Déjà Vu as Palm Oil Industry Brings Deforestation, Pollution to Amazon

Producers say their supply chains are green and sustainable, but prosecutors cite a long record of land grabbing, deforestation, pollution, and human rights violations

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Guided by an Indigenous leader, we drove down dusty roads in the Turé-Mariquita Indigenous Reserve, a "green island" encircled by oil palm plantations in the Brazilian Amazon.

Uniform rows of oil palms cover huge swaths of land here in the northeast of the state of Pará, once home to a vibrant expanse of rainforest. Our Mongabay reporting team was there to discover if the palm oil business, worth hundreds of millions of dollars, is sustainable and ecologically responsible, as industry representatives told us.

Federal prosecutors have pursued the country's leading palm oil exporters in the courts for the past seven years, alleging the companies are contaminating rivers, poisoning the soil, and harming the livelihoods and health of Indigenous and traditional peoples, charges the companies deny.

The stories of abuse we heard from our guide seemed almost unbelievable. After hearing dozens of claims of water contamination in the Indigenous villages, the local chief, Lúcio Tembé, led us to a mill run by Biopalma da Amazônia — Brazil's top palm oil producer and exporter — close to the Acará River, which meanders through the forest for almost 400 kilometers (250 miles) before spilling out into the Amazon gulf.

"Look," Tembé said, "they will throw [palm oil] residue in the river!"

Leaving our car, we watched from the riverbank, filming as unmarked trucks, and then a man with a shovel, dumped waste into the waterway. Tembé told us that the dark brown residue was a toxic sludge of organic materials, insecticides and herbicides from local palm oil mills. Every day, dozens of trucks dump this waste into the Acará River, he added.

Industry representatives would later tell us that such things do not happen, and that palm oil production isn't harmful to human health or to the environment. But the dumping we saw, as well as the rapid onset of coughing, shortness of breath, nausea and headaches when we inhaled the fumes from palm trees doused with pesticides, was enough to convince us that these claims were worth pursuing.

Over the past year we investigated allegations made by local communities of widespread abuses by palm oil companies in Brazil, discovering what appears to be an industry-wide pattern of brazen disregard for Amazon conservation and for the rights of Indigenous people and traditional communities.

"The oil palm only brought a lot of problems. First of all, it brought destruction of our fauna, our flora, our rivers," Tembé said as he looked out over the Turé River, close to the Turé-Mariquita reserve, an Indigenous territory about 250 km (150 mi) south of the city of Belém on Brazil's north coast. "This water isn't clean. But in the past we drank it. This river and the forest around it were like a supermarket for the population; it was where we fished, where we hunted."

The rights of Indigenous people and traditional communities are protected under Brazil's Constitution and international accords to which Brazil is a signatory. The Constitution also establishes that all Brazilians have the right to an "ecologically balanced environment."

But laws issued by Pará state have often overshadowed these commitments in practice. Biopalma's mill and one of its plantations lie adjacent to the Acará River and were constructed without a buffer zone as is required by law, according to documents seen by Mongabay.

Since 2014, federal prosecutors have faced a legal battle to approve a forensic investigation into pesticide contamination and the socioenvironmental and health impacts in Biopalma's production zone in the Turé-Mariquita Indigenous Reserve. "These are not minor problems faced by Indigenous peoples," Felício Pontes Júnior, one of the federal prosecutors, wrote in a legal filing in the case. "The defendant [Biopalma] is aware of the Indigenous complaints."

The claims date back to 2012, when Indigenous and traditional communities first raised the alarm. When the lawsuit was filed, a judge rapidly issued an injunction allowing a forensic investigation, but this was later overturned by another judge. The Federal Prosecutor's Office appealed and a final ruling is yet to be issued.

"The company says it has no impact. So, if it says it doesn't have [an impact] and we say it does, let's do the forensic report," Pontes Júnior told Mongabay in a phone interview in January.

Aerial view of Biopalma's Castanheira mill and palm plantation just a few meters away from the Acará River, in Tomé-Açu municipality, in northern Amazon's Pará state, on November 12, 2019. Image by Wilson Paz for Mongabay.

A troubled industry booms

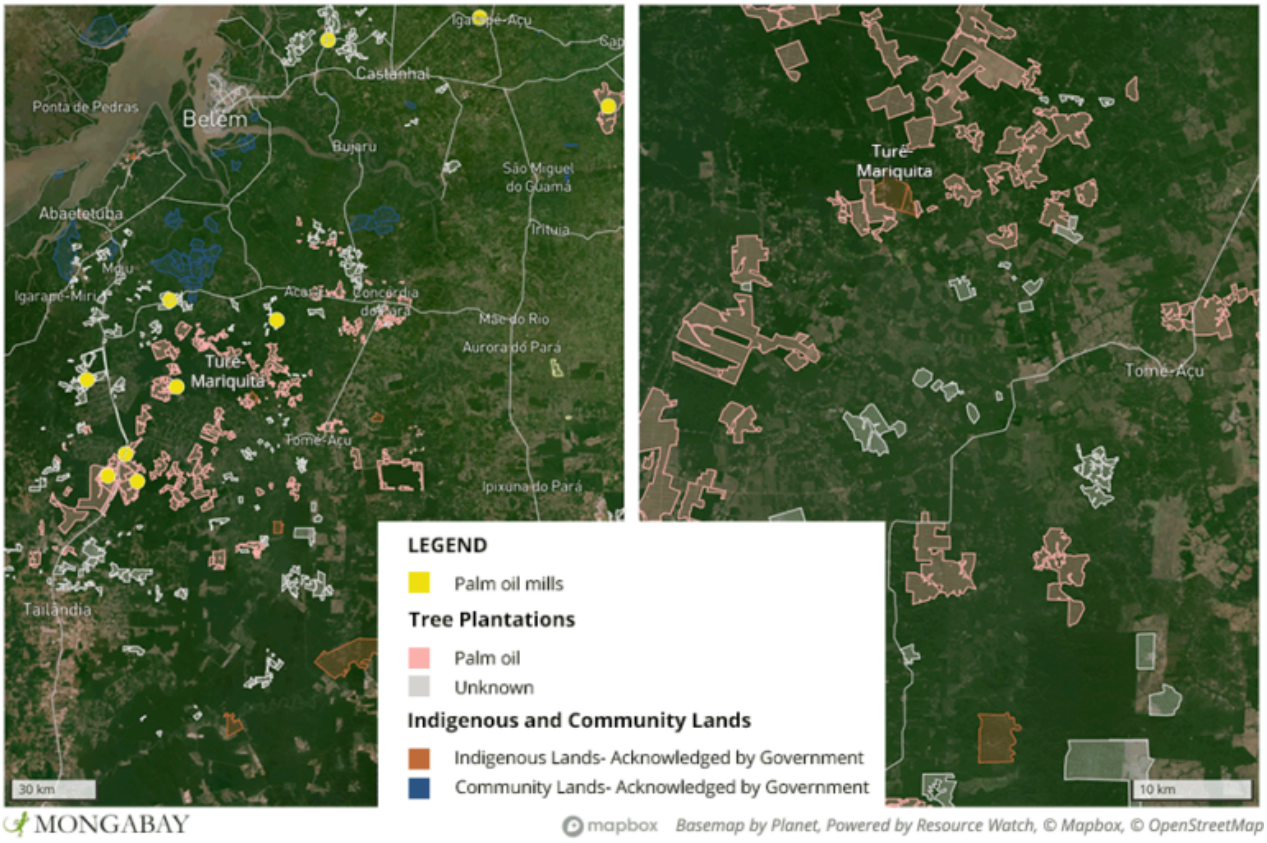
Palm oil has become ubiquitous in consumer societies. It's one of the primary vegetable oils produced and traded worldwide. That's partly because of its immense versatility: 80% of its production is channeled into the food industry, where it's a key ingredient in consumer products made by conglomerates like Unilever and Nestlé.

