

Green advocates pan Dilma Rousseff's appointees

Rio de Janeiro, Brazil

Brazil has garnered favorable press in recent years for passing a climate-change law and reducing the rate of Amazon deforestation. But these successes stem from initiatives of the previous government, not that of President Dilma Rousseff, who was reelected last October to a second four-year term.

So a key question in recent weeks has been whether Rousseff in her second term will improve on her first-term environmental efforts, which have been widely criticized as lackluster at best. Judging by the composition of her new cabinet, many experts here say, the chances of substantial green-policy progress are unlikely.

Environment Minister Izabella Teixeira, a technocrat who has not challenged large-

scale Amazon highway and dam projects, was reappointed. Meanwhile, Rousseff picked new leaders for the Ministry of Agriculture and the Ministry of Science, Technology and Innovation (MCTI)—Senator Kátia Abreu and Congressman Aldo Rebelo, respectively—who green advocates fear could compromise environmental initiatives aimed at climate protection.

“Rousseff’s appointments of Rebelo and Abreu show she doesn’t take climate change seriously,” says Carlos Rittl, Executive Secretary of the Climate Observatory, a Brazil-based network of 35 environmental groups. “Neither minister will likely increase government investments in projects that promote low-carbon ini-

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Paraguayan Chaco's rapid deforestation continues

The Paraguayan Chaco, a vast expanse of dry thorn forest long considered the nation’s last frontier, was cleared at a rate of 2,000 hectares (4,942 acres) a day by loggers and ranchers in October and November of last year, a record pace of deforestation that many experts believe could lead to large-scale desertification of the region over the next two decades.

Guyra Paraguay, a leading Paraguayan environmental group that uses satellite data to track land clearing, estimates that Paraguay’s Chaco will have lost 250,000 to 300,000 hectares (620,000 to 740,000 acres) in 2014 when year-end figures are tallied, a deforestation rate that is among the highest in the world.

The group blames a combination of high beef prices, land speculation and misguided government policy for the destruction of the wilderness, which is home to one of Latin America’s last uncontacted indigenous groups as well as rare fauna such as the lowland tapir (*Tapirus terrestris*), the giant armadillo (*Priodontes Maximus*) and the jaguar (*Panthera onca*).

“We are losing biodiversity as well as the region’s capacity for agricultural productivity at a tremendous speed,” says Alberto Yanosky, executive director of the Asunción-based Guyra Paraguay. “By 2035, there may be no forest

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Critics say President Horacio Cartes shares blame (AP photo)

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Around the Region



Rainforest Alliance is sued over Chiquita certification

The Rainforest Alliance, a New York-based nonprofit, prides itself on its ability to help multinational companies improve their labor and environmental practices. That work, the organization maintains, improves livelihoods and helps preserve fragile lands and water sources in developing countries.

But last month, the prominent environmental group and international certifier found itself accused in a civil lawsuit in Washington state Superior Court of “unfair and deceptive marketing practices.” At issue was its certification of allegedly unsound banana-producing operations in Guatemala by Chiquita Brands International.

The civil suit was brought on Dec. 17 by Water and Sanitation Health (WASH), a Seattle-based nonprofit dedicated to guaranteeing clean water for poor communities. It alleges that the Rainforest Alliance certified as ecologically friendly and sustainable plantations that in fact were contaminating drinking water used by thousands of people in six rural communities near the Nahualate and Madre Vieja rivers in southern Guatemala.

The communities, the suit alleges, were exposed to toxic fertilizers mixed into the plantations’ irrigation systems and to toxic fumigants, including dithane and paraquat, that were sprayed from airplanes over the banana fields. As a result, the drinking water in the communities today has levels of nitrites, nitrates and heavy metals that are 10 times the maximum levels recommended by the World Health Organization. The suit says

local residents are suffering from a variety of ailments, including fever, vomiting and skin rashes, despite Rainforest Alliance’s claim that its certified growers had eliminated the most dangerous pesticides.

Those impacts affect the rural residents of Guatemala as well as consumers in the United States who are willing to pay a premium for Chiquita bananas because of their Rainforest Alliance certification, the suit contends.

“Consumers are increasingly willing to vote with their wallets and purses as they purchase goods that are grown in an environmentally friendly way,” says Eric Harrison, the executive director of WASH. “But green-washing is a huge problem. When the Rainforest Alliance certifies bananas that in my opinion are no different than non-certified bananas, I believe they subvert the ultimate goal of improving the quality of produce in our country.”

Harrison says WASH ultimately hopes to reach a settlement with Rainforest Alliance that would either lead to clean up of the rivers and streams around the communities or provide filters that would allow residents to consume water safely.

In a statement reported in the media, the Rainforest Alliance denied the allegations and said it had confidence in its auditing practices.

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Cellulosic ethanol plants boost capacity in Brazil

Two distilleries recently brought online in Brazil have become Latin America’s first producers of cellulosic ethanol, a process that reduces biofuel’s

environmental impacts by making more efficient use of the crops used as feedstock.

The distilleries are making ethanol from waste products of sugarcane, whose juice already is used extensively to make ethanol in Brazil, the world’s second largest ethanol producer after the United States.

Brazil requires ethanol to be blended into gasoline. Currently the proportion is 72.5% gasoline and 27.5% ethanol. Pure ethanol also is sold at pumps nationwide, and nearly all new cars and most older cars in the country are designed to switch back and forth between the two fuels.

In Brazil, ethanol, a biofuel with lower greenhouse gas emissions than gasoline, is typically made by crushing sugar cane stalks to extract the juice, which is then fermented and distilled. Cellulosic ethanol is made by using enzymes and yeasts to process cane straw, an agricultural waste left on harvested fields, and bagasse, the cellulosic fiber left over after the juice has been extracted from crushed stalks. This cellulosic fuel is known as second-generation (2G) ethanol, as opposed to first-generation (1G) ethanol produced from cane juice. Experts say that by making both types of ethanol, producers can increase the per-acre yield of cane-based ethanol by 50%.

In late September, GranBio, a Brazilian biotechnology firm, became the first company in Latin America (and the Southern Hemisphere) to produce commercial-scale 2G ethanol, by converting sugarcane straw bought from third-party cane growers, says Manoel Carinaíba, GranBio’s vice president in charge of operations.

