heart of the land

The Science and Spirits of Indigenous Climate Solutions

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It took me almost two days on motorbike, car and train to get here, from Bangkok to Chiang Mai Province then to Samoeng District, where I last saw the road. From there, I embarked on another hour-long bumpy ride through a narrow, puddle-filled trail. Trees the height of six-storey buildings lined both sides of the track, some tied around with orange fabric like that of a Buddhist monk.

In what felt like the middle of nowhere, a sleepy cluster of little wooden houses standing on stilts, huddled together on the hill-slopes nestled among the trees. I've arrived to Soblan village.

Although there aren't any shopping malls or convenience stores, and the closest 7-11 is about half an hour away, around here there is more than enough of whatever one may need to last a lifetime and more if one is resourceful and respectful. If the groceries are out, one does not simply buy it from the supermarket or order it online — one grows it. Here, one does not merely live on the land — one lives off the land and with it.

For the past four generations, this indigenous Karen community has called this forest home, here in what is today called northern Thailand. Down the line from his ancestors who migrated here hundreds of years ago, Patii Taayae Chudboonming — '*Patii*' meaning *uncle*, as well as *teacher* — is now the leader to his community. With his traditional red woven top and a long, white beard, he looks just like the wise old man archetype.

I sat down on the floor for our first meal together, gathered around trays of steaming white rice with his family. Patii's wife, Mo Waypo — *Mo* meaning mother — then placed down a fragrant bowl of soup and a plate of omelette.

"*Org mae*," she said with a warm smile. "*Let's eat*."

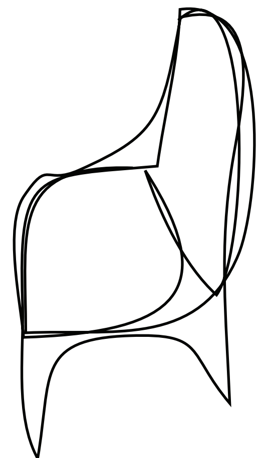
This rice, they tell me, came straight from their fields and forests. So were the bamboo shoots, eggplants and chillis and everything else we were eating, fresh eggs laid by hens clucking below their house and wild fish caught from the glistening streams nearby. And so were the bamboo beams that laid the flooring we sat on, the timber that raised their home and the palm fronds woven to form their thatched roof, which they've kindly offered for me to sleep under any night I needed.

Patii's family fed me kindly and generously, every meal with food grown on their land.

Patii Tayae Yodchudmingboon, the community leader, showed me around his home – the village and the forest.

I’ve never made a chair. With the help of their neighbours, this family had built their entire house with timber collected from the forests that surrounded them. But they don’t just chop down any random tree they find — Karens believe that trees struck by lightning or ones with split trunks can bring bad luck to them and their family, perhaps also knowing that to be a poor characteristic for any building material.

Once a good tree is selected, they perform a ritual to seek permission from the forest spirits before cutting it and carrying the logs back on foot to the village. Starting from the pillars, other villagers would help the family build their house from the ground up, everyone fed by their host each day they lend a helping hand. And like this, they do other areas of their living: as a close-knit community, as one loving family.



The sun has barely risen and everyone in the village was already up, cooking and chatting, along with the birds chirping, roosters crowing, pigs oinking, sounds of the villagers and the forest as one lively yet tranquil orchestra. When we were done with our breakfast, Mo wrapped two fistfuls of rice and a fried fish in a banana leaf for me and Patii to take as lunch for our day in the field.

For someone who's in his 70s, Patii was much ahead of me on our walk uphill. Along the way, he stopped, pointed at the ground and looked at me. I had no idea what he was trying to show me.

"*You can use this to stop bleeding*," he said, gently caressing a green jagged leaf with his fingers, before plucking it, crushing it and lifting it up to my nose for me to smell. "*It's called sarb suer.*" Also known as the Siam weed (Chromolaena odorata), sarb suer refers to the strong 'tiger odour' it reeks. Around us, there are dozens and perhaps hundreds of plant species that Karens use to heal and treat themselves for various pains and illnesses, many of which most Thais like myself have never heard of. After a few more steps, Patii paused again and pointed into the air. I still had no clue what he was getting at. "*I planted that cacao not long ago*," Patii said, and only then did I notice a small bud shooting from the soil where he pointed. Surrounding them are several other young saplings of coffee, tamarind and teak, resting under the shade of an older tree. Patii wants to try propagating some wild orchids and germinating some sunflowers next.

