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THE ASEAN HAZE TRAUMA

RESISTING TRANSBOUNDARY HAZE

DIOLAH DARI FOTO: GREENPEACE/ABRIANSYAH LIBERTO

THE ASEAN HAZE TRAUMA

RESISTING TRANSBOUNDARY HAZE

GREENPEACE

LIST OF CONTENTS

THE HAZE DISASTER: ONCE IS AN ACCIDENT, TWICE IS A COINCIDENCE, THRICE IS A PATTERN

FOREST and land fires in Indonesia occur every year. Yet there are years when the fires become particularly brutal, when El Niño joins in. The haze can be carried by the Monsoon winds all the way to neighbouring countries.

FOREST AND LAND FIRES IN INDONESIA, 2015–2025 (MoEF)

* Forest fire indicative (Greenpeace)

[1] Indication of burned area until September 2025. Sipongi

DIOLAH DARI FOTO: GREENPEACE/JURNASYANTO SUKARNO

"I wanted to ask why you (Jokowi) refused our assistance? But I haven't done so yet."

– Malaysian Prime Minister **Mahathir Mohamad**[1]

INDONESIA

	2015	2019	2023
Burned area	**2.6 million ha (MoEF)** – Greenpeace data	**1.65 million ha (MoEF)** – Greenpeace data	**1.16 million ha (MoEF)** – 2.13 million ha (Greenpeace)
Period	Began February–June, peaked September–October, subsided November	Began June–July, peaked August–October, subsided November	Began June–July, peaked September–October, subsided November
Areas affected by haze	Most affected provinces: Central Indonesia, South Sumatra, Riau, Jambi, Western and Southern Indonesia (BNPB)	Most affected provinces: Central and Western Indonesia, South Sumatra, Southern Indonesia, Riau	Most affected provinces: Southern Indonesia, Central Indonesia, South Papua, South Sumatra, Western Indonesia.
Health impacts due to haze	**500.000** people affected	**900.000** affected	
Estimated deaths			
Economic loss	**US$16 billion** (Rp 221 trillion)	**US$5.2 billion** (Rp75 trillion)	

1. SINGAPURA

	2015	2019	2023
Haze period	August–September–October to early November	August–September–October to early November	August–September–October to early November
Extent of impact	Entire Singapore	Entire Singapore	Entire Singapore
Health impacts due to haze	-	ER visits increased by **10-20%**	-
Estimated deaths	-	-	
Economic loss	**S$1.83 billion,** (0.45% of GDP)	-	-

2. MALAYSIA

	2015	2019	2023
Haze period	August–September–October to early November	August–September–October to early November	August–September–October to early November
Extent of impact	Peninsular Malaysia, Sabah, Sarawak– **15 million people affected**		
Health impacts due to haze	**20–30% increase** in patient numbers	**120,000** patients	**20–30% increase** in respiratory diseases such as acute respiratory infections (ARI), asthma, and conjunctivitis
Estimated deaths			
Economic loss	**RM 1.18 billion** (approx. Rp4 trillion)	**RM 128 million** (approx. Rp432 billion)	

"Before the dry season begins, everything should have been prepared. But we were negligent again [this year], so the haze became severe."

– Presiden Joko Widodo, during a meeting with officials in Riau Province, one of the regions worst affected by forest and land fires, on 17 September 2019.[2]

1 Kompas (2019). Mahathir kepada Jokowi: Saya Ingin Bertanya Mengapa Anda Tak Mau Terima Bantuan Kami?

2 Mongabay (2019). 'We've been negligent,' Indonesia's president says as fire crisis deepens

3. THAILAND

	2015	2019	2023
Haze period	September – October – November		
Extent of impact	South and North Thailand		
Health impacts due to haze			
Estimated deaths			
Economic loss			

4. BRUNEI DARUSALAM

	2015	2019	2023
Haze period	Indonesia – July – August – September – October		
Extent of impact	Entire Brunei		
Health impacts due to haze			
Estimated deaths			
Economic loss			

The THPA adds to the collective effort to hold accountable those companies responsible for irresponsible actions that have affected the wellbeing of communities across this region, including the most affected communities in Indonesia. Therefore, we are puzzled as to why Indonesia has not welcomed these efforts."

— **Spokesperson, Ministry of Foreign Affairs (MFA) Singapore,** on the *Transboundary Haze Pollution Act* (THPA), May 2016

5. ASEAN

	2015	2019	2023
Premature deaths		**100,300** cases of premature deaths across Southeast Asia	
Estimated deaths			
Economic loss			

6. DUNIA

	2015	2019	2023
Emisi	**11.3 million** tonnes of carbon dioxide are released into the atmosphere daily, exceeding the total daily fossil fuel emissions across the European Union. NASA reported that Indonesia's forest and land fires **released daily carbon emissions exceeding** those of the United States.		

"Longer and more severe forest and land fire seasons in Indonesia are recorded in years when the positive phase of the El *Niño–Southern Oscillation* (ENSO) and the positive *Indian Ocean Dipole occur,* usually between August and October. These fire emissions, in turn, influence climate change. Subsequently, climate change affects the ENSO system, leading to changes in weather patterns and potentially increasing ENSO variability or the frequency of extreme El Niño events."

— Frankenberg, McKee, and Thomas (2005); Crippa et al. (2016); Chen et al. (2017); Cai et al. (2015); Bin Wang et al. (2019)[3]

3 Greenpeace Southeast Asia (2020). Burning Up: Health Impact of Indonesia's Forest Fires and Implications for The Covid-19 Pandemic

CHAPTER 1.

WHO SOWS IT, WHO REAPS IT

Children play without wearing any protective gear in a playground while the air is shrouded in thick smoke from forest fires in Sei Ahass Village, Kapuas Regency, Central Kalimantan Province on the island of Borneo, Indonesia.

ARDILES RANTE/GREENPEACE

They come from different countries: Tikka Hun, Akata Yang, and Gunasekaran; Jay, Husni, and Marda. Akata lives in Johor, Tikka in Kuala Lumpur, and Guna in Kedah, all Malaysians. Meanwhile, Jay, Husni, and Marda live in South Sumatra, Indonesia.

Separated by the Strait of Malacca, they share the same story: all victims of the peatland fires in Sumatra.

Their stories follow the path of the eastern monsoon winds, always beginning with Marda and Jay, who live furthest south in the interior of Sumatra, then moving northward to Husni, and finally crossing the sea to Akata, Tikka, and Guna. Kisahnya mengikuti angin Munson Timur, jadi akan selalu bermula dari Marda dan Jay, yang lokasinya paling selatan, di pedalaman Sumatera, lalu ke Husni, dan menyeberang ke negeri Akata, Tikka, dan Guna. This is the story of smoke, a disaster that travels far.

2015

The dry season of 2015 arrived on time in Lebung Itam and Kuro villages, Ogan Komering Ilir (OKI) Regency, just as it always did. And, as always, the smell of smoke from nearby forest and land fires soon filled the air. That's how Pralensa, a resident of Lebung Itam, and Marda Ellius, from Kuro, remember it.

Yet no one was particularly alarmed by the smell, "We were used to it — it happens every dry season," said **Jay** (Pralensa's nickname) in early September 2025. "It comes from nearby fields and forests that people deliberately burn," he added.

"Clearing land by burning has become almost like a tradition every dry season here," added Marda.

What they didn't expect was how fierce the fires would become that year. Peatlands and forests covering half a million hectares — though some sources say 316,472 hectares — were reported burned across OKI, making it the epicentre of forest and land fires in South Sumatra. In total, 736,563 hectares burned across the South Sumatra province[1]. Together with smoke from fires in other parts of Sumatra, the haze swept across Singapore, Peninsular Malaysia, and Brunei, and was even believed to have reached Cebu in the Philippines and Vietnam[2].

1 Antara (2019). Area hutan-lahan yang terbakar di Ogan Komering Ilir meluas.

2 https://en.wikipedia.org/wiki/2015_Southeast_Asian_haze

ABRIANSYAH LIBERTO/GREENPEACE

According to Jay, the smoke suddenly thickened in September. He described Lebung Itam at that time as if "it were inside a fish-smoking furnace." "The smoke stuck to walls and glass, thick and greasy to the touch, sticky. And then there was the soot, flying everywhere."

Conditions in Kuro were no better, recalled Marda. Visibility dropped to

A burnt scar after a fire in the peatland area which belongs to villagers of Lebung Itam village, Tulung Selapan subdistrict, Ogan Komering Ilir Regency, South Sumatra. The palm oil concession PT. Bintang Harapan Palma (BHP), started the operation despite the standing land dispute with the villagers.

MUHAMMAD HATTA/GREENPEACE

The Ampera bridge on Musi river and its surroundings are covered by the haze from the forest and peatland fires in Palembang City. The fire has worsen the air quality to an unhealthy level in Palembang City in the last few days.

only a few metres. Even the light from lamps couldn't pierce through the haze.

Residents began to change their routines—or more precisely, as Jay put it, they shifted into *"survival mode"*. "We stayed indoors most of the time and always wore masks."

The daily schedule for working in the plantations was adjusted. "Usually, we went out right after dawn, or at the latest around sunrise. Because of the smoke, we only went at 10 a.m., waiting for it to thin out a little and for some sunlight to appear."

ULET IFANSASTI/GREENPEACE

A truck carries villagers who wear masks to protect themselves from the air pollution. The truck passes through smoke rising from fires on recently cleared peatland in the PT Rokan Adiraya Plantation oil palm plantation near Sontang village in Rokan Hulu, Riau, Sumatra.

No one dared to break that schedule, as many things could happen: vehicles could crash because the road ahead was invisible even with headlights on; they could be attacked by wild animals such as bears, snakes, or tigers; or ambushed by robbers. "All three have happened in the villages near ours," Jay said. In Kuro, Marda said, thieves often took advantage of the haze to steal villagers' water buffaloes.

As a result, villagers could only harvest a smaller amount of rubber latex from their plantations. For example, Jay's three-hectare rubber farm, which could normally be fully tapped

ABRIANSYAH LIBERTO/GREENPEACE

Kids on the yard of an elementary school that is covered by a thick smog haze from peatland and forest fires in Lebung Itam village, Tulung Selapan subdistrict, Ogan Komering Ilir Regency, South Sumatra. This area often burns during dry season since the activities of logging concessions T. Bumi Mekar Hijau (BMH), PT. SBA Wood Industries and PT. Bumi Andalas Permai (BAP) under Sinar Mas group, surrounded the village and destroyed the peatland ecosystem of the Sugihan River and Lumpur River.

in a single day, yielded only half during the haze disaster.

Rubber production also declined, "because the trees dried up and got less sunlight," Jay explained. "My income dropped by more than 50 per cent on average back then," he said.
The smoke was then carried toward mainland Asia by the East Monsoon, or Australian Monsoon; winds blowing from the Australian continent toward Asia[3]. In OKI, this meant the smoke drifted toward Palembang and the surrounding areas. At the average East Monsoon wind speed in Pangandaran, between 8.8 and 11.1 knots (around 16.3 to 20.6 km/h)[4], the smoke could reach Palembang, only 100 km away, within just a few hours.

Muhammad Husni, then a senior high school student in his third year at Al-Amalul Khair Islamic Boarding School, recalled that the smell of smoke had already been noticeable for months. "Then, around early September, it became really thick," he said. He said that at the time, his school was on a two-week semester break. "But I couldn't go home to Ogan Ilir. No travel services were running. So I stayed in the dormitory."

When the holiday ended, the smoke persisted, even worse than before. The provincial government issued a circular instructing all schools to close for another two weeks.

However, two weeks later, the haze had not completely subsided, so classes resumed with adjusted hours. School started at 10 a.m., waiting for the haze to thin out, and ended at 12 p.m. Normally, classes ran from 8 a.m. to 1 p.m. "We missed a lot of lessons, even though we were preparing for university entrance. The try-outs were cancelled."

Husni admitted he couldn't catch up on the missed material due to the haze, even though he was an excellent student, usually ranking second, third, or fourth in his class. He was fortunate enough to be accepted into Sriwijaya University (UNSRI) in Palembang through the Achievement Track. "Actually, I wanted to study at UIN Syarif Hidayatullah (Jakarta) and become a religious scholar, but I failed the entrance test because of a lack of preparation."

Within days, the thick smoke had crossed the Strait of Malacca and reached Singapore.

