mayan people can decide on their own model of development. It is hard to imagine a more succinct and convincing description of what academics call "decolonial thought." Decolonial thought is in this film produced on the ground by an indigenous activist. In 2020, two years after these scenes were recorded, Leydy's activism and intellect were honored with what is known as the "Environmental Nobel": the Goldman Environmental Prize.

My research shows that Mayan political mobilization has been considerably successful in shaping the governmental agricultural policies due to the Mayan relationship with the native stingless *Melipona* bees that Leydy cares for. Since this relationship constituted their cultural patrimony, Mayan beekeepers could allege that GM soy planting violated their constitutionally protected right to culture by killing their bees and destroying their forests. At the same time, world-renowned entomologists working in the region also spoke in defense of the bees. Villanueva-Gutiérrez et al. (2005, 2013) announced that *Melipona* bees were threatened with extinction, and Remy Vandame published and testified in Mexican courts that, contrary to the claims of Monsanto scientists—which were repeated in *¿Qué las pasó a las abejas?* by Mennonite farmers during the consultations—bees are indeed affected by GM soy and are threatened by the pesticides used on these plantations (Vides and Vandame 2012). A coalition of allies, scientists, activists, and politicians formed around the bees. It was as if the bees were telling people how to rethink their economy. Having observed this impression, we subtitled *Maya Land*, "Listening to the bees" and to conclude our story, we asked this question: what would the world look like if we gave priority to the bees?

In an interview in *Maya Land*, Vandame says:

If we give priority to the bees, to the diversity of the bees, to the health of the bees, we will start to consider models in which agriculture is less intensive, less industrial and which is more respectful of the environment, of biodiversity in general, and which depends less on pesticides . . . Until 80 years ago people farmed without agrochemicals. It's very recent, and of course they couldn't get today's yields, but it was possible to feed humanity then. Now the challenge is that there's a lot of us on this planet and we need to feed so many people, and it's a challenge, but there are proposals in agroecology to produce on a large scale, quantities that are sufficient and higher quality, free of waste, and with great respect for the environment. The bees get our attention and lead us to consider the agroecological condition. But the benefit of course of agroecology is not only for the bees but for the ecosystem in general, for Mother Earth and for us as human consumers of the food generated by agriculture. Of course, agriculture based

more on agroecological principles would be more respectful of the environment and of biodiversity in general, it would contribute to curbing climate change, and it would lower the contamination of the groundwater table, and so we would be consuming water that is much cleaner. But it would also generate food, vegetables, and animals, that are healthier and free of all contaminants like pesticides or hormones that are used a lot in animal husbandry. The agroecology proposal would be, in the medium or long term, obviously providing the benefits that we as humans need.

Similarly, honey producer and exporter, Federico Berrón, an important supporter of Mayan beekeepers' struggle, was interviewed in *Maya Land* and suggested that a world that gives priority to the bees is not only healthier, more diverse and happier, but also more productive:

Let's say, if we protect the bees in the first place, we will have more biodiversity. We will create the space for observing what other bees are doing, which we haven't observed here in America. We import bumblebees to pollinate crops like tomatoes, for example. We brought bumblebees from Holland, because here our native bees are damaged and unable to pollinate our tomatoes. So, if we conserve the bees, not only the ones that make honey but all the pollinators, we will surely have a big impact on the productivity of food.

Another important ally of *Melipona* bees, and of Mayan relationships with these bees, that we meet in *Maya Land* is Stephane Palmieri, director of Melipona Maya Foundation, who believes that learning from bees amounts to the science of biomimesis, and that this learning is needed to build a sustainable future economy:

We think that one of the linchpins of future development will be in biomimesis.

Biomimesis considers nature as a library, so it is an inexhaustible source of learning. In this case, in this huge library of nature, we have the bees. And the bees have developed incredible strategies. We are always learning from the bees. It is a book, a magnificent book where we can learn many things without destroying it.

