



Introduction to Innovation Policy for Developing countries

Module 01

Basic Concepts of Innovation and Innovation Policy



Introduction and Objectives

In this presentation, we will learn

1. What is Innovation?
2. Why is innovation important for developing countries?
3. What is inclusive innovation and why is it relevant for developing countries?
4. What is innovation policy?
5. What are the roles that the government should play in fostering effective innovation policies?

What is Innovation - The Basics

Lets start with a question, which one of the following is an innovation? The IBM lab inventing the Watson? An Indian Information Technology company purchasing Oracle's technology and using it in India?



Answer: Both, but why is the second point innovation as well?

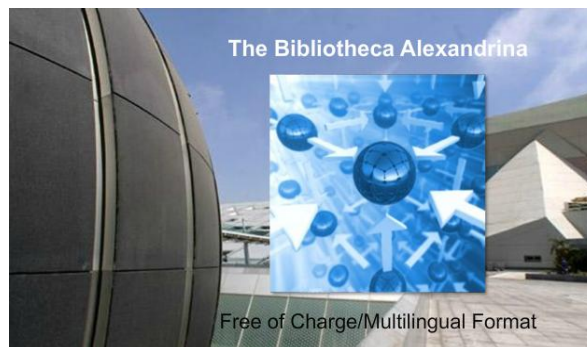
Its because innovation isn't what people commonly assume to be something absolutely new. Instead, innovation is about finding new solutions to existing problems, as well as offering opportunities to new activities. Innovation , in essence, should be understood as the dissemination of something new in a given context, not as something new in absolute terms.

Still sounds abstract? Lets look at some examples



Innovations at Work - Egypt

The Bibliotheca Alexandrina, in Alexandria, Arab Republic of Egypt, is starting a world digital library initiative in partnership with many other libraries around the world. This initiative, which includes digitizing its expertise, will make significant primary materials from cultures around the globe available on the Internet to people everywhere. These materials are to be accessible free of charge and in multilingual format.



This case exemplifies product innovation in that the digital library will make knowledge exchange much easier across countries by reducing language barriers and improving access to knowledge among the poor who otherwise would not be able to afford such access.

In addition, by improving access to global knowledge, the digital library will allow individuals from all over the world to receive the relevant technologies needed to improve welfare in their own country.

Innovations at Work - Mali

The Malaria Research and Training Center in Bamako, Mali, is a case of technology innovation. The center is able to adapt existing international knowledge on malaria treatment to the Malian context by allowing its researchers to participate in both international and local Malaria treatment networks.

- Mali's Malaria Research and Training Center in Bamako
- Adapt and absorb international knowledge through researchers participate in both local and international networks
- Outreach extension through working with traditional doctors to create immediate care





In addition, the training center also brings traditional and modern medicine together to meet the needs of the people through partnering with traditional doctors. In essence, since many of people in need of treatment are often not believers in modern medicine, the research center sought indirect methods to reach them through collaborating with local traditional doctors.

With these, the Malaria center was able to significantly reduce the mortality rates of people, in particular young children, from Malaria.

Why is Innovation Important - Theory and the Knowledge Factor

We have seen from the above examples of how innovation comes in many forms and can improve human welfare. However, why, then should policy makers care about how innovation is growing in their country?



In economic theory, well disseminated technological innovations will boost labor productivity and economic activities in a country, and will eventually lead to higher wages and better welfare for the country's citizens. The effects of education, sound regulatory policies, and Research and Development spending have been rigorously studied over the past decade, and this research indicates that the economic return from effectively applying policies to encourage various components of the innovation system is extremely high across countries regardless of income level

Why is Innovation Important - History

From a historical perspective, innovation has been a key component in increasing welfare throughout world history. Starting with the agricultural revolution, humanity has continued to invent, adapt, and foster the application of technological innovations to promoting economic development and social welfare. The invention of writing and metallurgy during the pre Christ era and more recent advances in modern medicine, transportation and communication technologies have all



contributed greatly to the advancement of socio-economic welfare of the world's population.

