

Innovation Policy for the Developing World

Success stories and promising approaches

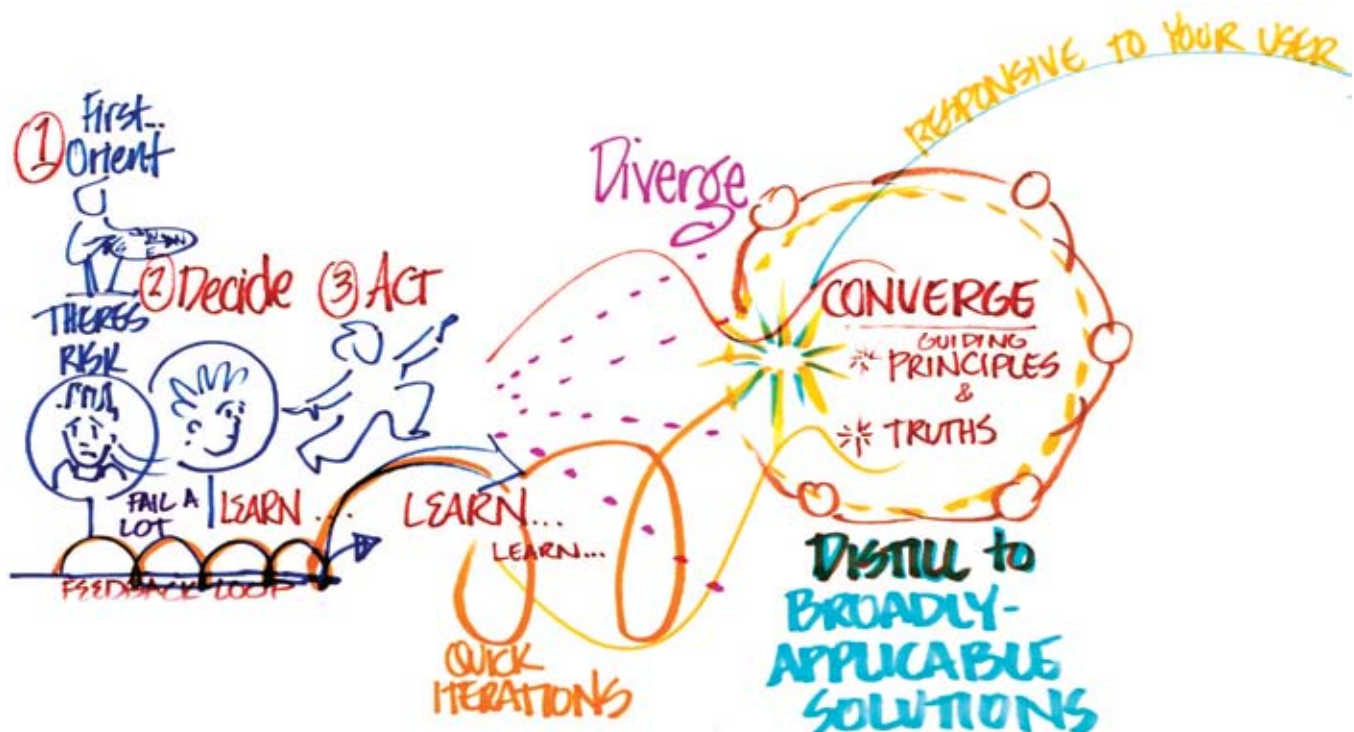
BY JEAN-ERIC AUBERT

INNOVATION, particularly technological innovation, is widely touted as a panacea for development. As more and more countries begin to formulate policies that support innovation, they expect to find a magic bullet in the experiences of the advanced and some of the more dynamic less developed economies. But emulating foreign success stories and models is not so easy. Moreover, the developing world is extremely diverse, ranging from giant powerhouse economies to poor fragile states. I will nevertheless present here some useful principles and illustrations that can help inform effective approaches to innovation in the difficult institutional and business climates of low- and medium-income countries.¹

Understanding innovation

IT IS IMPORTANT TO UNDERSTAND what constitutes innovation in the developing world. Generally it does not mean something "new" in absolute terms, but something new for the society in question. An innovation may be well known in one place, but virtually unknown in another for lack of dissemination. Even modestly innovative ideas can make an enormous difference: for example the use of mosquito nets to fight malaria or inventive uses of information technologies, including mobile phones for trade services, health care, and business management. These have had a tremendous impact in poor countries.

Innovation may also mean the development of productive sectors that may be new to a particular economy, but can



enable them to compete successfully in the world or regional markets. Numerous examples from recent decades can be cited: textiles in Tunisia, the auto industry in Romania, cut flowers in Kenya, computer components in Vietnam, and eco-tourism in Costa Rica. All these activities were highly innovative in the respective countries, and have since generated significant job growth and wealth.

