



# FROM DEFORESTATION TO URBAN POLLUTION

Forest code is expected to help Brazil reduce greenhouse gases, but the goals for 2030 are tied to industrial modernization, says report

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**G**reenhouse gas emissions from deforestation in the Amazon Region could be reduced to zero by 2030 if the new Forest Code is fully implemented. This finding is the principal conclusion of the report entitled “Land use change in Brazil: 2000-2050,” produced by researchers involved in a project known as REDD-PAC (Reducing Emissions from Deforestation and Forest Degradation – Policy Assessment Center), funded by the International the German government’s Climate Initiative and supported by FAPESP. Presented on October 7, 2015 at the Foundation’s headquarters in São Paulo, the study’s findings served as a guideline for Brazil’s proposal to reduce greenhouse gas emissions (its Intended Nationally Determined Contribution, or INDC). In September 2015, this proposal was delivered by President Dilma Rousseff to the United Nations Sustainable Development Summit, held in New York, for the adoption of the post-2015 development agenda. According to the report, on account of the gradual reduction in deforestation, more effort should be directed at curbing the pollution generated by the energy and industrial sectors.





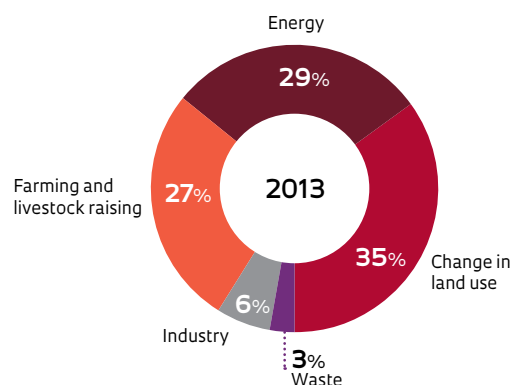
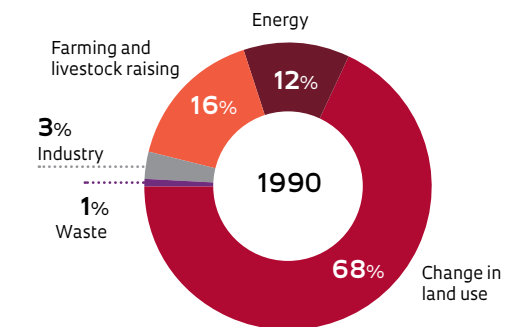
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## Brazil's emissions

Evolution of CO<sub>2</sub> emissions

Lack of investment in renewable energy and in the modernization of production lines, for example, makes it harder for Brazil to fulfill its promise of a 37% reduction in emissions by 2025 (compared to 2005) and a 43% reduction by 2030. The Brazilian government presented its goal at the 21st United Nations Conference on Climate Change (COP21), which was held from November 30 to December 11, 2015 in Paris.

One projection in the report indicates that, if the Forest Code is fully implemented, including the restoration of deforested areas along the riverbanks and in the headwaters, close to 11 million hectares of Brazilian land would be reforested by 2030. In addition, the emission of carbon dioxide (CO<sub>2</sub>) from deforestation in Brazil could be reduced by as much as 110 million metric tons by 2030. This figure would represent a 92% reduction in emissions from 2000, when close to two-thirds of the CO<sub>2</sub> released into the atmosphere by Brazil was attributed to deforestation. “This means that, for Brazil, deforestation is likely to cease being a major climate problem. The main focus at this time should be to reassess energy issues and the impact that the industry has on



SOURCE: INSTITUTE FOR ENERGY AND ENVIRONMENT (IEMA)



greenhouse gas emissions,” explained Gilberto Câmara, a researcher at the National Institute for Space Research (INPE) and Redd-PAC project coordinator. Also collaborating on the project were researchers from the Institute for Applied Economic Research (IPEA), the International Institute for Applied Systems Analysis (IIASA) in Austria, and the World Conservation Monitoring Centre of the United Nations Environment Program. “We don’t need more environmental laws to control deforestation. The issue now is to see that the Forest Code is implemented,” Câmara said.

The Forest Code, which was approved in 2012, is designed to prevent illegal deforestation. It stipulates the recovery of legal reserve areas and the Rural Environmental Registry (CAR) mandatory — an instrument created to regulate and monitor rural properties. The report estimates that, if these measures are implemented, Brazil will be able to balance its goals of agricultural production and environmental protection. Croplands are expected to increase in the next few decades from 56 million hectares in 2010 to 92 million in 2030 and could reach 114 million hectares in 2050. In the assessment by the researchers responsible for the report, the current environmental legislation allows for expanded land use for the production of food and bioenergy, without causing an increase in deforestation. They even expect a reduction in the area used for pastureland, as techniques for increasing productivity are developed.

“We project a reduction of 10 million hectares in the area used for pasture be-

## We need to reassess the energy sector and industry’s impact on emissions, says Gilberto Câmara

tween 2010 and 2030. In that year, we should have approximately 230 million head of cattle in Brazil, occupying 30% less area per head than in 2000,” Câmara noted. Currently, there are approximately 200 million head of cattle spread across roughly 200 million hectares— one head of cattle per hectare of land. This type of extensive livestock production predominates in Brazil. To meet the report’s projections, the country needs to increase its investment in alternative methods — ones that raise agricultural productivity without causing environmental damage. One such technique —

though still incipient in Brazil — is the practice of silvopasture, in which cattle are raised on wooded pastureland, within forests. With this method, farmers can raise up to five animals per hectare, producing an annual yield of 10,000 to 15,000 liters of milk per hectare, without the use of fertilizers and with hardly any need for dietary supplements (see *Pesquisa FAPESP* Issue No. 192). “Reducing deforestation involves making better use of the land. Contrary to what one might think, however, we still haven’t yet solved this problem in Brazil,” says Sergius Gandolfi, a professor at the Luiz de Queiroz College of Agriculture of the University of São Paulo (ESALQ-USP).