The R\$491 million (US \$190 million) GranBio distillery in northeastern Alagoas state is now producing 2G ethanol from straw at a rate of one mil-

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Protests against El Quimbo project continue

The El Quimbo hydroelectric plant has prompted fierce opposition since 2009, when the Colombian government approved its construction near the headwaters of the country's most important river, the Magdalena, a region of fertile farmland and productive fishing grounds.

Protests have brought students, farmers and fisherman to the streets for years, most recently last month, to denounce the dam, which is slated for completion by the end of this year. Opponents also have taken the government and Emgesa, the Italian-Colombian consortium building the dam, to court in a bid to stop the project.

And representatives of affected inhabitants in the southern department of Huila have traveled to Washington, D.C. to testify before the Organization of American States' Inter-American Commission on Human Rights about the forced displacement of 400 families to make way for the flooding of the 85-square-kilometer (32.8-sq-mile) reservoir later this year.

The government is determined to complete the project, arguing that the 151-meter (495-foot-) high, 400-megawatt dam and other planned hydroelectric facilities are key to its ability to continue providing mining and agro-industrial operations with cheap power. It also hopes to export electricity from the dam to Ecuador, Panama and Central America.

Presidential support

"The country needs this project and its clean, hydroelectric energy," President Juan Manuel Santos said while speaking at a 2012 business forum in Barranquilla.

Critics say their opposition to the US\$830-million-dollar project is not solely based on the fact that local residents will be displaced. They warn that massive quantities of fish will be killed when the oxygen levels in the river change as a result of the flooding of around 8,500 hectares (21,003 acres) of land. Cocoa, coffee, maize and tobacco plots also will be eliminated. Two models of development are in confrontation, critics contend: one that supports small-scale farmers and fishermen whose environmental footprint is small, and another that prioritizes economic growth gained through large dams, oil drilling and mining, irrespective of the environmental cost.

"This is about imposing the interests of large corporations over those of farmers and fishermen worried about their production and food security," says Jenniffer Chavarro, vice president of the Association of those Affected by the Hydroelectric Project El Quimbo (Asoquimbo). "We're already seeing impacts on artisanal fishermen as the diversion of the river

affects aquatic lifecycles and the mix of sedimentation and building materials in the river from dam construction reduces oxygen levels. The effect on both fishermen and farmers when the reservoir is filled will be even worse."

The controversy over El Quimbo unfolds as Colombia considers the possibility of building nine other dams and numerous power plants on the Magdalena in the coming years. In 2010, the state-owned Chinese firm Hydro-China signed an agreement with the Colombian government to draw up a "Master Plan for the Development of the Magdalena River," which would guide economic development in the Magdalena's watershed. The plan calls for river dredging starting this year to boost cargo traffic, as well as the construction of dams, dikes and irrigation and drainage projects.

Safety, savings cited

"The plan has many potential benefits," says Carlos Cuellar, director of the Autonomous Regional Corporation of the Upper Magdalena (CAM), the government's environmental authority in the department of Huila and a contributor to the Master Plan. "Dams generate energy and help regulate the river, reducing the risk to riverine settlements in our department from avalanches and floods. And the river's dredging will result in substantial economic savings from moving a far larger share of the nation's cargo by river rather than by road."

Still, critics fear the government is insufficiently attentive to risks to local inhabitants and the environment. They worry in particular about the dams, pointing out that when a dam was proposed in 1999 at the El Quimbo site, it was rejected by the Ministry of Agriculture because of the high productivity of the surrounding land.

Yet Álvaro Uribe, a pro-business president seeking foreign investment, allowed for the flooding of vast fertile fields and approximately 5,000 hectares (12,400 acres) of the Forestry Reserve of the Amazon, a protected area that spans six departments in or near the Amazon watershed. Since then, Emgesa has failed to reforest parts of the surrounding wilderness, as required under its contract, according to a report issued in September 2014 by the nation's Comptroller General's Office.

Says Cuellar, CAM's director: "Apart from the advantages, a problem with dams in our department is that they have a high cost in terms of the loss of fish as well as the agricultural land that is flooded, the families that are displaced, and the great social conflict that is generated as a result."

—Steven Ambrus

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Uruguay's ombudsman eyeing agrochemicals

Montevideo, Uruguay

The director of Uruguay's National Human Rights Institution and Ombudsman's Office (INDDHH) says his agency plans to prepare a report on public health impacts from agrochemical use in this country, where a boom in large-scale farming is believed to be increasing chemical exposures.

Juan Faroppa says his agency is investigating "concrete complaints—individual and collective—on situations relating to agrochemical spraying, mainly concerning the soybean sector." Two spraying cases were presented by residents of the rural communities of Paso Picón, in Canelones Department, and Guichón, in Paysandú Department; a third filed with the agency has to do with agrochemical waste.

The human rights and ombudsman's agency organized a public meeting in Guichón last month on the health impacts of agrochemicals, Uruguay's first government-sponsored national hearing on the subject. The meeting—held on Dec. 10, Human Rights Day—drew dozens of residents who claimed aerial and ground-based spraying were harming their health. It also included representatives of agencies including the Ministry of Ranching, Agriculture and Fishing (MGAP), the Public Health Ministry (MSP) and the government-run Toxicology Institute as well as social-advocacy groups.

Greater awareness

"I've worked in toxicology for 40 years, and my focus all my life has been pesticides," attendee Mabel Burger, the recently retired director of the Toxicology Institute, told EcoAméricas after the hearing. "I don't know if the cases have increased, but I do know people are realizing there are pathologies that are linked to pesticides and that, before, their origin was not known or people didn't dare complain."

Patricia Sartori, a resident of San José, a department adjacent to Montevideo, said at the hearing that aerial spraying of soy crops occurs within 300 meters of dwellings. On paper, Uruguay prohibits aerial spraying within 500 meters of population centers and schools and within 30 meters of water sources. Ground-based spraying is prohibited within 300 meters of population centers. "Three years ago they planted soy 150 meters away, and all of us neighbors have health problems," Sartori was quoted as saying at the hearing by Brecha, a leading Uruguayan weekly. "We are very exposed."

Valquiria González, a resident of Paysandú, was quoted as saying that in 2008, she lodged her first complaint with the operators of a soy, wheat and sorghum operation near her house. "We began to have signs of acute symptoms: rhinitis, diarrhea, dizziness, vertigo," González said, adding that since 2010 she has

had swollen glands, eye and nose irritation and other problems.

