

THIS WEEK



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A nation with ambition

India is making great strides in improving its science, but it needs to look carefully at its approach and work with the rest of the world if it is to realize its full potential.

The website of the Indian Department of Science and Technology proudly states that “India is one of the top-ranking countries in the field of basic research”.

It is true that India has made considerable progress in areas such as biotechnology, renewable energy and aerospace. But it is also mired in deep problems that impede innovation and are hampering the country’s progress. India has a puny scientific workforce, relatively few high-quality universities, an anaemic manufacturing sector and an epidemic of red tape. The result is that many Indian scientists head to other countries for training and jobs.

It would be easy to argue that a lack of funding is holding India back and stopping it from becoming a science superpower. The country devotes less than 1% of its gross domestic product to research and development, which puts it far behind emerging nations such as China and Brazil, as well as the established economies of the United States and Europe. But more money will not cure India’s multiple science ills, as *Nature* documents this week in a special issue on the state of research in the country (see page 141).

One of India’s biggest challenges is to boost its science to help drive national development. As a start, it must expand its research workforce. But that will require more high-quality universities and appropriate jobs for their graduates. The government is taking steps in the right direction. It has established tax incentives for research and development that are among the best in the world. These have helped to boost research investments by a few industries, but have yet to drive widespread innovation.

In tandem, India must tackle the bureaucratic morass that is impeding research and innovation. Scientists complain that funds for grants routinely arrive months late and that it can take years to fill positions. As a measure of the problem, one-third of the national laboratories, which are overseen by the prestigious Council of Scientific and Industrial Research (CSIR), lack permanent leaders (see page 144). Even the CSIR is run by a temporary director-general, Madhukar Garg, who told *Nature* that if the organization continues along these lines, “it will affect the national innovation system as a whole”.

Prime Minister Narendra Modi, like his predecessors, has denounced the bureaucratic brakes holding back science, but there has been little progress here. A key to solving the issue is to elevate talented scientists who have administration experience into positions of responsibility. One example is Krishnaswamy VijayRaghavan, who is profiled on page 148. He is a gifted geneticist who in 2013 took over as head of the Department of Biotechnology, the leading funder of bioscience research grants. Among other changes, he is attempting to streamline the notoriously cumbersome grant-application process.

India could use some help. Compared with some other developing nations, it has a relatively low level of international collaboration, even with the United Kingdom, with which it shares a unique history. It bodes well that the new UK minister of universities and science, Jo Johnson, has a strong interest in India. In fact, he co-edited

a book entitled *Reconnecting Britain and India: Ideas for an Enhanced Partnership* (Academic Foundation, 2012).

India does, however, need to look closely at the changes it is making, because not all are positive. As part of its effort to encourage development, the Modi administration has tried to silence some critics of policies on energy, climate and human rights. In April, the Indian government revoked the registrations of thousands of non-governmental organizations (NGOs) that receive foreign funds, and it has frozen the assets of Greenpeace over claims that it had violated reporting rules about foreign contributions. On 6 May, the US ambassador to India, Richard Verma, warned about “the potentially chilling effects of these regulatory steps focused on NGOs”.

Some scientists might be tempted to applaud India’s clampdown on environmental groups, which have stymied certain research initiatives. In March, environmentalists held up construction of a major neutrino observatory with debatable claims that the facility would harm an aquifer. And *Nature* reports this week that the Modi government has quietly moved forward with trials of genetically modified crops, which have long been desired by biotech researchers but have been impeded by environmental groups (see page 138).

But scientists in India should not cheer the government’s attempts to suppress dissent, even if it helps them to achieve their research goals. It would be wrong to blame environmental advocates for India’s lengthy and fault-ridden procedures for weighing up the impact of projects. The solution is not to silence discussion or to shrink environmental oversight. Rather, India should make strategic improvements to the environmental evaluation process that balance progress with protection. ■

“The solution is not to silence discussion or to shrink environmental oversight.”

Challenging times

A European initiative to ban animal research has galvanized resistance.

The Stop Vivisection initiative has been panicking European researchers since it was first proposed in 2012, but its long-trailed public hearing this week at the European Parliament in Brussels turned out to be a pretty grey affair.

The duo who presented the initiative — which calls for the replacement of the 2010 European Union (EU) directive on the use of animals in scientific research with legislation banning all animal research — spoke calmly but unconvincingly. Their extremist claims, that animal models have no predictive value for human disease, drew thin and only