

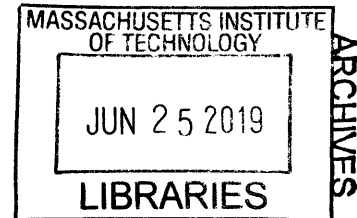
# The Living Library

An indigenous community in the Peruvian Amazon is combating climate change, deforestation, and loss of traditional knowledge by preserving their plants in the wild.

by

Devi Lockwood

B.A. Folklore & Mythology  
Harvard University, 2014



SUBMITTED TO THE PROGRAM IN COMPARATIVE MEDIA STUDIES/WRITING  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE WRITING  
AT THE  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SEPTEMBER 2019

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## ABSTRACT

*Farmacia Viva Indigena*, the Living Indigenous Pharmacy, is five hectares of primary forest in the Amazon preserved as an intact library of indigenous plants, many of them medicinally useful, near the river village of Paoyhan in Ucayali, Peru. The library is an indigenous climate adaptation strategy in the rainforest, and an effort to revive the Shipibo-Conibo culture of healing with medicinal plants. The pharmacy was established last year by Alianza Arkana, an NGO in Pucallpa. They have divided the land into sub-parcels, and are categorizing and archiving each of the medicinal plants contained inside. In Ucayali, the main environmental concern is deforestation. Land-use change also changes patterns of rainfall, as water is transported in the atmosphere through aerial rivers. The Living Library is an archive and repository of plants in a rainforest that is rapidly disappearing—an attempt to revitalize and preserve indigenous knowledge systems of medicinal plant life in Shipibo culture. The living library of plants in Paoyhan provides an economic alternative to deforestation. They also hope to attract ecotourism, scientists, and possibly pharmaceutical companies. Making the land useful by extracting medicines is one way of protecting it from loggers who enter legally or illegally.

Thesis Supervisor: Russ Rymer  
Title: Lecturer in Science Writing

## Acknowledgments

To all at Alianza Arkana in Pucallpa, Peru, especially Macarena Arias, Sebastián de los Heros, Gabriela Delgado Maldonado, Sophia Rokhlin, Laura Dev, Nora Ractuqui Sastro, Elías Medina, and Lily De La Torre: *mil gracias*. Thank you for sharing your stories with me.

To my cohort: Eva Frederick, Emily Pontecorvo, Emily Makowski, Gina Vitale, Diego Arenas, Brittany Flaherty, Madeleine Turner—you all kept me going in this program, even when I thought I couldn't. Thank you.

Thanks, Shannon Larkin, for listening. The chocolate was always appreciated.

Thank you to Miranda Shugars, Cassandra Euphrat Weston, and Erica Plouffe Lazure for early-stage feedback on flow.

With gratitude to the Kelly-Douglas Fund and the MIT Graduate Program in Science Writing for funding this research.

A massive thank you to Devin Bunten, for her super-hero level listening and kindness. I wrote most of this thesis on her couch. So excited for the next adventure together in NYC.

This thesis is for my mom, Heidi Howkins Lockwood, who matriculated at MIT in 1989 and should have finished the PhD program in Philosophy & Linguistics in 1994, but didn't, due to #MeToo issues that were unacknowledged by the Institute at the time. I have done my best, while here, to advocate for and alongside her. I stopped President Rafael Reif in the hallway earlier this year to tell him my mom's story. Her pain lives on in me. MIT has the opportunity to set a precedent of remedying an injustice that happened in the past. Beyond apology, I hope that President Reif has the courage to break the silence—for women everywhere who are victims of power-based sexual harassment and assault.

## The Living Library

“Walking through *Farmacia* is like swimming in plants,” Sophia Rokhlin said. She was trying to reheat lentils in the kitchen of a shared house called Ametra in Pucallpa, Peru, but the stove was running out of propane, the dim flame sputtering. Warm Amazonian air, humid and rich, flooded the kitchen through a slatted window. The spines of spider webs spread their geometry in the sun. An orange cat padded across the floor, haunches slinking against the hardwood. Everyone moved slowly in the heat. Rokhlin stirred the lentils with a wooden spatula and eyed the phone number for the gas delivery guy tacked to the wall.