So what lessons can governments learn from these success stories?

Acting as a gardener

INNOVATION IS NORMALLY INSTIGATED by a key actor: the entrepreneur who brings the project to fruition in designing the new product or process, looking for finance, and exploring markets. He or she interacts with different organizations within the so called innovation system, such as universities, public laboratories, banks, customer associations, other enterprises. In addition, the environment in which innovation takes place is strongly influenced by broader factors such as the macroeconomic situation, the level of infrastructure development, and the quality of governance.

Innovation policy is, therefore, fundamentally different from simply promoting ideas and projects from research to market, or—the reverse—identifying needs and calling upon research or the science base to satisfy them. This linear and mechanistic view of the innovation process is misguided; a holistic and biological approach is more appropriate. Governments should see their role as creating a favorable climate in which innovative projects can flourish.

Governments have basically three functions: providing incentives and facilities to elicit or support innovative projects; removing bureaucratic, regulatory, competitive and other obstacles to innovation; and improving the knowledge base and its use in developing technical education and R&D

structures. The government should thus act as a gardener tending to a plant (see Figure 1): he waters it, removes weeds and pests, and applies fertilizers.

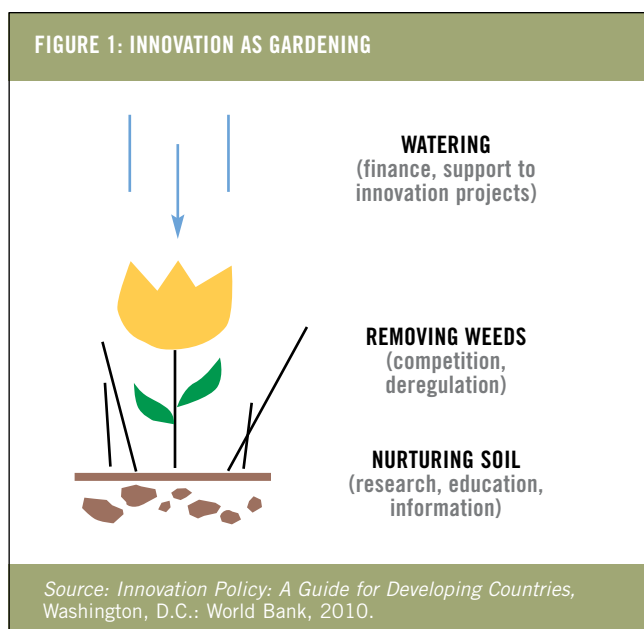
With efficient instruments

THE MOST IMPORTANT TOOL for supporting innovators is a flexible and agile agency able to serve their technical, financial, commercial, and other needs. All OECD countries have such bodies, providing incentives for the key actors, for example: matching funds to induce universities and industry to take part in joint projects. Some developing countries have also been able to set up efficient agencies, such as Chile's Foundation Chile which, by carrying out the functions mentioned, was instrumental in setting up the salmon and wine industries. Low- and medium-income countries generally do not see the need for an agency entirely devoted to innovation promotion, since they already have to deal with the bureaucratic hurdles presented by a number of other bodies dealing with related policy matters such as industry, trade, or foreign direct investment (FDI). Nevertheless, the creation of an agile, innovation-focused agency (or a program when a new institution with vested interests is not advisable) is essential.

Another important element of a system that supports innovation policies is a solid network of decentralized technical "sounding boards" that are accessible to entrepreneurs and potential innovators. A good example is the Japanese network of prefectural laboratories, established in the early 20th century, funded by the central government and the local authorities, which played a decisive role in the rise of Japanese industry, in particular small businesses. Such a technology infrastructure is key. In developing countries, attention is rightly paid to central Metrology, Standards, and Quality Control bodies, but local "antennas" providing at least minimal technical support and connections to sources of expertise are often neglected, or they are stymied by the profit-making rules that are imposed on them.

Well-designed, large-scale technology programs, developed through public procurement, have had a considerable impact on innovation development. For example, breakthrough technologies have resulted from the US defense and space programs. And some emerging countries have demonstrated their ability to mount large-scale technology programs, such as Brazil's aviation and agriculture industries. Low-income countries also need to take some form of large-scale approach, but adapted to their needs and resources, such as pro-poor technology programs. A recent World Bank project in Rwanda is an example of good design. The project provides a package of interventions, including financial support to communities, technical assistance and training, and improved infrastructure (energy sources and telecoms).