At yet another spot, Patii pointed at the earth again and passed me a glance. I squinted hard, but I still saw nothing. "*Look closer*," he said. I knelt down and stuck my face in front of the pile of dirt his finger pointed at. That was when I saw a tiny leaf sprout from the mound. I was staring at a heap of dung. "*We don't plant these ones. The birds and buffaloes do*," Patii says.

Walking through the dense forest, one could barely tell they are walking through what was once open farmland.

After about half an hour of walking, we arrived at a wooden fencing. Patii and his son climbed over the gate and I followed, trudging across a steep valley slope filled with blades of glowing green grass dancing and swaying in the breeze. We've reached the field.

But as it turns out, the entire span we've just walked through was once farmland, too. If no one had told me, I would have never guessed that those forests were ever anything but forests. Each year, Patii and other villagers move from place to place to grow their crops or what is referred to as 'rotational farming'. Often mistaken with the infamous 'slash-and-burn' or 'shifting cultivation' — a method in which farmers continuously abandon degraded farmlands and go on to devastate the next patch of forest — this traditional Karen agricultural practice instead leaves the land to naturally regenerate.

During its first year, harvested farmlands are left to their own devices and start to breathe in new life. As small plants emerge, the space remains open for for villagers, livestock and wildlife to graze and forage from. In the following two to three years, trees then begin to grow and bear fruits, shading mushrooms and welcoming in villagers, birds, rodents and more creatures for a plentiful forage. By the fourth or fifth year, a forest will start to take shape and grow back even denser and livelier than before, packed with mature trees which now accommodate larger wildlife like wild boar and barking deer.

By the time villagers circle back to the same plot after around seven to 10 years, the land would have returned to the forest it was. And so the cycle continues, this interaction between the Karens and their land kept alive for several centuries down the line and still counting today.

It all began with fire.

At the beginning of each year, villagers find a new place to farm. Again, they don't just go around cherry-picking any piece of land. If one goes to scout out a place and returns home to dream about fires, that land may bring illness and death upon the community and he or she knows not to farm on it.

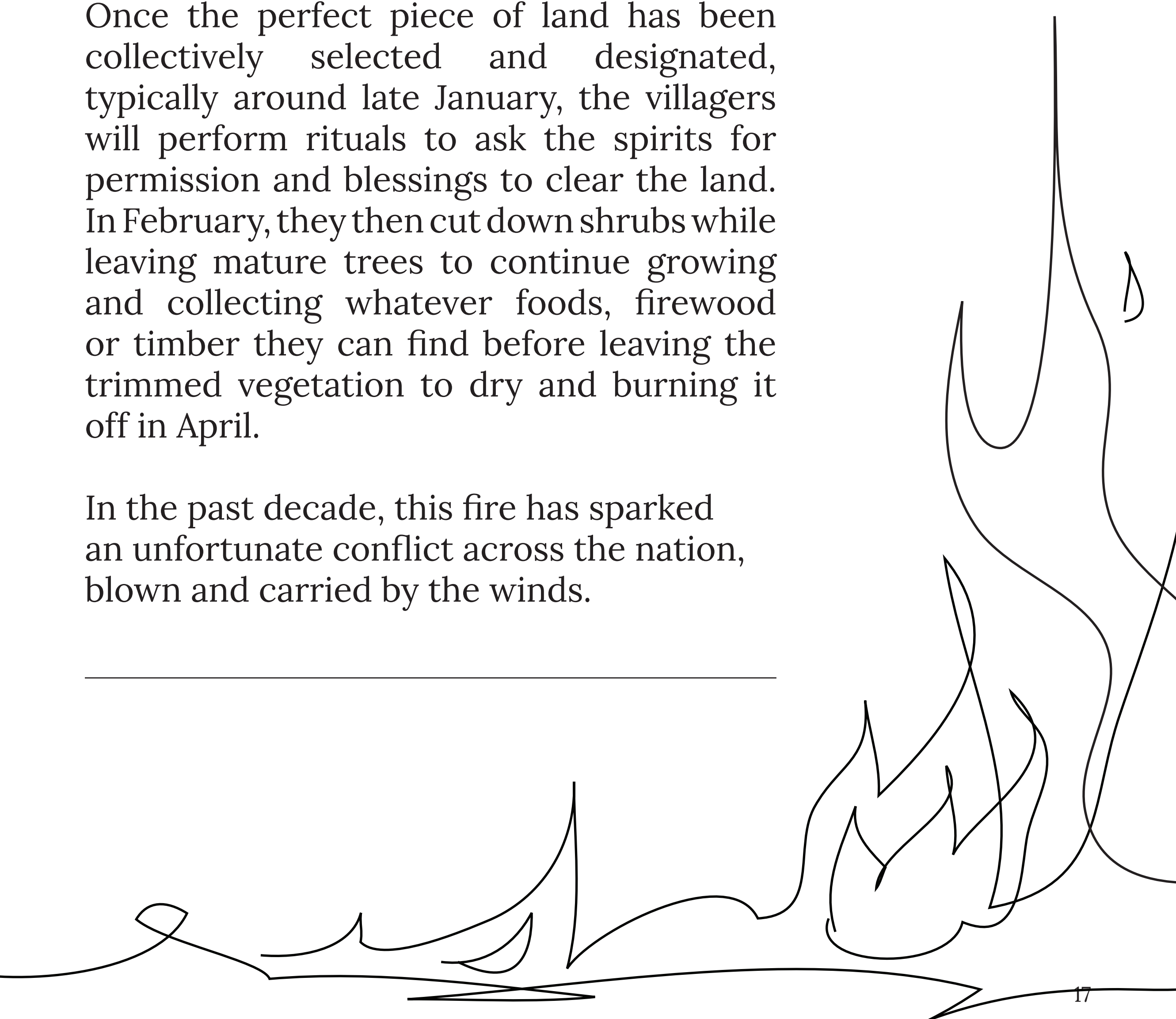
If one encounters a turtle or a deer, one doesn't farm there either, as it's believed that that could mean misfortune. A possible explanation could be that the presence of such animals indicate a crucial water source or thriving wildlife habitats nearby which the villagers are not to disturb.