Though most of us will never see it in its raw state, many of us will eat it in some form today. Various derivatives of palm oil are found in chocolate, ice cream, cookies, margarine and countless other products. It's found in hygiene, beauty and cleaning items and even at the gas pump in the form of biodiesel. Rich in vitamins A and E and the best substitute for trans fats, which were banned in the United States in 2018, it is the oil of choice of global capitalism.

But researchers are growing increasingly concerned over the socioenvironmental crises its popularity has brought to many rural communities in tropical nations. The damage done to rainforests, wildlife, Indigenous peoples and water supplies in Malaysia and Indonesia, which together account for 85% of global palm oil production, is well documented, as are problems in Africa, where the industry has grown in recent years. Less studied and publicized to date are its impacts in the Brazilian Amazon.

Though Brazil accounts for just 1% of global palm oil production (about 540,000 tons in

2020), the industry is spreading rapidly here. Oil palm coverage in northern Pará — today responsible for about 90% of Brazilian production — increased almost five-fold to 236,000 hectares (583,169 acres) between 2010 and 2019. While national production dipped slightly in 2018, production in Pará rose by 47,653 tons (3.2%) over the same period.



Despite a push by the government of then-president Luiz Inácio Lula da Silva to stimulate palm oil production in 2010 by mandating its use as a biofuel, almost allBrazilian production is still used in the food industry, mostly as a soybean oil substitute. Lula also launched a national biodiesel program in 2004, and a sustainable palm oil production program in 2010, which further stoked demand.

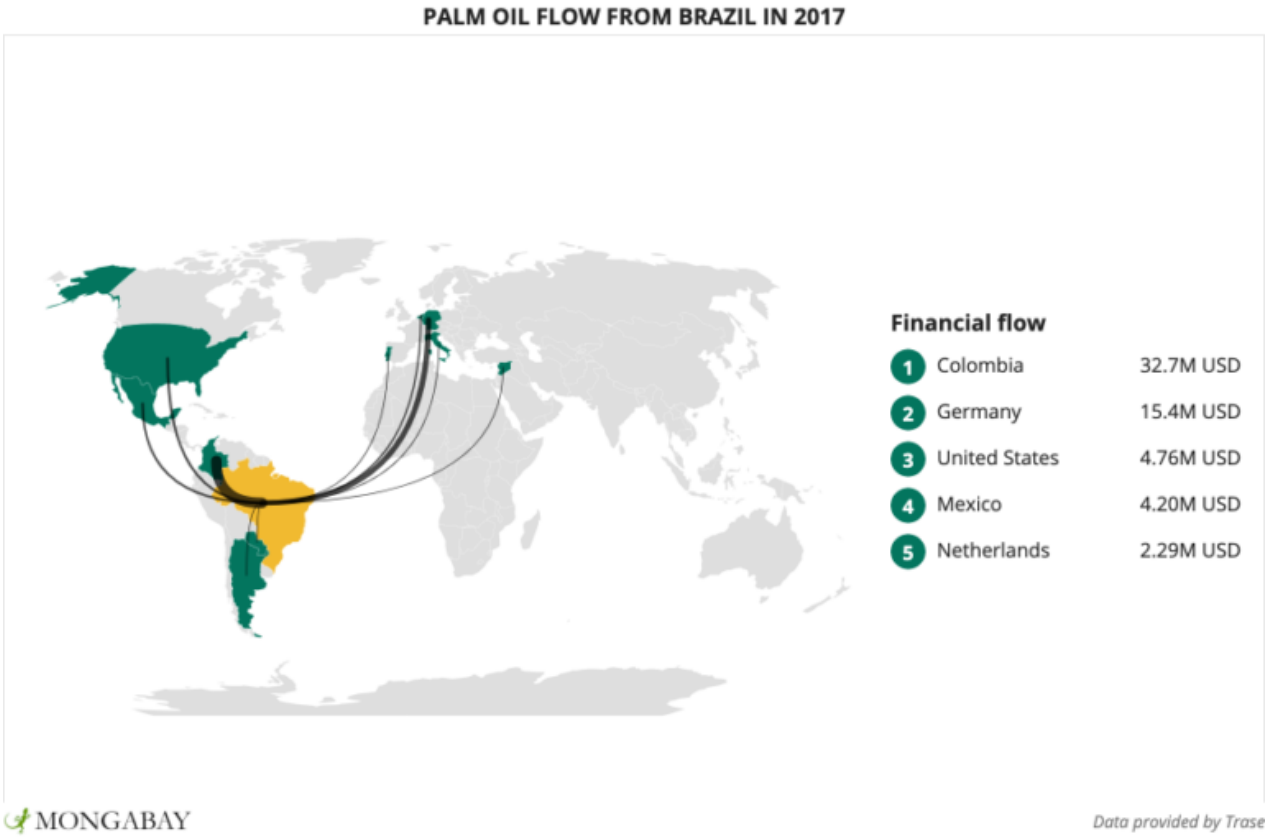
When it was launched, the sustainability policy aimed to guarantee the supply of biofuel while protecting the environment by banning deforestation in native forest areas for the expansion of corporate plantations.

Pará has the highest deforestation rate in Brazil. Although cattle ranching and soy cultivation are the top drivers of deforestation, there are increasingly concerns about the damage associated with palm oil in the region. Researchers expect a massive expansion of the Amazon oil palm crop by 2030, driven by a government target to double the proportion of biodiesel used in the country and phase out fossil fuels.

Most of Brazil's palm oil production is controlled by eight companies. The top producer, Biopalma, was a subsidiary of Brazilian mining giant Vale, which is responsible for the two most catastrophic environmental disasters in Brazil's history in terms of affected area. As part of a divestment plan, Vale sold Biopalma at the end of 2020 to Brasil BioFuels S.A. (BBF), an energy company. In a document sent to Brazil's antitrust regulator, Cade, BBF said all its oil palm is used for power generation.