Faroppa tells EcoAméricas that complaints aired at the meeting and those filed with his agency fall into three categories. In the first, spraying regulations are not followed and authorities fail to follow up. In the second, regulations are enforced, but only after a long, drawn-out process in which those making complaints feel it's up to them to find evidence. And the third, which Faroppa describes as "the most complicated," involves charges that banned chemicals are used, or that all agrochemicals must be banned as part of a transformation of Uruguay's agricultural model.

At December's meeting, Adriana Pascual of Paso Picón says a soy producer that various residents complained about was fined by the Public Health Ministry, but resumed spraying as before. "We need urgent measures because our lives are in danger every day," she said.

Ombudsman's limits

Faroppa says his agency lacks the authority to crack down on private individuals, but can prod other agencies to exercise their enforcement powers. And while it can refer those affected by spraying to the courts, he adds, it cannot involve itself in agrochemical cases being handled by the courts.

The best-known spraying case heard in the court system involved Silvia Nobelasco a teacher in a rural community here. She testified she was sprayed by a tractor-drawn agrochemical applicator in 2012 when she was trying to complain to the operators of a nearby plantation that they were spraying too close to the school. In a complaint she presented to civil and criminal courts and three government agencies, she said she awoke the next day choking and her entire body itching as a result of having breathed in a cocktail of herbicides—an exposure verified by authorities. In June 2013, she won US\$6,800 in damages against the company Agronegocios del Plata (ADP).

Concern about chemical exposures have grown in Uruguay along with the farm sector, which has been experiencing rapid growth. From 2005 to 2013, Uruguay's agrochemical imports quadrupled, climbing from US\$61.3 million to \$249.3 million, the government says.

Burger, the toxicologist, says that among the most pressing needs is to boost enforcement capacity. "There are regulations of every type, but almost none are followed," she says. "It is difficult to agree on what is a safe distance for spraying, but the worst part is that there is no one doing monitoring."

—Javier Lyonnet

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Argentina putting tidal-power toe in water

Buenos Aires, Argentina

Two buoys with sensors to monitor tides and ocean currents have been placed in the waters of Argentina's southern province of Santa Cruz, the first step in a government project to gauge tidal energy potential along the southern Patagonian coast.

The project, which involves the collaboration of scientists from various institutions and the state-owned oil company, YPF, reflects growing consensus here that Argentina needs to do more to develop alternative energy sources.

The country currently gets 66% of its electricity from fossil-fuel-fired plants, 29% from hydroelectric stations, 4% from nuclear-energy plants and roughly 1% from alternatives sources such as wind, solar and small-scale hydroelectric, according to government figures. National legislation passed in 2006 calls for alternative sources to contribute 8% of Argentina's electricity by 2016. Experts agree this goal will not be met, but they say Argentina does possess extraordinary alternative-energy potential, particularly in wind power.

The tidal and ocean-current project is taking place in Bahía Grande, a 300-kilometer (186-mile) stretch of coastal waters in the extreme south of mainland Argentina. The firm doing the testing is Y-TEC, an energy research and development partnership created in 2012 by YPF and Argentina's state-run National Scientific and Technical Research Council (Conicet).

"In Bahia Grande, tides produce ranges of up to 12 meters (39 feet)," Gustavo Bianchi, Y-TEC's director, tells EcoAméricas, adding that the bay's tidal range far exceeds that of the Rance River in Brittany, France, site of the world's first tidal power station. "Argentina needs to bet on

alternative energy. Our vision is that ten years from now, [alternative energy] will have to account for 15% of electricity production."

So far, US\$ 2.5 million has been invested in the project, all of it by Argentina's Science and Technology Ministry. The two satellite-linked buoys, placed in the waters off Santa Cruz province on Dec. 2, have different roles. The first, built in Canada, is designed to monitor relatively shallow waters at Río Gallegos, the capital of Santa Cruz, at the mouth of a river of the same name. It will be used primarily to measure tidal force and other factors including wind and wave patterns.

The second buoy was built in Norway for use in waters from 600 to 1,000 meters (2000 to 3,300 feet) deep. Set at Cabo Virgenes, which forms the southernmost tip of Argentina's mainland where Bahía Grande meets the Strait of Magellan, this buoy will gauge ocean currents at the eastern end of the strait.

Project organizers say they expect to place a four-kilowatt research turbine at Río Gallegos in July 2015 to gauge the efficiency of tide-based electricity production.

YPF President Miguel Galluccio says the state oil company's participation in Y-TEC represents an effort to tap unconventional energy sources of many types.

"The bet we made with the creation of Y-TEC is unconventional from the point of view of an oil company, which typically puts its money in a risky activity such as exploration, but not in research and development," Galluccio said at a Dec. 15 press conference in Buenos Aires. "We're moving in the direction of innovation both in terms of shale oil and shale gas and in terms of alternative energy sources. In this way we're thinking broadly, with the objective of achieving energy self-sufficiency."

Argentina has seen its oil production fall off to the point that the country lost its energy self-sufficiency in 2010. Though experts have cited a variety of reasons for the decline, President Cristina Kirchner blamed it squarely on a lack of initiative by the Spanish company Repsol, which at the time was YPF's majority shareholder. Portraying Repsol as a roadblock to energy self-sufficiency, she approved a government takeover of the company in 2012, reversing the privatization of YPF that was carried out in the 1990s by then President Carlos Menem.

Project organizers insist they will offset any environmental impacts in Bahía Grande, a prized coastal region that hosts a large variety of sea birds and marine mammals and is the site of the only national park in Argentina that combines marine and land conservation.

—Daniel Gutman

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Centerpiece

Culture, ecology get short shrift in river plan

Nauta, Perú

Manual Taricuarima, a shaman of the Peruvian Amazon's Kukama people, says that when he attended patients here in the past, he would put his hand on the person's head, shut his eyes and sense not only the seriousness of the problem, but also the spirits he had to summon in order to bring relief. Taking a bowl made from the shell of the fruit of a small tree called huinga (*Crescentia cujete*), he would go to the bank of the Marañón River, a major tributary of the Amazon, and scoop up water for the healing ritual as a symbol of his communication with the river spirits.



