



A large amount of logs are being transported. Some trucks drop their loads and escape into the woods to avoid getting caught.

GREEN DISAPPEARING FROM THE LAND OF TREES

Have you ever heard of Pau brasil? This tall tree, also called Brazilwood, can be over 10 meters high, with a trunk as big as one meter in diameter. Pau brasil produces red dye: Brazilin. The name comes from the Portuguese word Brasa, which means burning red, and gave the country where this tree lushly grows its name: Brazil.

Today, even this precious tree that Brazil's name comes from is registered as an endangered species due to excessive logging. Brazil has 60 percent of the Amazonian forest on earth, which is about half of the world's rainforest. Illegal logging is a critical issue for our planet and the possible impact on global warming is also a concern.

Although the government of Brazil once actively promoted deforestation for industrial development, the government has been more enthusiastic about forest preservation since the 1980s due to severe environmental damage.

Secret illegal logging is all over the vast Amazon forest. Every single instance of this logging is hard to spot and control, but Japan introduced breakthrough technology in 2009.

PROTECT THE FOREST FROM SPACE

Since the 1970s, the Brazilian government has been using satellite images to protect the Amazon forest from deforestation. The chief research scientist at the Remote Sensing Technology Center of Japan, Makoto Ono, explains: "The satellite images back then weren't that effective as they didn't show what was going on at ground level if there was cloud cover. In contrast, ALOS from Japan can capture the images of the ground regardless of clouds, so it began to be used for stricter response to illegal logging."

In Japan, ALOS is also known as Daichi. ALOS is an earth observation satellite launched by Japan Aerospace Exploration Agency (JAXA) in 2006. Ono

is an expert in remote-sensing technology which observes the earth from a distance such as from satellites; he helped provide technical support from 2009 to 2012 in Brazil for developing a monitoring system to detect illegal Amazon forest logging.

"The two project goals were to build a computer system that processes ALOS satellite images for better applications and to train the Brazilian engineers who interpret the images."

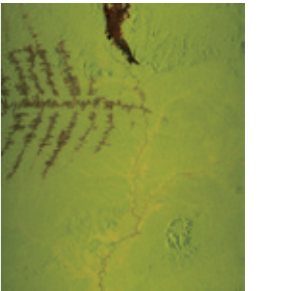
Since ALOS circles around the earth once every 46 days, changes in the forest can be spotted if the images are lined up chronologically. First, it was necessary to create a data-processing computer system to load the images from ALOS to fully use the new technology.

"It was a tough job. The factory had stopped working and we couldn't get the necessary materials. We had to wait six months," says Ono. After the trouble, the system was completed and its use produced effective results on computers. Today by minimizing the data size, even investigators walking through the Amazon can see the images on their mobile devices when they work on illegal logging detection.

Ono taught satellite image interpretation and educated 30 Brazilian technical engineers from the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA) and the federal police, which are the authorities on deforestation and illegal logging control in Amazon.

"As you can see, substantial changes in the forest are highlighted in color. That spot that looks like a fish bone is literally called a 'fishbone' and shows where the logging is happening," Ono explains. "It didn't take long for the staff trainees to understand the system because they were all IT-literate. During the three years of the project, we held training in Japan annually. We used to go skiing together on weekends in the winter. I enjoyed my time with those friendly and cheerful Brazilians," said Ono, looking back delightedly.

A 'fishbone' identified via ALOS satellite (above) and the actual logging site (below)



Preserve the Amazon Forest, a Treasure of Our Planet

Amazon is the biggest rain forest in the world extending in seven South American countries. Much work has been done so far to protect the forest that is disappearing due to development .



From a chopper, Ono checks a logging site spotted via an ALOS satellite image.



FORESTS CAN CHANGE THE WORLD: BRAZIL

The project has dramatically slowed down the pace of forest loss in Brazil in recent years. IBAMA and the federal police staffs who are now familiar with the technology are promoting remote-sensing by holding workshops around South America such as in Bolivia and other neighboring countries. Today, ALOS is no longer at work as a satellite, but the project will be carried on to Phase 2 via ALOS 2, the new satellite, waiting in outer space.