Innovators need to be insulated against bureaucratic regulations, monopolistic predators, and corporatist behaviors. Innovation policy requires a strong legal framework, and constant vigilance in removing, reshaping, or fine-tuning the diverse regulations that may prevent innovative initiatives, such as tariffs schedules, standards, intellectual property rights



(IPR), customs procedures, and so on. Although this issue is generally well understood in the developing world, countries lack the requisite judicial and enforcement mechanisms. Some countries have partly overcome these problems by creating special economic zones, techno cities and the like, that are relatively free from bureaucracy and friendly to entrepreneurs.

It is clear that developing countries, lacking the resources and a conducive institutional and business environment, should be particularly pragmatic in their innovation policy.

Being pragmatic

ALL SUCCESS STORIES have drawn heavily on comparative advantage. These advantages may result from natural endowments (a wine-friendly climate in Chile), human resources (a cheap, educated labor force in Vietnam), or market positioning (Romania's proximity to East European markets). Successful countries have cleverly exploited these advantages. Initially, they did not set the bar too high, nor did they neglect the technologies needed to move them up in the value chain.

These countries systematically scout around the world for new knowledge (e.g. new technology and new management methods) while gradually building up their own local capabilities. Korea is a good example. It began to develop its industrial base (shipbuilding and electronics) by buying technologies abroad and investing massively in technical and vocational education, before investing in higher education and research and becoming a global innovator. The lack of adequate policies for upgrading their knowledge base explains why a number of developing countries that have been successful in the cheap labor sectors (textiles, cut flowers, and others) have had trouble expanding into new growth areas.

Another key lesson is that countrywide change rarely happens quickly. Movement is normally gradual, starting with localized success stories in specific industries or geographic areas. Even in innovation-supportive climates, policy makers in charge of promoting innovation have had to demonstrate institutional creativity to advance their cause. After a few illustrative cases, they built up a critical mass of initiatives using both top-down and bottom-up approaches, conducive to broader reforms (see Figure 2). China is a prime example. It started with reforms in a few coastal areas to test what works, before extending them to other parts of the country, thereby rising up in the value chain and in technological sophistication.

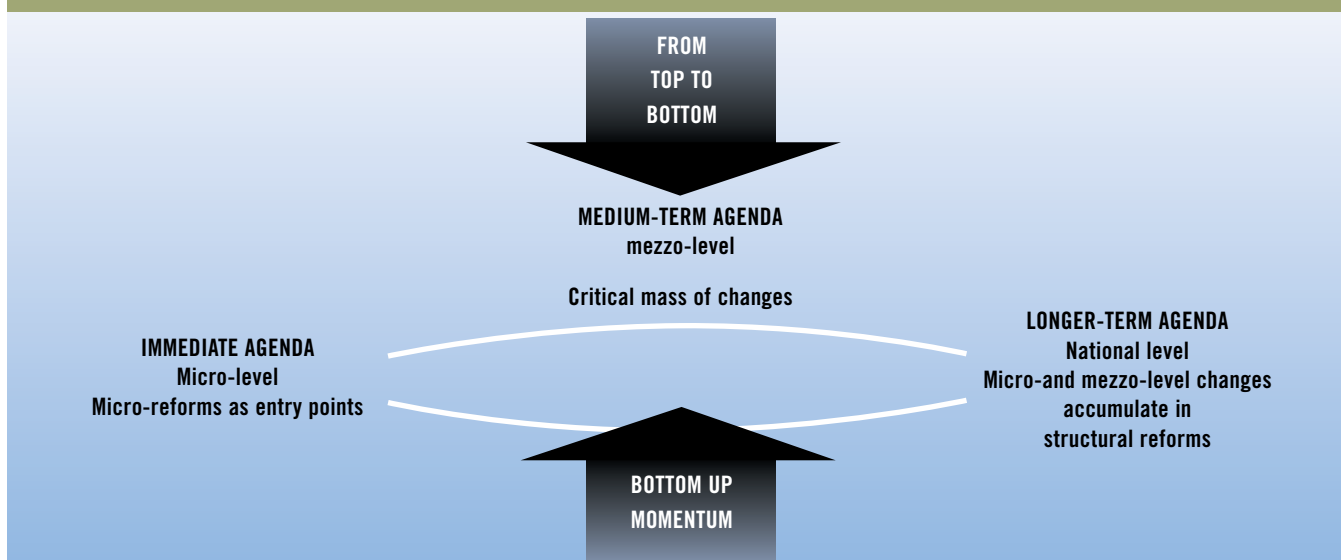
Regional initiatives, sometimes spontaneous and not stimulated by the central government, play a critical role in the change process. An example is the information and communication technologies (ICT) and software industry in Bangalore, India. The rapid spread of the "innovation buzz" to the rest of the economy, helped create a general climate of trust for reforms and investment in other sectors.