On Friday morning, 25 September 2015, the Pollutant Standards Index (PSI) hit 341 — the highest level that year. A day earlier, Singapore's Minister for Foreign Affairs, K. Shanmugam, stated that the haze from Indonesia's forest and land fires showed *"a total disregard for our people and their own."*[5]

The same smoke also swept across Malaysia. According to Greenpeace's

3 https://media.neliti.com/media/publications/116430-ID-arah-dan-kecepatan-angin-musiman-serta-k.pdf

4 https://bbmkg3.bmkg.go.id/public_data/dataspdf/bbmkg3-1723172705.pdf

5 BBC (2015). Singapore anger as haze from Indonesia hits highest level this year

analysis using the HYSPLIT Model and 2,500-foot wind data in the report *"Haze Sources and Distribution Analysis 2015–2019"* (2025), haze from the peatland areas along Sumatra's eastern coast would reach Kuala Lumpur, Malaysia, in about two days.

AKATA YANG, JOHOR

Around 800 kilometres from the epicentre of the haze in Ogan Komering Ilir (OKI), South Sumatra, lives 63-year-old Akata Yang in Johor. He is a farmer, environmental activist, and community organiser.

The haze from Indonesia at the time, he said, brought his vegetable farming activities to a halt. "At that time, I had a plot of land, around three acres (1.2 hectares), which I rented for farming. The haze was so thick that the crops that usually could be harvested in about forty days took fifty to sixty days instead because of the lack of sunlight."

At the very least, he said, his harvest dropped by 50%. "From the harvest period alone, you could see it, forty days turned into sixty days. That's already 50%," he said with a laugh.

Not all of his land was used for cultivation. Some parts were reserved for schoolchildren and residents who wanted to learn vegetable farming. "Because the haze was so bad, several visits had to be cancelled. If I'm not mistaken, more than a hundred outdoor activities couldn't be carried out at that time."

Akata recalled that the haze disaster lasted for more than a month. "I'm sure of it, because throughout that time, every day when I woke up, I could smell the smoke."

Once, he even fled from the choking haze to Tioman Island. Tioman Island is a popular tourist destination for marine recreation like diving and snorkelling, about 100 kilometres northeast from his town. He thought that because Tioman was farther from Indonesia, "the air might be a bit better," he said. But it turned out to be just as bad.

He noticed it from the moment he boarded the boat. "That was the first time I saw boats there using a compass to navigate between islands. Before, they never needed one because the sea was always visible," he said. The compass was necessary because visibility was "less than a hundred metres."

When he arrived, the island was quiet. "At that time, there were fewer tourists."

He tried snorkelling, but was struck by the contrast. "Underwater, the view was clear and clean, but the surface was covered in haze." Not only was the smoke thick, but it was also pungent.

As a result, he ended up trapped by the haze on Tioman. "I was there for three days, all haze, every day was like being in lockdown," he said.

He could no longer recall whether that haze disaster happened in 2015 or 2019. "But it was one of those two years. It happened before COVID-19, and in 2023, the haze wasn't that bad."

The father of three adult children

A woman rides a bicycle through a thick smog haze from peatland and forest fires in Lebung Itam village, Tulung Selapan subdistrict, Ogan Komering Ilir Regency, South Sumatra. This area often burns during dry season since the activities of logging concessions T. Bumi Mekar Hijau (BMH), PT. SBA Wood Industries and PT. Bumi Andalas Permai (BAP) under Sinar Mas group, surrounded the village and destroyed the peatland ecosystem of the Sugihan River and Lumpur River.

ABRIANSYAH LIBERTO/GREENPEACE

also could not remember which of the 2015 or 2019 haze disasters was worse. “Both were terrible,” he said.

GUNASEKARAN, KEDAH

Gunasekaran, now 62, lived even farther from the haze’s centre in Indonesia than Akata. He resides in Sungai Petani, Kedah, Malaysia, which is about 1,500 kilometres from Palembang[6] and 700 kilometres from Akata’s place. But he, too, said the haze from Sumatra became a disaster where he lived.

He recalled that the 2015 haze drastically reduced visibility. “I live near the coast. You couldn’t see even one kilometre out to sea, not even half a kilometre,” he said. It was the same on the highway: “You couldn’t see half a kilometre ahead.”

Schools in Pulau Pinang, Batu Feringhi, Sungai Petani, and Alor Setar were all closed. The Ministry of Education ordered the closures because of the haze. It was around October, the exam period. “Even the exams were postponed by the government,” he said.”

The school closures, he recalled, lasted for about two months.
Guna said his livelihood was also affected. “I am an insurance agent. At that time, I couldn’t do my job.”

He actually had another source of income. Like Akata, he was also a farmer. “I rented land for farming and employed five workers,” he said. On his six-acre farm, he grew five types of crops: eggplants, cucumbers, long beans, and okra, among others. “All sorts of vegetables,” he said.

The problem was, the haze paralysed his farming operations because the Ministry of Agriculture issued a prohibition on any agricultural activity. “You couldn’t open your farm. If you did, there was a fine,” he said. The restriction lasted 60 days.

“The economy couldn’t run properly at that time,” he added. “It was just as bad as the COVID pandemic in 2020, which happened afterwards. All farming activities had to stop.”

He said he suffered huge losses from his farmland. Normally, his daily income from the farm ranged from 1,200 to 1,500 ringgit. “The loss was about 1,500 ringgit times sixty days,” he said.

The losses increased further because, after the ban was lifted, his farm had turned into a jungle. “After sixty days, it was completely overgrown,” he said. To clear it, he had to hire a tractor. “The cleaning alone costs around forty thousand ringgit.
During the haze disaster, he said, there was no government assistance at all. “The government didn’t help. The Prime Minister didn’t help us then.”

According to Guna, that was the first time he experienced such an extreme haze disaster.

NANDAKUMAR S. HARIDAS/GREENPEACE

A boat passes a bridge shrouded in haze in Penang, Malaysia. Malaysia is plagued by haze caused by forest fires on the Indonesian islands of Kalimantan and Sumatra. Numerous forest areas and palm oil concessions in Indonesia have burned this year, including those belonging to Malaysian and Singaporean companies.

6 The source of the haze that reached Peninsular Malaysia originated from the eastern parts of Sumatra (Riau, Jambi, and South Sumatra)

/JOSHUA PAUL/GREENPEACE

Buildings shrouded in haze in Kuala Lumpur, Malaysia. Malaysia is plagued by haze caused by forest fires originating on the Indonesian islands of Kalimantan and Sumatra. Numerous forest areas and palm oil concessions in Indonesia have burned this year, including concessions belonging to companies from Malaysia and Singapore.

TIKKA HUN, KUALA LUMPUR

Tikka Hun, now 49, said she was relatively lucky during the 2015 haze disaster. Her city, Kuala Lumpur, was badly affected by the haze. But, "At that time, I managed to escape from KL," she said. "I forgot where I went, but since I was living alone, I felt a sense of freedom."

However, as she would later tell, when the 2019 haze struck Malaysia, she wasn't as free. "I was trapped in my condominium room on the 13th floor throughout the haze disaster, together with my baby," she said.

2019

The 2015 haze began to fade by November and disappeared completely when the rainy season arrived. After that, the annual forest and land fires never truly stopped; they simply didn't escalate. "In concession areas around my region, fires still happen every dry season," said Jay.

In OKI, the burned area covered 213 hectares in 2016, decreased to 179 hectares in 2017, and rose again to 864 hectares in 2018[7]. Then, in 2019, the fires flared up once more, again starting in OKI, which has the largest peatland area.

The fires in OKI spread to other regions such as Musi Banyuasin, Banyuasin, South Ogan Komering Ulu (OKU Selatan), East Ogan Komering Ulu (OKU Timur), PALI, Muara Enim, Musi Rawas, Ogan Ilir, Empat Lawang, and North Musi Rawas (Muratara). In 2019, burned areas in OKI reached 91,665 hectares, Banyuasin 24,692 hectares, Ogan Ilir 13,730 hectares, Musi Banyuasin 11,851 hectares, and Muratara 6,015 hectares[8].

For Jay and Marda, whose village once again became the epicentre of the forest and land fires, the haze in 2019 was less intense than in 2015. "The peak was shorter, maybe because there was more rain," said Jay. He mentioned that during the 2019 fires, rain-making aircraft often flew over his village.

Husni — who at that time was already a student at Sriwijaya University and studying in Ogan Ilir — reported the same thing. Thick haze blanketed his city, and rainfall helped disperse it. "It somewhat helped reduce the haze concentration," he said.

However, the intensity of the haze was not the only factor determining how severe its impact was. For Jay and Marda, for instance, the 2019 disaster felt twice as hard because they had babies.

At that time, Jay had his second child, who was about two years old. "The haze made my child develop asthma. We had to use a nebuliser. I bought the device in Palembang, even though the roads weren't safe then," he said.

Meanwhile, Marda had her first child at the end of 2017. Although her baby didn't get sick, "I was constantly anxious, worried the haze would affect my child's health. I felt like I was thinking for two people," she said.

7 Antara (2019). Area hutan-lahan yang terbakar di Ogan Komering Ilir meluas

8 Mongabay (2020). Hari Lingkungan Hidup: Melacak Pasien COVID-19 di Sekitar Gambut yang Sering Terbakar

ABRIANSYAH LIBERTO/GREENPEACE

Plaintiff Muhammad Husni (25), Master's program student in Universitas Sriwijaya, Palembang.
Muhammad Husni is using "Market Share Liability" for land fires and smoke which caused health problems and economic losses for residents, against PT BMH, PT BAP, and PT SBA to the Palembang City District Court and also the Ministry of the Environment and Forestry (KLHK).

The same was true for Tikka. At that time, the haze disaster once again reached Kedah, Johor, and Kuala Lumpur. When the 2019 haze arrived in Kuala Lumpur, Tikka said she was a single parent with a one-year-old baby. On top of that, she was sensitive to haze, "because I have sinus problems."

Whenever the haze came, she said, she would start sneezing. "At that time, I felt like being in jail," she said. "I remember—it was during the MCO." MCO (Movement Control Order) was a government advisory to stay indoors because the haze concentration had exceeded safe limits.

Tikka said that during the MCO, she shut all her windows to prevent the haze from entering her home. At first, she only closed the doors and windows, but that wasn't enough as smoke still seeped in. "So I sealed all the gaps with tape, every little hole, until there was no smell at all."

She also used an air purifier to clean the indoor air. The problem, she later learned, was that air purifiers work effectively only within a certain room size. "So for serious haze like I experienced, you'd need one in every room," she said. But at that time, she only had one.

So she came up with a plan. Since she had only one air purifier, she stayed in the smallest room in the house, which is the bedroom, so that the purifier could work more efficiently.
"For several days, I wasn't just locked in my home, I was locked inside one room," she said with a laugh. "I ate there, I slept there."

Fortunately, the bathroom was inside the room. She only left when she needed to cook. "Even when I cooked in the kitchen, I did it as quickly as possible, then took the food straight back into the room," she said. All that, she added, "was because my baby was still one year old, and I wanted to make sure the air was clean for him."
From her twelfth-floor condominium, she could clearly see how bad things were outside. "Because from up high, you can see far. So when the haze came, I knew."

Normally, she said, she could see buildings several kilometres away from where she was, five, six, even ten kilometres. "But that time, you couldn't see a thing. Even those five hundred metres away were invisible. You couldn't even see the trees right in front of the building. So that's how we knew how serious it was."

The sun and sky, she said, "always looked red." That was a warning sign. The sky turned red due to the high concentration of very fine pollutant dust particles, around 0.7 micrometres, in the atmosphere. The diameter of these particles matches the wavelength of red sunlight. When the colour darkens into reddish-black, it means coarse and fine dust particles have mixed. The air becomes more dangerous when the sky turns greyish-black[9].

Tikka couldn't remember how long she had locked herself in. "It was on and off, depending on how thick the haze was, sometimes for several days," she said. "When it looked a bit

9 Kumparan (2019). Fenomena Langit Memerah di Jambi karena Karhutla

ABRIANSYAH LIBERTO/GREENPEACE

Marda Elius was fishing in Bangsal Village, Pampangan District, Ogan Komering Ilir Regency, South Sumatra, Wednesday (7/3/2024). Marda Elius and two other Bangsal Village residents filed a Market Share Liability lawsuit against PT BMH, PT BAP, and PT SBA for land fires that resulted in smoke-related health problems and economic losses to residents at the Palembang City District Court and the Ministry of Environment and Forestry (KLHK).

clearer, I'd step outside a little."

Waktu itu, ujarnya, dia sempat mencoba *escape*. Dia sudah mencari tahu tempat-tempat yang asapnya kurang. Dia bahkan sudah berencana akan pergi ke hutan Gunung Tahan, di Taman Negara di Pahang selama beberapa hari. "Saya nak pergi ke sana dengan anak saya," kata dia.

She once tried to escape. She researched areas with less haze and even planned to take her baby to Mount Tahan Forest in Taman Negara, Pahang, for a few days. "I wanted to go there with my child," she said. But when she called to ask about the smoke condition there, the answer was disappointing. "They said there was haze there too," she recalled. "So I couldn't find anywhere without haze. The whole of Malaysia was covered. So I just stayed, stayed in KL."