Sophia Rokhlin is one of ten volunteers living at Casa Ametra and working for [Alianza Arkana](#), a nonprofit organization engaged in regional environmental, health, and education projects, among them *Farmacia Viva Indígena*, the Living Indigenous Pharmacy. *Farmacia* is five hectares—five football fields—of Amazon rainforest preserved as an intact library of indigenous plants, many of them medicinally useful, near the river village of Paoyhan. Two years ago, the residents of Paoyhan invited Alianza in to help build the project, in the process making Paoyhan the center of a small, international experiment meant to address challenges in the community and the region: climate change, the disappearance of native cultures and languages, and deforestation that threatens local biodiversity.

Traveling from Rokhlin’s home in Pucallpa to Paoyhan involves a boat trip. There are two options: the fast boat—70 soles (20 USD) for three hours—or the slow boat—30 soles (9 USD) for five hours. The boat is loud, a vibrating hull with the motor as its node, cumbia playing at max volume over engine’s rumble. These boats are filled with passengers or cargo, often bananas. The *Farmacia* project has made this trip a frequent one for Rokhlin and her housemates.



*Inside a boat that travels up and down the Ucayali River. Photo by Devi Lockwood.*

On a recent visit, Rokhlin told me, the group trekked through *Farmacía* with their raincoats on, hoods zipped up, even under a clear sky. “Just our eyes out,” she said. “Yes it was hot, but worth it not to be eaten alive.” The mosquitos, Rokhlin said, “bother new people the worst. After you’ve been there for a while, it’s not so bad.” She turned back to the sink, found a spoon in the drying rack, and started eating her lentils cold, straight from the saucepan. “The guides were telling us the names of plants faster than we could write them down,” she told me. “This is why the list is a bit disorganized. But it’s getting better.”

Now, in January, the entire Ucayali River basin was inundated by more than mosquitos. Seasonal rains had come a month and a half late, and with them the floods. Boats still departed from

Pucallpa, but the village of Paoyhan wasn't receiving visitors. Its houses, wooden and mostly unpainted, are roofed with [shebon palm](#) and built a meter or more off the ground to stay dry when the river grows. During a flood, people travel from house to house via boat, or by wading through thigh-high water. In the rainy season, drinking water becomes a concern.

People in Paoyhan pump and collect groundwater for drinking. In a flood, raw sewage from dry toilets mixes with the water. Stomach infections are common, and recourse to the clinics in Pucallpa limited. In this region, as in many around the world, climate change, water, and public health are intertwined.

The weather has become fiercer and more erratic in recent years, exacerbating the interlocked difficulties faced by Paoyhan's residents. In the past decade, the Peruvian Amazon has experienced the most intense flooding and droughts in recent history.

Climate change is likely to increase the frequency and severity of these floods. Changes in rainfall patterns in the Peruvian Amazon are expected to accelerate soil erosion, reduce water availability, lower crop yield, and increase human diseases. It is exactly these sorts of difficulties that *Farmacía* is, in its small way, intended to address.

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The region of Ucayali is home to 500,000 people, occupying a constellation of settlements that hug the banks of the Ucayali River, which flows 1675 miles through the forest, undammed on its way to the Amazon River. The majority of the floodplains in Ucayali are, for now, still forested. The Ucayali River, broad and brown from suspended sediment, is a highway not only for people and bananas, but also for the cut trunks of trees—some cut legally, many [poached](#)—lashed together into rafts and floated to sawmills downstream.



*What it looks like flying into or out of the region: patches of forest are punctuated with lighter patches of cut land.*