He had done that ever since his father taught him to heal. But then came 2012, and the rights to the port in this small city were granted in concession to private companies as a first step toward the development of a river- and highway-transportation network linking Peru and Brazil. Under the new regulations, residents of local river communities could no longer dock their small canoes at the port. Taricuarima felt his spiritual bond with the river had been broken.

"Now, I feel very weak," says Taricuarima, who is 76. "Now I can hardly cure people of their illnesses. Since they sold the ports to the companies, there are many vessels, motor oil and much noise. The spirits with whom I work have fled far away, and they don't come when I call them."

The Marañón River figures prominently in the Kukama people's creation stories and in their everyday lives. They travel on it, bathe and wash their clothes in it, drink its water and communicate with spirits and relatives who they believe live in its depths. For this reason, the impacts of ongoing oil production and of anticipated efforts to harness the river for energy and navigation stand to affect not just the river's ecology, but also the local culture. Experts say that in combination, the impacts of damming and dredging could be particularly powerful.

The hydrovia, or waterway, project that Taricuarima says has severed his bond with the water spirits is part of the Initiative for the Integration of the Regional Infrastructure of South America (IIRSA). The initiative is a regional infrastructure-integration effort that includes plans to improve and connect highways and waterways in a network linking the continent's east and west coasts. It will provide a route for Brazil to ship commodities such as iron ore and soybeans to China, and ease the transport of goods to and from areas of northeast Peru such as the city of Iquitos (now accessible only by river or air), thus lowering their cost.

Thus far, IIRSA's highway work in this part of Peru is finished,

and the plan's upgrades for the coastal port of Paita as well as the river ports of Iquitos, Yurimaguas and Pucallpa are underway. The airport in the northern coastal city of Piura also is being expanded as part of the plan. The next phase involves dredging parts of the Marañón, Huallaga and Ucayali rivers at an estimated cost of US\$74 million to make them navigable year-round for cargo and passenger vessels traveling to and from Brazil. That would allow river traffic to connect with highways in the Peruvian towns of Yurimaguas and Pucallpa, which in turn lead to seaports on Peru's Pacific coast.

Eight bidders have expressed interest in the project, which will include dredging, installing navigational aids and monitoring water levels and channel depths. The winner will be chosen during the first half of this year, according to the Peruvian development investment agency ProInversión.

Critics have raised environmental, safety and cultural concerns. More vessels on the Amazon, Marañón, Huallaga and Ucayali rivers will make river travel more dangerous for local residents who depend on dugout canoes or small open boats equipped with small motors called peque-peques, for the chugging sound they make.

Small-boat traffic is especially heavy when government officials disburse the bimonthly payment from Juntos, a conditional cash transfer program that provides a subsidy of about \$30 a month to mothers who have prenatal checkups and ensure their children stay in school and get regular checkups and vaccinations. On the pay days, flotillas of canoes head up and down the rivers to the designated disbursement points and return home loaded with supplies that the women have purchased. Riding low in the water, a heavily laden canoe risks being swamped by the wake of a larger vessel.

The hydrovia will require periodic dredging of sand bars that make parts of the Marañón, Huallaga and Ucayali rivers impassible when water levels are low. That could alter crucial sediment flows in a river system where the seasonal flood cycle distributes nutrient-bearing silt over riverside fields and through wetlands such as the 2-million-hectare (5-million-acre) Pacaya-Samiria National Reserve between the Marañón and Ucayali rivers.

The terms of reference for the hydrovia environmental-impact assessment call for inclusion of information about sediments "if pos-



Peruvian river dredging and highway-improvement projects are being undertaken as part of a regional infrastructure initiative to link South America's east and west coasts.

sible.” But Jorge Abad, a Peruvian researcher at the University of Pittsburgh’s Center for Research and Education of the Amazonian Rainforest, says little is known about those flows. “If you change the dynamics of the bars, you might change the dynamics of the whole river,” Abad says.

That could alter the ever-shifting meanders that make Amazonian rivers resemble huge snakes looping across the landscape. Although the consequences might not be visible immediately, “there could be impacts 20 or 30 years down the road,” he says. Because basic data about sediment flow in Peru’s Amazonian rivers are lacking, Abad and his colleagues are studying the rivers to develop a baseline against which future changes can be measured.

The situation is complicated by plans for a dam on the upper part of the Marañón River, on the east flank of the Andes Mountains. Rules for environmental impact state-



Small canoes are at risk of being swamped by large riverboats on the Marañón River. (Photo by Barbara Fraser)



For locals, the Marañón River is an economic lifeline, a spiritual touchstone and a playground. (Photo by Barbara Fraser)

ments do not require that planners consider the combined effects of the dam and the hydrovia. “Dams alone will change the flow patterns and sediment content in rivers, and typically ecosystems will have a hard time [coping] with that,” says Bernhard Lehner, assistant professor of global hydrology at McGill University in Montreal, Canada, and coauthor of a recently published paper about the impact of dams worldwide on flow regulation and fragmentation of rivers.

Dredging for the hydrovia downstream of the dam will exacerbate the impact, he says. Kukama fishermen along the Marañón River view sandbars differently than IIRSA planners. “Engineers call them ‘bad spots,’ [malos pasos]” says Ribelino Ricopa, who lives in the tiny village of Santa Clara, a few

hours upstream from Nauta. “But for us they are ‘good spots’ [buenos pasos].”

Sandbars and the flotsam they snag provide shelter for fish, and the Kukama believe they provide a resting place for yacruna—people who live under the water. “When my grandson fell in the river, he was drowning,” says José Murayari Saquiray, 72, of Nauta. “The mermaid grabbed him and rushed him to the health center in the river using a well-paved highway. My grandson is not dead. He lives in the river with the mermaid. He comes home in dreams and talks with his wife and children.”

People who have drowned in the river and whose bodies haven’t been found are believed to live in the river. Like Murayari, many Kukama families say they communi-

cate through dreams or shamans with relatives who live under the river. Taricuarima, the healer, tells of lifting up the riverbank as if it were mosquito netting, slipping into the water and spending three days at a time with spirits of caimans, freshwater rays and boas, as well as shamans who have died and chosen to live there. Through these relationships, he says, he gains greater power and knowledge, enabling him to treat illnesses and keep his people’s culture alive.

