

Why invest in research, science, technology and innovation (S&T) in Brazil?

Por que investir em pesquisa, ciência, tecnologia e inovação (C&T) no Brasil?

Ana Lúcia Barbosa Góes 

Escola Bahiana de Medicina e Saúde Pública, Universidade Federal da Bahia (Salvador), Bahia, Brazil. albgoes@bahiana.edu.br

Since 2015, we have seen successive budget cuts for the development of science, technology, and innovation in Brazil. This text proposes to analyze the role of the main research promotion agencies (CAPES and CNPq) and the consequences of the current federal government policy, from the blackout in CNPq to the brain drain in the present (and future) moment of Brazilian science and society.

KEYWORDS: Budgets; National Scientific and Technological Production; Science

Hello, you, reader, who took a few minutes of your time to read this reflection.

We live in a time of polarities and intolerance to other people's opinions. Mainly when it comes to politics. However, as much as we don't like to discuss and debate, politics defines the course of society. If we don't get involved in political issues, we let other people decide our lives for us.

You may be asking yourself: what is she trying to achieve? I will explain.

Since 2016 and more evident after the 2018 elections, the attempt to transform the state into a minimal state, removing labor rights, public services, and privatizing institutions, is becoming increasingly clear. At this point, it is difficult to observe what has been happening in the ministries and not to draw an analogy with research.

We watched a minister who, it is suspected, favored illegal deforestation, land grabbing, and the loss of lands by native people¹ take over the Ministry of Environment. We saw the Ministry of Education being taken over by a sequence of ministers who promoted successive cuts in the education budget²⁻⁷, acting directly on the funds for research, from Zika-virus to cancer. This situation worsens if we consider the ongoing Covid-19 pandemic, when we need public research institutions and universities to produce vaccines, diagnostic tests, and possible treatments.^{6,7}

What about the large institutions that promote, foster, and disseminate research, science, technology, and innovation? What happened to their management? What we saw recently was, on the one hand, a person without expression and technical capacity assuming an important

space in CAPES^{8,9} and, on the other hand, a 10-day blackout in the CNPq platforms that generated harmful repercussions for the researchers and the entire apparatus of promotion through research scholarships.^{10,11}

CAPES, the Coordination for the Improvement of Higher Education Personnel, is an agency linked to the Ministry of Education (MEC). It has several programs to encourage scientific research in various areas, such as programs for access and dissemination of scientific production, investments in the training of master and doctoral researchers, scientific cooperation programs, among others. The major purpose of CAPES is to develop people's scientific knowledge, training people in research.

CAPES is also responsible for evaluating the more than 4,000 master's and doctoral programs every four years (quadrennial assessment), conferring on their qualifications in producing scientific knowledge and training of researchers through these programs. The parameters for the quadrennial evaluation (Qualis Periodicals) have been elaborated by members of the Scientific-Technical Council for Higher Education (CTC-ES), and it was expected that, in 2021, the quadrennial evaluation for 2017-2020 would be published.

On September 10th, 2021, CAPES published Ordinance No. 145, defining new parameters for Qualis Periodicals. In an open letter, four days after the publication of the ordinance, the CAPES Area Coordinators, who are full members of the CTC-ES, publicly express their concern with the conduct of the quadrennial evaluation. According to them, it undoes all the work done over four years, together with the Follow-up Commission of the National Postgraduation Plan and the evaluation goes back to using obsolete instruments applied in the past quadrennial evaluation, with no progress.

At the same time, we see an internal political action (and crisis) in CAPES, the publication of this ordinance led the Public Ministry of Rio de Janeiro (PM-RJ) to judicialize the four-year evaluation process of CAPES, determining its suspension. According to Cale, the National Association of Postgraduates (ANPG) president, this suspension has immeasurable negative consequences, ranging from the loss of improvement of the assessment process and possible

blackout of data on scientific production in Brazil to the loss of credibility and reputation of the National Postgraduation System, generating deregulation of higher education and research.¹²

Speaking of the blackout, let us return to CNPq. The National Research Council (CNPq), now called the National Council for Scientific and Technological Development, was created in 1951 to foster the development of science in the country and is linked to the Ministry of Science, Technology, Innovations, and Communications (MCTIC). Everything, or almost everything, related to research in the country goes through CNPq. It hosts platforms such as Lattes Curriculum, which concentrates information of the researcher's curriculum; Carlos Chagas platform, which concentrates information about the various types of scholarships for research promotion and the Brazilian Institute of Information, Science, and Technology (IBICT), whose function is to promote the popularization of scientific and technological information and that today is the only institution in Brazil for assigning the ISSN code to scientific journals.¹³

CNPq is responsible for offering scholarships for scientific initiation, scholarships for masters, doctoral, post-doctoral, visiting researcher, senior internship, and scholarships in academic competitions such as mathematics Olympics for elementary and high school students. CNPq's main focus is to foster research and provide adequate financial conditions for researchers to develop their research.