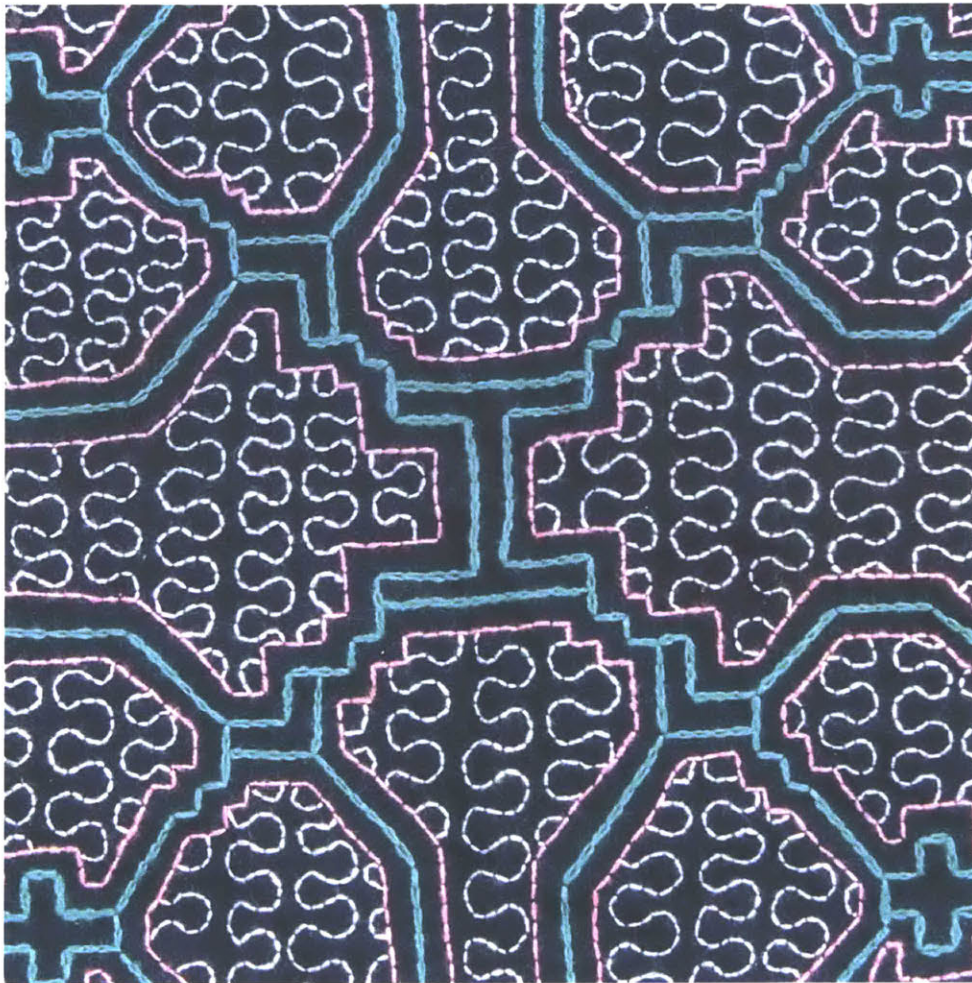
*You can see the ribbon of the Ucayali River, a tributary to the Amazon, on the horizon.*

*Photo by Devi Lockwood.*

Pucallpa is the regional metropolis, but smaller towns like Paoyhan, with 2000 residents, and hamlets like Santa Elisa, population 300, are spread throughout the forest. Many of the smaller communities resemble Santa Elisa, a long hallway of single-room, wooden houses with banana plantations on either end, lit for a few hours each night by a string of street lights powered by a generator, every third one out. By day, shade is a luxury. Along the river banks, under broad-leafed trees, there are one-plank benches and places to hang hammocks. Life here is gendered—men farm, fish, and hunt; women raise the children, and embroider fabric under the trees. A few homes have TVs.

Some people in Paoyhan make a living by selling plants like cat's claw (*uña de gato*), a medicinal vine used to combat viral infections, cancer, arthritis, parasites, and inflammation. A

large fraction of income comes from women's artisanal work. Women of all ages often spend their days, between cooking and taking care of the house and kids, working on embroidered maps of rivers—geometric patterns that tell a story of the land and water and the people who live here.



*An example of Shipibo-Conibo kené (design) stitched into fabric. Photo courtesy of Alianza Arkana.*

The culture of these villages is Shipibo-Conibo, an indigenous group in Peruvian Amazon who live between 6 and 10 degrees of latitude south of the equator. Shipibo people have been living in the Ucayali region of the Amazon for thousands of years. They speak Shipibo, a language in the [Panoan language family](#), though most people under seventy also speak Spanish. Shipibo



culture is distinctive for its connection with traditional plant medicine. Knowledge comes from plants directly. Shamans apprentice themselves to a plant in order to heal members of their community and themselves. Cut down the trees, and the Shipibo people who call Ucayali home are threatened too. To kill the plant world is to kill the Shipibo spirit world as well.

