

AMAZON ENVIRONMENT IS DAMAGED DUE TO CONTROVERSIAL CASSITERITE MINING POLICIES

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The thin argil mud runs close to the partly destroyed margins of the Jacaré River, in the northern Brazilian Amazon state of Rondônia. The Jacaré is an *igarapé* _ indigenous term for brook _ located near the town of Ariquemes, more than 3,000 kilometers from São Paulo.

Little by little, the mud is suffocating the trees on the margin of the *igarapé*, and isolating in islands the just over 3,000 inhabitants of Bom Futuro, the largest and most environmentally problematic cassiterite in Brazil.

Used in the manufacture of pewter, the mineral is extracted either by the excavators of the rich, or the pickaxes of the poor miners, known as "requeiros."

Bom Futuro is an enormous gaping hole, 30,000 degraded hectares.

There, the dense vegetation of the Amazon was thoroughly removed, the hills torn asunder in a succession of unstable and chaotic gullies, mining machines dominate the landscape, the rivers were brutally silted up; and death comes normally under the cover of landslides or fights, precarious living conditions, the worst imaginable water quality, and record numbers of malaria cases.

Below the Jacaré, the residual mud from the cassiterite washings clouds and increases the acidity content of another *igarapé*, the Santa Cruz, and the Candeias River. This affects the water supply of the riverside populations _ known as *ribeirinha* _ and of nearby villages.

The mud itself does not contain pollutants, because cassiterite mining demands only physical processes for its separation from the soil; but the pollution seriously affects the fish population of the rivers.

The alterations of the riverbeds, and the silted up Jacaré are such, that part of their waters have begun to run backwards. Rather than flowing from the head to the mine, they hit the improvised dams and return to the places of origin.

Behind this ecological disaster is a major judicial squabble. The mine is not totally illegal, since a certain amount of legal approval and the blackmarket traffic of invoices guarantees the regularized trade of the pewter.

Ebesa, the Brazilian Pewter Company, a conglomeration of the nine largest mining companies in the country — Paranapanema, Cesbra, Best, Brumadinho, Fluminense, SNA, Impar, Corumbataí, and Mequimbrás, is the only company authorized to exploit the mine.

The requeiros discovered Bom Futuro's resources, but a large company, MS Mineração, holds the patent for the cassiterite. An Ebesa firm, Paranapanema, bought MS shortly after it had acquired the rights to the Bom Futuro couch.

According to the general director of Ebesa, José Carlos Boa Nova, the permission to mine the deposit was accompanied by a preliminary environmental license, along with a proposal for the recuperation of the area environment. The cost of this project would have been undertaken by the requeiro (or garimpeiro) cooperatives, and mining companies, together.

The garimpeiro cooperatives, did not accept this investment priority, however. By means of a judicial threshold, they were temporarily allowed access to the pewter. Even when there is no official permission, and during the various interdictions by the state of Rondônia's environmental agency, the garimpeiros continue to mine.

What changes in the comings and goings of the judicial question, is the buyers. When the sale of invoices was regularized, national pewter industries bought the pewter straight from the garimpeiros, then benefitted and exported the material.

In periods of mine interdictions, or when disputes between garimpeiros and the large companies become thicker, the cassiterite goes into the hands of the Bolivian companies.

Besides the environmental degradation and the fiscal evasion, there is another disturbing factor in the exploitation of this natural bed of cassiterite: waste.

Due to poor planning and inadequate technology, the garimpeiros take only the more easily extractable ore, with the highest pewter content, but waste about 50 percent of it in the run-off," said geologist Waltair Prata Carvalho, operation manager of the Pitinga River mine.

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The president of the garimpeiro cooperative, Pedro Paulo Eleutério Lima, admitted there is waste. Although he did say that the mud will be re-mined for its mineral content, in the near future.

"The money from this, more than \$15 million dollars, will be invested in environmental clean-up," he said.

While recuperation efforts remain on paper, the mining continues to cause damage to the area, with few economic advantages for Brazil. Along with the environmental problems, basic sanitation and recurring social disorders are common in Bom Futuro.