For the Kukama people, a relative who lives under the water is not dead, and continues taking part in family life. Families have an intimate relationship with the river, which helps ease the pain of loss. With no sharp boundary between life inside and outside the river, they believe dredging the riverbed will affect the people in both places.

That view is rarely reflected in scientific and engineering studies, says Paige West, an associate professor of anthropology at Columbia University in New York. “People who are expressing those beliefs, that’s the world they live in. It’s real to them, and it’s very hard for western scientists to take that seriously in a way that’s not patronizing [by saying] that these people have a very rich mythology about water beings,” says West. “No, these people live in a world where water beings exist.”

Government officials have argued that an indigenous minority should not have the power to veto development that could benefit a majority of Peruvians. West says improved dialogue could be crucial. “It’s not out of the realm of possibility [for developers] to sit down with indigenous leaders

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Documents & Resources

For information on IIRSA:
www.iirsa.org

On the hydrovia project in Peru:
www.proyectosapp.pe/modulos/JER/PlantillaProyecto.aspx?ARE=0&PFL=2&JER=5644&SEC=22

and say, ‘We really need to build this. Is there any way that we can move your ancestors? Is there any way that we can facilitate the transfer of these souls to another location?’ ”

While she acknowledges the answer might be no, West says that avoiding the discussion makes it more difficult to avoid destruction of indigenous culture. She adds: “A project that removes ancestral burial grounds [or] sites of ancestral souls [leads to] a dissolving of people’s sense about the past, present and future. If you destroy history and memory by destroying the river souls, then you destroy people’s ability to cling to other parts of their tradition.”

A lawsuit filed by local indigenous leaders before the Constitutional Court in Nauta noted the cultural impacts of the planned hydrovia and called for prior consultation of indigenous communities—as required under Peruvian law—before the project could continue.

In October, a judge ordered the project suspended until the government carried out a consultation. Officials agreed to the consultation, but appealed the decision, saying the process should be conducted after the environmental-impact statement is prepared. The plaintiffs are calling for the

consultation to take place before the project can proceed. A decision on the timing of the consultation is pending.

The Constitutional Court judge did not address cultural impacts in the ruling, says Juan Carlos Ruiz, a lawyer at the nonprofit Legal Defense Institute (IDL) in Lima who argued the case. Ruiz is also preparing a constitutional case against various government agencies on the grounds that they failed to protect the health of residents of Cuninico, a village on the Marañón River, where some 2,000 barrels of oil leaked in June 2014 from a pipeline that is operated by the state-run company PetroPerú. (“Spill points up risks of rainforest oil projects”—EcoAméricas, Aug. ’14.)

That spill underscored how four decades of oil production in the northern Amazon, combined with untreated municipal wastewater discharges and runoff from mines in the Andes Mountains, have fouled the major waterways. In 2013, government water-quality studies found that pollution from metals and bacteria made drinking water in all the communities tested in

the lower Marañón River Valley unfit for human consumption. (See “Communities in Peru push for more pollution tests”—EcoAméricas, May ’14.) Peru’s Ministry of Housing is preparing to install temporary water treatment plants in more than 60 communities in the Marañón watershed, where pollution persists despite the declaration of various health and environmental emergencies in the past decade. Others have suggested villagers should collect rainwater to avoid drinking surface water, but that’s not as straightforward as an engineer might think.

For the Kukama, river water and rainwater aren’t the same, and river water is preferable for drinking. Even if people switched to rainwater, not all rainwater is the same, since according to Kukama beliefs, different rains have different characteristics. For the Kukama, some rains cause illness, especially to children who bathe in the rainwater, and rains accompanied by sun bring evil spirits that can cause illness or death if a shaman isn’t summoned. Cold-weather rains also are thought to bring bad spirits and illness, while other rains are seen as beneficial to health and plant growth.

It is unclear how villagers will view water treatment plants. The plants are meant as a stopgap until a permanent source of safe drink-

ing water is provided, says Francisco Dumler, head of construction and sanitation in the Ministry of Housing, Construction and Sanitation.

The long-term impact of pollution—and development projects like the hydrovia—on shamans also remains to be seen. Taricuarima and other shamans say they’ve tried other ways to maintain contact with the rivers and the spirits within them. They seek out lakes far from the river where they can communicate through dreams and keep their spiritual powers strong.

Meanwhile, some fishermen have hung up their nets. “I don’t fish anymore because there is no place to fish,” says Jaime Nashnate Huayamari, 64, of Nauta. “Who will feed our children? Where will they fish if they want to be fishermen someday?” Yet Nashnate has not given up altogether. “I have put away my fishing equipment, but not my knowledge,” he says. “I share what’s important about fishing and the life of fishermen with my children and others, hoping that together we can all recover our waters.”

—Barbara Fraser and Leonardo Tello Imaina



Man from the Kukama community of Cuninico, Peru, holds up a dead fish caught behind an oil containment boom six months after a pipeline spill occurred. (Photo by Barbara Fraser)

Rousseff appointees
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tiatives that reduce emissions.”

In her first term, Rousseff drew criticism for allowing the paving of Amazon highways and the construction of large Amazon dams, projects that typically lead to land invasions and illegal deforestation. She also drew fire for only minimally increasing the area of Amazon land under federal protection. And in 2012 she signed highly controversial legislation that revised the Forest Code, the country’s central, forest-protection law. The rewrite, a victory for the farming and ranching lobby, suspended fines and replanting requirements for many landowners who had cleared forest illegally. Effectively, this amounted to an amnesty that some experts argue will encourage more illegal cutting—a key driver not only of habitat loss, but also of greenhouse-gas emissions in Brazil.

Green advocates worry such moves will undermine hard-won accomplishments made in recent years. In the climate legislation enacted under Rousseff’s predecessor, Luiz Inácio Lula da Silva, Brazil pledged to hold its greenhouse-gas emissions from 36.1% to 38.9% below projected 2020 levels. The law marks one of the few such commitments by a large developing nation. Meanwhile, tighter woodland enforcement, also launched under Lula, helped decrease the Amazon deforestation rate substantially in five of the past six years, a trend that, if continued, will be key in enabling Brazil to reach its emissions-reduction targets.

Challenging climate

With Brazil’s economy now sagging, pressure to favor development priorities over environmental concerns will only increase, green groups and scientists warn. In that context, they say, Rousseff’s second-term appointments do not bode well for the country’s ecosystems.