When children and babies in his community have bronchitis, pneumonia, or vomiting, Victor Sanchez Valles, told me, “we cure this with traditional medicine. Medicinal plants. If you can’t with those, you have to go to the medical post” in La Libertad, 25 minutes away from Santa Elisa by *motocarro*, a motorized tricycle with a bench for passengers or a flatbed in back. Sanchez, 56 years old, is the lieutenant governor of Santa Elisa. He has lived in the town, an entirely Shipibo community, all his life. Sanchez said that his ancestors and the elders in the community know about medicinal plants, but among “those who are just born, some don’t know.”

Sanchez credits the current education system with the disconnect from medicinal plants: “Because they study at school, primary school and nursery school, and some know but not many. They do not know about medicinal plants. And things have changed. They change their understanding with the influence of other countries,” he said. In the 1950s, a Spanish-language education system was introduced in Ucayali, creating a gulf between the youth then, who were educated in Spanish, and the elders in their community who spoke only Shipibo. Valles learned about medicinal plants from his grandparents. “I understand a little bit about traditional medicine to heal fever, diarrhea, and vomiting,” he said. “That’s it.”

In Santa Elisa, medicinal plants don’t grow among the banana plantations or in town. “There are none here,” Sanchez said. “You have to go look for them in the center of the forest.” Each way takes 45 minutes to one hour on foot, with a machete in hand. Sanchez brings the barks of the plants he knows back to Santa Elisa and boils them down to create a tonic that’s drinkable.

When Sanchez goes walking in the forest, finding medicinal plants can be unpredictable. “Sometimes there are no plants. Sometimes there are. That’s how it is,” he said. Lack of access to

medicine, both traditional and western, is part of what inspired the residents of Paoyhan to found *Farmacía*.



*A peke peke carrying cut logs on the Ucayali River. Photo by Devi Lockwood.*

*Farmacía* is a short distance by water from the community of Paoyhan. To visit the library, people take a long, narrow boat that can carry four to 15 people. From September to December of 2018, approximately 50 tourists visited. The boats are constructed out of tree trunks, sit two people across, and have a long arm of an extended outboard motor, called a *peke peke*. The trip from Pucallpa to *Farmacía* is about 20 minutes long, and winds through a small river that's narrow enough in places that you can reach out and touch the plants on the shore.

As the distance from town grows, trees start getting bigger. Under the larger trees, the overstory is dense. The ground is muddy and shaded and the air full of mosquitos. Even though it's so close, many people in Paoyhan haven't been to visit this tract of land. Many youth in the community have never seen it.

Two years ago Humberto Rojas, the elected leader, or *jefe*, of Paoyhan wanted to confront a problem. He noticed a trio of bad things affecting his community. The weather was getting worse. Unpredictable flooding washed away crops, punctuated by periods of drought. In other words, the climate was changing. Economic opportunities, beyond subsistence farming and crafts, were slim. Some people in Paoyhan had turned to logging to earn a living, which took them away from their community for extended periods of time. While logging brought in some money, it resulted in the destruction of the forest elsewhere. Finally, and perhaps most concerningly, Sanchez noted a disconnect between the youth his community and their traditional medicinal culture—*non rao*—of healing with plants. In Shipibo, *rao* means medicine. *Non rao*, “our medicine”, refers to plant medicines. *Nahuan rao*, or “foreigner’s medicines,” refers to pills and other forms of western medication. In Shipibo culture, many medicines are plants. Without youth to carry the tradition forward, the cultural knowledge of healing with medicinal plants was at risk of becoming obsolete.

In early 2017, Rojas approached [Alianza Arkana](#) in Pucallpa to ask for help. Alianza had done several workshops in Paoyhan in the eight years since its founding—most recently a [women's empowerment workshop](#) focused on stopping violence against women in the community. This included a leadership workshop for young women, and a workshop for young men about sexual health, masculinity, and personal development.

The longstanding relationship between the town of Pucallpa and Alianza Arkana has centered on its plant life. In 2010, a year before he co-founded Alianza Arkana, [Dr. Paul Roberts](#), a professor at the University of Guadalajara and Head of Department of Leadership Studies at the National Institute for Public Health, went to Papa Gilberto, a Shipibo healer in Paoyhan, to “diet” the local

plants. Dieting is a ritual in which a person consumes part of a medicinal plant and either fasts or eats only foods without salt, oil, fat, or meat for a certain period of time, to strengthen the effect of the plant's chemicals. Ayahuasca is one medicinal plant, but there are many others.