Brazil exported almost 90,000 tons of palm oil in 2017, mostly to Colombia, the European

Union, the U.S. and Mexico, according to Trase, a research group run by the Stockholm Environment Institute and the NGO Global Canopy. Biopalma accounted for almost three-quarters of these exports. The company, which has operated in Pará since 2007, has announced an ambitious goal of becoming the largest palm oil producer in the Americas.



'Poisoned' water

As the palm oil industry expands in Brazil, the threat of water contamination has become a growing concern. We visited Turé-Mariquita in the Amazon's dry season, when companies spray agrochemicals in huge quantities. Activists say that in the rainy season, when river levels rise substantially and flood the land, all the accumulated toxins enter the river system, polluting the water and killing fish and other aquatic life.

We weren't the first visitors to experience the impact of the oil palm plantations. Researchers Jamilli Medeiros de Oliveira da Silva and Brian Garvey told us how they had bathed in a stream near the Acará River where it flowed past a pesticide-drenched field.

"Our skin itched and we stayed sick for two, three weeks," says Garvey, a researcher with the University of Strathclyde, in Glasgow, Scotland. "Several studies show that the water is contaminated. We witnessed them [Biopalma staff] dumping poison just a few meters from the river."

A 2014 analysis by a federal laboratory under the umbrella of the Ministry of Health identified banned pesticides like endosulfan in rivers and streams near oil palm plantations in the Acará region. Researchers collected data from 18 aquatic locations and identified the presence of pesticides in 80% of samples collected during the rainy season, with some agrochemicals linked to hormonal disorders and cancer.

There's no lack of anecdotal evidence regarding pesticide poisoning. "My husband's aunt

died of cancer," Indigenous leader Uhu Tembé told Mongabay in the Yriwar village. "We say that's because of this [oil palm-linked pollution], because these diseases didn't exist in our village before. And today there is a lot of disease in our village … In the summer, we have a lot of headaches because that's when they [the companies] throw poison."

Cíntia Tembé, another resident of the Turé-Mariquita reserve, speaks of witnessing a previously healthy young man, whose job it had been to spray chemicals over the oil palms, fall ill and die in the local hospital. "He arrived there with exaggerated pain in the abdomen," she said at his home in the Arar Zena'i village. "It was terrible. Blood started to come out of his ear, nose, eyes … as if something had burst inside him."

Brazil is the largest consumer of agrochemicals on the planet, purchasing about a fifth of all pesticides produced globally. Dr. Peter Clausing, a toxicologist at the Pesticide Action Network (PAN) in Germany, said four out of nine pesticides approved for use in oil palm plantations in Brazil are listed as "highly hazardous." Two of them — glufosinate-ammonium and methomyl — are banned in the European Union.

Waste generated during palm oil production contains a considerable amount of organic nutrients and heavy metals that can contaminate rivers, pollute the air and generate greenhouse gases. The effluent is typically released into rivers as a cheap and easy disposal method, according to Clausing.

Alleged palm oil residue being dumped in the Acará River, close to Biopalma's Castanheira mill in Tomé-Açu municipality, northern Amazon's Pará state, on November 12, 2019. Image by Thaís Borges for Mongabay.

"My sister died of cancer because she drank water from the [Turé] river," Emídio Tembé, chief of the Tekena'i Indigenous village, told Mongabay in 2019, during our visit to the Turé-Mariquita reserve. "She died of cancer [three] years ago due to poisoned water," he added, referring to the pesticides sprayed by Biopalma. "It's been nine years since we could not drink water from the river because it's polluted with poison."

When Biopalma began planting its oil palm crop in the Turé-Mariquita area in 2010, residents told us, locals experienced a mysterious wave of chronic, debilitating, and

sometimes fatal, symptoms: headaches, itching, skin rashes and blisters, diarrhea and stomach ailments. Many of the health complaints arose shortly after drinking from or bathing in local streams and coincided with the annual pesticide-spraying season.

The accounts of the impact of oil palm pesticides on Indigenous and traditional communities are supported by a 2017 study that found traces of three pesticides (two of them typically listed among those used in oil palm cultivation) in the major streams and wells used by the Tembé people in Turé-Mariquita.

According to research from the University of Brasília (UnB), the number of reported cases of skin disorders in 2011 and 2012 increased considerably. “About a year after planting, there were many complaints of skin diseases and headaches. It was quite intense for about six months,” a local health worker told the researchers. “In 2005, the rates of skin diseases, diarrhea, flu and headaches were almost zero.”

Among the pesticides found in surface and underground water in the reserve were glyphosate-based herbicides. Glyphosate has been shown to be carcinogenic and has been banned or restricted in more than 20 nations, although not in Brazil. Also detected in samples of surface water and sediment taken by the researchers was the insecticide endosulfan, a persistent organic pollutant banned in Brazil in 2010.

“The most important scientific finding of this study is the identification for the first time, at least as far as we know from the scientific literature, of glyphosate-based herbicide residues in environmental water samples, both superficial and underground, in an Indigenous reserve surrounded by oil palm,” Sandra Damiani, the UnB researcher who conducted the study, told Mongabay. “In addition, our data also corroborates the presence of residues of other organic contaminants in the environment, this time not only in water, but also in sediment samples collected in the same water bodies studied.”

Damiani said they found contaminant residues in all six sampled streams and 40% of the wells sampled. Residue presence in groundwater samples was considered “particularly worrying” because these water sources are the only alternative to streams for Indigenous people in the area.

“We noticed a very large increase [in the number] of water wells after the company arrived,” Damiani told Mongabay. “And the presence of residues in the wells was a surprise, and it was something that caught our attention and requires great care because the [Indigenous] population uses either the stream directly or underground wells. If both have contaminants, what will they do?”

The maximum levels of glyphosate and endosulfan residues found in the water by the researchers were 45.5 micrograms per liter (µg/L) and 0.03 µg/L, respectively. While these are within the legal bounds in Brazil, they are well above the much stricter levels set by the European Union. “This is a controversial discussion,” Rosivaldo Mendes, a researcher at the laboratory that analyzed the samples, told Mongabay. “For me, the safe limit is having nothing [in the water].”

Following the disclosure of her findings to the authorities, Damiani says, she was told that the companies agreed to not use pesticides around Indigenous reserves in the future.

BBF, the energy company that acquired Biopalma, said in a statement it was unable to

assess the accuracy of the academic studies since it did not have access to the results of the analysis. The company said it "faithfully complies with the environmental standards and procedures applicable to palm oil production and is unaware of the situation reported in such a study."

Legally, the glyphosate limit for drinkable water in Brazil is 500 µg/L. "Water is [only] considered unsafe if it is above [this level]," Mendes said, adding he disagrees with this parameter.

Brazilian legislation sets no limits for any pesticide residue found in sediments, even though they could potentially contaminate crops and pose a public health risk. Damiani's sampled sediments were found to contain DDT and its degradation products at levels that greatly exceed the thresholds established by the National Environment Council, a regulatory body. DDT is banned in more than 40 countries, including Brazil and the U.S. There is no national limit on sediment contamination with endosulfan.