Drawing the keenest attention are Abreu and Rebelo, whose political parties—respectively, the Brazilian Democratic Movement and the Communist Party—form part of Rousseff’s governing coalition. Rebelo was the main author of the Forest Code overhaul. Abreu, a senator and cattle rancher, recently stepped down as president of the National Confederation of Farmers and Ranchers (CNA), Brazil’s main agribusiness lobbying group. She spearheaded the rewritten Forest Code in the Senate after Rebelo had pushed it through the lower house, the Chamber of Deputies.

“Rousseff’s appointments of Rebelo and Abreu, perhaps the two congressional leaders most responsible for gutting the Forest Code, are a slap in the face to the scientific community, which opposed it,” says Philip Fearnside, an ecology researcher at the government-run National Institute of Amazon Research (INPA).

Nelson Pereira dos Reis, who heads the environmental department of the Industrial Federation of São Paulo State (FIESP), a powerful business lobby, portrays such concerns as overblown. “The policy of any government ministry reflects the policies of the government, and not of a particular minister,” he says. “So I don’t see Abreu’s or Rebelo’s appointments as indicative of a change in the government’s policies on agriculture, scientific research, or environmental protection. And Rebelo, in getting Congress to pass the Forest Code revision he drafted, has shown an ability to dialogue with all segments of society.”

Pereira dos Reis adds that two provisions in the revised Forest Code could help curb illegal deforestation if they are enforced by state agencies, a point on which green advocates agree. One requires landowners to register their properties with state authorities, pinpointing areas that have been illegally cut, and the other requires eventual restoration of that cleared land or a similar quantity elsewhere.

Commitment required

Yet critics argue that to improve protection of the Amazon and achieve other, related goals such as greenhouse-gas reductions, Brazilian authorities must possess an environmental commitment that Rousseff, by way of her appointments, appears to lack. They point in particular to the appointment of Rebelo, who asserted publicly that climate change is a hoax. In a July 2010 article entitled “Environmental Scam,” Rebelo wrote: “there is no scientific proof of global warming projections and even less that it [global warming] is occurring because of man and not because of natural phenomena. It [global warming] deals with a formulation, based on computer simulations.”

Rebelo’s article was meant to rebut an article by Márcio Santilli, one of the founders and coordinators of the Social- Environmental Institute (ISA), a leading Brazilian conservation group. Santilli’s article, entitled “Reactionary and Predatory,” said the Forest Code revision “fails to recognize the irrefutable role that a healthy forest plays in a healthy climate and in the well-being of its populations.”

Santilli says that while President Rousseff called climate change “a major challenge” in a U.N. speech last September, “the president’s appointment of Rebelo, a climate change denier, to head the MCTI is particularly troubling...[B]oth Rebelo’s and Abreu’s appointments cast doubt on whether the government really plans to reach the emission-reduction targets of the climate change law.”

—Michael Kepp

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Documents & Resources:

July 2010 article by ISA founder Santilli criticizing Forest Code revision (in Portuguese):
www.socioambiental.org/pt-br/blog/blog-do-isa/reacionario-e-predatorio

Rebelo’s July 2010 rebuttle (in Portuguese):
www.socioambiental.org/banco_imagens/pdfs/carta%20aldo%20rebelo.pdf

Paraguayan Chaco continued from page 1

left. Yet I hear Paraguayan politicians say that nature is but an obstacle to further development for livestock and crop production.”

The Paraguayan Chaco is part of the Gran Chaco, which covers some 725,000 square kilometers (280,000 sq. miles), with over half in Argentina, a third in Paraguay and the rest in Bolivia. The largest dry forest and second largest forested area in South America after the Amazon, it often is referred to as “a green hell” on account of temperatures that regularly surpass 38 degrees Celsius (100 degrees Fahrenheit) and scant rainfall that in some areas rarely exceeds 200 millimeters (7.9 inches) annually.

Yet the heat, drought and poor roads have not stopped Paraguayan and foreign investors from pouring into the spiny forest to develop it for cattle ranching. In the process, the Paraguayan Chaco is being transformed at breakneck speed. Woodlands are cut. The topsoil, with nothing to bind it, blows away in harsh northern winds. The remaining soil fails to absorb the meager rains and sand dunes rise up where forest once stood, at times covering the roads in especially denuded areas along the border with Bolivia.

Broken biological corridors

The unregulated forest clearing, which has spawned illegal cutting in several national parks, is not only destroying the region’s long-term potential for livestock and crop production, experts say. It also is dismantling biological corridors for iconic species including the jaguar and the Chacoan peccary (*Catagonus wagneri*) and putting huge strains on the uncontacted Ayoreo people, hunter-gathers who have roamed the Chaco for centuries. With little ancestral land left, the Ayoreo are being driven out of isolation and onto private lands. Violent clashes between them and settlers have erupted.

Much of the blame for those problems lies with raw economics, experts say. For Brazilians, Argentines and Uruguayans with excess capital, the cheap land prices in Paraguay’s Chaco are attractive. So are the low taxes and the unenforced regulations. They can move their cattle operations there and, with land prices in Paraguay also rising quickly, develop ranches for resale.

But Paraguay’s government is also to blame for heavily promoting the region without ensuring adequate environmental safeguards, the experts say. Last February, President Horacio Cartes made a direct pitch to Brazilians at a Paraguay-Brazil business forum in Asunción.

“Use and abuse Paraguay because this is a moment of opportunities,” he said in what was widely understood to be a reference to devel-

opment of the Chaco, among other places.

Then in November, as land in the Paraguayan Chaco was being cleared at record rates, the Paraguayan government made another pitch, this time in a business supplement in Britain’s Observer newspaper. Agriculture Minister Jorge Gattini touted the “cheap but productive land in the Chaco for cattle, sugarcane and soybean.”

Paraguay’s beef exports rank eighth in the world, last year bringing in US\$1.25 billion—the country’s second biggest foreign-exchange earner behind soybeans. But, even with its beef production concentrated in the Chaco, Paraguay’s government could ensure better protection by improving implementation of a 1973 law that requires landowners to set aside 25% of each parcel to protect forests and watersheds, experts say.