Elías Medina, now treasurer of the *Farmacia Viva Indígena* committee, describes dieting a plant as a form of communication. We sat across from each other under the screened-in porch behind the Ametra kitchen in Pucallpa. He rocked on a green mesh hammock; I balanced on narrow bench with one plank of wood missing on the seat, on top of a pillow made to resemble the cross-section of a tree.

“There are plants that you can bathe with, or drink, or diet,” he told me. “When you drink, you diet, and you see them”—the plant guardians/owners—“in visions.”

Medina paused to put both of his feet on the wooden porch floor, turning towards me.

“Medicinal plants are the same as human beings. If you want to delve deeper into the project, you must see it.”

This communication happens without talking. “It is like a dizzy feeling,” Medina said. “You sleep and you dream. Through your dreams you can see.” The guardian spirit of the plant can take the form of male or female. The plant will ask questions in your dreams, Medina said, questions like: “‘Why have you drunken me? Why do you need me?’ and in your vision you have to say... ‘I need you to heal me, and I need your power, I need you to help me.’”

Medina recounts a time when he had rheumatism. He dieted a plant, machinga (*Brosimum utile*), a large tree with serpentine roots whose white sap under the bark can be used to heal different forms of physical trauma. “In my dreams I had surgery,” Medina said. “The next day I felt my body was good. In three days I did not feel any more pain.”

Another plant—known in Shipibo as *janin*, in Spanish as *Tangerana*, and in Linnean classification as *Triplaris americana*, of the Polygonaceae (buckwheat) family, has multiple uses. In Shipibo communities, the leaves can be used to alleviate sunburns, the trunk cortex for malaria, and an infusion of the cortex for diarrhea.

*Boaenf*, in Shipibo, *ajo sachá* in Spanish, or *Mansoa alliacea* in Linnean terms, of the Bignoniaceae family, smells of garlic and looks like a vine with purple flowers. Its cortex, leaves, stem, and roots can be used to make a pain-relieving tonic that's also useful against arthritis, headaches, epilepsy, fevers, and rheumatism. Filling the house with smoke of its leaves will drive away bats and insects.

Since 2011, many volunteer-workers at Alianza have been to Paoyhan to diet—to get closer to this realm of communicating with and being healed by a plant first-hand. A small trickle of tourists who were curious about *rao* and hungry for a connection with Shipibo worldview, or cosmovision, have also visited.

Through Alianza Arkana, some researchers had come to do interviews in Paoyhan about medicinal plants and climate change. In 2017, the *jefe*, Rojas, came to Alianza Arkana's headquarters in Pucallpa to discuss the connections between climate change and medicinal plants.

In response to the *jefe*'s suggestion, Laura Dev, a PhD student at University of California, Berkeley in Environmental Science, Policy, and Management who serves as Alianza Arkana's Research Coordinator, helped plan a climate change workshop in Paoyhan. There, the idea for a living library of medicinal plants was born.

The workshop was held inside the *local*, an aquamarine blue community hall, The *local* is filled with natural light that comes in through the slatted windows, and rests on an elevated platform

that protects it from the Ucayali River water. A mixed group of teenagers, adults, and elders came together over a lunch of rice, beans, and fried plantains to discuss the issues.



*The community hall in Paoyhan is built on stilts, for when the floods come. Photo by Laura Dev.*

They drew a map to organize their thoughts. Community members called out issues that they had, and two teenagers plotted each topic with colored markers to a specific place on the map. “A lot of concerns were environmental,” Dev remembers. “The bank is eroding, there’s flooding, and the lakes are drying up.” Another cluster of concerns were about medicine: “we need more medicines for the health post,” or technology: “more technological education in our schools.”



*The climate change workshop in progress in Paoyhan. Photo by Laura Dev.*

Dev consolidated this list of things that were important to the community, based on where they were drawn on the map. Then they ranked each issue in order of importance: low, medium, or high. People who live in Paoyhan presented the problems, and then used the place-based framing of issues to freeform brainstorm solutions.

The key solution that emerged was a botanical preserve—a place where existing, indigenous plants could be cataloged like books in a library, protected for future generations, used as educational material for youth in the community, and, eventually, attract ecotourism from the outside.