Damiani said they found residues of at least one contaminant in almost a third of the 33 samples collected in the Turé-Mariquita reserve, with a much higher percentage for glyphosate-based herbicides in water collected during the dry season. Two-thirds of the groundwater samples and more than a third of surface samples contained traces of glyphosate-based herbicides.

Nazaré Coutinho Pereira, a resident of the Tembé Indigenous Reserve looks over the Acará-Mirim river. Image by Karla Mendes.

Research from the Federal University of Pará (UFPA) also detected glyphosate in water samples collected in the municipality of Tailândia, another key oil palm cluster in Pará's northeast. The 2018 study also found atrazine, a widely used weedkiller, and the presence of aquatic plants, indicative of water pollution from nitrogen-, phosphorus- and potassium-based fertilizers. Its use is not allowed for palm oil in Brazil but family farmers often refer to

atrazine as one of the main pesticides used in palm crops, researchers told Mongabay.

In this region, the top palm oil producers are Agropalma, the country's second-largest producer and exporter, and Belem Bioenergia Brasil (BBB).

Agropalma is the only Brazilian company certified by the Roundtable on Sustainable Palm Oil (RSPO), the world's leading palm oil sustainability certification scheme. It is a subsidiary of the Brazil-based Alfa conglomerate, a major player in the finance, insurance, agribusiness, building materials, communications, leather and hotel sectors.

BBB previously counted Brazilian oil giant Petrobras, the firm at the center of the Lava Jato corruption scandal that landed former president Lula in jail, as one of its main shareholders. It is now controlled by Portuguese oil company Galp and Ecotauá Participações, a holding company.

The UFPA study, led by Rosa Helena Ribeiro Cruz, collected nine water samples in the tributaries of sub-basins of the Anuerá and Aui-Açu rivers. The toxicological tests, carried out by the same laboratory that analyzed the samples collected in the Turé-Mariquita reserve, found "significant levels of glyphosate," but still within the regulatory limits, from two collection points in the outflowing streams from BBB's plantations, Cruz said.

Atrazine within Brazil's regulatory limit of 2 µg/L was also detected at two points — outflowing streams from BBB site and in a community closer to Agropalma's plantations, the researcher noted — including an intersection between oil palm, corn and soybean crops. Banned in the EU, the herbicide is still often detected in water samples two decades after its use was prohibited. Atrazine is quite toxic, and potentially carcinogenic to humans, and persists in the environment, especially in water bodies.

"There is no way to say that there is no water contamination," Cruz said. "We came to the conclusion that this pesticide glyphosate is being used. But as they are pesticides that are under the ground, in the water, it will be diluted." She added that no previous data on river contamination for Tailândia were available.

No traces of pesticides were detected from collection points inside Agropalma's plantations, where the researchers were escorted by company minders.

"BBB didn't let us enter the company [plantation area], only Agropalma. But we were accompanied all the time," Cruz told Mongabay, adding that the collection points were chosen by the company. "Two people were assigned to accompany us and at the same point where we did the collection, they did it too. But then there is this doubt: I don't know if they really took us to the points where there is leaching into the soil… They wanted us to do my analysis inside their laboratory, they wanted us to stay inside Agropalma, paying for [our] lunch, coffee, dinner, all support, but we didn't accept it."

Agropalma's director of sustainability, Tulio Dias Brito, said the company does not use atrazine. He also challenged the research, claiming that the points where Cruz detected atrazine do not have any connection with Agropalma's area.

“They are far from Agropalma and … they are upstream… So, there is no way, even if I had sprayed… an atrazine truck at a stream of Agropalma, it would not reach this point,” Brito told Mongabay in an interview in February.

Geographer Daniel Sombra, coordinator at UFPA’s Laboratory of Environmental Analysis and Cartographic Representations, disagrees. Although the natural watercourse is upstream, he said, it could also flow downstream, given the high level of variation of the tides of the Amazon rivers.

“[This point] is 2 km upstream on the Aiu-Açu river… It may be that they [the pesticides] came from upstream plantations, which are from other properties, including family farms cultivating oil palm, some linked to BBB. But it is not impossible that the effects deposited downstream could move 2 km upwards,” noted Sombra, who built the maps for Cruz’ thesis. “So, it is undetermined whether it really came from upstream or downstream. The fact is: the pesticides collected are typical residues of palm monoculture.”

Brito also challenged the research’s allegations about the presence of aquatic plants as indicative of water pollution from nitrogen-, phosphorus- and potassium-based fertilizers, claiming that the photos from the study didn’t show any macrophyte superpopulation; the existence of many factors in the area could have triggered macrophyte growth, including sun incidence and a nearby road, while laboratory testing for these substances was lacking. Brito also argued that none of the collection points are close to Agropalma, adding that other factors should be taken into account.

Brito says Agropalma has collected water samples from the outflowing streams and within its area as well to check the presence of phosphorus and nitrogen at eight pre-selected points since 2015, as one of the requirements of the Palm Oil Innovation Group (POIG), an industry group. The results of the sampling are recorded and published in the company’s annual sustainability report.

“When comparing streams that cross the palm plantation, we compare them with streams that only cross primary forests,” Brito said. “The species composition is not exactly the same: some populations are favored, others are disadvantaged, but the ecological function is fulfilled. And the water quality is adequate, it is good.”

Moreover, he said that Agropalma has monitored watercourses within its farms in partnership with NGO Conservation International and UFPA’s department of biological sciences, which monitor water quality and aquatic fauna on company property. “So far, we have not received any indication of contamination,” he noted. He also cited a UFPA study that found that oil palm plantations “appear to be one of the least deleterious for native fauna” compared to the different options available for use of soil in the Amazon basin.

According to Brito, Agropalma only uses herbicides, mostly glyphosate, but is testing other compounds. “Our mission is not to use [glyphosate] anymore,” he said. “But it is very difficult because we have to keep the crown of the plants clean. And we also publish every year the amount of active ingredients that we use.”

Smallholders quoted in Cruz’s research said that glyphosate, known locally as mata-mato, was the main pesticide used in oil palm cultivation in Tailândia, even though they said the risks are unknown.

Brito said Agropalma only provides glyphosate after carrying out the due training with farmers.

In a statement, Gilberto Cabral, a BBB spokesman, said the company observes “the best practices applicable in environmental terms” and “without substantial change in land use.” According to him, the trees were planted between 2011 and 2015 in areas that had been used as pastures or areas that were already degraded before 2005.

However, he noted, Tailândia’s land is also used by independent palm producers and by producers of other crops, such as corn and soybeans, “with recurrent use of pesticides in all areas sown.”

As a means of environmental monitoring, Cabral said, the company periodically analyzes surface waters, upstream and downstream, and underground, in order to detect any changes.

“The company strictly observes the dosages and other instructions expressed on the labels and package inserts of the few pesticides it uses, since we prioritize preventive, mechanical (brushing) and biological (Bacillus thuringiensis) means of control on a large scale,” he wrote.