This was confirmed by Guna, who said his region was also hit by the 2019 haze. "It was just as bad as 2015," he said.

For Husni, the 2019 haze disaster felt worse because it was followed by the arrival of COVID-19. At that time, he was in his seventh semester at university. If it hadn't been for the haze, he said, he should have been able to finish his bachelor's degree a year earlier. "But the haze disrupted my research, and then COVID-19 came. So I only graduated after eleven semesters," he said.

2023

Sumatra was once again ravaged by fires in 2023. By then, Husni had moved to Palembang for his Master's degree at Sriwijaya University (UNSRI).

He felt that the 2023 haze was worse than in 2019. "Because I had to switch to online classes. I also often went to the field for data collection, and the situation was terrible."

As in previous major fires, he said, the smell of smoke appeared early in the dry season. "You could already smell it from July," he said. "Fires had started by then, though not severe yet. The peak was between September and early November. At one point, visibility dropped to just three metres."

The haze disaster also forced schools to close for about a week, following a circular from the Governor.

He still vividly remembered the intensity of the fires. "Along the Indralaya toll road, both sides were burning. So when people drove through it, they said it felt like crossing the *Sirat al-Mustaqim* bridge, with fire on both sides like hell," he said.

Actually, the area had also burned in 2019, but the toll road wasn't yet operational then. "That's why it didn't go viral like in 2023, because by then, many people were already using the toll road."

Akata said that the 2023 haze also reached Johor. "However, it wasn't as severe as in 2015 and 2019," said Akata.

It was the same in Kedah. "Near Penang, the haze didn't come as much," said Guna. Meanwhile, Tikka said she didn't recall any haze in 2023.

CHAPTER 2.

WHAT HAPPENED?

People on motorcycles as they ride on the Aur Duri II bridge, covered by thick haze from forest fires in Muaro Jambi.

MUHAMMAD ADIMAJA/GREENPEACE

THE 2015 FOREST AND LAND FIRE AND HAZE DISASTER

THE 2015 forest and land fires were among the worst environmental disasters in Indonesia's history. The fires began in mid-year, peaked between September and October 2015, and only subsided in November with the arrival of the rainy season.

The total burned area that year reached approximately 2.6 million hectares, which is why Greenpeace refers to it as one of the largest environmental disasters of the 21st century to date. Most of the fires occurred on the islands of Kalimantan and Sumatra.

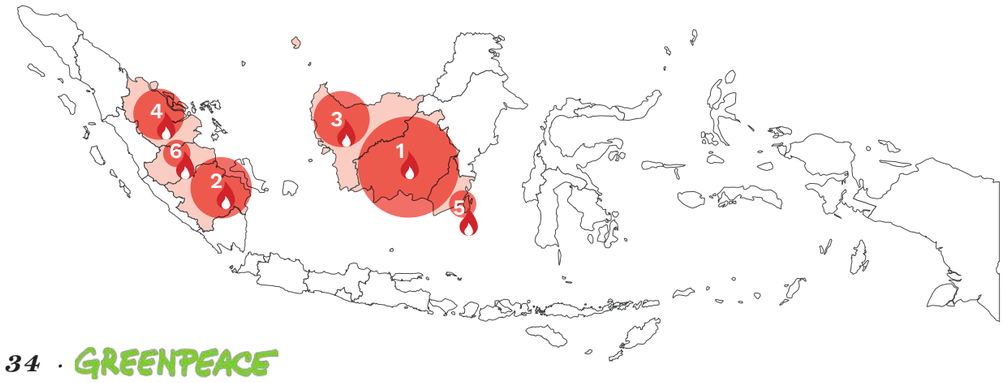
The HAZE DISASTER originated in Indonesia. In 2015, 2019, and again in 2023, Indonesia's forests and lands burned more severely than usual. As shown in the data at the beginning of this report, fires in 2019 were three times larger than the previous year, while those in 2023 were five times larger than in 2022. These forest and land fires produced enormous amounts of haze, as much of the affected area consisted of peatlands[1].

1 Wetlands (2013). Kebakaran di Sumatra: mengurusi gejala, tak cukup aksi dalam menangani penyakit

Six Provinces with the Largest Burned Areas in 2015

Source:
Indication of burned area until September 2025. Sipongi

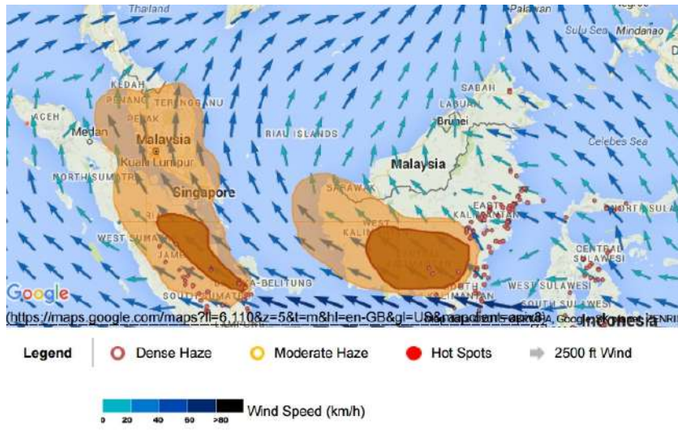
1. Central Kalimantan **629 thousand hectares**
2. South Sumatera **600 thousand hectares**
3. West Kalimantan **416 thousand hectares**
4. Riau **266 thousand hectares**
5. South Kalimantan **179 thousand hectares**
6. Jambi **160 thousand hectares**



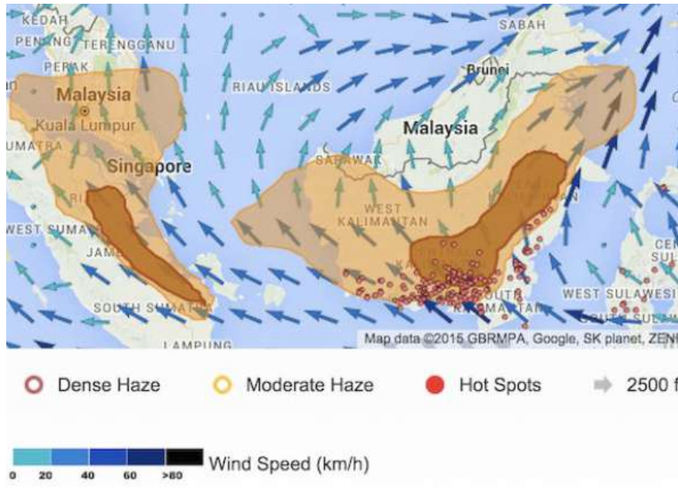
The impact of the 2015 haze and forest fires was severe on public health, the economy, and the environment.

In Indonesia, according to the Deputy for Planning and Cooperation of the Peatland Restoration Agency, Budi Wardhana, the fires lasted for nearly five months. During that period, 500,000 people suffered from acute respiratory infections (ARI) like Husni in Palembang, and more than 60 million were exposed to air pollution like Jay and Marda. As a result, direct medical costs reached IDR 1.9 trillion,[2] while total economic losses were estimated at IDR 221 trillion, due to disruptions in transportation, productivity, tourism, and ecosystem damage[3].

Carbon emissions from the burning of peatlands reached extremely high levels, exceeding the annual carbon emissions of industrialised countries. The destruction of forest and peatland ecosystems also led to the loss



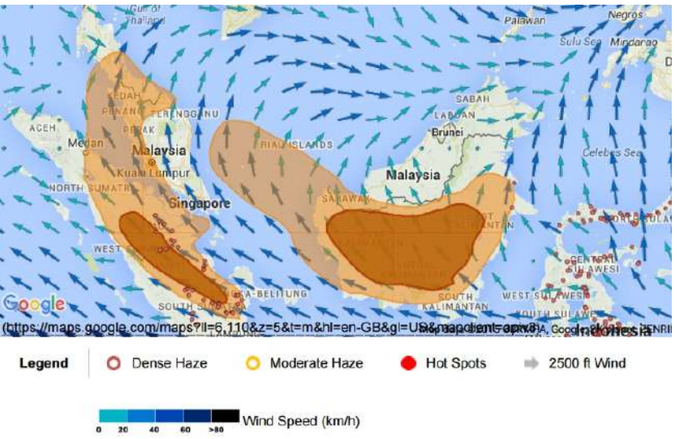
ASMC 3 oct 2015.



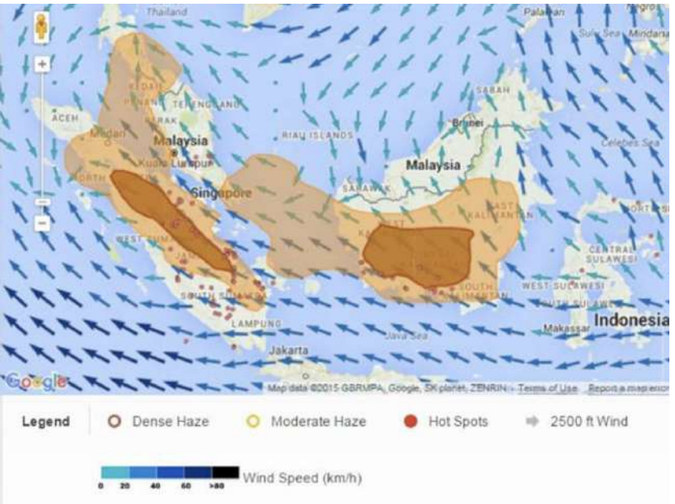
ASMC 18 oct 2015 Map of haze over Indonesia, Singapore and Malaysia for October 18th via the ASEAN Specialised Meteorological Centre (ASMC).

2 Tempo (2019). Riset Harvard University: Asap Kebakaran Hutan Ancam 36 Ribu Jiwa

3 Kompas (2025). Karhutla Yang Memicu Krisis Kabut Asap



ASMC 21 Oct 2015.



ASMC 23 Oct 2015.

of habitats for flora and fauna, including orangutans and Sumatran tigers. NASA released a report showing that the fires emitted 600 million tonnes of CO_2 by the end of September, surpassing Malaysia's total annual emissions in 2022, which amounted to 277.5 million tonnes of CO_2[4].

The haze from the 2015 fires spread to neighbouring countries, particularly Malaysia, Singapore, and Brunei. Malaysia and Singapore were the hardest hit due to their proximity to Sumatra and Kalimantan.

The transboundary haze spread intensively from September to early October 2015 and only began to dissipate with the onset of the rainy season in late November 2015[5].

In Malaysia, the haze covered the southern and southwestern regions, including where Tikka Hun (Kuala Lumpur), Akata (Johor), and Gunasekaran (Kedah) lived, as well as Selangor, Melaka, and Sarawak. Visibility in Putrajaya dropped to as low as 700 metres.

In 2015, citing the SUHAKAM report (2024), the total economic loss caused by the haze disaster in Malaysia amounted to RM 1.07 billion, or around Rp3.292 trillion (based on the lowest 2015 exchange rate of RM 1 = Rp3,076.46[6]). Meanwhile, the total Cost of Illness (COI) was RM 64.81 million in 2017. It was also estimated that the average annual economic loss from inpatient healthcare reached RM 273,000. This increase in healthcare costs also led to higher government expenditure[7].

Still citing the Suhakam Report (2024), air travel productivity was also affected due to flight delays and cancellations caused by low visibility. In September 2015, it was reported that Kuala Lumpur, Kuching, and Penang International Airports were all affected by the haze. There were also transport losses and damages due to vehicle collisions, maritime navigation issues, and cargo delivery disruptions.

Similarly, the haze pollution affected fish farmers and fisheries who were unable to reach their offshore fish cages, as Akata's snorkelling story earlier illustrated. This threatens food security, especially for urban poor communities. According to the Suhakam Report (2024), Malaysia's Forestry Research Institute also reported that two hybrid rice varieties experienced a 50% reduction in growth rate during the haze episode, as the pollution reduced sunlight radiation, a factor that significantly hampered crop productivity.

The 2015 haze was also reported to have caused significant economic losses across the tourism, sports, and food industries due to widespread business closures.

In Singapore, the haze covered the entire island, which is geographically small. At its peak, the Pollutant Standards Index (PSI) reached levels categorised as "very unhealthy" to "hazardous" (above 300 PSI), directly correlating with an increase in respiratory illnesses.