Segundo Franco, an elder in Paoyhan, jumped up to his feet and said: “If I see a botanical preserve in this community by the time I die, I can die happy. I’ll just die right there.”

The community of Paoyhan chose to designate five hectares of primary forest that was close enough to their community that people could access it in a fifteen minute boat ride. The land had never, to anyone’s knowledge, been cut, save for a logging road to elsewhere that bisects it. To manage the land, the group appointed a *Farmacia Viva Indigena* committee, comprised of ten community leaders from Paoyhan. Segundo Franco is its president.



*Members of the Farmacia Viva Indigena committee in Paoyhan. Photo by Gabriela Delgado Maldonado.*

The committee is still figuring out the best way to defend, protect, and set aside the land from future land-use changes. There are two ideas: to persuade the regional government to grant legal permission, or to ask *Servicio Nacional de Áreas Naturales Protegidas por el Estado*, a federal



agency, to declare *Farmacía* a protected natural area. As of now, the land is not legally protected, but the project is in motion, already achieving some of its goals of documentation and education.

To date, Alianza Arkana and the residents of Paoyhan have catalogued 400 medicinal plants in 3.5 hectares of *Farmacía*. On each trip to Paoyhan, Alianza Arkana helps to catalog more. They divided the land into sub-parcels and travel through with a Shipibo guide, taking notes to catalogue each medicinal plant in *Farmacía* like books in a library.

This information is later imported into a spreadsheet. One spreadsheet column lists the name in Shipibo (*bonxix*), in Spanish (*copaiba*), and in scientific terminology (*Copaifera officinalis* — of the legume family). The last column lists uses of the plant. The essential oil of bonxix is a laxative, diuretic, and stimulant. It can be used for the treatment of inflammation, hemorrhoids, cystitis, chronic diarrhea, and against colds and bronchitis. It's irritating if taken in large doses.

Another example, called “moe” in Shipibo, “ishanga” or “ortinga brava” in Spanish, and “*Laportea aestuans*” in Linnean classification, is of the family urticaceae. An infusion of its leaves is a diuretic and laxative. The juice of the leaves can be used against conjunctivitis and as a bactericide and anti-inflammatory medicine.

*Farmacía Viva Indígena* is a cultural survival initiative as much as it is a health initiative. “The Living Pharmacy emerges from us, from valuing our traditional plants. Before, our grandparents did not use chemical medicines,” Elías Medina, treasurer of *Farmacía*, said. “We used natural plants. Today, this important wealth is lost in our Shipibo culture, which is why the Living Pharmacy is born. *Rao* for Pharmacy (medicines). Living, because we want to live. Today, the youth have lost this tradition, and we want to revalue it and explain to them how important our medicinal plants are.”

Medina cites the decline of knowledge as due to a missing link between ancestors, the current generation of adults, and youth. “Our ancestors did not explain it to us,” he said, “Today, the youth do not express much interest in our culture. We want to revalue this, so Paoyhan’s Living Pharmacy stems from that.”

Medina’s goal is to have knowledge of traditional plants be a part of the curriculum for kids at school in Paoyhan. “In nursery school, primary school, and secondary school, we want to take them to the Living Pharmacy and explain to them each medicinal plant. What is its use? There are plants for being healers, good doctors, massage therapists, and more. And sometimes our children do not know traditional stories either. This is why we have done this project. So they do not lose the culture,” he said.

Common illness in the community are hepatitis, cancer, stomach aches, gastritis, and diabetes. “In the pharmacy, we are discovering many plants for these illnesses,” Medina said. The committee’s goal is to use the plants found in *Farmacia* to supplement pills and other supplies that the medical post in Paoyhan dispenses. They hope that this will both aid public health and provide a source of income for the community by attracting visitors from other countries.

Nearly one in four western pharmaceuticals came from rainforest plants. [Vincristine and Vinblastine](#), a drug which originated from the Madagascar Periwinkle (*Catharanthus roseus*), is widely used to treat lymphoma. Taxol, which is derived from the bark of the North American yew tree, is a common treatment for ovarian and breast cancer.

The National Cancer Institute estimates that seventy percent of anti-cancer plants identified so far come from the rainforest. Some doctors like [Drauzio Varella](#), an oncologist in Brazil who has dedicated his life to finding cancer cures after his younger brother died from lung cancer in 1991, scour the Amazonian rainforest looking for future cancer treatments. Since 1995, Varella’s team has gathered over 2000 extracts from plants and trees in the rainforest, [The Guardian](#) reports. In partnership with São Paulo's Sírio-Libanês Hospital, Varella and his team dry the plant samples and grind them into a powder for testing on tumor cells.