Roberto Yokoyama, the head of the Brazilian Association of Palm Oil Producers (Abrapalma), said if the contamination of watercourses has indeed occurred in Pará, there should be an official investigation.

Yokoyama challenged Cruz’ research, claiming the levels of atrazine found in watercourses and the fertilization period were misrepresented. He also challenged the methodology used by the researcher and argued that the study did not present evidence that proved palm oil plantations were the source.

“The data and results that the master’s thesis presents, in fact, do not indicate that oil palm

plantations were responsible for the application of atrazine and glyphosate in their plantations," Yokoyama wrote.

Aerial view of palm crops in Tomé-Açu municipality, in northern Amazon's Pará state, on November 11, 2019. Image by Wilson Paz for Mongabay.

Scientific evidence of health impacts

Several studies provide evidence of the harmful health impacts of the contaminants found in Turé-Mariquita and Tailândia. Endosulfan levels of 0.01 µg/L (a third of the concentration found in the water in Damiani's study), for example, have been shown to be lethal to fish. Studies also detected serious health issues linked to exposure to DDT, diuron and glyphosate-based herbicide residues. There is also growing evidence for atrazine's carcinogenic potential.

Another concern is the possible proliferation of cyanobacteria and the generation of cyanotoxins in streams containing glyphosate-based herbicides. Cyanotoxins are powerful natural poisons, and some can cause rapid death by respiratory failure.

The regulations governing the use of pesticides in Brazil apply only to the active ingredients, and fail to consider the toxicity of the complete formulation, as well as the interaction between contaminants, whose health impacts can be worse but are often not studied or poorly understood. Lab tests using human cells have shown that glyphosate formulations can be up to a thousand times more toxic than just the active ingredient alone, which means that individual analysis of active ingredients can underestimate the risks to living organisms.

Brazil banned the use of endosulfan in 2010 and DDT in phases from 1985 to 2009, citing their high toxicity and the capacity for bioaccumulation and persistence in the environment. Both are considered persistent organic pollutants under the Stockholm Convention, a global treaty.

It's thought the DDT found in the Turé-Mariquita samples may have originated from its widespread use to control malaria-bearing mosquitos in the Amazon.

At least seven herbicides and 16 insecticides are currently used in oil palm cultivation in Brazil and other countries that grow the crop. Damiani notes the lack of transparency regarding agrochemicals used by Brazilian palm oil companies, as well as the amounts and periods of application — a lack of publicly available data that could potentially conceal much higher exposure of Amazonian communities to oil palm pesticides.

Damiani obtained access to pesticide data collected by prosecutors from Biopalma and other palm oil firms. “Scientific research corroborates the Tembé’s claims,” she said. But “this data we obtained is [just] a snapshot of a reality that requires more frequent monitoring.”

Another study in 2014 by the Instituto Evandro Chagas (IEC), the federal laboratory that carried out the testing for Damiani’s and Cruz’ studies, found endosulfan residues and cyanobacteria, but no pesticide residues, in another oil palm-growing area. According to Mendes, the lab researcher, further systematic analysis of the impacts of oil palm plantations’ pesticide use in Pará is needed, but previous attempts to secure funding have failed.

While the Turé-Mariquita Indigenous Reserve’s residents can point to Damiani’s study to corroborate their claims, their neighbors, including in the Tembé Indigenous Reserve, have voiced similar contamination and disease concerns, but lack any scientific evidence to support their accounts.

Their ancestral lands abut oil palm plantations owned and operated by BBB. The reserve’s Indigenous inhabitants say BBB is shirking its obligations by denying the existence of a tributary of the Acará-Mirim River that runs inside one of their oil palm plantations. Mongabay visited the area and verified the existence of a river inside the property.

In the nearby village of Acará-Mirim, Funai, the federal agency for Indigenous affairs, has set up a water supply system at the center of the community. But it doesn’t reach Nazaré Coutinho Pereira’s house by the banks of the Acará-Mirim River. “We keep drinking this water because there’s no [other] option,” Pereira said. “We consume a lot of water to drink, to wash, [but] the body always becomes itchy and we need to take medicine.

“[When] we fill a can with this water, in a few hours we can see a finger of mud in the bottom of the pan,” she added. Come the rainy season, she said, “all the poisons, all the dirt comes … dead animals on top, oxen, horse, they throw everything in the river … and we drink the juice from it all.”

Pereira said she has experienced symptoms including diarrhea after drinking the once-clean river water, something that didn’t happen in the past. “I feel my stomach get big, it gets full, unwilling to eat,” she said. “I also have urinary infections very often.” Residents who drink from Funai’s water supply also describe similar symptoms, she added.

In a statement, BBB denied the use of pesticides, saying it only used “mineral fertilizers that contribute to the growth of plants, both cultivated and native.” The company acknowledged the existence of a river called “Rio Pequeno” near its farm, but said that its plantations “are within a regulatory distance from this water body.”

It added its technicians are investigating the situation, including “rigorous analysis of all water bodies near the plantations.” The company said it received on February 18 a

complaint from the Tembé Indigenous Association of Vale do Acará about the carrying of liquid effluents, distributed in the planting plots as complementary organic fertilizer, for streams that flow into the river that serves the community in which they live.

A decade-long legal battle

Local communities have frequently pursued legal action against Brazil's major palm oil players. Biopalma has been targeted by the Tembé people of the Turé-Mariquita Indigenous Reserve and by small farmers and Afro slave-descendant quilombola communities.

The Tembé say they were not properly consultated before Biopalma's oil palm venture got up and running. "We were not listened to for this project; when we saw it, the project was already established around our territory," Lúcio Tembé, chief of the Turé Indigenous village, said. Pontes Júnior, the federal prosecutor, points to a loophole in Brazilian law that requires a buffer zone of 10 km (6 mi) and a socio-environmental impact study for ventures around conservation areas, but not around Indigenous reserves.

For large development projects, like dams, such a buffer zone is also mandatory for Indigenous reserves, given the potentially harmful impacts of these types of developments. But palm oil plantations are considered an "agrosilvopastoral culture" with "low polluting and degrading potential" by the state environmental council, and so are not required to go through the same licensing process, instead qualifying for a simplified licensing process.

Brazil is a party to international conventions that require consultation with, and consent by, Indigenous and traditional communities who will be impacted by major development projects. In this case, however, there was no prior consultation, and the impact was not assessed, Pontes Júnior said. "Everything depends on [getting] this forensic report. From this forensic report, a series of other actions will be triggered… [But] without this forensic report I have my hands tied in this action," he said.

In a statement, the Federal Circuit Court for the First Region in Brasília said a ruling may be made in March.

Another enabling factor in the oil palm industry's environmental violations can be found in the plantation licensing process. In Pará, the state government didn't acknowledge the presence of Indigenous or traditional communities when granting licenses for oil palm cultivation, prosecutors say.