According to Gandolfi, who took part in the discussions leading up to the approval of the new Forest Code, one must view the law not only for how it might impact emissions but in a broader sense. He is of the opinion that a resumption of the previous Forest Code, which mandates an increase in forest recovery, is necessary and still possible. It would also enable us, Gandolfi says, to achieve a greater reduction in emissions at an earlier date and to effectively save rivers, lakes, mangroves etc. “We might be able to revive part of the previous law, because, at present, four direct actions (ADINs), which aim to declare the new Forest Code unconstitutional, are being pursued before the Brazilian Supreme Court,” he says. The Public Prosecutor’s Office is questioning the constitutionality of a number of articles within the new Code, which are related to Permanent Preservation Areas (APPs), reduction in size of legal reserves, and amnesty for those who promote environmental degradation. “So the Code, which was approved three years ago, might still be reverted, in regard to many important points,” Gandolfi explains.

According to the researcher, about 90% of the country’s rivers have a width of less than 10 meters. For these areas, the previous 1965 law called for a 30-meter riparian protection zone on both sides of the streams as, a protec-



Coal mine in China: the country has pledged to reduce emissions, but only beginning in 2030



Integrated system of agriculture, livestock raising and forests in rural São Paulo State: increased productivity and low environmental impact

tion measure. “The current code allows for reduction of the protection zone, depending on the size of the property. It could be just five meters, for example, which would be six times smaller than before,” he explains. According to Gandolfi, a five- to eight-meter forest protection zone would not be enough to retain sediments or excess fertilizer, which would consequently flow into the rivers. “This shows us how land use still remains an unstable situation in Brazil, with areas along riverbanks and in headwaters, which should be reforested to ensure water security being legally converted into production areas,” he says.

#### STRUCTURAL CHANGES

Other countries have also announced their voluntary proposals to curb greenhouse gas emissions. The United States, which is responsible for 14% of global emissions, plans on a 28% reduction by 2025 from 2005 levels. China, which is responsible for 28% of all emissions, recently reaffirmed its pledge to reach its maximum level of greenhouse gas emission by, or possibly before, 2030. According to official data, coal currently supplies 66% of China’s energy demand, whereas oil supplies 18.4% and natural gas 5.8%.

The expected emission reductions, however, would not be enough to save the planet from an increase in temperature of 2.7°C by 2050. “Based on the INDCs announced to date by several countries, global emissions could be reduced by an average of up to 40%,” according to Paulo Artaxo, a professor at the USP Physics Institute who spoke at the event held at FAPESP. “The figure could be lower,

however, because goals vary considerably from one country to another, making it hard to provide a more accurate estimate. To ensure that the average increase doesn’t exceed 2°C, we would have to cut global emissions by roughly 70%,” he said.

Gilberto Câmara steered the discussion towards a dilemma. “Do we want to go with oil, including pre-salt reserves, or with renewable fuels?” he asked. He explained that in 2035 Brazil is expected to produce approximately six million barrels of oil per day, yet the country has one of the world’s highest potentials for bioenergy production. “Whereas our fossil fuel consumption makes up about 20% of the energy matrix, oil consumption has a 50% share globally. If you now project that Brazil will become a big exporter of oil, you’re projecting a much warmer world,” he noted. Rubens Maciel Filho, a professor at the University of Campinas (Unicamp), noted that one does not simply change a country’s energy matrix overnight. “We have an interesting path to pursue with oil as we continue to reap some benefits from deep-water exploration,” he said. “We might be able to take advantage of some of our pre-salt revenue by applying it to the development of biofuels. Biomass energy, such as sugarcane, is becoming a strategic long-term focus,” Maciel emphasized.

According to physicist and FAPESP President José Goldemberg, if Brazil is to meet the commitments it presented at the Paris conference in December 2015, it will be important to invest in modernizing the country’s industrial sector, much of which is located in the state of São Paulo.

“Modernization means adopting technological innovations that not only reduce the consumption of energy and other inputs, but also raise Brazil’s industrial sector to a performance level comparable to that of the industrialized countries,” Goldemberg wrote in an October 19, 2015 article published in the newspaper *O Estado de S.Paulo*.

#### CLIMATE PROTOCOL

On October 8, 2015, the São Paulo State Secretary for the Environment and FAPESP signed a letter of intent for the implementation of the state’s Climate Protocol. Its objective is to help companies identify or develop technologies that mitigate and adapt to the impacts of climate change. Thirteen days later, at a meeting in which she presented the protocol to companies, associations and business entities who operate in the state, Secretary of the Environment Patricia Iglecias said that the partnership with FAPESP would support small and medium-sized businesses in particular, which have a harder time implementing measures to reduce emissions. “The big businesses and more highly structured sectors already have initiatives in that area,” she told *Agência FAPESP*.

Entities can accede to the protocol on the department’s website ([www.ambiente.sp.gov.br/spclima](http://www.ambiente.sp.gov.br/spclima)). Representatives of major companies such as Unilever, Grupo Votorantim and Carrefour have already signed a memorandum of understanding in reference to that document. The protocol establishes a system that awards up to nine points for information provided by businesses, such as inventory data of greenhouse gas emissions, voluntary goals and climate adaptation measures. According to Oswaldo dos Santos Lucon, one of the Secretary’s climate change advisors, industry contributes to greenhouse gas emissions in a number of ways. “From the use of fossil fuels for transportation and logistics, to the impact of end products, such as automobiles,” he said. ■