

**Brazil: Science, Technology and Innovation Policies – The Way Ahead**  
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Our planet is undergoing rapid and dramatic changes in recent years. The classic division of nations, as from North or South, developed or under-developed, economically stable or financially unpredictable, rich or poor, leaders or followers, these are all visions that have been shuffled and undisputedly changed in the past 20 years, since the world last met here in Rio. And yet, the global challenges continue to be as critical as they already were in 1992.

Much has changed for better, as the growing social inclusion in many countries - Brazil is an example in this respect -, the access to information and knowledge provided by the internet, the available resources for improvement of human health and treatments of diseases, and last but not least the consistently growing consciousness and concerns about environmental questions and sustainability as global challenges.

But in the other hand, the dimensions of problems ahead are huge. Just to name a few of them:

1. The growth of the global population with two opposite vectors: in one direction, the increasing extreme poverty usually coupled with environmental degradation, widening the gap separating the very poor from the minimal levels of a decent human life; and in another direction an increasing number of people being inserted in middle class levels, which is important of course, but with aspirations of consumption patterns equivalent to the ones that are standard in the so called developed nations, but that are clearly incompatible with a finite planet and as healthy economy;
2. The increasing global usage of fossil fuels, with the consequent growing emission of green-house effect gases, with impact in climate changes and all subsequent effects in agriculture, health, forests, oceans and biodiversity in general.
3. The rapidly growing demand for food and energy that clearly cannot be sustained with the current practices and available technology.
4. The increasing pressures on our finite planet, provoking climate change, resource depletion, environmental degradation, loss of biodiversity and water stress, amongst other pressures.

Therefore, from the perspective of an emerging economy, as Brazil is, the challenge of sustainable development is to achieve continuing prosperity with social inclusion, but without the undesired consequences for the environment. Indeed, we have a unique opportunity, provided by science and technology, to aim paving a development pathway that does not necessarily repeat the destructive practices to the environment that the developed countries followed in the 20<sup>th</sup> century. Yes, we can aim economic growth compatible with reduction of poverty and environmental protection, in a sustainable mode of operation. We have a very good basis for that purpose, for example considering our energy matrix, which already is composed of around 50% renewable sources.

This new set of compatible economic, social and environmental processes is far from evident, and can only be achieved through an intense, focused and multidisciplinary research program, at the interface of natural, social and technological areas of knowledge, simultaneously aiming at human well being and the health of the planet from local to global scales.

Solving problems in sustainable development will require great advances in fundamental understanding of social and natural systems and the connections among these systems into technological solutions, as well as cultural changes, that can be rapidly brought to society.

For that purpose, the Brazilian National Council for Scientific and Technological Development – CNPq, the leading research funding agency of the Ministry of Science, Technology and Innovation, has established, in resonance with the National Strategy for Science, Technology and Innovation, a research agenda materialized in a set of Programs, Call for Proposals and Research Networks focused on the various aspects of sustainable development.

In the broad areas of biodiversity mapping, ecosystems, biotechnological potential evaluation, Amazon, Ocean and Antarctic sciences, the main actions involved the investment of R\$ 220 million in the past 4 years, supporting 320 projects selected in 12 programs. In the various aspects of sustainable agriculture we additionally invested R\$ 100 million supporting around 200 projects selected in 4 programs. We are also promoting research in the field of Renewable Energy Sources, Biomass, Biofuels, Photovoltaic, wind power generation, hydroelectricity and climate changes, involving resources of R\$ 65 million in the past 4 years.

An important initiative of CNPq is The National Institutes of Science and Technology Program (INCT), launched in July 2008, established as a powerful tool for promoting Science, Technology and Innovation in the country. It involves an initial investment of more than R\$650 million, with 126 approved projects in different research areas. The Program aims to mobilize and aggregate as networks, the best research groups in Brazil, working in the frontiers of science and in strategic areas for the sustainable development of the country. Of those, 26 are specifically focused in the various aspects of environment, sustainability, water resources, ocean sciences, biodiversity, renewable energies and urban studies, involving an investment of around R\$ 100 million.

The planned future funding of strategic and cross-cutting interdisciplinary Sustainable Development research involves water management, environment and health, society and environment, urban environment, energy, biofuels, green economy and green chemistry, biodiversity, climate change, sustainability (agriculture/land use/water), food production, waste management, food security, amongst others.

More recently, the Brazilian government, through CNPq and CAPES, has established The Program Science without Borders, a large scale nationwide scholarship program aiming to strengthen and expand the initiatives of science, technology and innovation through the expansion of the international mobility of undergraduate and graduate students, as well as post-docs and researchers. The primary goal is to offer 100 thousand fellowships for Brazilian students and researchers to go to top universities or research centers worldwide until 2014. The broad areas of interest include sustainable development, biodiversity, green economy, water resources, ocean sciences and renewable energies. The program also provides grants for young talented scientists and highly qualified researchers from abroad to work in Brazil in these areas, in joint projects with local research groups, thus contributing to the promotion of a global vision of sustainable development.

This brings me to my final comments, which refer to the urgent need of a much more intense international cooperation in research related to global challenges. The importance of the future for us all requires that we work together. This is why we named this fellowships program as Science without Borders. That is why CNPq is challenging our fellow funding agencies from all countries, to promote similar programs for their own students and researchers. We have to foster an international community of scientists that understand each other, that can work together and collaborate, rather than just compete, in joint research projects related to sustainable development. An example of such joint initiatives will be launched in the Rio+20 conference, consisting of a joint trilateral call of CNPq/Brazil, the Institut de recherche pour le développement (IRD)/France and the Pan-african Agency of the Great Green Wall, to support projects focused on the combat of the desertification in Africa and the sustainable agricultural usage of dry lands.

About a month ago, a group of Heads of National Research Councils from 47 research intensive countries met in Washington and decided to create the Global Research Council, a forum that aims:

- To improve communication and cooperation between funding agencies;
- To promote the sharing of data and best practices for high-quality research cooperation;
- To provide a forum for regular meetings of the Heads of Research Councils;
- To respond to opportunities and to address issues of common concern in the support of research and education;
- To be a resource for those institutions wishing to build a world-class research landscape; and
- To explore mechanisms that support the global science enterprise and the worldwide research

This is one step forward. The creation of the Future Earth initiative by ICSU, launched here yesterday, is another one. Together with the proposal of the creation of an international fund to support the promotion of sustainable development worldwide, this makes us imagine that this dream is possible, for that purpose mobilizing thousands of scientists while strengthening partnerships with policy-makers and other stakeholders to provide sustainability options and solutions in the wake of Rio+20.

Let us work together for a better planet.  
Thank you!