The Turé-Mariquita reserve, for example, was demarcated in 1991, 16 years before Biopalma arrived in the region. The Tembé themselves have been present in Pará since the second half of the 19th century, when they were forced to migrate from neighboring Maranhão state.

Since their first recorded contact with Portuguese colonizers in 1615 in Maranhão, the Tembé have had to face forced proselytization by missionaries, slavery, infectious diseases, persecution, conflict, and extreme droughts that devastated the land. A branch of the Tupi-Guarani family, they called themselves Tenetehara but in the migration process came to be called the Tembé in Pará; those who remained in Maranhão are called the Guajajara.

The presence of several quilombola settlements, or quilombos, also dating back more than a century was similarly ignored during the licensing process. State and federal prosecutors say this renders the process invalid, given the lack of attention paid to the impacts on these

communities. Pontes Júnior and state prosecutors Eliane Cristina Pinto Moreira and Raimundo Moraes have also called on the Pará state environmental council, Coema, to reform its palm oil licensing policy to introduce more regulation, but the requests have been rejected.

Researchers at UFPA have found that Biopalma's Castanheira processing mill, next to the Acará River, received two separate licenses — one from the municipality of Acará and one from the state — yet neither defines any buffer zone requirements. "The conditions are ridiculous, i.e., annual reports of activities, something that the legislation already establishes... The environmental authority simply relies on the companies' self-monitoring procedures," lead researcher Elielson Pereira da Silva told Mongabay. He added that the environment secretary in Acará had only shown him the documents on condition he not make any copies or photograph them.

In a statement, Pará's Secretariat of Environment and Sustainability (Semas-PA) said it carried out inspections from May to December 2019 in six municipalities, including Acará and Tomé Açu, and at the time "there were no violations of current environmental standards."

In relation to the pollution of watercourses, Semas-PA said it plans to inspect the area; there are also scheduled inspections for Tailândia's oil palm farms, but monitoring rivers and streams within Indigenous Reserves is the responsibility of the federal government, it added.

Brazil's Ministry of Health, Funai, and the municipalities of Acará and Tailândia did not respond to requests for comment for this story.

'Desperate' strategy to be heard

Brazilian companies like Biopalma portray their operations as sustainable to consumers in Latin America, Europe and the U.S. But palm oil companies the world over have long been accused of destroying traditional livelihoods, leaving poverty and social deprivation in their wake. In Pará, the industry has left many Indigenous and traditional residents feeling estranged from their culture, which is deeply intertwined with the natural world.

By 2019, Biopalma's plantations had encircled the Tembé's lands, and local resistance morphed into campaigns of direct action against the company. Tired of nearly a decade of fruitless campaigning for compensation through official channels, the Tembé took direct action, seizing company vehicles in the hope of forcing Biopalma to hear their concerns. Uhu Tembé, an Indigenous leader, told Mongabay how she and her husband seized a Biopalma tractor during the protest and used it to bulldoze oil palm trees near the village of Yriwar in the Turé-Mariquita reserve.

"We have been asking for [Biopalma's] help for a long time to clean the area so we can plant; they never answered. Then we decided to get their machinery to do it ourselves ... because we've been asking them for ten years," Uhu said, pointing to the tractor that sat outside her home for three months. "We are cleaning it up here to plant our cassava, corn, rice. We don't eat this here," she added, pointing to oil palms. "They did not respect our land, our area. That's why we feel outraged."

Frustration with palm oil companies has grown across the region over the last years, and the

seizure of company property by the Turé-Mariquita residents is not an isolated case.

Like the Indigenous communities, the quilombolas have also protested against Biopalma, blocking roads to call for development assistance. But such actions may have provoked violence, including the murder of a quilombola leader in 2018, and an arson attack on the home of another.

The Mongabay team visited the village of Acará-Mirim in the neighboring Tembé Indigenous Reserve the day after residents had seized tractors and a car from BBB. Indigenous leader Valdevan Evangelista dos Santos Tembé said their goal was to force a dialogue with the company, and that they would return the vehicles once an agreement was reached. In the meantime, residents used the machinery to prepare the area to plant crops.

“All Indigenous leaders in Acará-Mirim and Cuxiu-Mirim villages agreed to do this protest. We agreed to put on war paint [over] our bodies, take our bows and arrows and seize the company’s … tractors,” Valdevan Tembé said. “What was our objective? To bring the company’s manager to our village to talk to us and sign an agreement. We would only give them back their machines after they start the construction works they promised us.”

The protests have had some successes. For Valdevan Tembé and his neighbors, BBB committed to conducting a social and environmental impact study to determine if the plantations had damaged the Indigenous communities. BBB said the study was contracted and is being carried out at the moment, with completion expected for the first semester of this year to be “the basis for the adoption of measures to mitigate any impacts.”

BBB also made some improvements to the road requested by the Acará-Mirim villagers, Lúcio Tembé said.

In Turé-Mariquita, Biopalma went to court to get its machines back. The villagers handed them back three months after seizing them, with the company agreeing to pay each community 30,000 reais (about $5,600) quarterly for three years to finance local development projects, according to Urutaw Turiwar Tembé, chief of the Yriwar Indigenous village. “It is not enough for us, but it was what they gave us. We fought for more, but we failed,” he said.

But none of these projects have been completed so far, Urutaw Tembé said, due to higher costs amid the COVID-19 pandemic. According to him, instead of paying the quarterly amount, Biopalma only paid annually.

The Indigenous have tried to seal a new deal to replace the amount for the obligation for carrying out the projects, regardless of the amount but “it became very complicated to negotiate” after Biopalma’s sale to BBF, Urutaw Tembé noted.

In a statement, BBF said its relationship with Indigenous communities close to palm plantation areas “is always maintained in a spirit of technical and social cooperation” under agreements made last year that included providing clean drinking water, ensuring food security, and educational and cultural schemes.

November 2015 saw the first major mobilization of Indigenous people, quilombolas, ribeirinhos (traditional riverside dwellers) and residents of neighboring communities against the palm oil firms. About 140 people came together and occupied Biopalma’s Vera Cruz headquarters, paralyzing the company for 11 days.

The protest began when Biopalma started operating a ferry on the Acará River, close to the Vila Formosa quilombola community. The quilombolas asked if they could also use the company ferry to travel to other communities or even to the city, but were rebuffed, leading to the occupation. Days later, a judge intervened and the protesters left peacefully. Biopalma denounced the occupation, alleging its property had been looted, and a judge in Acará ordered the arrest of the leaders of the associations involved in the occupation. One quilombola leader was jailed for eight months.

However, in a counterargument of appeal signed in early 2020 in defense of the Tembé's November 2019 protests against Biopalma, federal prosecutor Felipe Moura de Palha e Silva said the demonstration was a legitimate act of Indigenous resistance made in response "to the years of illicit conduct by the company, which severely damages their health," and was carried out "in a desperate attempt to at least be heard [in] a dispute over Indigenous rights."