Mountain ridges, too, are an absolute no, as they are the main passages for spirits, or simply just harder to farm on. To the Karens, spirituality and logic are intertwined, whether spirits of the forest or their own intuition providing a sound voice of reason.

Each household is designated land according to their needs. An elderly couple may be given a plot closer to home, while a big family of young adults may receive vast, steeper hills that they'd be able to tend. And though certain plots of paddy may belong to a single household, many will help tend to it and the rice they grow will feed many. Through rain and shine, droughts and floods, this land and all that it gives is shared by all.

Once the perfect piece of land has been collectively selected and designated, typically around late January, the villagers will perform rituals to ask the spirits for permission and blessings to clear the land. In February, they then cut down shrubs while leaving mature trees to continue growing and collecting whatever foods, firewood or timber they can find before leaving the trimmed vegetation to dry and burning it off in April.

In the past decade, this fire has sparked an unfortunate conflict across the nation, blown and carried by the winds.



In the past decade, the Thai government has attributed forest fires and the PM2.5 air pollution — toxic particulate matter smaller than 2.5 microns — in the central and northern regions of the country, as well as climate change to the lifestyles of the Karen and other indigenous groups who are seen to set fire to swathes of forest in search of mushroom and wild meat.

"*These government officials don't understand how meteorology works*," said Dr. Jatuporn Tianma, a researcher and Professor of Sustainable Land and Natural Resource Management at the Mahasarakham University. "*Air floats up, not down*,"

According to the principles of atmospheric pressure, as elevation rises and temperatures decrease, hot air molecules naturally travel towards cooler air and vice versa, creating a movement which we commonly know as wind. This means that heat and air pollutants are more likely to get trapped within the low-lying, concrete towers of Bangkok and in the bowl-shaped valley city of Chiang Mai than up on the mountains upon which Soblan and many other indigenous villages sit.

"The air pollution measured in cities usually occur in the cities, except it's not as visible as images of the blazing fires from the Karens' fields," Dr. Jatuporn said.

Standing amidst the field just a few months after the land has been cleared and crops have been planted, I could see where such misconceptions arise. What a picture from afar might capture is a patch of dry barren land and littered by burned down tree trunks, before it gets circulated around the internet with an out-of-context description or an unread caption.

From afar and out of context on the internet, this scene could easily be mistaken for one of deforestation.

“If you say burning emits greenhouse gases, I wouldn’t argue. Any kind of burning does that,” Dr. Jatuporn said.

