Cultivating and Harvesting Innovation: The Role of the Millennium Science Initiative

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Lessons Learned in Latin America about Matching Grants as an Incentive for Technological Innovation
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Innovation is an essential component of every country's economy. Today, I will explore with you how one cultivates and harvests innovation. Many mechanisms exist, but my focus will be on the Millennium Science Initiative. The MSI already exists in Chile, Mexico and Brazil. It was founded in the belief that world-class science can, under the appropriate conditions, be practiced anywhere in the world. And it was founded on the premise that science pays.

Of course science pays in the knowledge it spreads. It leads to a more productive work force. Ideally, science also will lead to innovation that will have significant payoff for the public. At its most successful, an MSI will comprise part of a system that encourages the transformation of academic science to innovation for the national, regional and global good.

Effective science is an integral part of a sophisticated system. Advanced nations have the capacity to create, organize, transform, transmit and use scientific and technological knowledge. They also can adapt knowledge created elsewhere. There are communication and collaboration among scientists, engineers, entrepreneurs, manufacturers and users.

In an ideal system, there is 'pull' from the business sector, which actively supports research and development. There is 'push' from the scientists who recognize the potential real-world applications of their research. There is a spectrum of trained personnel to handle every link in the chain from research to development to manufacturing to distribution and use. And there are opportunities for feedback, adaptation and further development at each stage. These disparate actors operate on a solid and transparent legal and commercial foundation.

In nearly all countries, the system has gaps. But that doesn't mean innovation can't happen. What are the real challenges? The first is understanding the innovation process: identifying a need and harnessing local talent and resources to create a solution. Next is transforming the new concept into a reality.

Innovation doesn't happen only in wealthy countries. One thinks of new crop varieties – wheat in Mexico, rice in the Philippines. These resulted from world-class science and led

to increased productivity, increased income, and vastly decreased famine in most of the world. The birth control pill was developed in Mexico from natural products, leading to enormous profits for its US inventor and the pharmaceutical companies that invested in it. It also helped to stem worldwide population growth.

How can Central America foster innovation?

Beginning with the MSI would be one option. A typical MSI consists of one or more Centers of Excellence, or "MSI Institutes." They are selected competitively through international peer review. A critical mass of MSI-caliber scientists, committed to pursuing frontier science, is a prerequisite for an MSI. In the case of Central America, the MSI could be done by individual country or regionally.

If there is interest in exploring the MSI as a tool for innovation, the Science Initiative Group could help catalyze the process. I would like to emphasize that the MSI belongs to the host countries themselves. They determine their own priorities and mechanisms, with SIG serving as advisor and facilitator.

Our role would be to bring together groups of scientists to help assess areas of scientific strength, relevance, and greatest potential for innovation. We also would hold discussions with ministries of finance and science and technology, and other ministries as appropriate, such as commerce and trade and higher education. We also would coordinate discussions with the IDB and/or other financing agencies. Government commitment and viable financing strategies are essential for creating an MSI.

A Central American MSI could incorporate specific strategies for taking science to the marketplace. This could be the starting point for developing broader national (or regional) innovation strategies, to begin to fill the gaps in the system.

Innovation mechanisms in the MSI context could take advantage of the globalization of science. That is, scientists could engage in joint ventures with counterparts from the United States or Canada. The MSIs could focus on areas where Central America has an advantage in terms of natural resources, for example cotton in Nicaragua. Costa Rica created a thriving business from ecotourism, and Costa Rica's ingenuity shows how wide a spectrum innovation actually covers.

You should also be aware of the Global Science Corps, an integral part of the MSI. The GSC sends scientists from advanced countries to work alongside their counterparts in MSI Institutes and other top-quality centers or laboratories in developing countries. They stay for periods of one to two years. The GSC fellows provide training in the most sophisticated techniques, while taking advantage of the unique resources of the host countries to strengthen their own research. The GSC is expected to generate long-term collaborations that will last well beyond the placement period.

The MSI represents an important first step in creating a real culture and infrastructure for innovation.

In the United States, the integration of research and innovation has occurred only since World War II, when several models emerged for bringing science and technology to the marketplace. Academics, particularly engineers, started coming out of the universities to start new companies. Research incubators were funded by the private sector.

The relationship between industry and government changed in the US with the Bayh-Dole Act of 1980. This law allowed federally-funded research to be commercialized, based on the premise that it is good investment because otherwise the research would not be exploited. The payback to the public comes from tax dollars and economic growth.

Any innovation strategy would need to consider the relationship among academia, industry and government. It also would have to address the significant issues of academic freedom and intellectual property.

The notion of matching grants to promote technological innovation seems to be an excellent one. But money alone is not enough. When we started the MSI, we researched the factors leading to the success or failure of other capacity-building initiatives. The initiatives that have had the greatest impact are the ones that enjoy the active engagement and support of whole a range of actors. The MSI is successful because it involves not only scientists, but also policy makers, educators, government officials, financing entities, aid agencies, and increasingly the business sector as well.

The Science Initiative Group is committed to the development of world-class, productive science wherever scientists, policy makers, government ministries and funding agencies are willing to come together to make it happen. We stand ready to help in any way we can. We are ready to help now.

Thank you very much.