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The biome faces a variety of increasing threats

Guest Column

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The Amazonian biome faces multiple threats, ranging from deforestation to climate change. Although the forest's vastness can give a false sense of security, many of the forces leading to its destruction are expected to increase.

Deforestation in the Brazilian Amazon continues, with various forces and actors dominant in different locations. Other Amazonian countries, such as Bolivia, Peru and Ecuador, hold approximately one-third of the biome and also have advancing deforestation.

Cattle pasture is the main cause of deforestation in most of the Brazilian Amazon. But soybeans are also important along the southern edge of the forest, especially in the state of Mato Grosso. Soya is pushing cattle into the interior of the Amazon, causing "indirect" deforestation.

In addition to the visible economy, based on the sale of products such as beef and soya, there are illegal forces linked to deforestation, including illegal logging. This is as true of small (if increasingly organised) landless squatters as it is of large land grabbers, called *grileiros*, who illegally obtain claims to vast tracts of forest.

Deforestation also plays a role in land speculation and the laundering of money from drugs, corruption and tax evasion.

Deforestation in Brazil remains a serious problem despite the fall in rates between 2005 and 2010. Only part of this decrease was the result of government programmes or stricter enforcement of environmental laws.

The main reason was that the international price of beef and soya fell from 2003 to 2007, and this was followed by the global economic collapse that began in 2008.

Over that period, the Brazilian real almost doubled relative to currencies such as the US dollar. This cut the profits of

commodity exporters deeply, as all their expenses remained in reals while their revenues were in diminished foreign currencies.

Such macroeconomic "windfalls" can help contain deforestation, but they are only temporary.

Indeed, the fragility of the decline in deforestation was exposed this year, when clearing advanced, especially in Mato Grosso.

This was in anticipation of a general pardon of past environmental crimes as part of a congressional revision of Brazil's "Forest Code". The revised code, passed by the lower house in May and nearing a critical vote in the Senate, did not include forgiveness for violations committed in 2011. However, the lower-house version granted "amnesty" for violations to 2008, fuelling expectations of further amnesties.

The revised law is only part of the tremendous headway recently made in weakening environmental protections. Pending legislation tabled by the "ruralist bloc", the congressional representatives of large landholders, would strip IBAMA, the federal environmental agency, of its power to inspect farmers and fine wrongdoers. Another proposal aims to prevent the federal government from creating more protected areas and indigenous reserves unless local politicians agree, which they rarely do.

In addition, Dilma Rousseff, the president, has pushed hard to curtail the environmental licensing process for infrastructure projects.

The government has launched a programme to build dams and open highways, pipelines and electrical transmission lines into Amazonia. Such initiatives mean more, rather than less, deforestation.

The worst is the BR-319 highway that would connect

Manaus in central Amazonia with the "arc of deforestation" along the forest's southern edge.

The existing road network in northern Amazonia, plus planned additional roads, would make

approximately half of what remains of Brazil's Amazon forest accessible to migration.

In addition to outright deforestation, climate change represents another significant threat.

Much of Amazonia is expected to become hotter and drier because of global warming. The conversion of ever more forest into cattle pasture, which reduces water recycling, only adds to this process.

Amazonia is already experiencing severe droughts, and these are expected to become more severe and frequent.

Droughts are caused by two phenomena, both linked to global warming. The first is El Niño, the warming of surface water in the tropical Pacific Ocean (as happened before the forest fires of 1997-98 and 2003 in Roraima state).

The second is the Atlantic dipole, caused by a warming of surface water in the Atlantic (as happened before the fires of 2005 and 2010 in Acre state).

There is substantial uncertainty in global climate models as to the severity and timing of future Amazonian droughts. The UK Meteorological Office's Hadley Centre model has traditionally been the most catastrophic.

However, a new version tested in 2011 showed much less forest die-off than its predecessor. Most other models also show Amazonia becoming drier and hotter. These include the NCAR model from the US, and models from Germany, Japan and Canada.

The GFDL model from the US projected more rain in Amazonia at the time of the last report from the Intergovernmental Model on Climate Change. But it has since had an error corrected and no longer shows this encouraging result.

Be that as it may, substantial areas of forest are near their limits for tolerating greater heat and drought, especially in eastern and southern Amazonia.

Forest fires, which are not included in current climate models, increase the risk. Forest death would be followed by transformation either to savannah or low-biomass woody vegetation.

International agreement to control global warming is therefore an urgent priority.

Otherwise, forest die-off implies significant carbon emissions, making climate change even more difficult to control at a global scale.



The creation of pasture for cattle is one of the main causes of deforestation

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