“The plots [that the Karens] burn do emit carbon... but how about the rest of the plots they’ve conserved and the carbon they capture?”

Various studies have shown that young forests tend to sequester a higher amount of carbon at a higher rate than old-growth forests, with evidence that rotational farming has the ability to "lower nitrogen and carbon dioxide emissions, while also increasing yields" when compared to other kinds of continuous plantations.

This is not by chance. Like many indigenous communities around the world, the Karens follow culturing burning practices and farming calendars which have been developed by their ancestors over centuries of learning and adapting. The reason they do what they do, where they do it and when they do it, isn't based upon mere superstition or serendipity, but rather generations' worth of knowledge about their land and climate — a true understanding of nature, her language and her rhythms.

"Fire is not always the villain. Fire is essential,"
said Patchara Kumchunan, an indigenous rights activist who works at the Northern Development Foundation.

"And fire management is truly fascinating local wisdom."

April is the hottest time of the year in Thailand with the highest level of air pressure, presenting the best conditions to ignite fierce flames of extremely high temperatures that minimise smoke and ensure the complete scorching of deeply-rooted weeds. To prepare for their annual burning, villagers create 'firebreaks' around their fields, usually all working together on a plot of one family, then later moving on to the next. This task could take several days, as they sweep or blow dry leaves in piles away from the farmland to create a wide strip of land void of anything that might catch fire, carving out one ring around the plot and another one to surround the first ring in order to ensure that the "*fires don't hop*".

Only then and after another ritual to seek blessings from the fire spirits, the villagers light the flames from the outer edges — some rising up to 10 metres in height — shepherding them for days to eventually meet in the middle of the circle, compete for oxygen and naturally extinguish themselves.

“When the fires are out, we place our hands on the ground,” Mo said.

“If it’s still hot, we won’t go home, otherwise the fires might reignite and spread to the forests.”

What’s left of the scorched vegetation is a blanket of ashes on the ground or what Dr. Jatuporn calls “*a carpet of nutrients*”. The felled logs, now charred and disintegrated, have become an easily digestible form of phosphorus which nourishes plants and helps them expand their roots deep into the soil to find nitrogen. This nitrogen is, too, readily available and abundant within the soil, long fertilised by existing microorganisms which have decomposed plant and animal remnants over the years for which the forest was left to renew.

“There is no waste in nature,” Dr. Jatuporn said.

To conclude their burning, the Karens perform yet another ritual, sacrificing a pair of chickens to thank the fire spirits that act as guardians for the humans, the forests and all wildlife across the land, welcoming a new season for rejuvenation: the first rainfall of the year.

The Karens see trees as more than trees – spirits and higher beings who protect and deserve respect.

With the land cleared and ready for sowing, the men dig holes and the women drop the seeds in the soil. Over the next five months, villagers will weed the fields almost everyday. But despite this relatively exhausting task, cooperating with nature lifts much of the workload.

Along with the rice, the villagers also plant a variety of plants such as chilli, pumpkin, lettuce, taro and eggplant all crisscrossed throughout the fields. Sometimes, they also grow colourful plants like the cockscomb flower around the crops, which act as a natural pesticide by attracting insects like bees and hornets that predate on other menacing bugs.

“Intercropping serves as highly effective pest control,”