The hope of attracting research projects like Varella's to *Farmacía* offers peril along with promise. It's a tricky balance—along with the desire to make knowledge of medicinal plants public is a wish to keep this knowledge in the community, without large political and corporate interests barging in. After all, *Farmacía* was inspired by the imperative to preserve traditional culture, and the local environment, both under threat from the world outside Ucayali.

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Plants in the Amazon are especially vulnerable to changes in precipitation and temperature. In Paoyhan, this fact is personal. Shipibo residents feel the climate around them is in flux, threatening their medicinal plants.

“We have felt it,” Medina said. “Heat. The rivers, the waters dry, the lakes. There is fish scarcity and in the middle of December, sun. Before, there was rain. We say there is a total change in our world,” Medina said. “And we know why. Because we deforest.”

Climate change is a global problem with highly localized impacts. The residents of Paoyhan have taken a local approach to confronting the changes in temperature and precipitation that they are already experiencing at home. Another goal of the project is to enhance health and quality of life for people in the community by revitalizing and seeding younger community members' connection to their traditional culture of healing illnesses with plants found locally in the forest. *Farmacía* committee members recognize that planetary health and public health are interconnected. To take steps to mitigate climate change is to enhance the health of people in Paoyhan in the same breath.

“This project is about saving our forest,” Medina said. “Not taking down big trees because of global warming, from which many diseases can come. For our children that come after us we

want to explain why it was born, why is this pharmacy important. So they value it and become leaders that can orient their children.”



*A mural in Pucallpa, Peru, depicting the perils of deforestation. Photo by Devi Lockwood.*

“Within the perimeter of the pharmacy, nobody will take down big trees, because they are the lungs of the planet,” Medina said.

Medina’s concept isn’t fanciful. Evapotranspiration, the movement of moisture from forest-shaded soil and through breathing foliage, is a key driver of rainfall. Moisture travels through the atmosphere in aerial rivers. Deforestation cuts the supply of evapotranspired water to the aerial river, disrupting the amount of rainfall downwind. Cut the trees in Ucayali, Peru, and

rainfall reduces not just locally but also further down the aerial river, in Brazil and Colombia. Stated another way, the trees curate the rain.

Ucayali is an ecologically sensitive area—an area of importance for climate change both regionally and globally. Land use change here matters. Looking at aerial rivers helps determine aerial river conservation hotspots. Amazon forests regulate not just the regional cycle but also the global climate system. When that land is deforested for pastureland, or to grow rice, cassava, maize, or soybeans, rainfall changes both regionally and globally.

Despite the consequences, [deforestation](#) is showing no signs of halting in the region. In Ucayali, in the last 20 years alone, 4.7% of the tree cover has been deforested. Slash-and-burn agriculture and mining are largely to blame, and these extractive industries accrue profits elsewhere, leaving Shipibo people with few benefits other than small payments for unprocessed timber. The Peruvian national government is investing in roads that make logging even easier, which is likely to increase both deforestation and migration to the region. *Farmacia*'s challenge is to make sure that logging, roads, mining, and other destructive forces stay out.

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The environmental and cultural goals of *Farmacia* are in tension with another goal, one that is more conventionally economic: to provide a source of income for the community through ecotourism. This tension is unavoidable. In order for *Farmacia* to remain uncut, it has to generate income for the community.

Results of similar efforts in other parts of the world have been mixed. Costa Rica, after a boom of ecotourism from the 1970s to 1990s, copes with business that are not environmentally sustainable taking a [free ride](#) on the green image of others. A similar struggle plagues New Zealand, a nation that, while riding on the [“clean, green”](#) image of its tourism marketing that drives adventurers to alpine reservation areas, suffers from polluted lowland rivers, 90% of which are unswimmable from pollution linked to the dairy industry. The presence of ecotourism

doesn't automatically make an entire region more ecologically sound, and can be an excuse to continue with destructive practices. Ecotourism can be a fraught formula.

The tourists that Paohyan hopes to attract are *dieteros* interested in dieting the plants, and researchers who want to learn more about the biodiversity of the region.