In the face of the analogies typified at the beginning of this text, the Ministry of Science, Technology, Innovations, and Communications seems to have been handed over to someone who does not have much interest in defending it and caring for the scientific and technological development in Brazil. In the last 20 years, Brazilian science has become a reference in Latin America.¹⁴ According to a study by the Centre for Science and Technology of Leiden University (Netherlands), Brazil has 23 scientific research centers and 31 universities among the main ones in the world, counted in the period between 2016-2019.¹⁵

However, from 2015 to this moment, successive cuts in the budget of the MCTIC and consequently of CNPq have happened, to the point that, in 2019, the Brazilian science, technology, and innovation and its

researchers found themselves without resources to continue their research because the MCTIC had no way to pay the research scholarships, compromising the research of 83,000 scholars throughout the country.¹⁶ Furthermore, in 2020, both CAPES and CNPq needed parliamentary amendments due to the cut suffered by 40% in CAPES and about 87% for infrastructure investments, equipment purchase, and research funding for CNPq.¹⁷

In 2021, history repeats itself, and the budget allocated to research, which was already small, decreased even more. There was a cut in the budget proposal of 34%, and part of the amount allocated still depends on approval by the national congress to be released, called supplementary credit.¹⁸ As a result, researchers speak of paralysis of science in Brazil and vegetative state.¹⁸ In a new blow to research in Brazil, through the SEI Official Letter nº438/2021/ME, the Ministry of Economics decided to cut the supplementary credit of R\$ 690 million - approximately 90% of the resources for science, technology, and innovation¹⁹, which means to stifle the Brazilian scientific production deliberately.

Two direct consequences can be identified due to the actions described above, according to the UNESCO report on sciences²⁰: brain drain, which has been a reality for developing countries, such as Brazil, and loss of positions in the rank of powers for the development of sciences. As stated in the report, countries that invest less than 1% of their GDP in research perpetuate their dependence on foreign technologies. One can also comment on a third consequence: the loss of capacity to produce and publish science, technology, and innovation.

I would like now to lead you into thinking about the importance of research for society. Why do we do so much research?

Over the years, we have seen how research can be transformative when inserted into the social context. It was through research that antibiotics were discovered, and this discovery revolutionized society. Through the hands of researchers, HIV-AIDS, which killed thousands of people in the 80s and 90s, was identified. And there are many, many examples showing how the research results in the most diverse areas can improve several aspects of living and life in society.

And how not to talk about the coronavirus pandemic that we are (still!) living? In the most crucial moment, when science, both global and Brazilian, needed the support to face the Covid-19, the government, through the Ministry of Economy, cut the arms and legs of CNPq, which had already been agonizing after successive cuts of funds. Countries that had adopted the minimum state in their administrations turned back in the pandemic period and invested in science, health, strengthening of social protection networks, and the creation of emergency fiscal packages to face the Covid19, even if they have exceeded the ceiling of spending budget planning.²¹

And Brazil, against the world, as seems to be the specialty of the federal government, insists on maintaining the ceiling of spending, at the expense of more than 600,000 deaths by Covid-19, 13 million unemployed, a minimum portion receiving an average aid of R\$150.00, which does not buy, today, nor a gas cylinder, in most states. We have counted more than 19 million people living in food insecurity due to the pandemic.

If the fundamental purpose of research is to transform the living conditions of a society, why should the government invest in research when this same government shows us every day that we are experiencing a decimation process of the Brazilian population?

Nevertheless, we warn whomever it may concern, as long as curious people are willing to live in a better world, researchers will be trained, and researches will be published. And each new study will be an act of resistance. This government will pass. And we will be here to rebuild this country.

Conflicts of interest

No financial, legal, or political conflicts involving third parties (government, private companies, and foundations, etc.) have been declared for any aspect of the submitted work (including but not limited to grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

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