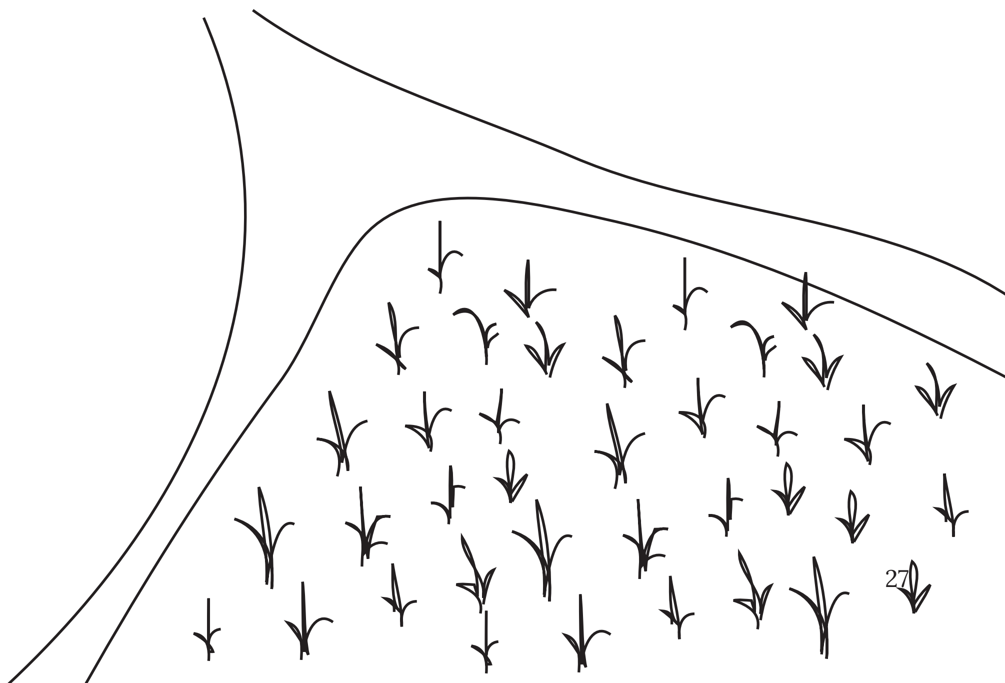
Dr. Jatuporn said. “*You confuse all the insects and worms. They think, ‘Where’s my food? How is this plant here, and*

where are the rest? Why is there just one of this kind, and is this going to be enough for my kids?' whereas in monoculture they think, 'wow, this is a great feast in one place!"

Done with the afternoon, farmers often return home with a basket of fruits and vegetables from the field which ripen as their rice waits to mature.

"*The rice saplings open up when they know rain is about to come,*" said Patii's daughter-in-law.

From light drizzles in July, August carries in the monsoon season, which softens down in September and comes to a halt by the end of October. In November, the entire field will have turned golden and blooming with fully-grown rice that the villagers can finally reap, after they sacrifice another pair of chickens for the rice and fire spirits. By December, for grace giving, villagers tie bracelets around the wrists of those who will thresh the harvested rice. Finally, the rice is brought home and the village celebrates with copious amounts of eating, drinking and socialising, marking the end the season and the start of a new year.



Even as they wait for their rice to mature, the villagers always have fresh produce to bring home from their fields.

“If they are able to follow their farming calendar, Karens’ fields never encounter droughts,”
Dr. Jatuporn says.

Even as climate change exacerbates, with unpredictable bouts of intense pouring, and at other times, lack thereof, these increasingly erratic rainfall patterns mostly pose little harm to rotational crops. The answer lies in the ground.

Plants need water as a soluble substance to help absorb nutrients, but not much is needed as long as the soil is healthy enough to retain moisture year-round. Samples collected from Karen lands show just this. Unlike the widespread form of intensive agriculture which today plague and poison our lands with chemicals, traditional Karen methods have actually been proven to prevent erosion. Because no tilling is involved, studies[1] have shown they also reduce impact from heavy rainfall, surface runoff, sediment detachment and soil loss.

But in recent years, the Thai government has imposed bans on burning to address what’s known across Southeast Asia as the annual “haze season”[2], when air pollution concentrates to the point of suffocation. From 30-day prohibitions then 100 in the following years, many Karen communities suffer the most. Allowed to legally burn only after April has passed, they are left with moist grounds swarming with mould and weed roots. Many have had to abandon their fields and save seeds to plant in the following year — assuming that the bans aren’t repeated again.

1 P.W. Unger and T.M. McCalla. “Conservation Tillage Systems”.
2 Luke Hunt. The Diplomat. “Southeast Asia’s Deadly Annual Haze is Back”.

“But is the PM2.5 situation getting any better?”said Patchara. “No. It’s only getting worse every year.”

Referring to other large-scale farmers who are still allowed to burn monoculture crops such as corn and sugarcane in low-lying areas, Patchara believes such measures and policies are centralised, only targeting local communities without holding agricultural giants accountable.

And though wildfires are naturally-occurring in some parts of Thailand, with climate change, the North has witnessed record-breaking temperatures of up to almost 45 degrees celsius[3]. Again, indigenous peoples bear the brunt along with the blame, sometimes labeled as encroachers and even drug smugglers who drive deforestation, forest fires and wildlife poaching.

This blazing conflict is toppled by land rights issues. The government’s latest forest reclamation scheme intends to increase national forest cover by 40 percent — which, by legal definition, does not necessarily entail forestland, but simply state-owned land — and much of this is done by declaring protected areas in existing green areas, such as the place where Patii’s village lies.