The total cost of the two-month haze event in 2015 in this country was estimated at S$1.83 billion, or around Rp21.566 trillion (S$1 = Rp11,785, the lowest 2015 exchange rate[8]), equiv-

4 Worldmeter. Emisi CO2 Malaysia

5 Kompas (2023). Perkara Kabut Asap Karhutla di Lintas Batas Negara

6 https://www.exchange-rates.org/id/riwayat-nilai-tukar/myr-idr-2015-05-01

7 Suhakam (2024). Silent Enemy: Report on Haze Pollution and the Right to Clean Air

8 https://www.exchange-rates.org/id/konverter/sgd-idr

THE 2019 FOREST AND LAND FIRE AND HAZE DISASTER

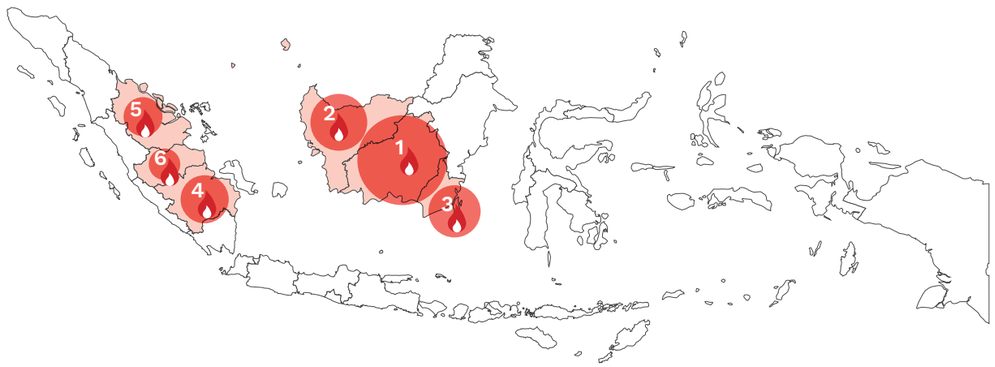
In 2019, another wave of severe forest and land fires occurred, once again sending haze across borders to Singapore and Malaysia. The 2019 fires intensified in July, peaked in September, and subsided in November with the onset of the rainy season.

According to data from Sipongi, the monitoring system of the Ministry of Forestry—then still known as the Ministry of Environment and Forestry (KLHK)—the total burned area in Indonesia in 2019 reached 1,649,258 hectares. The provinces most affected were the same as in previous years: Central Kalimantan, West Kalimantan, South Kalimantan, South Sumatra, Riau, and Jambi.

ABRIANSYAH LIBERTO/GREENPEACE

Six Provinces with the Largest Burned Areas in 2019 (hectares):

1. Central Kalimantan approximately **576,248**
2. West Kalimantan approximately **261,265**
3. South Kalimantan approximately **231,259**
4. South Sumatra approximately **190,252**
5. Riau approximately **108,625**
6. Jambi approximately **73,080**



alent to 0.45% of the country's GDP. Of that amount, tangible costs were estimated at S$1.46 billion, equivalent to 0.36% of GDP, while intangible costs reached S$0.36 billion, equivalent to 0.09% of GDP[9].

The severe impacts of the 2015 haze disaster prompted repeated protests and diplomatic pressure from the Malaysian[10] and Singaporean[11] governments, urging Indonesia to take stronger action. However, as the following years would show, the situation resembled the saying, *"the dogs bark, but the caravan moves on"*.

The impact of the 2019 fires in Indonesia was devastating, particularly for public health, the economy, and the environment. Thick haze blanketed parts of Sumatra and Kalimantan, pushing air quality in cities like Palangkaraya and Jambi to "hazardous" levels. More than 900,000 people suffered from acute respiratory infections (ARI), with many cases of asthma and eye irritation reported.

According to the World Bank's Indonesia Economic Quarterly (IEQ) Report for December 2019, the 2019 forest fires caused an estimated US$5.2 billion in losses (0.5% of GDP) due to their impact on natural resources and the economy. The fires, which were Indonesia's worst since 2015, significantly slowed economic growth, destroyed timber resources, negatively affected the palm oil industry through reputational damage, and created severe public health problems due to the haze.

The transboundary haze once again spread to Malaysia, Singapore, and Brunei, with Malaysia and Singapore being the hardest hit. At its peak, haze covered the Malaysian Peninsula, Sarawak, and all of Singapore, exposing millions of people to dangerous air pollution.

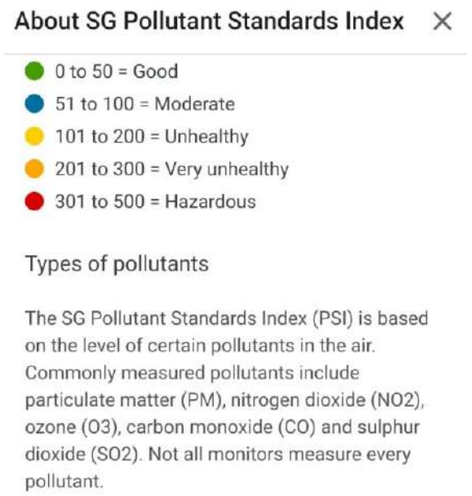
The haze intensified in August 2019, peaked in September, and subsided in November with the arrival of rain. During September, air quality deteriorated significantly across Malaysia and Singapore. In Singapore, the PSI reached "very unhealthy" levels (101–200), while in Malaysia, the Air Pollution Index (API) in several regions, especially in Sarawak and southern Peninsular Malaysia, hit "hazardous"

9 Quah, Euston & Chia, Wai-Mun & Tan, Tsiat-Siong, 2021. "Economic impact of 2015 transboundary haze on Singapore," Journal of Asian Economics, Elsevier, vol. 75(C).

10 Straits Times (2015). Indonesia needs to take action against haze culprits, says Malaysia's PM Najib

11 The Jakarta Post (2015). Singapore Upset by RI's Haze

levels (above 300)[12].



Malaysia's Minister of Health, Datuk Seri Dzulkefly Ahmad, stated that there was a 20–30% increase in patients suffering from conjunctivitis, respiratory infections, and asthma[13]. Shah Alam Hospital alone reportedly saw an increase of 40 to 80 patients during the haze period[14].

In Singapore, during peak haze days, the 24-hour PSI frequently entered the "Unhealthy" range (101–200). For example, in September 2019, the PSI in southern Singapore reached 145, approaching the "Very Unhealthy" range (201–300)[15]. Data from Singapore's health authorities indicated a 10–20% rise in emergency room visits during the worst haze episodes.

The severity of the haze once again turned it into a sensitive intergovernmental issue. Singapore's Minister for the Environment and Water Resources, Masagos Zulkifli, emphasised that Indonesia's forest fires had a major impact on the global climate, noting that the fires had released up to 360 million tonnes of carbon dioxide since August 2019, surpassing Spain's total emissions in 2018[16].

The governments of Malaysia and Singapore lodged official protests against Indonesia, demanding stronger measures to tackle the fires. However, the Indonesian government, through the Ministry of Environment and Forestry (KLHK), denied that the haze originated from Indonesia, despite findings from multiple sources, including the ASEAN Specialised Meteorological Centre (ASMC), indicating otherwise.

Data from Greenpeace and various other sources indicate a higher figure, with the total burnt area reaching 2.13 million hectares, twice the government's figure and equivalent to three times the size of Bali Island[17].

NADAKUMAR S. HARIDAS/GREENPEACE

A haze blankets the air in Penang, Malaysia. Malaysia is plagued by haze caused by forest fires on the Indonesian islands of Kalimantan and Sumatra. Numerous forest areas and palm oil concessions in Indonesia have burned this year, including concessions owned by Malaysian and Singaporean companies.

12 https://www.nea.gov.sg/

13 CNN Indonesia (2019).Kabut Asap Karhutla Bikin Warga Malaysia Kena Radang Mata

14 Astrowani (2019). Kerugian ekonomi akibat jerebu

15 The Straits Times (2019). Air quality improves but remains unhealthy in some areas as haze persists in Singapore

16 Kompas (2019). Menteri Singapura: Kebakaran Hutan di Indonesia Berdampak Besar pada Iklim

17 Greenpeace Indonesia (2024). Bagai Api Dalam Sekam Data, Karhutla Kronis 2023

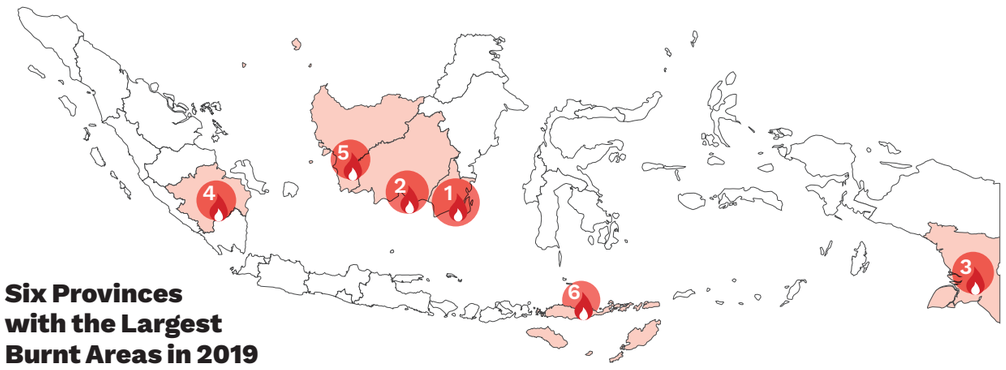
THE 2023 FOREST AND LAND FIRES AND HAZE DISASTER

Then, four years later, in 2023, Indonesia once again experienced devastating forest and land fires. In both major fire events, the total burnt area exceeded one million hectares.

The 2023 fires began to increase significantly in August 2023, reaching their peak in September and October, and subsided only in November 2023 with the onset of the rainy season.

According to data from the Sipongi system of the Ministry of Forestry, the total burnt area that year reached approximately 1.16 million hectares.

ALIF R NOUDDY KORUA/GREENPEACE



Six Provinces with the Largest Burnt Areas in 2019

1. South Kalimantan: **190,394.58 ha**
2. Central Kalimantan: **165,896.44 ha**
3. South Papua: **150,813.34 ha**
4. South Sumatra: **132,082.86 ha**
5. West Kalimantan: **111,848.43 ha**
6. East Nusa Tenggara: **102,536.89 ha**

Several of the provinces most severely affected by the 2023 fires were the same regions that had frequently suffered similar disasters in previous years, including South Kalimantan, Central Kalimantan, South Sumatra, and Riau. These provinces contain extensive peatlands that are highly susceptible to burning. More than 1.3 million hectares of the total burnt area in 2023 were lands that had previously burned between 2015 and 2022.

The main cause of the 2023 fires once again lay in human activities, specifically, land burning for plantation development, carried out by both companies and individuals.

The 2023 forest and land fires caused dense haze to cover large parts of Sumatra and Kalimantan. Air quality in several cities, such as Palangka Raya and Jambi, reached hazardous levels. Consequently, cases of acute respiratory infections (ARI), asthma, and eye irritation surged, resulting in economic losses and the release of vast amounts of carbon emissions into the atmosphere.

The 2023 haze also covered Malaysia and Singapore.

The transboundary haze spread intensively from August 2023, peaked in September and October, and dissipated in November with the onset of the rainy season. During the peak period, air quality in many parts of Malaysia and Singapore deteriorated sharply. The Air Pollution Index (API) in several areas of Malaysia, such as Johor and Kuala Lumpur, reached “unhealthy” and “very unhealthy” levels.

Reuters, in a report titled *“Malaysia Prepares to Make Rain, Close Schools as Haze Worsens,”* wrote that Malaysia’s Department of Environment even attempted cloud seeding to address the worsening haze[18]. It was reported that air quality deteriorated, particularly in the western part of Peninsular Malaysia, with 11 areas recording unhealthy Air Pollution Index (API) levels at the time. Malaysia stated that the fires in Indonesia were the cause of the pollution, though Indonesia denied the accusation.

18 Reuters (2023). Malaysia prepares to make rain, close schools as haze worsens

Source:
Data Indonesia (2024). Data Luas Karhutla Menurut Provinsi di Indonesia pada 2023

MUHAMMAD FAJRI/GREENPEACE

Ongoing forest and peatland fires in Palem Raya Village, North Indralaya District, Ogan Ilir, South Sumatra, have worsened air quality to unhealthy levels in Palembang City over the past few days.

The Associated Press also highlighted the haze from Indonesia's forest fires that had drifted over to Malaysia. "The fires in Indonesia have blanketed parts of Indonesia, Singapore, Malaysia, and southern Thailand in thick haze. Several parts of Malaysia have been experiencing haze from the fires in Indonesia since last week," the AP wrote in its article titled "Fires on Indonesia's Sumatra Island Cause Smoky Haze, Prompting Calls for People to Work from Home.[19]"

19 AP News (2023). Fires on Indonesia's Sumatra island cause smoky haze, prompting calls for people to work from home

RONY MUHARRMAN/GREENPEACE

Once again, the haze prompted complaints from the Malaysian and Singaporean governments to Indonesia. According to the AP, Malaysia's Department of Environment Director-General Wan Abdul Latiff Wan Jaffar said that the return of haze in several parts of the country was due to hundreds of forest fires in Indonesia. "The forest fires in southern Sumatra and in central and southern Kalimantan, Indonesia, have caused the haze to cross national borders," he said.