Improved set-asides needed

“At present, most landowners set aside the worst land they have,” Yanosky says. “The ideal is to preserve production while insisting that the land set aside is that which truly protects forests and preserves biological corridors for plant and animal species.”

Rossana Scribano, a researcher at the Development Institute, a nonprofit Asunción-based think tank, warns that ineffective government policy combined with the rapid deforestation of the Chaco bodes ill for Paraguay in an era of climate change. Already, she says, the region is experiencing more intense droughts in the summer and heavier rains and flooding in the winter months of May and June, with rivers more frequently overflowing their banks.

“Given what we’re already seeing and the predictions of the IPCC [the UN Intergovernmental Panel on Climate Change], there are going to be real reductions in the production of cattle and of milk, as well as of subsistence crops such as corn and beans in the next 30 years, as temperatures soar and water becomes more scarce in the Chaco,” Scribano says.

She adds that the government must begin taking adaptation steps, such as rainwater retention and silvopastoral ranching to better conserve water and soil while minimizing the space needed for cattle grazing.

“The threat to the Chaco from climate change in terms of both production and biodiversity losses is already upon us and will only become more severe with the passing of time,” Scribano says. “We are going to need new policies to adapt and new legislation to halt the disappearance of the remaining forests if we are to begin dealing with it.”

—Steven Ambrus

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lion liters (264,200 gallons) annually, and expects by the end of the year to reach its full-capacity rate of 82 million liters (21.6 million gallons) annually, Carnaúba reports. GranBio stores and uses bagasse, also bought from third-party 1G producers, to generate thermo-electric power for the distillery. It has contracts to sell 2G domestically, and eventually might export to California.

Currently only two other companies, Italy's Beta Renewables, from whom GranBio bought the plant's technology, and POET-DSM Advanced Biofuels in the United States, produce 2G ethanol on a commercial scale.

Beta Renewables opened the world's first such plant in Italy in October 2013, and POET-DSM Advanced Biofuels started up the world's second in the United States in September of last year, according to the companies' websites.

GranBio's 2G plant opened in late September 2014, nearly one month after the POET-DSM plant. And in December, Raízen, a Brazilian biofuels joint venture involving Shell and the local Cosan energy and logistics group, became the world's fourth producer of commercial-scale 2G ethanol.

Raízen's R\$237 million (US\$85 million), 40-million-liter- (10.6-million-gallon-) per-year distillery in southeastern São Paulo state converts straw as well as bagasse into 2G ethanol. Expected to reach full capacity by May 2016, the plant will sell most of its ethanol domestically.

The Raízen distillery is the first of eight 2G ethanol plants that the group plans to build and bring online in Brazil by 2024, according to a statement issued by the company. It estimates the plants will have a combined capacity of 1 billion liters (264.2 million gallon) per year and cost from R\$2 billion to R\$2.5 billion (US\$763

million to \$953 million).

Follow-up: Manoel Carnaúba, Vice President for Operations, GranBio, São Paulo, Brazil, +(55 11) 2739-0500, granbio@granbio.com.br; Antonio Alberto Stuchi, Executive Director, Raízen, São Paulo, +(55 11) 3147-7900.



After rights ruling, Argentine zoo seeking home for Sandra

The Buenos Aires Zoo is looking for a foreign institution willing to give a new home to Sandra, an orangutan deemed recently by an Argentine court to be a "non-human individual" deserving of basic rights.

Sandra won world attention when Argentina's Federal Court of Appeals, acting last month on a habeas corpus petition, endorsed the view of animal-rights campaigners that orangutans, on account of their cognitive capacity, must not be treated as objects.

The zoo insists that its search for a new home for Sandra, the only orangutan in Argentina, is not due to concern about her living conditions but, rather, to its plans to focus exclusively on native animal species.

Sandra is a hybrid of the two existing ape species, Borneo (*Pongo pygmaeus*) and Sumatra (*Pongo abelii*). Due to turn 29 in February, she was born in Germany's Rostock Zoo, and has lived in zoos ever since.

The Argentine nonprofit spearheading the habeas corpus petition, the Association of Officials and Lawyers for Animal Rights (Afada), argues that animals such as orangutans must not be confined and must not live alone, as is the case with Sandra. Adrián Sestelo, the Buenos Aires Zoo's director of biology, contends that the concern about Sandra was overblown.

"I'd say that those who filed this case are fundamentalists, and they seek to analyze Sandra's conduct as if she were a human," Sestelo says. "They

don't understand that orangutans are not energetic, as chimpanzees are, but instead have a contemplative and solitary attitude. Although Sandra is fine where she is, we are looking for a new place for her—it could be a zoo in the United States—which is not easy to find."

The appeals court did not order a remedy; it merely instructed a Buenos Aires penal court handling the case to take into account that Sandra is a "non-human individual," rather than a thing, and must therefore be accorded basic rights.

Claudio Bertonatti, an Argentine naturalist, argues that while Sandra should not be released into the wild, she should no longer live in a zoo.

"It is not reasonable to free Sandra because she was born in captivity and because she could cause genetic or sanitary contamination in either of the two species of orangutan," Bertonatti says. "We have to get the court to order her moved to a sanctuary for large primates where she can have improved welfare."

Follow-up: Adrián Sestelo, Director of Biology, Buenos Aires Zoo, Buenos Aires, Argentina, +(54 11) 4011-9934, asesstelo@zoobuenosaires.com.ar; Claudio Bertonatti, advisor to the Félix de Azara Foundation of Natural History, Buenos Aires, +(54 911) 3673-0764, claudiobertonatti@yahoo.com.



Uruguayan city takes a step forward in waste processing

The city of Florida, population 45,000, is becoming a proving ground for solid-waste processing in Uruguay with the construction of a US\$1.5 million center to sort, compress, encapsulate and bury the municipality's trash.

The facility, built using Argentine technology by the Uruguayan company Eronal in partnership with the government of the local department

of which Florida is the capital, is expected to process 50 metric tons of solid waste a day.

"The departmental government as well as the citizens expect to end an endemic problem, 30 years of pollution from an open-air dump," declares Florida Department Mayor Carlos Enciso.

Enciso says 25% of the city's trash will be recycled manually by 15 people who had previously been trash pickers working on their own account but will now be paid by Eronal and the city.

The trash that is encapsulated and buried, he adds, might one day be used as fuel for power generation. The city could thus be converting "a current environmental liability into an energy asset, because the bundles that will be buried can be a source of energy when the appropriate technology for this exists in our country," Enciso says.