*Dieteros en route to Farmacia Viva Indígena. Photo by Gabriela Delgado Maldonado.*

The *Farmacia* committee, just two years into their project, faces questions of great magnitude. Who will this library be for, and how can the forest generate income while still benefiting the community first? The committee is discussing with the idea of allowing pharmaceutical companies to access their catalogue of medicinal plants.

“The vision of the pharmacy is for our foreign friends to support us in making pills from medicinal plants. This is what we want, to support not only my fellow countrymen,” Medina said. “There are a lot of foreign friends that are ill too. We want to support them as well.”



*Dieteros visiting Farmacia Viva Indigena. Photo by Gabriela Delgado Maldonado.*

There is not yet consensus among the members of the *Farmacia* committee about whether attracting big pharma will best serve their interests. They haven't yet defined whether international pharmaceutical companies would be involved, or if the committee would be working with the industry. It is also unclear, in this scenario, whether profit would flow to Paoyhan or be diverted elsewhere. Right now, one Alianza Arkana volunteer told me, the idea of pill production is just “floating in the air.”

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Each January, many people travel from Paoyhan to Pucallpa for the Mundial, a pan-indigenous soccer tournament. In the rainy season, and with intensified floods, it's hard to travel to many communities along the shores of the Ucayali River. Shipibo communities gather in the city of Pucallpa instead.



*Spectators at the January 2019 Mundial, a pan-indigenous soccer tournament in Pucallpa, Peru.*

*Photo by Devi Lockwood.*

The Mundial is an expression of cultural survival. Spectators packed the wooden bleachers so densely that, even in the midday heat, I couldn't find a place to sit. I sought shelter from the sun in a patch of shade next to a woman with a tray full of watermelon and peanuts for sale, and watched the men's soccer team from Paoyhan get knocked out by another indigenous community in the first round. The crowd, composed of representatives from different villages around the region, was riveted by every play.



Paoyhan's women's team, playing barefoot on the dirt pitch, won and advanced. The field had a deep puddle in the center, left over from the previous night's rains, that the players navigated with skill, sometimes splashing with the ball through ankle-deep water. Alianza Arkana had screen-printed matching jerseys for the Paoyhan teams, with the complex geometry of kené on the back, a nod to Shipibo design and the cosmovision of the plant world.



*Packed stands at the Mundial in Pucallpa, Peru. Photo by Devi Lockwood.*

A few blocks away, at Casa Ametra, members of the *Farmacia* committee gathered at Alianza Arkana's kitchen between rounds of the tournament for a visioning meal, served around a long table. On the menu were boiled plantains, chicken, and rice. The stove was lit, the pots bubbling. We pulled in extra chairs, and passed around salt and soda.

Nora Ractuqui Sastro, age 50, a member of the committee, took a break from cooking to extol the virtues of *Farmacia*. She emphasized cures for diseases that commonly afflict foreigners. "There there are many medicinal plants for all kinds of diseases," she said. "Cancer and other things. And you can go there and diet. Anything that has to do with medicinal plants, you can learn."

When she visits the library, "I feel good, happy, because the foreigners come to see and know the forests," Sastro said, "and then some funds come in. That is why I am happy when people from other countries come to get to know the big trees."

When she gets older, Sastro hopes that her children will replace her with their knowledge of the plants. Her favorite medicinal plant is a tree, *capirona* (*Calycophyllum spruceanum*), which she uses to heal her baby when he has diarrhea or fever. To use *capirona*, Sastro cuts the bark and squeezes it. She gives her baby the liquid that is left to drink, uncooked.

The educational arm of the Living Library is just getting started. In September 2018, Alianza Arkana led a trip for Shipibo youth in Paoyhan to visit *Farmacia*. Fifty participants traveled in four boats, guided by the local committee. The group visited "the great tree doctors, some of which teens had never seen in real life." In the future, the *Farmacia* committee plans to make these visits more frequent, to collaborate with the school in town such that plant life is part of the curriculum.

“Many young people see plant medicines as something ‘old people do,’” an Alianza Arkana [blog post](#) said. “However, after seeing certain plants and trees live for the first time, one of the young girls, Kelly Cassandra, said, ‘now I feel like I know what my mom was talking about.’ If young people never experience a plant, how are they going to connect to it? How can you value what you don’t know?”

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