Burning peatland forest and scorched earth in an oil palm concession in Pangkalan Terap, Teluk Meranti, Pelalawan regency, Riau.

CHAPTER 3.

THE PATTERN OF THE HAZE *(JEREBU)*

Smoke rises during fires in the peatland area in Palangka Raya, Central Kalimantan. The amount of land and forest fires in Indonesia through September this year has exceeded to 857,756 hectares (2,12 million acres), according to data given by the Indonesian Forestry and Environment Ministry.

JURNASYANTO SUKARNO/GREENPEACE

JURNASYANTO SUKARNO/GREENPEACE

A silhouette of a house near big fires burning the surrounding area, in Palangkaraya city, Central Kalimantan. This year's nearly 2,000 wildfires are burning across Indonesia. It is the worst year since 2015. Officials estimate that the fires have burned more than 800,000 acres. Greenpeace criticized the government for not taking action against the companies that set fires to clear land for agriculture purposes.

HAVE you ever studied number patterns in mathematics? What pattern do you see in these numbers: 2015, 2019, 2023?

The haze disasters—*jerebu* in Malay—caused by forest and land fires (karhutla) in Indonesia in 2015, 2019, and 2023 reveal a repetitive numerical pattern, with a consistent root cause despite significant differences in scale, impact, and response. Understanding this pattern is crucial to ensuring that such disasters never happen again. Remember the old saying: *"There's no smoke without fire"*?

From One Fire to Another: The Same Pattern

The haze and fire disasters of 2015, 2019, and 2023 share recurring fundamental similarities. Forest and land fires are triggered by human activity and magnified by climatic phenomena. This is the main cause. The question is, why do the fires only rage in certain places, so often that many of them recur, as if fire favours those areas?

Peatlands

Data from Greenpeace and organisations such as Auriga Nusantara[1] show that the forest and land fire disasters and haze sources in 2015, 2019, and 2023 occurred repeatedly in the same provinces in Indonesia. The epicentres are in South Sumatra, Riau, Central Kalimantan, and West Kalimantan. Reports from the Ministry of Environment and Forestry (MoEF/KLHK) and the National Disaster Management Agency (BNPB) also state that most of the areas burned were lands that had burned in previous years.

The reason lies in the vast peatlands within these regions, which become highly flammable when dry and are extremely difficult to extinguish. Data from MoEF and BNPB consistently indicate that peatlands and corporate concession areas often serve as the primary hotspots.

In reality, peatlands are not easily ignited under natural conditions because they are naturally wet. "The problem is, the lands that are supposed to remain wet have become dry," said Sekar Banjaran Aji Surowijoyo, Forest Campaigner at Greenpeace Indonesia[2]. "So, when these areas catch fire, it means there's a third party involved; in this case, humans deliberately setting them alight."

According to her, the damage to peatland ecosystems is caused by various factors, one of which is human activity for land clearing. Corporate canalisation often degrades peatlands, leaving them dry during the dry season.

President Joko Widodo also highlighted this issue a year before the 2015 fires. "By building canal blocks, peatlands will remain wet, making them less likely to burn or be set on fire," said the President[3].

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1 Mongabay (2024). Kebakaran Hutan Banyak untuk Pembukaan Lahan?

2 Mongabay (2025). Karhutla Satu Dekade 7,7 juta Hektar, Jaga Lahan Gambut

3 Antara (2014). Presiden Jokowi Tinjau Pencegahan Karhutla Riau

Greenpeace's analysis of the sources and distribution of haze from 2015 to 2023 revealed the origins of the 2019 haze, considered the period with the most complete dataset, and its connection to concessions located within critical peat hydrological units. The main findings point to a significant overlap between fire areas (as the sources of haze) and concession areas within Critical Peat Hydrological Units (KHGs) in Sumatra and Kalimantan.

Critical Peatlands vs Corporate Concessions

The analysis showed that most Peat Hydrological Units (PHUs) in Sumatra and Kalimantan are classified as Highly Critical Peatlands, making them extremely prone to fire. Greenpeace also found that many of these highly critical PHUs are already occupied by plantation concessions, particularly for palm oil, pulp and paper, and mining operations.

The high vulnerability of these lands is evident from the 2019 fire data: the total burnt area within KHGs and concession zones in Sumatra and Kalimantan reached 583,000 hectares.

A timeline of fire hotspots (FHS) shows that fires within KHGs peaked in September 2019. The distribution of hotspots inside concession areas during the first half of September (1–15 September) and the second half (16–30 September) indicates a significant concentration in both Kalimantan and Sumatra.

Fires in KHGs produce far more smoke[4]. This is because peat fires burn incompletely. Such incomplete combustion appears as glowing embers (burning slowly and at low temperatures) rather than as open flames. Complete combustion is difficult because peat consists of decomposed plant matter lying beneath the soil surface, often several metres deep. When the peat dries out, fire spreads underground, consuming the organic material and generating thick smoke that lingers for a long time.

Transboundary Haze

The massive haze generated during the 2015, 2019, and 2023 fire events spread across national borders for several reasons. The first factor is wind direction. Based on HYSPLIT models and 2,500-foot wind data analysed by Greenpeace, haze that reached Kuala Lumpur (Malaysia) originated from the eastern coast of Sumatra, particularly from peatland areas. The journey of the haze towards Malaysia's capital took approximately two days.

4 Wetlands (2013). Kebakaran di Sumatra: mengurusi gejala, tak cukup aksi dalam menangani penyakit

Accumulated daily haze distribution throughout September 2019.*

*Greenpeace analysis (2025)

HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory Model) is a model developed by the National Oceanic and Atmospheric Administration (NOAA) to calculate and predict the movement of smoke and pollutants in the atmosphere, represented through backward trajectory maps.

The second factor is the extent of the haze coverage. Satellite imagery from Himawari-8 and Aqua in September 2019 confirmed the presence of moderate to dense haze over Kalimantan (around Palangkaraya) by mid-August, which later spread across Sumatra, Peninsular Malaysia, and Singapore in September.

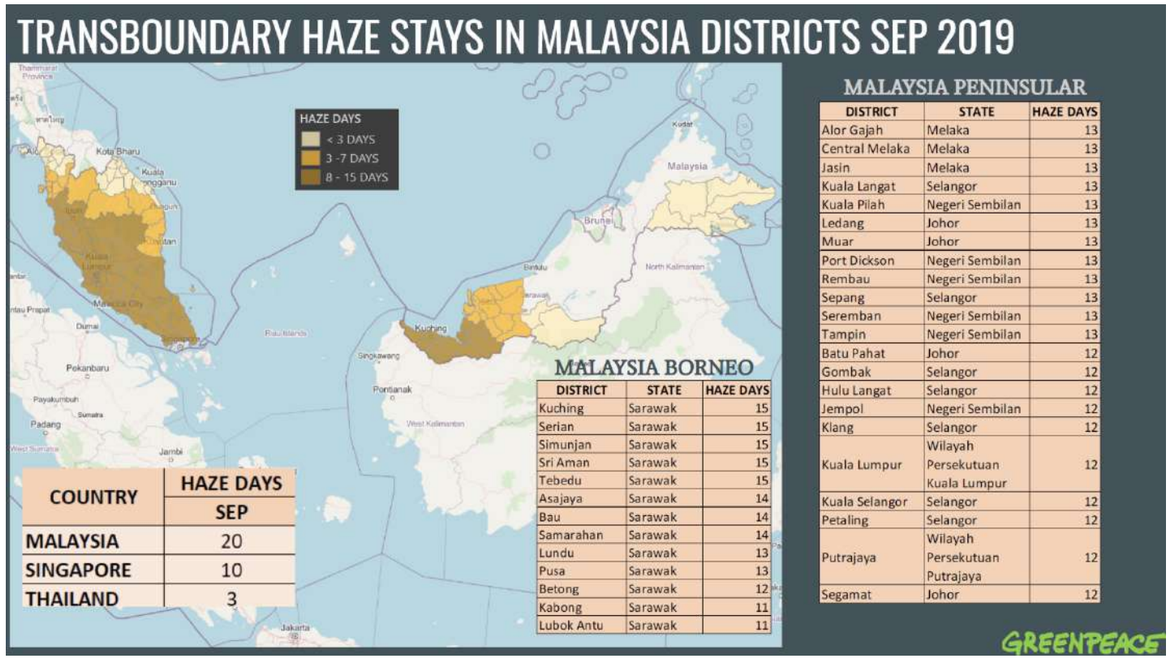
The third factor is the duration of the haze. Greenpeace's analysis shows that several regions experienced prolonged haze days in September 2019. Katingan (Central Kalimantan) recorded 30 days of haze, followed by Bengkalis (Riau) with 29 days. Regionally, Malaysia recorded 20 haze days, Singapore ten days, and Thailand three days.

Giant Concessions

The Greenpeace report specifically listed several companies in Sumatra and Kalimantan with the highest number of fire hotspots within their concessions during September 2019.

● **Transboundary haze at Malaysian cities during September 2019.***

*Greenpeace analysis (2025)



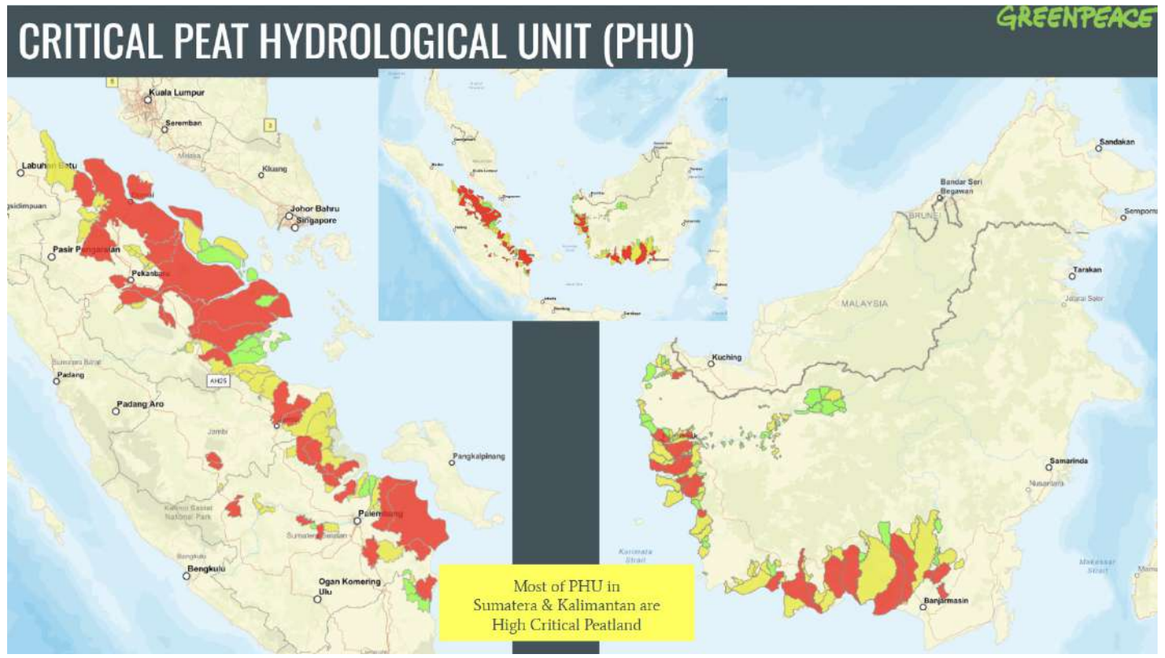
COUNTRY	HAZE DAYS SEP
MALAYSIA	20
SINGAPORE	10
THAILAND	3

DISTRICT	STATE	HAZE DAYS
Alor Gajah	Melaka	13
Central Melaka	Melaka	13
Jasin	Melaka	13
Kuala Langat	Selangor	13
Kuala Pilah	Negeri Sembilan	13
Ledang	Johor	13
Muar	Johor	13
Port Dickson	Negeri Sembilan	13
Rembau	Negeri Sembilan	13
Sepang	Selangor	13
Seremban	Negeri Sembilan	13
Tampin	Negeri Sembilan	13
Batu Pahat	Johor	12
Gombak	Selangor	12
Hulu Langat	Selangor	12
Jempol	Negeri Sembilan	12
Klang	Selangor	12
Kuala Lumpur	Wilayah Persekutuan Kuala Lumpur	12
Kuala Selangor	Selangor	12
Petaling	Selangor	12
Putrajaya	Wilayah Persekutuan Putrajaya	12
Segamat	Johor	12

DISTRICT	STATE	HAZE DAYS
Kuching	Sarawak	15
Serian	Sarawak	15
Simunjan	Sarawak	15
Sri Aman	Sarawak	15
Tebedu	Sarawak	15
Asajaya	Sarawak	14
Bau	Sarawak	14
Samarahan	Sarawak	14
Lundu	Sarawak	13
Pusa	Sarawak	13
Betong	Sarawak	12
Kabong	Sarawak	11
Lubok Antu	Sarawak	11

● **Distribution of peatland landscapes categorised as Highly Critical (red), Critical (yellow), and Moderately Critical (green).**

Source:
Greenpeace Indonesia (2021). Restorasi Hilang dalam Kabut Asap



From this analysis, Greenpeace emphasised that critical peat areas, most of which lie within company concession boundaries, were the main sources of the fires and the transboundary haze that swept across Southeast Asia in 2019.