The search for the wisdom of nature encourages local and international scholars, activists, and politicians to learn from indigenous people who have studied this wisdom for millennia. This happened in Yucatán, where bees mediated political organization and learning that revalued the knowledge of the Mayas. One of the most thought-provoking aspects of Mayan survival and prosperity on their land is that their struggles are mediated by their historically grounded relationships with the environment. While the Mayas struggle to maintain their way of life, they do so in the interest of their bees, their forests, water, and maize. The interspecies character of Mayan culture and wisdom that has lasted for millennia—the relationships with bees, plants, and animals—also functions as a political advantage. This indicates that various actors and organizations, including, ultimately, the Mexican state, perceive the need to rethink and redesign human relationships with the environment for the sake of the future. Paradoxically, extending our future as a species on the planet may mean learning from other species and re-establishing our relationships with them in ways that change our anthropocentric economy. The vision of a future with a past that Maya people defend is one where interspecies relations matter and a bioculture ethically considers all life, guaranteeing our mutual health and wellbeing. A future with a past is a future in which bees, forests, water, maize, humans, and our relationships with them will not be lost.

Funding: This research received no external funding.

Conflicts of Interest: The author declares no conflict of interest.

Notes

- ¹ *leep Dealer* is in fact inspired by *Maquilopolis* Dir. Funari and de la Torre (2006), also shot in Tijuana, and tells the story of how a city of sweatshops on the US border drains the bodies of its workers while all the benefits are experienced elsewhere.
- ² For more about this story, see Gómez González (2016), and Suryanarayanan and Beilin (2020).
- ³ Mennonites arrived in northern Mexico from Canada in the 1920s, leaving the country in protest against the secularization to which they were subjected by the establishment of the Canadian state school system. They were looking for a place that would grant them freedom from military service and oaths of allegiance, as well as the freedom to establish their own schools and teach in their language the subjects of their choice. President Obregón granted them these privileges hoping that they would in turn help to reconstruct the agriculture that had been destroyed by the Mexican Revolution. There are around one hundred thousand Mennonites in Mexico today and they are among the fastest growing ethnic groups (<https://themennonite.org/opinion/amish-growth-enriches-us/>, accessed on 18 April 2018).
- ⁴ According to Kelly Jr. James's (Kelly 1994) splendid analysis of the evolution of land property law, Article 27 of the Mexican Constitution of 1917 was the cornerstone of the agrarian reform demanded by the peasant armies of the Mexican Revolution. Article 27 declared that land, water, and mineral resources are the property of the people. That same article mandated the Government with the task of expropriation of latifundios for the sake of agrarian communities. Kelly writes that this article prompted a successful agrarian reform; "by 1988, more than three million households lived in over 28,000 rural communes called *ejidos*" (np). In 1991, aware of the approaching Nafta agreements, President Carlos Salinas de Gortari, who had written his Ph.D. dissertation criticizing the decreased productivity of *ejidos*, proposed that the Article 27 of the Mexican Constitution be modified, allowing for the members of *ejidos* to mortgage, sell or rent their plots of land. Both houses voted in favor of the modification, ending the process of redistribution of land to the *ejidos* and giving way to the transfer of this land to multinational food corporations and other buyers such as Mennonites.
- ⁵ *Maya Land* contains a long section focused on water contamination featuring an interview with the toxicologist, Angel Polanco.
- ⁶ For more about the Argentinian struggles about GM soy, see Beilin and Suryanarayanan (2017).
- ⁷ Activism against GM soy economy in northern Argentina, raised only after traditional rural culture had already disappeared, was mainly provoked by its resulting toxicity and illness. The struggle was mainly focused on minimizing damage through establishment of non-fumigation zones between human communities and GM soy fields.
- ⁸ Consultations are obligatory according to the Article 6 of Convention No. 169 of the International Labor Organization (ILO) ratified by Mexico in 1990. This convention, decolonizing in its intentions, "obliges governments to consult indigenous peoples, through appropriate procedures and through their genuine representatives, whenever it is considering measures which may affect them directly" (Henriksen 2008, p. 20). Consultations must be led if developments disturb indigenous people's institutions (33) among which are traditional practices such as hunting, beekeeping, and agriculture (34). This declaration represents the recognition of the historical denial of indigenous people's rights to preserve their practices and customs and attempts to remedy this denial.
- ⁹ For more about this issue, see Suryanarayanan and Beilin (2020).
- ¹⁰ GM soy growers appealed this decision. Pesticide and GM seed corporations lobbied the government until this prohibition was ultimately reverted in August 2019. Yet, again in the first week of November 2019, the newly nominated director of a powerful state agency CONACYT (Consejo Nacional de Ciencia y Tecnología), Elena Álvarez Buylla, herself a world-renowned plant geneticist, announced her support for Yucatán bees and blamed GM soy and the current president of Mexico, Andrés Manuel López Obrador, announcing that no GM crops would be planted in Mexico by 2024. In the meantime, in Yucatán, the struggle continues.

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