Global Biodiversity Threatened by Science Budget Cuts in Brazil

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Brazilian biodiversity is under threat by legislation pushed for by Brazilian agribusiness that softens environmental licensing and reduces the protection of Atlantic and Amazon forest and indigenous lands (Crouzeilles et al. 2017). These developments add to an already problematic situation: Deforestation in the Amazon has once again reached high rates in 2017, after a reduction in the years before, and other Brazilian biomes likewise currently see alarming rates of the conversion of natural vegetation to other land uses (Overbeck et al. 2015, Crouzeilles et al. 2017). The Cerrado, a biodiversity hotspot just like the Atlantic forest, for instance, is losing one percent of its natural vegetation per year—that is, land-use change is occurring at an even faster rate than in the Amazon region (Fernandes et al. 2016). In consequence, large parts of Brazil, including parts of the Atlantic Forest, Cerrado, Caatinga (semiarid woodland), and Campos Sulinos (South Brazilian grasslands), are crisis ecoregions or at high risk (Watson et al. 2016).

Although this is bad news for biodiversity, the situation becomes even worse when considering the Brazilian government's attempts to solve the country's severe fiscal crises: The field of science and technology has recently suffered severe budget cuts (Angelo 2016, Escobar 2016), even though this is a critical field for the future development of any country. Current estimates are that federal funding for research in 2017 will be two-thirds below the values of 2004 (Fernandes et al. 2017). This had also caused concern in early August of 2017 that Brazil's National Council of Scientific and Technological Development (CNPq) may not have sufficient resources to pay 100,000 research scholarships in the near future (*http://cnpq.br/web/guest/noticiasviews/-/journal_content/56_INSTANCE_a6MO/10157/5796658*). These recent developments severely affect research on biodiversity that is a crucial basis of public policies for nature conservation and sustainable development, including the Research Program on Biodiversity (PPBio) of Brazil's Ministry of Science, Technology, Innovation, and Communications, with impacts on human well-being in Brazil and beyond.

PPBio was established to address the issues raised by the Convention on Biological Diversity. The program, with more than 600 researchers working at over 90 institutions throughout the country, is the largest biodiversity research network in the country (Fernandes et al. 2017), and it has mobilized a huge effort that has improved biodiversity research infrastructure, including new graduate programs, the support of scientific collections and ecological research, and capacity building in remote areas of the country. The importance of the program can be illustrated by the large number of plant descriptions in the semiarid Caatinga biome (more than 250 species in the past 10 years), where biodiversity had been underestimated before (Fernandes et al. 2017).

Brazil holds a considerable portion of the world's biodiversity. Its forest and nonforest ecosystems play a significant role in regional and global climate stability and provide other ecosystem services essential for human well-being. Sufficiently equipped and staffed research institutions are not only necessary to map and understand Brazil's biodiversity but also to find solutions to the country's severe and increasing environmental problems, such as deforestation and land-use change that negatively affect food, water, and energy security both in forest and nonforest biomes. The latter have been especially neglected in terms of biodiversity research and conservation (Overbeck et al. 2015), and programs like PPBio are important for bringing public attention to all types of ecosystems, their biodiversity, and ecosystem services. A recent analysis gives clear indication of substantial gaps in biodiversity knowledge in Brazil: More than 70 percent of Brazil's protected areas have less than 0.01 species records per square kilometer (Oliveira et al. 2017). Furthermore, the current network of protected areas is unsuitable to protect the larger part of Brazil's endemic species (Oliveira et al. 2017). This is but one example of the importance of countrywide efforts to know and understand Brazil's biodiversity. Maintaining underfunding of programs for biodiversity research and conservation, such as PPBio, will have long-term consequences on biodiversity that aggravate the effects of other setbacks for the environment and for sustainable development. It also means that Brazil will likely fail to reach the Aichi Targets for Biodiversity and the national restoration targets made in the context of the United Nations Framework Convention on Climate Change.

Brazil is not alone regarding the recent lack of consideration, by part of

its federal government, of the importance of science in general and of biodiversity or climate-related research in particular—as is evidenced, for instance, by the current situation in the United States (Gropp 2017). Although the importance of science to reach global biodiversity and climate-change targets has repeatedly been pointed out, national governments ignore this or, even worse, ignore the commitments they have made to conserve biodiversity and to mitigate global change. Brazil's current policy of reducing research funding will have critical consequences for global biodiversity and the ecosystem services related to it. This is bad news for the world. Nonetheless, the scientific community across the Americas and beyond must strengthen its efforts to provide data critical for policymakers and to critically comment on the actions taken by their governments.

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