Distribution of peatland landscapes categorised as Highly Critical (red), Critical (yellow), and Moderately Critical (green)[5]

Dry Season and El Niño

Another key factor that exacerbated the fires and haze in 2015, 2019, and 2023 was the dry season that coincided with El Niño, which caused forest and land areas, including peat ecosystems, to become extremely dry.

El Niño is the warm phase of the El Niño–Southern Oscillation (ENSO) cycle, characterised by an abnormal warming of sea surface temperatures in the central and eastern tropical Pacific Ocean. This phenomenon occurs periodically, typically every three to five years, and causes global changes in wind and rainfall patterns[6].

In Indonesia, the impact manifests as prolonged dry seasons. Reduced rainfall results in longer and drier dry seasons across many regions, delaying the onset of the rainy season and making rainfall patterns increasingly unpredictable. These arid conditions heighten the risk of severe droughts and forest fires.

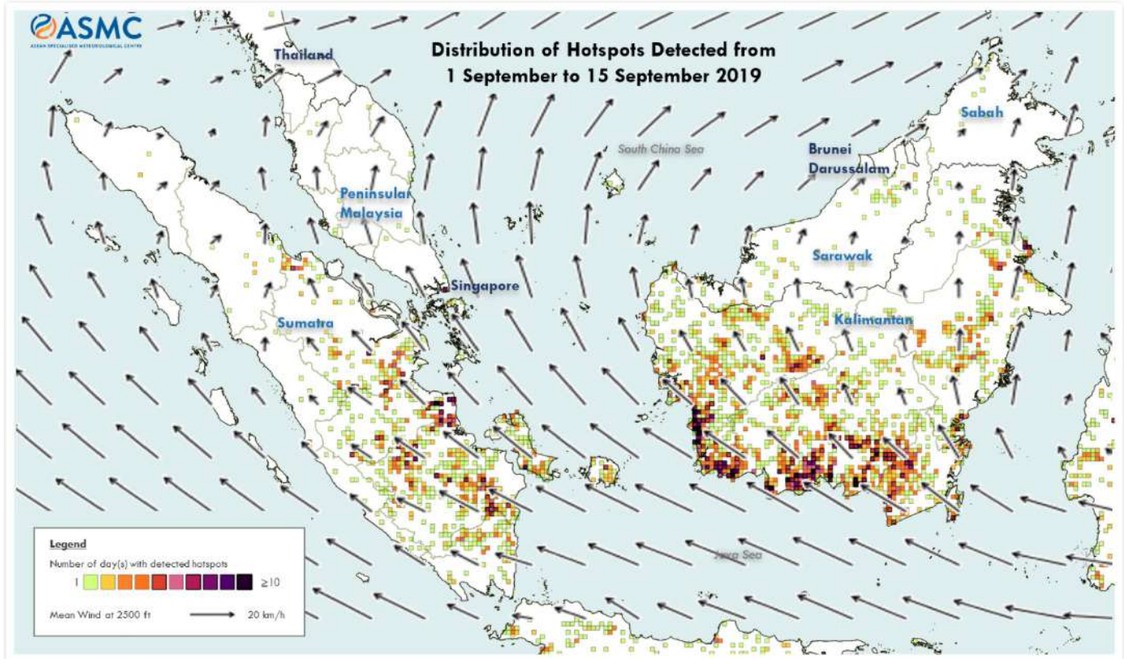
Monsoon Winds

According to the Greenpeace analysis, wind direction plays a highly crucial role in the spread of transboundary haze. Wind determines how far the smoke travels and which countries are affected. Seasonal wind patterns, particularly the monsoon winds, are the main factor explaining why haze spreads to neighbouring countries during the forest and land fires of 2015, 2019, and 2023.

Wind patterns in Indonesia and Southeast Asia are dominated by two main monsoons: the West (Asian) Monsoon and the East (Australian) Monsoon. These winds also determine Indonesia's wet and dry seasons.

The west monsoon blows from the Asian continent towards Australia between October and April, bringing Indonesia's rainy season. It carries abundant moisture as it passes over large bodies of water such as the Pacific Ocean and the South China Sea. Conversely, the east monsoon blows from Australia towards Asia, passing over Indonesia between April and October. This wind brings Indonesia's dry season, as it is dry air from the Australian continent during its winter period[7].

Major forest and land fires in 2015, 2019, and 2023 occurred when Indonesia was under the influence of the east monsoon. This meant that smoke from major fire hotspots in Sumatra and Kalimantan was carried by the wind towards Singapore, Pen-



The Wind Direction and the distribution of hotspots detected from 1 September to 15 September 2019 in Sumatra, Kalimantan and Malaysia, based on NOAA-20 satellite surveillance.

Source of prevailing winds: JMA)

5 Greenpeace Indonesia (2021). Restorasi Hilang dalam Kabut Asap

6 BMKG (2025). Ketika Laut Memanas, Dunia Berubah: El Niño Super 2023–2024 dan Dampaknya

7 https://bbmkg3.bmkg.go.id/public_data/dataspdf/bbmkg3-1723172705.pdf

MAJOR FOREST AND LAND FIRES IN 2015, 2019, AND 2023 OCCURRED WHEN INDONESIA WAS UNDER THE INFLUENCE OF THE EAST MONSOON. THIS MEANT THAT SMOKE FROM MAJOR FIRE HOTSPOTS IN SUMATRA AND KALIMANTAN WAS CARRIED BY THE WIND TOWARDS SINGAPORE, PENINSULAR MALAYSIA, SARAWAK, AND BRUNEI DARUSSALAM.

insular Malaysia, Sarawak, and Brunei Darussalam.

This wind influence creates a recurring phenomenon known as transboundary haze.

Although the pattern of fire and haze disasters in 2015, 2019, and 2023 remains largely the same, there are notable differences. The 2015 forest and land fires were the most severe, covering an estimated 2.6 million hectares. The 2019 and 2023 fires affected smaller areas, which were around 1.6 million and 1.16 million hectares, respectively (according to government data), though other sources reported higher figures.

The primary reason lies in the 2015 El Niño, which was among the strongest in history, contributing significantly to the massive scale of fires. The 2019 and 2023 El Niño events were also strong, but not as intense as that of 2015, possibly explaining why the fires were not as extensive. The 2015 El Niño is often said to have been comparable in strength to that of 1998[8].

Many observers also noted that the Indonesian government showed a better response to the 2019 and 2023 forest and land fires compared to 2015. In 2015, the response was considered slow and poorly coordinated. However, in 2019 and 2023, the government acted more swiftly, deploying larger joint teams and using technologies such as weather modification. While artificial rain technology was still rarely used in 2015, by the 2019 and 2023 fires, the method had been applied intensively by the government. This was witnessed by Jay, a resident of Lebung Itam: “During the 2019 fires, many aircraft flew over the village,” he said. ●

8 BBC (2015). El Nino 2015 samai rekor 1998 sebagai ‘yang terkuat dalam sejarah’

MUHAMMAD TOHIR/GREENPEACE

A boat pass on the Musi river below the Ampera bridge as it covered by thick haze in Palembang, South Sumatra. The toxic smoke from wildfires in Sumatra island especially Palembang city increased to the danger level this week due to the massive forest and plantation fires season in the island.

CHAPTER 4.

WHO DID THE BURNING?

Forest and plantation fires in Jekan Raya sub-district, Palangkaraya city, Central Kalimantan, Indonesia. The Indonesian government has declared a state of emergency in six provinces on the islands of Sumatra and Kalimantan as forest fires spread across the country.

ULET IFANSASTI/GREENPEACE

THE plantation sector bears the greatest responsibility for the fires that occurred between 2015 and 2023. Data from the Ministry of Environment and Forestry (KLHK) and the National Disaster Management Agency (BNPB) consistently show that peatlands and corporate concession areas often become major hotspots. In 2019, 27% of the mapped burned areas were located within palm oil and timber plantation concessions. The government's 2023 report also stated that most of the burned areas were lands that had previously burned in earlier years[1].

Greenpeace's analysis of fires during the 2015–2019 period focused on companies and groups with the largest burned areas and recurring fires. The analysis found that 27% of the mapped burned areas in 2019 were located within palm oil and industrial timber plantation (HTI) concessions. In the palm oil sector, these included Sungai Budi/Tunas Baru Lampung (e.g., PT Samora Usaha Jaya), Bakrie, Best Agro Plantation, LIPPO, Genting, and the Fangiono Family. PT Samora Usaha Jaya recorded the largest total burned area (2015–2019) at 26,600 hectares, including 17,500 hectares in 2019 alone[2].

In the pulp and paper (HTI) sector, the groups Sinar Mas/Asia Pulp & Paper (APP) and APRIL/Royal Golden Eagle (RGE) were identified. The concessions associated with Sinar Mas/APP burned 314,200 hectares between 2015–2019, with 77,300 hectares burned in 2019[3].

Greenpeace's analysis also found supply chain connections between the 2019 fire hotspots and major corporations such as Mondelēz, Nestlé, Unilever, and Procter & Gamble (P&G) as buyers, and Wilmar as a trader. These buyer companies were linked to up to 9,900 hotspots within their suppliers' concessions in 2019[4].

Among those companies, according to Minister of Environment and Forestry Siti Nurbaya on 13 September 2019, there were five foreign companies from Singapore and Malaysia. Four were located in West Kalimantan, and one in Riau[5].

The four companies in West Kalimantan were: "PT Hutan Ketapang Industri from Singapore in Ketapang, PT Sime Indo Agro from Malaysia in Sanggau, PT Sukses Karya Sawit from Malaysia in Ketapang, and PT Rafi Kamajaya Abadi in Melawi. They were sealed off because they caused forest and land fires," said Siti at the Coordinating Ministry for Political, Legal, and Security Affairs, Jalan Medan Merdeka Barat, Central Jakarta.

1 Greenpeace Indonesia (2023). Report: Indonesia's Chronic Forest Fires – 2023

2 Greenpeace Indonesia (2020). Karhutla dalam Lima Tahun Terakhir

3 Greenpeace Indonesia (2020). Karhutla dalam Lima Tahun Terakhir

4 Greenpeace International (2019). Burning down the House: How Unilever and other global brands continue to fuel Indonesia's fires

5 IDN Times (2019). Menteri LHK: Ada Perusahaan Malaysia dan Singapura Terlibat Karhutla

RENDRA HERNAWAN/GREENPEACE

Greenpeace Forest Fire Prevention (FFP) team extinguishes fire at a peatland area in Punggur Kecil village, Sungai Kakap sub-district, Kubu Raya district, Pontianak, West Kalimantan. The FFP team is deployed in the peatland area to suppress the fire and carry out investigation.

ABRIANSYAH LIBERTO/GREENPEACE

The Greenpeace Forest Fire Prevention Team inspects the condition of a dried-up riverbank in a burnt area shrouded in thick smoke from forest and peat fires in Lebung Itam Village, Tulung Selapan District, Ogan Komering Ilir Regency, South Sumatra.

In total, according to Rasio Ridho Sani, Director General of Environmental Law Enforcement at the MoEF, the ministry had sealed land owned by 62 companies due to fires that caused forest and land burning as of Sunday, 29 September 2019. Of these, 20 were foreign companies. “Most of them are from Malaysia and Singapore,” said Rasio (Roy) Ridho Sani[6].

Among the foreign companies were nine from Singapore, six from Malaysia, one from Hong Kong, and four others whose countries of origin were not disclosed. These companies include: PT SP (Singapore) in West Kalimantan, PT IGP (Malaysia) in West Kalimantan, PT MJSP (Malaysia) in Central Kalimantan, PT SIA (Malaysia) in West Kalimantan. Next, PT GH (Singapore) in Riau, PT SMA (Singapore) in West Kalimantan, PT RKA (Malaysia) in West Kalimantan, PT AUS (Singapore) in Central Kalimantan, PT HKI (Singapore) in West Kalimantan.

