

# Research Funding Crisis Deeply Affects Brazilian Scientists

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Science, and the scientists that do the research, need funding. This money may come from public and private sources, but research that is basic/fundamental and not immediately applicable will often depend largely on funding from government sources. This is the predominant model for research funding since the late 19<sup>th</sup> century. Unless you are independently wealthy, you will need a stable and adequate funding to run your lab and research program. This is especially true in less-developed countries.

## Big Cut to Research Funding in Brazil

Brazil is a land rich in natural resources and is a member of the BRICS which includes other countries like Russia, India, China and South Africa. One would think that the federal funding for science in this country, as a wise investment in knowledge and training to secure its prosperity, is stable and adequate, right? However, that is not the case.

Just a week ago, Brazil's new president, Michel Temer, announced that the federal science budget will be gutted by a whopping 44%. This paints a dire scenario for science and scientists alike in Brazil. Going down to 2.8 billion reais, or 898 million USD, in less than a year is especially severe. Other federal departments also got lower cuts, of 28%, to their budgets by way of comparison. Making matters worse, scientists and research institutions cannot turn to state governments for help, since many are going

broke (e.g., Rio de Janeiro's funding agency). This last cut follows a 25% cut to science funding in the 2015 federal budget.

Adding insult to injury, there is no longer a stand-alone ministry of science in Brazil. Soon after its former president, Dilma Rouseff, was impeached, her replacement (Temer) merged the science ministry with that of telecommunications. This new entity, the Ministry of Science, Technology, Innovations, and Communications (MCTIC) replaced the near 30-yr-old science ministry (MCTI). This spiteful government action prompted mass protests last June by scientists outside and online (e.g. #VoltaMCTIC).

Back then, in June 2016, there was still hope that the new minister of the MCTIC "super-ministry" would leverage its size and power to mitigate cuts to scientific funding. This hope has now received a fatal blow by the 2017 budget cut. In order to get a proper sense of how badly science and scientists are struggling, bear in mind that in just a 3-yr-period Brazil has seen its science budget slashed by 40% (from 7.9 billion reais in 2013 to 4.6 billion reais in 2016) before even considering the latest cuts! To put this into perspective, previously, science funding was at a 7-yr low, however, now it is at a 12-yr low. Also, there is no guarantee that the current research funding scenario won't worsen as Brazil's 2-yr economic slump worsens.

## Impact on Researchers

These draconian cuts to the federal science budget affect Brazilian researchers in several ways. First, they are very angry and despondent and without enough funds for lab/field infrastructure and student scholarships, there is less opportunity to do good research and fewer people to do it. Scientists will likely see delayed salaries or perhaps job cuts, too, and this will add to the air of despair and fuel the declining morale in the universities across Brazil, where some now struggle to pay even basic utility bills.

Second, is the real risk of a brain drain of Brazil's best and brightest scientists to greener pastures. For example, resignations of professors have begun at one of Rio's state universities, and a continued cloud of uncertainty about science funding has many considering jumping ship. While some researchers might go elsewhere in Brazil, many will likely go abroad, to countries like Canada and USA, where funding is secure and their research more valued.

Finally, many Brazilian research programs will not survive, collaborations will be crippled or disappear altogether in the next decade. At present, publications are on the wane and unless the funding climate dramatically improves, the next generation of scientists will suffer the consequences. For example, no longer can Brazilian students benefit from a once-prized foreign exchange program.

## Blaming the Economic Slump

The reason behind these cuts to science funding is to reign in Brazil's ballooning fiscal deficit. Since 2012, Brazil's economy was one of the fastest-growing in the world, like other BRICS nations. The economy was flush with money, especially royalties from

offshore oil fields once earmarked for science funding. Since 2013, Brazil has been mired in a 2-yr economic slump, and any oil revenue must compete with health care and education expenditures. This is the worst recession ever in Brazil, and GDP is going down drastically.

This economic slump has paralyzed and poisoned the Brazilian scientific community and its long-term future. With aim of reigning in public spending, federal budgets have continuously been shrunk since 2013, with shortfalls in spent science funding every year. In short, the economic slump has led to shrinking revenues at the federal and state levels, made worse by a poor exchange rate. The cure espoused by the government for this economic slump: austerity. Whether this works remains to be seen.

## Ripples of Brazil's Woe

Brazilian politicians should find new revenues as the ripple effects of this funding crisis will be felt by the global scientific research community. International collaborations, and trust, will suffer; hosting visiting researchers in Brazil will become a luxury; as is partaking in conferences abroad; contributing to big global projects, like Amazon rainforest monitoring and dynamics, may no longer be a given. However, the exodus of Brazilian talent might directly benefit other countries hungry for PhD students, post-docs, professors, and scientists in general.

How will the tragedy unfold in Brazil? It is too early to tell, but clearly, the signs do not bode well. Understandably, the MCTIC must try to mitigate these accumulated cuts to science funding. Perhaps this attack on science will wake up and anger more researchers and other people, too and they will get out and march on the 22 April to make their voices heard as there is still time to save Brazilian science.

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