Even in a rational organized mine such as Paranapanema's Pitinga, 250 kilometers from Manaus, the state capital of Amazonas, 3,971 kilometers from São Paulo, the mining residues are considered irrecoverable.

After passing through the dredges and excavators, immense lagoons are left in the place of the igarapés. These contain the residual argil mud. The igarapés are so extensively altered after this process, and the various layers of soil so well separated, that the mud remains suspended several years, making the natural rebuilding of the aquatic fauna impossible.

The difference is that in a so-called rational mine, the mud is contained by well-built dikes. In the garimpo, or rustic mines, the mud invades everything, even the garimpeiros' drinking water — it flows downriver and spreads degradation for many kilometers.

In Pitinga, "the water from the residual deposit lagoons stays within the physical-chemical patterns of the incoming water," said the mine's environmental manager, Aldo Antonietto Junior.

It was not always this way. Despite the dikes, there were two accidents in Paranapanema, involving the quality of water. On two separate occasions, a storm broke contention barriers, and washed residues more than 100 kilometers into the Madeira igarapé and the Waimiri Atroari indian reserve.

Because of the accident, the contention walls had to be remade, and in order to ensure the existence of the surrounding waterways, the lakes will remain long after the cassiterite couch in Pitinga runs dry.

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Pitinga was considered the biggest pewter mine in the world until Bom Futuro. Since 1983, it produced 120,000 tons of the material. Also, \$200 million dollars were invested in the mine, and a profit of \$915 million reported.

This year, after eight months in operation, and great environmental problems, the mine finally began a recuperation program - predicted to cost at least \$45 million dollars.

The state of Amazonas regional manager of the Brazilian institute for the environment and renewable natural resources (Ibama), Ben-Hur Bataglia, said that "this sets a very important precedent in the changes which must occur in the environmental culture of the state."

"Because of its strength as a company," said Bataglia, "Paranapanema should drag other industries in its wake: they are taking responsibility for an environmental debt which must, and will be paid for - through corrective investments."

The recuperation of Pitinga began in April with the reforestation of the margins of the residue lakes. Of the 1,800 degraded hectares, to be reforested in 10 years, 410 hectares were prepared. A new layer of organic material and a quantity of pioneer plants should permit the regrowth of native forest species.

The regenerated wood serves as both immediate aesthetical relief from the mine's degradation, and to effectively contain erosion, as well for the improvement of the diked-water quality. Fish cultures in the lakes are also part of the recuperation project.

Another promise is the deactivation of the four mega watt thermoelectric plant, fueled with local wood. The plant generates electricity for the mining equipment and the three villages of the mine, home to 3,000 miners and their families.

By 1992 Pitinga will use electricity produced from a new hydroelectric plant, at four times the cost.

"The environment has to be cost-effective," said the president of Paranapanema, Otávio Lacombe, adopting a discourse belonging, until recently, to sustainable development-defending environmentalists. Lacombe said that five percent of the mine's operational costs were spent on the environment this year.

"The garimpo has no planning, it does not measure infrastructure, and its acts of irresponsibility cannot be charged," he said, adding that "this generates impunity."

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The garimpeiros defend themselves by attacking the mining companies. They believe the mining companies should have been fully responsible for the environmental costs of the mine, since they held the legal rights to the couch.

"But when their pretended monopoly was deemed unconstitutional, they decided to find environmental problems," said the president of the garimpeiro cooperative (Coogari). He also said Coogari has begun to collect a \$3 million dollar fund for environmental clean-up.

Meanwhile, falling pewter prices in the world market led to a slow-down of environmental concerns.

"Bom Futuro prodeced more than the market absorption capacity," said Samuel Hanan, managing director of Paranapanema.

Hanan calculated a loss of \$46 million dollars for Brazil, based on falling international prices, more money than Paranapanema plans to spend over the next 10 years on environmental recuperation alone.

The match between information, numbers, and judicial issues still has a promising number of rounds to go. So far, it has been difficult to establish the winner, though the loser was long ago announced: the environment.