Also, PT API (Malaysia) in Riau, PT FI (Singapore) in West Kalimantan, PT GMU (Hong Kong) in West Kalimantan, PT NPC (Singapore) in East Kalimantan, PT AAI (Singapore) in West Kalimantan, PT WAJ (Singapore) in South Sumatra, dan PT KGP (Malaysia) in West Kalimantan. All of these companies held foreign investment (PMA) status, Rasio (Roy) said. The remaining four companies whose corporate types were not specified were PT RK, PT THIP, PT TANS, and PT MAS.

“Of the other 44 companies holding domestic investment (PMDN) status,” Rasio added, “some were also led by Singaporean and Malaysian nationals.”

However, Greenpeace’s study found that many of these same concessions burned again in 2023, including those owned by foreign companies. During the 2023 palm oil concession fires, 55% were identified as recurring fires. These fires occurred across 298 palm oil concessions, with a total burned area of 319,000 hectares. Similarly, in the pulp sector, fires occurred across 90 HTI concessions, with a total burned area of 119,000 hectares, 45% of which were recurring fires. On peatlands, around 599,000 hectares burned in 2023, 66% of which were repeat fires. In total, around 144 concessions covering 174,000 hectares had previously burned between 2015 and 2022[7].

One such recurring fire occurred in the concession owned by PT Samora Usaha Jaya, which burned area was 15,000 hectares. The same concession had previously burned 26,000 hectares between 2015–2019 and 17,000 hectares in 2019 (the company denied Greenpeace’s 2019 fire area analysis). Despite repeated fires from 2015–2023, the company has never received any sanction other than being sealed in 2019 and 2023.

6 Detik Sumut (2023). 39 Lokasi Disegel KLHK Terkait Karhutla di Seluruh Indonesia

7 Greenpeace Indonesia (2023). Report: Indonesia’s Chronic Forest Fires – 2023

RENDRA HERNAWAN/GREENPEACE

Burning peatland inside the palm oil concession of PT Sumatera Unggul Makmur (SUM) at Punggur Kecil village, Sungai Kakap sub-district, Kubu Raya district, Pontianak, West Kalimantan. The Greenpeace Forest Fires Prevention team is deployed in the area for fire suppression and investigation.

Concessions owned by two companies from the Best Agro Plantation Group, which are PT Bangun Cipta Perkasa and PT Karya Luhur Sejati, also burned again, with 8,929 hectares and 4,379 hectares burned, respectively. Both companies ranked among the top ten palm oil companies with the largest burned areas between 2015–2019.

The concession of PT Waringin Agro Jaya was also burned again in 2023, with an area of 8,500 hectares. The company had previously been fined IDR 466 billion for fires covering 1,626 hectares of peatland in 2014. Although the court ruling had permanent legal force (*inkracht van gewijsde*), the company has not yet paid the imposed fine.

Palm oil concessions in Papua, particularly South Papua, have largely

had their permits revoked. However, the area has since been designated as part of the Merauke Food Estate, and some areas were also burned, including concessions belonging to PT Sukses Pratama Andalan (inactive) and PT Pelangi Prima Indonesia (inactive) on Dolok Island, where 31,000 hectares burned in 2023.

As for forest and land fires in timber plantation concessions, Greenpeace's analysis showed that PT Bumi Mekar Hijau recorded the largest burned area in 2023, reaching 26,400 hectares. The company, affiliated with the Sinar Mas Group, had previously been fined IDR 78 billion in 2016 for repeated fires covering 20,000 hectares in 2014–2015. Between 2015 and 2018, at least two civil sanctions were imposed on the company. Despite these penalties, the company appeared undeterred: fires continued to recur across its concessions; 87,600 hectares burned between 2015–2019, and 40,400 hectares in 2019 alone.

In addition to PT Bumi Mekar Hijau, other pulp concessions affiliated with the Sinar Mas Group, such as PT Sebangun Bumi Andalas Wood Industri and PT Bumi Andalas Permai, also burned, covering 6,744 hectares and 2,179 hectares respectively. Both companies had previously experienced fires between 2015–2019 and had already been sanctioned.

CHAPTER 5.

FROM PATTERNS TO TRAUMA

Volunteers from the Greenpeace Indonesia Forest Fire Prevention (FFP) team took a photo session after they held an Independence Day ceremony on the burned peatland in Bunga Baru Hamlet, Madusari Village, Sungai Raya District, Kubu Raya Regency, West Kalimantan, Thursday (8/ 17/2023).

KIKY/GREENPEACE

WHAT keeps repeating leaves behind trauma, said Jay, Marda, Husni, Ataka, Gunasekaran, and Tikka.

Husni said he noticed a numerical pattern in the three biggest haze disasters of 2015, 2019, and 2023. “Fires happen every year, but the really bad ones seem to occur every four years,” he said. “So I’m definitely afraid that in 2027 it might happen again.”

He admitted he already has a *to-do list* prepared if the haze disaster returns, which he believes follows the four-year El Niño cycle and—this is his guess—the acacia harvest cycle in HTI concessions in South Sumatra. “I’ll go back to the village first. There’s no other choice. When haze hits the city, economic access is blocked, and social activities are disrupted. I’ll just work as a farmer for a while,” he said.

Marda is more worried about the impact. “I’m obviously traumatised, sad, anxious. We have to think about our children’s health and our own. Work gets disrupted, and some even lose their jobs.” That includes her own work as a female motorcycle taxi driver who used to travel as far as Palembang. “That’s why I joined others to file a lawsuit against the companies responsible for the haze in my area,” she said.

Marda, along with Jay and Husni, is among twelve residents of South Sumatra who filed a civil lawsuit against three companies over the long-term impacts of haze in their region. The lawsuit was filed with the Palembang District Court on 29 August 2024, demanding compensation for material and immaterial losses caused by haze that damaged their environment and health[1].

Beyond the lawsuit, Jay found another way to release his trauma. After the 2015 fires, he founded a community forum in Lebung Itam to fight for a decent and just living space. He took a stand against the concessions surrounding his village.

Though far from the source of the haze, Gunasekaran admitted that every year since the 2015 fires, as October approaches, he feels fear. “I’m afraid that when October comes, there will be haze. I can’t forget October.”

To ease his worry, he does something similar to Jay, putting pressure on those responsible, including the Indonesian Government. “I’m worried that if I don’t take action against the Government of Indonesia, this will keep

1 BBC (2025). Warga Sumsel banding vonis PN Palembang yang tidak menerima gugatan karhutla

JURNASYANTO SUKARNO/GREENPEACE

Rafa, a 50-day-old baby, is held by his mother as he receives oxygen treatment due to thick smoke from forest fires in the intensive care unit at Doris Sylvanus General Hospital in Palangkaraya, Central Kalimantan. Nearly 2,000 wildfires have occurred across Indonesia this year, the worst year since 2015.

JURNASYANTO SUKARNO/GREENPEACE

A boat crosses the Kahayan River, shrouded in thick haze from forest fires in Palangkaraya City, Central Kalimantan. Nearly 2,000 forest fires have occurred across Indonesia this year, the worst since 2015. Officials estimate the fires have burned more than 323,748 hectares (800,000 acres). Greenpeace criticized the government for failing to take action against companies burning land for agricultural purposes.

happening."

"I'm not doing this just for my family's rights," he added. "It's for my people, the schoolchildren, pregnant ladies, those with poor eyesight, asthma patients, diabetics, people with high blood pressure, and others. I myself have hypertension and diabetes. My wife is on dialysis," ujarnya.

Tikka, meanwhile, has already taken precautions to prepare for the haze's return because she is "of course afraid," she said. "At the end of every year, I used to worry. Now, after some time, I've forgotten."

Still, to be safe, she has moved to a new home, one surrounded by a bit more greenery. She still lives in a condominium but refuses to stay on the 12th floor or higher because "the smoke hits you directly up there. So now I live lower down, on the 5th floor," she said.

She has also bought an extra air purifier. "I bought another one, just to be prepared."

Ataka Yang, who lives closer to the haze's epicentre in Indonesia compared to Gunasekaran, always greets the arrival of July with unease, worrying that haze will return. But she doesn't prepare anything in advance. "What can we do? Sorry, I still remember. When it comes, there's nothing we can do," she said.

Do these accounts suggest that they are traumatised?

The answer may be found in the literature. A scoping review titled *"The mental health and well-being effects of wildfire smoke: a scoping review"* found that while research on the mental health impacts of wildfire smoke is still in its early stages, smoke exposure can affect mental health and overall well-being, especially during prolonged and persistent haze episodes. Studies, including those focusing on "haze" in Southeast Asia (Singapore and Malaysia), reported associations with symptoms such as anxiety and depression, acute psychological stress, intrusive thoughts (recurrent thoughts and dreams about the haze), and hyper-arousal (marked by irritability), insomnia, and poor concentration.

Meanwhile, another study conducted in Kuala Lumpur, Malaysia, found that 70% of respondents reported *sadness* as a response to haze, and 79% felt fear about its health effects.

This research also found that qualitative studies, particularly during extended haze periods, revealed emotional impacts such as heightened fear, anger, depression, stress, hopelessness, uncertainty, and guilt; social isolation; and—importantly—feelings of *ecological loss* among communities whose livelihoods depend on nature, including customary communities.

Who experiences these symptoms?

CHAPTER 6.

WHAT HAS BEEN AND CAN BE DONE?

Greenpeace Forest Fire Prevention (FFP) team extinguishes fire at a peatland area in Punggur Kecil village, Sungai Kakap sub-district, Kubu Raya district, Pontianak, West Kalimantan. The FFP team is deployed in the peatland area to suppress the fire and investigate its cause.

RENDRA HERNAWAN/GREENPEACE

RENDRA HERNAWAN/GREENPEACE

WHAT also recurs in every haze and forest–land fire disaster, and plays a crucial role, is the unequal enforcement of the law against perpetrators. Although the Ministry of Environment and Forestry (KLHK) has stated that the government has sanctioned 64 companies related to forest and land fires (karhutla), through orders for corrective action, suspension, or licence revocation[1], Greenpeace's findings tell a different story.

Greenpeace's latest analysis shows that between 2015 and 2019, forests and land covering 3.4 million hectares burned across Indonesia. Many of these fires occurred within corporate concession areas. Greenpeace revealed this data by comparing fire occurrence with the best available concession data for palm oil and pulpwood companies, along with administrative and civil sanctions imposed on companies, compiled through freedom of information requests and official government reports. "And from our analysis, we can see that not a single one (has been held accountable)," said Kiki Taufik, Global Forest Campaign Head at Greenpeace Indonesia[2].

None of the ten palm oil concessions with the largest total burned areas in Indonesia were given any serious sanctions, Kiki added, "whether civil or administrative, such as licence revocation. The same applies to pulp and paper companies involved in forest and land fires during the same period."

In fact, under Indonesia's Environmental Law, there is a *strict liability* provision that stipulates that if land within a concession burns, the company must be held fully responsible for it. This indicates that "the government is not serious about law enforcement," which is a key reason "why these fires keep happening every year".

"So the hotspots appear again (in the same concessions) because there are no sanctions at all. They don't feel guilty. There's no deterrent effect," said Kiki.

The public has also mobilised to address this chronic transboundary haze problem, which is widely viewed as unresolved and inadequately addressed. Public actions concerning transboundary haze pollution caused by forest and land fires in Indonesia during 2015, 2019, and 2023 have primarily involved legal measures, advocacy by civil society organisations (CSOs)/NGOs, and regional cooperation efforts.

Among the first to act was Singapore. On 25 September 2015, Singapore's National Environment Agency (NEA) took legal action under the *Transboundary Haze Pollution Act* (THPA), after the haze crisis from forest and land fires in Sumatra and Kalimantan reached hazardous levels in Singapore that month, with the 24-hour Pollutant Standards Index (PSI) exceeding 101 over several periods.[3]

The THPA, enacted in 2014, allows individuals and the government to file civil liability claims against any entity, whether located within or outside Singapore, that causes or contributes to haze pollution in Singapore. The Act defines "haze pollution" as occurring when the 24-hour PSI reaches 101 or higher for at least 24 continuous hours.

NEA identified the haze in Singapore as originating from fires on four—and later six—concession areas belong-

1 Mongabay (2019). Kepatuhan Cegah Karhutla Rendah, KLHK Kaji Perampasan Keuntungan Korporasi

2 BBC (2019). Kebakaran hutan: Sejumlah perusahaan di balik karhutla 2015-2018 lolos dari sanksi serius

3 National Archive of SIngapore. SINGAPORE SENDS NOTICES TO FOUR INDONESIAN COMPANIES AND SEEKS INFORMATION FROM SINGAPORE-LISTED APP

ing to several Indonesian companies[4]. NEA then issued *Preventive Measure Notices* to these companies:

1. PT Rimba Hutan Mas
2. PT Sebangun Bumi Andalas Wood Industries
3. PT Bumi Sriwijaya Sentosa
4. PT Wachyuni Mandira
5. PT Bumi Andalas Permai (later identified)
6. PT Bumi Mekar Hijau (later identified)

Through these notices, NEA required the companies to deploy firefighting personnel to extinguish or prevent the spread of fires on land they owned or occupied; to cease, or refrain from initiating, any burning activities; and to submit an action plan to extinguish the fires or prevent their recurrence.