The prosecutor encouraged both sides in the conflict to engage in mediation over Biopalma's omission of environmental impacts and the need for corrective environmental licensing, among other points of contention. "For these issues, the company omits and tries to criminalize the demonstration of the Indigenous people through lawfare and police procedures," Silva wrote.

In a statement, Biopalma said it filed a repossession suit given "the repeated undue seizures of agricultural machinery" through "serious threats like wielding melee weapons against Biopalma employees."

Residents of Yriwar village watch Biopalma's seized tractors knocking down palm trees a few meters away from their house. Image by Thais Borges.

Fewer game animals, more pests

The arrival of the oil palm plantations in the Amazon has driven out the wildlife that

Indigenous and traditional communities often hunt for food and ushered in an influx of disease-carrying insects and venomous snakes, the communities say.

Before the plantations encircled the reserve, “we [easily] found, very close to here, paca, armadillo, a lot of fish,” said Nazaré Coutinho Pereira from Acará-Mirim village. “Hunting has changed because there are no more [animals]. It is difficult for us to find [animals to hunt] … There’s nothing else [left], neither hunting nor fish.”

In Yriwar village, residents say game animals like tapir and tortoise have disappeared since Biopalma arrived. And even when they do catch animals, they are afraid to eat them due to the risk of pesticide poisoning. The few animals that remain, such as foxes, reportedly also suffer symptoms such as hair loss, while many others have been found dead from no obvious cause, according to Lúcio Tembé.

The cultivation of oil palms close to Indigenous reserves affects livelihoods and lifestyle quality in other ways beyond depriving residents of hunting and fishing. Urutaw Tembé said they have seen an increase in the number of insects and snakes.

The plantations “touched our territory [and] didn’t respect the buffer zone. This has brought us a lot of damage today: insects, lizards … that we had never seen [before]. Venomous snakes, many snake species … flies, flies that bother us. It ends up hurting the children’s bodies, triggering allergies,” he said.

According to Indigenous residents, the swarms of pests are caused by the loss of native vegetation and the large number of rodents attracted by fallen palm leaves. The snakes, in turn, are drawn by the abundance of the rodents, posing a serious health threat to residents, for whom the nearest clinic is an hour’s drive away and the closest hospital about four hours away.

Urutaw Tembé also complained about the damage caused by the planting of pueraria (*Pueraria phaseoloides*), a crop in the pea family that is used by the oil palm companies to fix nitrogen in the soil, control weeds, and reduce erosion. The Tembé say it attracts insects during the dry season that burrow beneath the skin, causing rashes.

Indigenous chief Lúcio Tembé poses for a photograph in front of Biopalma's Castanheira mill, just a few meters away from the Acará River, in Tomé-Açu municipality, northern Amazon's Pará state, on November 12, 2019. Image by Thaís Borges for Mongabay.

Forests replaced by palm crops

Biopalma has said in the past that it established its plantations only on already cleared land, but Indigenous residents and researchers dispute this.

Sandra Damiani from UnB, who investigated the pesticide use in the area, said she found evidence of about 300 hectares (740 acres) of deforestation for oil palm around Turé-Mariquita, where old-growth forests were felled as loggers first encroached, followed by agricultural settlers, a mining company whose pipeline crosses the reserve, and finally by Biopalma.

Studies have shown that the conversion of forests into oil palm plantations is a major problem, not only locally, but across northeast Pará. Research suggests between 9%and 39% of oil palm production occurred in deforested areas in Pará between 1989 and 2014, raising concerns about future expansion. This casts into doubt Biopalma's claim, and that of other companies, that their oil palm production stems only from previously cleared land.

Another study found that 40% of oil palm expansion in Pará had replaced woody vegetation, despite the government's ban on oil palm plantations expanding into forests and lands deforested before 2008.

The use of heavy machinery on the plantations also has an impact on biodiversity by scaring off game animals, Damiani said. The reduction in both abundance and diversity of animals was noticed immediately by Indigenous people after the planting of palm oil crops bordering their land, she said. Numerous bird species, for example, were no longer seen after the conversion to oil palm.

The native vegetation in the now-deforested territory outside the Indigenous reserve was important for the community to collect non-timber forest products, including herbs and honey that are used as medicines, vines for making of utensils, seeds for handicrafts, and fruits such as *pequiá* (*Caryocar villosum*), *uxi* (*Endopleura uchi*), *bacuri*(*Platonia insignis*) and *bacaba* (*Oenocarpus bacaba*).

The Indigenous people initially welcomed the increased access to urban centers that the new roads laid by Biopalma facilitated. But the roads also increased exposure to outsiders, making them feel that they were losing control of their territory. Another consequence of more roads has been an increase in illegal logging in the area. Numerous studies in the Amazon have identified road construction as an important vector of deforestation, and the Mongabay team regularly saw trucks loaded with timber passing through the area.

In a statement, BBF said it has identified "the role of illegal deforestation gangs in areas close to its farms" since it took control of Biopalma in November 2020 and had reported the allegations to the authorities. It added that palm oil crops were "planted in the parcels of land authorized under the terms of the applicable environmental legislation."

Truck loaded with palm oil fruits in Tomé-Açu municipality, northern Amazon's Pará state, on November 12, 2019. Image by Thaís Borges for Mongabay.

Deforestation in quilombola areas is also occurring as the direct result of oil palm expansion. Nearly 4,800 hectares (11,900 acres) of forest was cleared between 2007 and 2018 to make way for oil palms in the municipality of Acará, according to research by Jamilli Medeiros de Oliveira da Silva at São Paulo State University (UNESP). The study looked at satellite imagery from Mapbiomas — a network of NGOs, universities and tech firms that include Google — and crosschecked them with NASA's Landsat 5 and 8 data.

This further disproves the companies' and government's claims that oil palm plantations were established only on previously cleared land.

In 2010, the federal government launched an agroecological zoning program for palm oil cultivation in deforested areas in the states that make up the Brazilian Amazon. Called ZAE-Dendê, it offered benefits to palm oil companies for meeting certain sustainability requirements. But as Damiani and da Silva found in their research, some areas were deforested and overlapped onto traditional quilombola communities.

Adriano Venturieri, the researcher who led the palm oil agroecological zoning program, said the quilombola communities were not considered because their presence was not formally acknowledged at the time. He added the program may be updated at any time to include this data.

Quilombolas affected

Like the Indigenous communities impacted by the plantations, the quilombola communities in Acará — the third-largest palm oil-producing municipality in Brazil —complain about similar issues arising from the plantations, including deforestation, reduced water levels in their streams, and pesticide pollution.

"They wanted to plant oil palm here. We did not allow it," José Renato Gomes de Gusmão

told Mongabay at his home in 19 de Massaranduba, a quilombola village in the Tomé-Açu region. “People who live close [to the palm plantations] got sick [with] too much poison. The waters are gone, with so much poison that they throw. The streams are all gone.

“I don’t like it,” he added. “The palm brought a lot of income, a lot of jobs… [But] it is not healthy.”