PROTECTING WILDLIVES THROUGH A NEXT GENERATION ZOO

Now, let's shift back from space and look at Manaus in the center of the Amazon. The city has a wide variety of ecosystems and wildlife, but much forest and wildlife have been lost due to rapid urban expansion.

Takehide Ikeda, a fish researcher from the Wildlife Research Center of Kyoto University says, "De-

spite being surrounded by rich nature, the people in Manaus are not very interested in local nature and animals. Most of the fish they choose to have in their homes are foreign species as well."

Kyoto University started its Field Museum project with JICA, the Japan Science and Technology Agency and a Brazilian institute in 2014 July. They are planning to create an outdoor museum within the actual natural environment, preserving wild animals there, unlike a usual zoo which keeps and exhibits animals in artificial facilities. The project is aiming for sustainable development along with ecosystem research and environmental education for the local public.

The Instituto Nacional de Pesquisas da Amazônia (INPA), which collaborates on the project, protects Amazon manatees injured by poachers. Using urban locations, INPA also advocates for animal conservation through exhibitions and educational activities for citizens.

"Under the project, a research station will be built by the riverside near Manaus. The station will be mainly for Amazon river and forest researchers, but we are also planning to utilize it for the community to understand local nature, for programs like eco-tours. Also, in an exhibition at INPA located in the city center, we will be presenting the latest research results from the Amazon," Ikeda says.

In the project, all these research stations are to be linked together to make real-time underwater sounds in the Amazon audible in the urban area. Returning Amazon manatees preserved and raised by humans in a semi-natural environment to the natural river is another example of promoting river ecology research and preservation.

Returning a rescued Amazon manatee back to the wild. On this occasion, advocacy work in the local community was done for better understanding rare animal conservation.

Image of Field Museum



Producers at Comprehensive Agricultural Cooperatives in Tomé-açu. FRUTA FRUTA contributes to sustain and expand Agroforestry through the business.

The idea of a Field Museum is for one that has space for ecological research and environmental education that will help us to progress toward a co-existence model for humans and nature.

ACAÍ BUSINESS FOR FOREST RESTORATION

Work for Amazon forest preservation can be seen in Japan too. FRUTA FRUTA Inc. is an Amazon fruit importer and food maker with a philosophy of living in harmony with nature and is known for raising açai's popularity in Japan. The company is an exclusive distributor of Comprehensive Agricultural Cooperatives in Tomé-açu in Japanese market and sells raw material fruit such as açai and acerola, produced mainly through agroforestry by Japanese-Brazilian farmers in Amazon.

Agroforestry in Tomé-açu is characterized by planting in a desolate part of the Amazon. Usually pepper plants easily get sick and die, but anticipating this loss, farmers plant fruit or tree seedlings between them. This enables harvesting a variety of crops and naturally cultivating the forest. Further, pest damage can be minimized unlike with monoculture, and it brings stabilized income for farmers.

"Agroforestry in Tomé-açu was created, learning from failures in monoculture. People had seen agroforestry as a form of sustainable agricultural management, but as environmental awareness in-

creases, the focus on forest development capacity is also growing," according to Keiko Matsuda from FRUTA FRUTA.

Tomé-açu had many poverty-related crimes before, but after the Japanese-Brazilian farmers brought agroforestry knowledge to poor local farmers, the city gradually became safer. A new form of development, in which people improve the environment while seeking better economic performance, is now becoming reality.

The farmers working hard in Tomé-açu's fields, the vast and rich natural forest, and wildlives. We should all take a moment to think about them and reflect on the gifts they give us from the faraway Amazon that we receive here.



Açai products of FRUTA FRUTA



About 20 years after planting, an agroforestry farm became mature forest.