NEA also sent a notice to Singapore-based Asia Pulp & Paper Company Ltd (APP), requesting information about its subsidiaries, affiliates, and suppliers in Indonesia, as well as the preventive measures they had undertaken.

Under the THPA, companies found guilty could be fined up to S$100,000 per day while the haze persisted, with a maximum total fine of S$2 million (approximately IDR 21 billion at the time).

The implementation of the THPA triggered diplomatic tension with Indonesia. Several Indonesian officials objected, arguing that Singapore's extraterritorial law violated Indonesia's sovereignty.[5]

Singapore, however, responded that the THPA was intended to complement other countries' efforts to hold irresponsible companies accountable and did not constitute a breach of sovereignty. The law also received government support[6]. In May 2016, NEA even obtained a court warrant to ensure the attendance of a director from one of the Indonesian companies under investigation, who had failed to respond to a summons, for questioning should he enter Singapore. However, the success of prosecutions under the THPA has depended heavily on law enforcement and prosecution efforts within Indonesia itself.

Another lawsuit came in the form of a citizen lawsuit filed in 2016 by seven residents of Central Kalimantan against the President of the Republic of Indonesia, Joko Widodo, several ministers, and the Governor of Central Kalimantan. The plaintiffs won the case in the District Court, the High Court, and at the cassation level in the Supreme Court in 2019. The ruling obligated the government to take concrete measures for the prevention and control of forest and land fires.

However, the government filed for judicial review (*peninjauan kembali*)[7] and on 3 August 2022, the Supreme Court granted the petition[8]. This decision overturned the previous rulings and released the government from liability for compensation. The Court also ruled that President Joko Widodo was not responsible for the fires. Nonetheless, the 2019 Supreme Court decision on the government's duty of mitigation continues to serve as a reference.

Then there were Jay, Husni, and Marda, who also decided to fight back. Along with eight other residents, they filed a lawsuit against three companies—PT BMH, PT BAP, and PT SBA—at the Palembang District Court on Thursday, 29 August 2024, over the prolonged haze disaster in their region.

The plaintiffs came from diverse backgrounds, including farmers, rubber tappers, fishermen, swamp buffalo herders, housewives, informal workers, and environmental activists.

Supported by a coalition called *Inisiatif Sumatera Selatan Penggugat Asap* (ISSPA), which includes Greenpeace, the eleven residents demanded compensation for the violation of their right to a good and healthy environment, as well as environmental restoration for the haze disaster caused by forest and land fires (*karhutla*), which had harmed them both materially and immaterially.

Jay recounted that for years he had felt victimised by the haze resulting from forest and land fires, and that last year his swallow house even burned down. He came to the Palembang District Court to sue the three companies he believed had caused the haze that blanketed his area almost every dry season. "Through this lawsuit, we want to send a warning that what these companies have done is wrong because they have damaged our environment and living space, and caused haze pollution," he said[9].

4 Todayonline (2017). NEA clears 2 firms, warrant issued for director in haze probe

5 The Jakarta Post (2020). Indonesia draws the line on Singapore's 2015 haze investigation

6 Ministry of Foreign Affairs Singapore (2016). MFA Spokesman's Comments on Indonesia's Foreign Ministry's response to NEA obtaining court warrant against the director of an Indonesian company, 13 May 2016

7 Betahita (2022). Presiden Jokowi Ajukan PK dalam Kasus Karhutla Kalteng 2015

8 Betahita (2023). MA Menangkan Pemerintah Atas Gugatan Karhutla Kalteng 2015

9 Betahita (2024). 12 Warga Sumsel Pakai Jurus Baru Lawan Korporasi Asap

The legal counsel for the eleven residents, Ipan Widodo from the Palembang Legal Aid Institute (LBH Palembang), stated that the people of South Sumatra had long remained silent in the face of the severe impacts of haze from forest and peatland fires. He said this was the first time citizens had demanded *strict liability* from corporate entities for losses arising from environmental pollution or destruction caused by such entities. “This struggle will mark a new chapter in the development of environmental law in Indonesia—and a new form of people’s struggle against the climate crisis,” he said.

The forest and land fires that occurred within the defendants’ concession areas significantly contributed to the haze pollution in Palembang in 2015, 2019, and 2023. According to civil society records, the total burned area within these companies’ concessions from 2015 to 2020 reached 254,787 hectares—nearly four times the size of Jakarta. These three companies had previously been sanctioned and fined for recurring fires, yet by last year, their concessions were still burning.

Alongside citizen lawsuits, civil society organisations (CSOs) have also taken action. CSOs have been actively conducting advocacy campaigns, publishing reports (such as Greenpeace’s analysis of the 2023 burned areas), and engaging regional bodies to raise public awareness. Civil society actors often frame the haze issue as a human rights concern, arguing that it affects the right to life, the right to health, and the right to a healthy environment.

Among these initiatives was one led by a coalition of civil society organisations in Malaysia, including CERAH[10] and Greenpeace Malaysia[11], in 2021. They submitted a complaint to the Human Rights Commission of Malaysia (SUHAKAM), calling for a review of Malaysia’s legal framework concerning domestic and transboundary haze pollution. This serves as an example of how national and regional human rights mechanisms have been used to address the haze issue.[12]

At the regional level, ASEAN’s role in addressing transboundary haze pollution has been significant, though its effectiveness remains limited by ASEAN’s defining principles—*Non-Interference* and the *ASEAN Way* approach.

Broadly, ASEAN’s engagement between 2015 and 2023 focused on strengthening cooperation frameworks, monitoring mechanisms, and roadmap development. One of ASEAN’s key contributions in addressing haze pollution has been the establishment of a legal framework through the *ASEAN Agreement on Transboundary Haze Pollution* (AATHP), adopted in 2002.

10 Cerah Malaysia. Suhakam Project

11 Greenpeace Malaysia (2024). Ending haze, the Silent Enemy

12 Suhakam (2024). Silent Enemy: Report on Haze Pollution and the Right to Clean Air

NGUYEN TUAN ANH/GREENPEACE

Office workers endure the thick smog in Singapore’s worst ever haze in history. Many have to cover their nose and mouth using bare hands or handkerchiefs as N95 mask supply is running low. The Pollutant Standards Index (PSI), Singapore’s main index for air pollution, has hit record levels. These measurements are classified as “hazardous” and can aggravate respiratory ailments.

ACCORDING TO CIVIL SOCIETY RECORDS, THE AREA BURNED IN THE DEFENDANTS' CONCESSIONS IN 2015-2020 WAS 254,787 HECTARES – EQUIVALENT TO ALMOST FOUR TIMES THE AREA OF DKI JAKARTA.

Indonesia, as the main source of haze, ratified the AATHP in January 2015, making the agreement fully applicable to all ASEAN member states. This ratification represented a major diplomatic milestone for ASEAN. However, although the agreement is legally binding, the AATHP lacks clear legal enforcement mechanisms or sanctions against member states that fail to meet their obligations. This reflects the *ASEAN Way's* emphasis on dialogue and consensus over confrontation. As a result, the recurrence of haze crises (in 2015, 2019, and 2023) has raised questions about the agreement's effectiveness.[13] [14]

For ASEAN, the severe 2015 crisis acted as a catalyst, pushing the organisation to strengthen its institutions and technical mechanisms rather than relying solely on what had been a "weak" agreement. ASEAN developed and implemented the first *Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control* (2016–2020) [15] and subsequently the second Roadmap (2023–2030)[16]. These roadmaps aim to achieve a "Haze-Free ASEAN" (initially targeted for 2020, now extended to 2030). ASEAN also established the *ASEAN Coordinating Centre for Transboundary Haze Pollution Control* (ACC THPC), based in Indonesia[17]. The Centre serves as a platform for coordination, information-sharing, and management of forest fire and haze impacts. Through institutions such as the *ASEAN Specialised Meteorological Centre* (ASMC)[18], ASEAN has also focused on enhancing fire monitoring, assessment, and early warning systems to help member states prepare for the dry season.[19] [20]

13 https://asean.org/wp-content/uploads/2021/01/ASEANAgreementonTransboundaryHazePollution-1.pdf

14 ASEAN. ASEAN AGREEMENT ON TRANSBOUNDARY HAZE POLLUTION

15 NUS (2016). 2016 Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation

16 ASEAN (2024). THE SECOND ROADMAP FOR ASEAN COOPERATION ON TRANSBOUNDARY HAZE POLLUTION CONTROL WITH MEANS OF IMPLEMENTATION

17 Antara (2023). ASEAN inaugurates ACC THPC to combat haze pollution

18 ASMC. Regional Haze Situation

19 ASMC. Advisory Alert Level

20 ASEAN. ASEAN Fire Alert

ABRIANSYAH LIBERTO/GREENPEACE

RECOMMENDATIONS

For Southeast Asia

On 28 July 2022, all Southeast Asian countries—except Cambodia—voted in favour of the United Nations General Assembly (UNGA) resolution declaring access to a clean, healthy, and sustainable environment as a universal human right. The resolution calls on states, international organisations, and businesses to scale up efforts to ensure a healthy environment for all.

Accordingly, ASEAN can take leadership in aligning its regional human rights framework with the UNGA resolution by:

Integrating Environmental Rights into the ASEAN Framework

Embedding the "Right to a Clean, Healthy, and Sustainable Environment" into ASEAN's human rights instruments, declarations, and action plans, ensuring alignment with international standards and addressing regional realities such as transboundary haze and corporate accountability.

Strengthening National and Regional Legal Commitments

Encouraging ASEAN member states to adopt and implement national legislation that recognises environmental rights and to reform the ASEAN Agreement on Transboundary Haze Pollution (AATHP) so that it establishes legally binding commitments protecting every ASEAN citizen's right to clean air and a healthy environment.

Promoting the Rule of Law and Implementation

Reinforcing ASEAN's collective commitment by ensuring that regional agreements are translated into enforceable domestic actions—linking human rights, environmental governance, and accountability mechanisms at both national and regional levels.

ULET IFANSASTI/GREENPEACE

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For Indonesia

Given the weak law enforcement and recurring fires within concession areas, the recommendations for the Government of Indonesia are as follows:

Strict Law Enforcement

The government must strengthen law enforcement efforts by enhancing coordination among enforcement institutions, reviewing all concession permits in peatland landscapes, revoking permits for companies whose concessions experience repeated fires, imposing the heaviest sanctions to prevent further recurrence, and repealing regulations that weaken peatland protection.

Data Transparency

The government must ensure transparency in providing real-time forest and land fire (*karhutla*) information or, at the very least, communicate events to the public promptly after field occurrences. Data collection on hotspots and burned areas should be conducted through field reports, high-resolution satellite imagery, and transparent updates on law enforcement progress, enabling civil society participation in addressing the forest and land fire crisis.

Comprehensive Peatland Restoration and Protection

The government should treat Peat Hydrological Units (KHGs) as unified ecosystems, ensuring that both the protection of intact peat ecosystems and the restoration of degraded peatlands are conducted holistically. Peat drainage through canal systems must be prohibited, and existing canals should be closed.

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A volunteer extinguishes fires in the peatland area in Palangka Raya, Central Kalimantan. The amount of land and forest fires in Indonesia through September this year has exceeded to 857,756 hectares (2,12 million acres), according to data given by the Indonesian Forestry and Environment Ministry.

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For the Government of Malaysia

Amend the Federal Constitution to explicitly recognise the right to a safe, clean, healthy, and sustainable environment as a fundamental right, as recommended by the Human Rights Commission of Malaysia (SUHAKAM) in its 2024 report *"The Right to Clean Air"*.

Enact a comprehensive legislative framework for clean air, such as a *Clean Air Act* or *Domestic Transboundary Haze Pollution Act*, to address transboundary haze pollution and regulate Malaysian-owned companies.

Hold Malaysian companies accountable for their involvement in peatland fire disasters in Indonesia.

For the Government of Singapore

Given that Singapore already has the assertive *Transboundary Haze Pollution Act* (THPA), efforts should be made to strengthen its extraterritorial reach.

Strengthen the THPA

Expand the scope of the THPA to target parent companies or corporate groups based in Singapore that exercise substantial control over subsidiaries in Indonesia, not only the subsidiaries themselves.

Technical Support

Allocate funding to support civil society initiatives in Indonesia that monitor peatland conditions.

Hold Singaporean companies accountable for their involvement in peatland fire disasters in Indonesia.

For Global Consumers

Global consumers must take firm action by demanding that multinational companies cleanse their supply chains of suppliers implicated in forest and peatland fires. ●

FERINA NATASYA/GREENPEACE