Building dynamic innovation climates takes time—at least a decade. It takes three to five years for innovation projects to bear fruit; and seven to ten years before a specific industry or site can show significant job creation or income generation. At the same time it is important to seek support from recognized outsiders (for example, through international policy reviews) in order to strengthen the credibility of policy initiatives.

INNOVATION POLICY

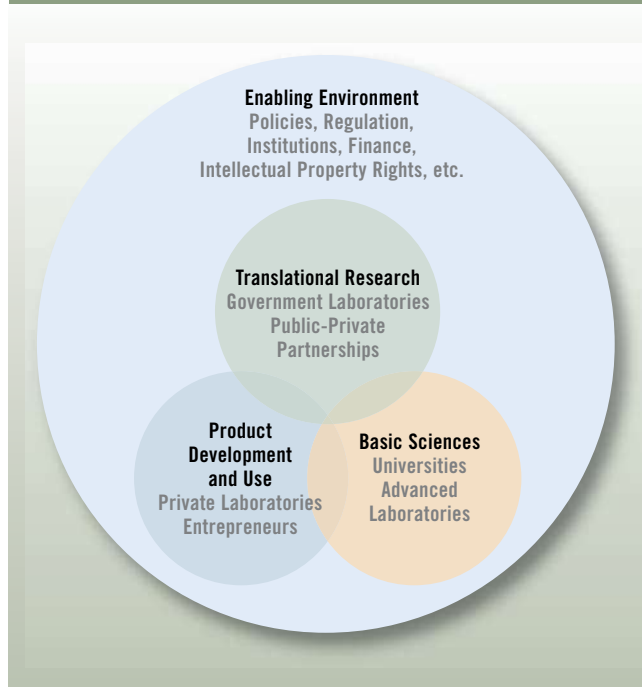
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FIGURE 2: SCALING UP INSTITUTIONAL CHANGE: FROM MICRO-REFORMS TO NATIONAL REFORM



Source: *Innovation Policy: A Guide for Developing Countries*, Washington, D.C.: World Bank, 2010.

FIGURE 2: A SCIENCE INNOVATION SYSTEM



ensuring national security and productivity. Scientists from around the world now collaborate with each other for a variety of reasons, but particularly to access the best expertise, resources and partnerships, and funding and institutions have adapted accordingly.³ Importantly, certain scientists, institutes and countries participate much more actively in the system than others, thus influencing the direction and benefits of research and outputs. 

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This is an excerpt from the new book, *Science and Innovation for Development*, by Gordon Conway and Jeff Waage. UK Collaborative on Development Sciences (UKCDS), London, 2010.

Notes

¹ Vermeulen, S. & Bass, S., (2005) *Science and Development*. [Internal Scoping Paper]. IIED, London.

² Office of Health Economics. (2007) *Life Expectancy in England and Wales*. Available at: www.ohe.org/page/knowledge/schools/appendix/life_expectancy.cfm [Accessed 08 Oct 2009].

³ Wagner, C., (2008) *The New Invisible College*, Science for Development. Brookings Institution Press, Washington DC.

INNOVATION POLICY


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Within broader development strategies

A KEY SUCCESS FACTOR is to integrate a vision for innovation in long-term development strategies. For example China decided to become “the world’s factory.” Malaysia aimed at becoming an “information society world leader.” This vision allows a country to define priorities and implement them across ministries and throughout its territory with properly aligned policies and investments.

This requires an explicit “government-wide approach.” Malaysia has such a mechanism for its ICT policy with a powerful monitoring body attached to the Prime Minister. Tunisia is another role model in the Arab World, using a wide consultation process to develop its Five-Year plan in which becoming an innovation and knowledge society is a major goal. In the developed world, Finland was a model pioneer, with its very influential Science & Technology Policy Council, chaired by the prime minister, and involving all the key ministers, including finance, as well as representatives from the business and labor communities.

Although a number of developing (and developed) countries have tried these kinds of coordinating bodies, in most cases they failed because they did not have sufficient authority. So they became, at best, a locus for reaching soft consensus and for information sharing. Making such bodies work takes strong political leadership, collective will, and clear commitments.

In sum, innovation policy can be a key component of 21st century development strategies, even in poor countries with constraining economic environments. But to succeed, innovators must be supported by high-level central and local government policy makers who have the vision, pragmatism, and the ability to work creatively in institutional contexts. 

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Note

¹ These lessons are based on *Innovation Policy: A Guide for Developing Countries*, Washington, D.C.: World Bank, 2010.