Officials hope to make it easier for city residents to sort recyclables voluntarily at home. Enciso says the US\$13.5 per ton Eronal will receive for processing trash represents a third of the cost that was required to operate the landfill.

Says Fernando Zapiola, Eronal's director: "Compacting waste that has no value added, the volume can be reduced six-fold into bales of 1,000 kilos per square meter with up to 80% of the moisture removed, and capsules can be produced measuring 2.5 by 1.6 meters and weighing five [metric] tons."

The yellow capsules, the company says, will neither break nor degrade, and will be buried on the grounds of the Eronal facility, which is adjacent to the existing dump. **Follow-up:** Carlos Enciso, Mayor, Department of Florida, Florida, Uruguay, +(598) 4352-5161, intendenteenciso@florida.gub.uy; Fernando Zapiola, Director, Eronal, Montevideo, Uruguay, +(598) 2323-5161, trsu.uruguay@gmail.com.

Q&A:

Brazilian expert sees need for rapid reforestation drive

Every year there is a flurry of excitement as the Brazilian government publishes its annual deforestation report. Produced through analysis of satellite images recorded by the National Institute for Space Research (INPE), the data show how much of the Amazon rainforest was clear-felled in the previous year. A decline in the rate of deforestation wins applause, while an increase fuels concern that the forest-conservation battle is being lost. Antonio Donato Nobre, a senior researcher at Brazil's National Institute of Amazonian Research (INPA) examined recent scientific studies of the Amazon and presented his conclusions in "The Future Climate of Amazonia: Scientific Assessment Report," published last October by Articulación Amazonica. Nobre concludes that forest cover itself plays such a key role in driving climate conditions that the goal must shift from reducing the annual deforestation rate to urgently replanting native woodlands. EcoAméricas correspondent Sue Branford interviewed Nobre recently by e-mail.



Antonio Donato Nobre

What did you conclude in your review?

As I made my way through the 200 or so articles I read for this study, it became clear to me that Brazil was already suffering the catastrophic impact of climate change and that one of the main causes was the continued felling of the Amazon forest. This made me aware we must change policies. It is no longer enough to achieve piecemeal victories by reducing year by year the rate of Amazon deforestation. We need to put an end to the deforestation once and for all and recreate the forest. Unless we do this, we'll see Brazil increasingly assailed by serious climate catastrophes, like the alarming, on-going drought in São Paulo. For a long while scientists paid little attention to vegetation in determining climate processes, concentrating almost exclusively on the colossal flows of mass and energy occurring around the planet. But recently this has changed, with scientists publishing more studies on the vital importance of vegetation. A key discovery has been that vegetation, particularly trees, play an essential role in releasing moisture into the atmosphere. The figures are impressive: in a single day a large tree in the rainforest can pump over a 1,000 liters of moisture from the soil and then transpire this liquid into the atmosphere. If this is scaled up for the whole forest, it means the Amazon forest transpires 20 billion tons of water a day. This is even more than the 17 billion tons that the Amazon River discharges into the Atlantic each day.

What happens to all this transpired water?

It plays a key role in cloud formation. A recent study, published in the scientific journal *Nature*, shows that nearly 90% of all water that reaches the atmosphere from the continents does so via plant transpiration. In contrast, only slightly more than 10% reaches the atmosphere through simple evaporation without the mediation of plants. It takes a huge amount of solar energy to cause this evaporation. In fact, one would need all the energy of the giant Itaipu hydroelectric power station for 145 years just to evaporate the amount of water evaporated by the sun from the Amazon forest in a single day. It provides rainfall to a fortunate quadrangle—bounded by Cuiabá to the north, São Paulo to the east, Buenos Aires to the south, and

the Andes to the west—which is responsible for 70% of the region's GDP. The hydrologist Enéas Salati [of the University of São Paulo] in the 1970s led observational studies on rainfall and evaporation that unequivocally demonstrated how the forest, via moisture recycling, keeps the air humid over an inland area that extends south some 3,000 kilometers. Much later, in 2012, José Marengo [of Ecosystem Services for Poverty Alleviation, a British research fund] and other scientists took this work further, showing that a system of monsoons similar to that in Asia operates in South America, bringing copious amounts of water in what have been dubbed "flying rivers" to the quadrangle.

Which depends on the forest's continued existence.

Yes, very much so. Over the years, scientists have tried to predict the impact of the clear-felling of the forest, and their conclusions have become increasingly alarming. In a

ground-breaking study in 1991, Carlos Nobre [a leading Brazilian climate scientist and Antonio Nobre's brother] and others predicted that, if forests were entirely replaced by degraded pasture, rainfall would fall by about 25% and average surface temperatures would increase by about 2.5°C in the Amazon basin. They also predicted an increase in the duration of the dry season in the southern half of the Amazon basin. More recently, in 2009, other scientists included the response of the oceans to the deforestation scenarios, something not taken into account in earlier studies. They then predicted clear-felling would lead to a projected decrease of 42% in rainfall. However, actual change happening on the ground suggests the situation may be even worse. Their models suggested a prolonged dry season would only occur after the complete destruction of the forest, but it's actually happening now, after only 19% of the forest has been cut down. There may be factors at play we don't fully understand. For instance, Russian scientists Victor Gorshkov and Anastassia Makarieva have developed a "biotic pump" theory which posits transpiration and condensation processes that are mediated and manipulated by the trees change the atmospheric pressure and dynamics, resulting in increased moisture supply from the ocean moving inland where there are forested landmasses. If the Russians are right—and some very recent empirical tests suggest they are—then clear-felling would disrupt the trade winds and rainfall would fall to almost zero. (See "Physicists challenge tropical air flow theory"—EcoAméricas, Aug. '10.)

What needs to be done?

The federal government has taken steps to initiate processes of control and dissuasion. Significant results have been achieved in terms of the area of forest felled annually, which peaked at 27,423 square kilometers in 2004 and fell to under 7,000 square kilometers a year since 2009. However, we need to dig much deeper and get to the real root of the problem by expanding executive policies and mobilizing society. Above all, we need to rebuild the forest. Luckily, the forest itself offers us outstanding solutions because it possesses ingenious mechanisms for rebuilding, or healing, itself.