Researchers Brian Garvey and Jamilli Medeiros de Oliveira da Silva said they heard similar stories of water contamination in quilombola communities close to the Acará River. In 2016, a palm oil spill in the river left a yellow slick on the water’s surface for more than a week. Quilombola communities including Vila Formosa village, where the protest over Biopalma’s ferry began, were devastated as the fish they relied on died out. Since then, fish catches have declined, and even the river dolphins have disappeared, residents say.

In 2019, two palm oil spills near Agropalma’s plantations in Tailândia polluted the Acará River and its tributaries. The company’s director of sustainability, Tulio Dias Brito, said all of the oil was collected and the impact was “virtually nonexistent.”

“We have the floating barriers that surround oil in the river … We managed to surround the oil there and we managed to collect it to the last drop,” he told Mongabay. “No fish, no tree died. So, there was no environmental impact. Although the volume was a few tons of hollow oil, which is a relatively large volume, the environmental impact was zero, objectively speaking … We have all the proof: the photo before, the photo after.”

Elielson da Silva from UFPA visited the area in the days after the second oil spill in October 2019 and documented the environmental impacts, including water contamination and the death of animals and fish. “There was contamination. I was there. I photographed people, I witnessed the [damages of the] oil spill,” he told Mongabay, adding that residents said that there were three oil spills that year.

Water contamination issues derived from both pesticides and oil spills have been faced by quilombola communities close to Agropalma’s concession for several decades, but the situation worsens each year, especially the degree of fish contamination, a quilombola, who talked on condition of anonymity after receiving death threats, told Mongabay.

“The water is muddy, it’s dark; it’s so dark that we cannot have any visibility,” the source said.

After the 2019 oil spills, the source noted, one of the main impacts was scarcity of fish. The fishes are only coming back now, the source noted. “The fish eat the palm oil; it fills its belly. Then you go fishing, when you open the fish, where its tripe ends from its gills, everything is full of oil palm… The oil hardens inside the fish… The fish dies with that inside.”

Photographs from an environmental inspection released by Tailândia municipality and seen by Mongabay corroborate the allegations of negative environmental impacts from Agropalma’s oil spill. The document, dated May 2019, ordered that steps be taken to repair the rivers and streams.

In a statement, Semas-PA said it had recorded an infraction notice against Agropalma, without providing further details.

Palm fruits stored on the road in Tomé-Açu municipality, northern Amazon's Pará state, on November 12, 2019. Image by Thaís Borges for Mongabay.

Community-wide impacts

During our investigation, we witnessed how the oil palm plantations impact the daily lives of people living in the wider Pará community — at a school, for example, which was surrounded by palm trees. Although the companies say the agrochemicals they use are not toxic, this particular school endured a forced three-day closure while the firm was spraying, residents told Mongabay.

"There was no class for three days [and] no one could pass through the area," said Alex de Oliveira Pimentel, a local farmer. "[The company] said [the pesticide used] was organic, [that] it wasn't unhealthy… But the requirement was that nobody could pass through the area for 48 hours."

Aerial view of a school completely surrounded by oil palm plantations in Tomé-Açu municipality, in northern Amazon's Pará state, on November 13, 2019. Image by Wilson Paz for Mongabay.

Beyond the contamination of the soil and water, Pimentel said farmers have lost their crops due to the spread of pests and disease from the palm plantations, including butterfly infestations destroying fruit crops like dragon fruit and cashew.

When the big agribusiness companies first came to the Tomé-Açu region, they approached several small farmers with an offer to lease their lands for oil palm cultivation. Some resisted, unwilling to turn over their land to grow a then-unknown crop.

Among them was José Edimilson Ramos Rodrigues, one of many farmers in his community who rejected the lease offer. But that has not stopped the community from feeling the impact of the plantations, which now surround them. The residents have regularly complained about water contamination, reduced fish catches, and animal deaths since the oil palms were planted close to the river.

Rodrigues said he has noticed some changes in local crops, including a vine that now grows in coconut trees and which he said didn't exist before. He said the damage done far outweighs any benefits from the lease offer. "There's no way. What we must do is try to avoid … so that it won't happen again," he said.

Lax agrochemical controls

The spread of pesticide use in Indigenous and traditional communities has once again shone a light on the lax regulatory climate governing the sales and use of harmful chemicals in Brazil. Only one company is officially approved by Pará state to sell pesticides in Tailândia, but a thriving illegal market has flourished, selling glyphosate under the local name mata-mato. The farmers' union in Tailândia, Sintraf, told UFPA researcher Rosa Helena Ribeiro Cruz that the palm oil companies do not dispose of the packaging properly, opening the possibility for misuse later on. Proper package disposal is regulated by a federal law, which holds the farmer, vendor and manufacturer legally responsible for any such misuse.

Tailândia's farmers also said they were initially given personal protective equipment by Agropalma and BBB, but the supplies were short-lived, even though people began falling ill due to the use of pesticides.

Brito, the Agropalma director, denied all the accusations. According to him, the company collects the agrochemical packaging, which is incinerated. He said Agropalma also controls all glyphosate provided to farmers and provides appropriate safety equipment.

Cabral, BBB spokesman, said it is common for farmers to plant other crops in areas adjacent to palm groves, which are managed separately. Pesticide packaging supplied by the company is "inert and recyclable" and is collected by local companies after use; the use of appropriate safety equipment is also inspected, he added.

Sintraf also told Cruz that the use of pesticides by the palm oil firms had led many local farmers to adopt new practices, heavily reliant on agrochemical use, and abandon their traditional farming methods. This has compounded the pollution of rivers, as up to half the farmers in some communities have switched to using pesticides.

The Ministry of Health launched a health surveillance program in the 1990s for people exposed to pesticides, but the system failed to produce any reports for Tailândia, Cruz noted.

For some federal prosecutors, the problems caused by the palm oil industry's inroads into the Amazon over the past decade are a repeat of what they witnessed with the cattle, soy and mining sectors and all development projects.

"The palm oil [sector] doesn't differ at all from the other monocultures established here in the Amazon," prosecutor Felipe Moura de Palha e Silva told Mongabay. "The modus operandi follows a primer as well, which is a primer for violating the rights of communities."

In Tomé-Açú, game animals and fish were once plentiful. Now only oil palm trees grow, in some cases within meters of the Indigenous reserves.

"The palm oil company left us in a space like an egg … Only the company profits," said Urutaw Tembé, pointing to oil palms just a few feet from his home in Yriwar village. "We are dying with pesticides, with water contamination. How does a company like this come from outside to enrich [itself] on our land? We don't accept it … We will keep fighting."

Residents of the village of Acará-Mirim in the Tembé Indigenous Reserve use with seized tractors from palm oil company Belem Bionergia Brasil (BBB) on November 14, 2019. Image by Karla Mendes

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Featured image: Harvest time at a palm oil plantation in Pará, Brasil. Photo by Miguel Pinheiro/CIFOR.
