Undermining of institutions and lack of local policies hinder fire management in Amazonia

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A lack of community involvement impairs fire control programs in the region known as MAP, between Madre de Dios (Peru), Acre (Brazil) and Pando (Bolivia). Credit: Gleiciane Pismel

An article published in the *International Journal of Disaster Risk Reduction* discusses Amazon Rainforest wildfire governance with local community participation in the so-called tri-national border region between Madre de Dios in Peru, Acre state in North Brazil, and Pando,

one of Bolivia's nine departments (subnational administrative divisions). The region is sometimes referred to as MAP.

"Living in Acre, we have little or no influence on environmental management policy. We see scientists from other regions or other countries talk about the Amazon and highlight the importance of policy issues, but we who live here are left out of this governance. The fact that our study presents a local perspective on the region's vulnerabilities and capabilities is highly positive," said sociologist Gleiciane Pismel, first author of the article and a researcher at Brazil's National Disaster Surveillance and Early Warning Center (CEMADEN).

To garner the perceptions of local and regional stakeholders, the researchers conducted an [online survey](#) during the COVID-19 pandemic (in 2020-21) involving 111 practitioners, policymakers, representatives of NGOs and scientists. Some 60% of the participants considered deforestation the main factor contributing to wildfires in the Amazon, followed by the use of burning in agricultural management (58%), and drought (39%).

These are accurate perceptions in light of other recent studies showing an increase in forest fires associated with the advance of deforestation that endangers conservation of the Amazon Rainforest and its socio-biodiversity.

For the respondents to the online survey, the main vulnerabilities in governance to contain fires and their impact on the region are deficiencies in institutions and control bodies associated with staff cuts and underinvestment.

Besides weakening of institutions, instability in national and local public policies figured prominently among perceived governance failures. To a large extent, the policies and measures implemented reflected national

actions that did not take local peculiarities into account. Other issues included lack of participation by local communities and socio-cultural aspects of the use of fire, especially in areas of pasture and cropland in the vicinity of environmental protection areas.

"The significant risks to ecosystem services, apart from deforestation, include degradation by fire, clearcutting and fire edge effects, as we showed in our article in *Science*. On the other hand, few studies have analyzed governance issues relating to fire and burning. These are urgent emerging issues for the Amazon region. We assembled a multidisciplinary team of researchers in all three countries to analyze them," Liana Anderson, last author of the article and a researcher at CEMADEN, told us.

The article to which Anderson referred is "[The drivers and impacts of Amazon forest degradation](link)", a cover feature of the January 2023 issue of *Science* showing that about 38% of the Amazon Rainforest is currently degraded owing to fire, illegal logging, edge effects, and increasingly frequent extreme drought due to climate change.

MAP-FIRE Project

The current study is part of the Multi-Actor Adaptation Plan to cope with Forests under Increasing Risk of Extensive fires (MAP-FIRE), launched in March 2019 to focus on fire governance in the MAP region as a project of the Tropical Ecosystems and Environmental Science Lab (TREES) at the National Space Research Institute (INPE).

The MAP-FIRE project team is developing an [online monitoring and management platform](link) for [disaster risk reduction](link) and impact quantification associated with wildfires in the region.

"The project engages with actors in the frontier territory, such as NGOs,

public administrators, and interdisciplinary and transdisciplinary scientists in Brazil, Peru and Bolivia, to conduct discussions of risk management. Disasters in the region don't respect political or administrative boundaries so that interdisciplinary and transdisciplinary methods are needed to create and strengthen risk mitigation actions," said Marchezini.

In the study, the group analyzed perceptions of wildfire governance vulnerabilities and capabilities in the MAP region in terms of knowledge of the risks, monitoring, education and communication, and disaster prevention and responses. Vulnerabilities and capabilities were classified as economic, educational, environmental, organizational, political, legal, socio-cultural and technological.

The project design was based on workshop discussions held during the pandemic with 668 participants from the three countries involved. "Three different perspectives are needed to analyze the socio-environmental issues. These are provided by the MAP-FIRE project and the article. The team is multidisciplinary, and we have researchers from all three countries, including Galia Selaya from Bolivia and Eddy Mendoza from Peru," Pismel said.

Wildfires in the Amazon are a growing threat to forest [ecosystem services](link) and biodiversity. They can also become cross-border disasters, owing mainly to the adverse effects of smoke on human health, transportation and the regional economy.

Soot microparticles, which are easily inhaled, contributed to a rise in hospital admissions due to [respiratory problems](link) in five states in the Brazilian Amazon between 2010 and 2020, for example. According to a [March 2021 press release](link) issued by Oswaldo Cruz Foundation (FIOCRUZ), an arm of Brazil's Health Ministry, 174 people were admitted to hospital per day for treatment of respiratory difficulties in

Pará state and 57 per day in Mato Grosso state in the period.

Wildfires and burnings in the Amazon are costly to the SUS (Sistema Único de Saúde, Brazil's national health service). Public hospitals and clinics in the region spent BRL 1 billion on the treatment of patients with respiratory disorders due to exposure to smoke from [forest fires](link) in the ten-year period.

Alternatives

According to the authors, the respondents to the survey supported measures to improve wildfire governance such as organizational capacity building, community involvement, investment in socio-environmental management as permitted by the prevailing conditions in each country and the MAP region, and better staffing of organizations in both quantitative and qualitative terms.

Municipal civil defense units in Brazil are staffed by one or two people, mostly as political appointments and without professional valorization. Funding for disaster prevention and risk management [does not feature in the budgets](link) of most municipalities.

The authors also stress the importance of drafting public policies and laws that take local conditions into account and distributing responsibilities and resources at the national, regional, and municipal levels.

"Inhabitants of the region who are exposed to fire, or use it, aren't involved in any governance systems that can help them make decisions or become more well-informed. It's important to improve integration between institutions, as well as communication between and inside them. Environmental education is necessary, as is inclusion of topics relating to fire in school syllabuses, connecting very clearly with the reality of the

people who live there," Anderson said.

To fill the gap in educational material, the researchers have produced a teacher training textbook, which is [available online](#).

"Producing this educational material was the means to introduce the topic into the classroom, especially given the ongoing superabundance of fake news. In Brazil, we've witnessed losses of infrastructure and institutional capacity, alongside the undermining of knowledge by disinformation. When disinformation becomes widespread in a society, it's very hard not only to recoup trust and confidence in the institutions that produce knowledge and science but also to combat the false information so as to make room for the facts. Disinformation usually travels faster than the truth," Anderson said.