“If we’re clearing our fields and we hear a sound, we immediately run home,” Mo spoke of the rangers.

“We get exhausted from farming. Now we’re also scared.”

3 The Nation. “Thailand to see hotter weather as summer continues”.

Although Patii and his ancestors have lived on this land for centuries long before the arrival of the national park, they do not currently hold any legal ownership of it. Depending on the provincial law, this means government officials can enter homes, seize lands and force eviction at any moment without a warrant.

“Indigenous peoples have always tried to explain in their own language, but without technical vocabulary, researchers don’t really listen,”

Patchara Kumchunan,

Indigenous rights activist who works at the Northern Development Foundation.

Across Thailand, several indigenous communities have faced human rights abuses from authorities, but only few of them make the news. One such was Bang Kloi village[4] who received nationwide attention after exposés revealed that officials have torched Karen houses and fields in an effort "*to protect the forest of Kaeng Krachan National Park*". Despite being promised relocation and compensation, many community members reported having received none. National park authorities also allegedly murdered one of the community's prominent indigenous rights activist, *Porlajee "Billy" Rakchongcharoen.*

"When a fire erupts in the forest at 2 in the morning, does a single ranger rush to check?" Patchara said.

"It's the villagers who take care of it, because they see it as their home."

The new "30 x 30" goal set by the UN Convention of Biological Diversity (CBD) aims to place at least 30 percent of all land and sea areas under conservation status by 2030. However, many of these areas overlap with ancestral lands held by various indigenous peoples and local communities.

Reports have shown that indigenous lands alone hold 80 percent of the world's biodiversity and more than a third of the planet's most intact forests[5], storing at least 24 percent of the aboveground carbon[6]. Without proper safeguards in place to protect them, up to 300 million people could be abused and displaced in the name of fortress conservation, an approach that upholds that nature is best preserved kept away from humans.

4 Thai PBS World. "Examining the deep roots of Thailand's dispute with ethnic Karen forest-dwellers".

5 Julia E Fa et al. "Importance of Indigenous Peoples' lands for the conservation of Intact Forest Landscapes".

6 Peter Veit and Katie Reytar. World Resources Institute. "By the Numbers: Indigenous and Community Land Rights"

Together with 19 other households, Patii and his relatives manage 730 rai (roughly a hundred hectares) of forest. Of this, they use only a fraction for subsistence — the rest, they leave for the spirits, as sacred sites where higher beings dwell and their late loved ones rest.

Earlier along the way to the village, I had seen trees wrapped with orange strips of fabric. Patii said these trees were ‘ordained’. First originated from a group of Buddhist monks and activists in northern Thailand[7], this spiritual practice is now effectively used to ward off illegal loggers as well as developers who wish to cut down trees.

7 Avery Morrow. “Tree Ordination as an Invented Tradition”.

In Thailand, monk robes have proven effective at warding away loggers from cutting down trees – faith is powerful.

The Karens believe that, before each of us are born, our spirit travels to a banyan tree where an angel called *mue ka khloer* awaits to open up the gateway for it to emerge into the world. This tree will provide for us the rest of our lives, from the smallest things like shade to the most essential elements like breath. With a baby's birth, the father will bring his newborn's snipped umbilical cord and tie it onto a branch of the depo tree, leaving his child's fate to its guardianship and make sure it is never to be cut down. Should their child die young, he or she will be brought to a communal graveyard, to be buried under another banyan tree whose bark will be slit to seep out sap that will nourish and care for the juvenile in their afterlife.

Concrete roads and power lines had arrived to the village just over five years ago. Undoubtedly, these new developments brought various benefits and conveniences — like proper pavement to drive to the hospital and electricity to watch television — but with it also comes bills to pay and ways to let go of. Many have gone to town to take on labour work to afford gasoline for their motorbikes and formal schooling for their kids. But ultimately, many have chosen to return to their ancestral home, to the origins of their being and the roots of their identity, back to their motherland.

I would like to thank *Dr. Jatuporn Tianma* and *Patchara Kumchunan*, and most especially *Patii Taayae Yodchudmingboon and his family* for showing me the science, solutions and spirit in our culture and nature. This eye-opening journey and learning experience was made possible by the support of *Climate Tracker*, as well as the kind generosity of the *Soblan community*.