

The way forward

Scientific capacity for development

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In the 1970s and early 1980s, many developing countries invested substantial amounts in education and research. Some academic centres reached promising levels of scientific excellence. The University of Khartoum in Sudan, for example, was one of the best universities in the developing world.

Unfortunately, those investments were not maintained long enough to allow these countries to develop and sustain a culture of excellence in scientific research and education linked to the needs of society.

Today, it is recognised that harnessing scientific knowledge, especially in frontier areas of technology and innovation, and applying that knowledge to address critical problems, are perhaps the most important challenges facing all nations, and developing nations in particular.

This 'renewed' way of thinking, however, leaves one question unanswered. If governments across the developing world are again to embrace scientific capacity as a key aspect of their strategy for economic growth, how should they go about melding home-grown science to development? The surprising answer is that there are many ways to do so, and some developing nations are already taking the lead.

Science-based development

China's successful strategy for science-based development, for example, has focused on the role of the government in Chinese society. A set of government-led plans for investment in science has helped fuel an average annual GDP growth rate of nearly 10% over the past decade. India has also relied on broad government policies and programmes but, at the same time, has tapped into its English-speaking university-educated population to gain prominence in the IT sector. South Africa has taken advantage of the infrastructure left behind after the welcome demise of apartheid to build the strongest economy and scientific enterprise in Africa. Brazil, meanwhile, faced with a weak higher education system, decided to invest in individual scientists and research groups. In the process, Brazil has strengthened its scientific institutions, which are now poised to work for the economy.

There are many ways in which developing nations can build and then use their scientific capacity to fuel economic growth. Those nations that have pursued the most successful science-based development strategies have gauged their capabilities, and then devised long-term plans to enhance their strengths and overcome their weaknesses.

We may not have adequate educational institutions at home, officials in China said, but we can send our students abroad and then entice them back with good working conditions and attractive pay. Our scientific infrastructure may leave much to be desired, Indian officials observed, but we have an educated, English-speaking workforce. We don't have strong universities, officials in Brazil reasoned, but we can devise a reward-based system for capacity building focusing on individuals. We have been victimised by apartheid's oppression and violence, South African officials noted, but that should not prevent us utilising the facilities left behind to help create a more prosperous society for all our citizens.

Government commitment

So what does this say about scientific capacity and economic development? First, the marriage between the two has never been stronger. A growing number of developing countries are now proving that investment in science pays, not just for science, but also for society. Second, these efforts can take place in a broad range of political settings. The keys to success are long-term government commitment and a willingness to give people the freedom to introduce effective policies and programmes. While China's political system may be very different from those in Japan or the United States, the internal management of its scientific enterprise, with its emphasis on competition and reward for results, is not.

Finally, developing nations can compete in the knowledge-based global marketplace, but only if they invest in education and training, and provide career opportunities for their most productive citizens.

Given current trends, science-based sustainable development is not just a strategy worth considering, it's the only one worth following.