As seen by graph, human innovation speed advanced rapidly in the period following the first industrial revolution and this corresponds directly with a rise in the average life expectancy and increase in per capita income

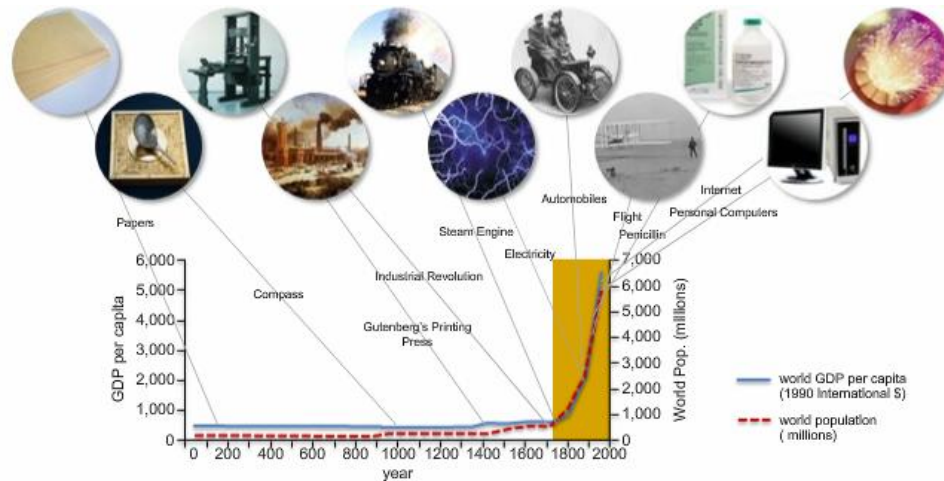


Figure 1.3 Growth in Population and GDP per Capita in the Past 2,000 Years world GDP per capita (1990 International \$) world population (millions) Source: Maddison 2006

Why is Innovation Important - Rise of the United States

One cannot speak of innovation without mentioning the rise of the United States during the 19th and 20th century. Many scholars attribute the success of the United States to its ability to innovate over the past century. The U.S boasts not only its high number of innovative entrepreneurs that founded transformative companies in all sectors of the modern society, but also education and research institutions that are world renowned for their ingenuity and effectiveness. Its industrial research laboratories are the best in the world and have contributed to many great inventions that propelled the U.S to a global economic superpower



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However, the Education and Research and Development mechanisms are not the only contributing factors to U.S's success. The market driven economy, and supportive governance environment that promotes fair competition and risk taking by entrepreneurs are also crucial components to the U.S's rapid ascendancy.

Why is Innovation Important - Developing Country's Success

While the United States is far from a developing country, it is wrong to assume that innovation can only be carried out by advance, capital rich economies in the West. In contrast, developing nations have demonstrated that innovation remains integral to the economic success and prosperity of a rising nation regardless of where you are starting.



In examining the developing countries, of those that have sustained economic growth rates and has since emerged from absolute poverty, such as Korea, China and Singapore, researchers have found that these countries were all well integrated into the global economy and had established strong innovation systems to tap global knowledge. In essence, these developing countries were able to innovate by absorbing knowledge that is present. These developing nations adopted policies that promote the dissemination of knowledge and had in place regulatory and education policies that promoted business innovation. As a result, labor productivity rose rapidly and socio-economic welfare of the citizens improved as well.



Innovation for All - Inclusive Innovation

Innovation in developing countries is often difficult as a result of various obstacles ranging from capital shortages to unfavorable investment climate. However, citizens of these countries are often the ones who need innovations the most.

- Innovation in developing countries is often difficult to scale up and diffuse



Innovation, as demonstrated by previous examples, does not necessarily mean new knowledge, and hence, can also be accomplished with little capital investments. In addition, in taking existing knowledge to resolve current problems, innovation can benefit a lot of people with relatively little cost.

Hence, is the concept of “inclusive innovation”. In essence, inclusive innovation is cost-effective innovation that brings vast amount of benefits to a large number of people for very little cost, or “more for less for more innovation”, and is of particular relevance to developing countries facing various obstacles.

Still sounds abstract? Lets look at India’s case for inclusive innovation

Inclusive Innovation in India - The Background

India is a developing nation with the world’s second largest population and a large portion of the world’s poor. With financial and regulatory institutions still under development, capital and resources are largely off limits to India’s entrepreneurs, and a population that has but recently experienced a gradual increase in education attainment, India’s attempt at innovation for the poor seems an elusive idea.

However, rather than innovating at the frontier with heavy capital investments, India’s innovation paradigm focuses on inclusive innovation for/of & by the people. In particular, India’s innovation is one of ‘frugal innovation’ that produces products and services that are affordable by more people at low levels of income, without compromising quality



India's challenges:

- Huge population
- Lack of capital and resources
- Low levels of education attainment and ability to access knowledge



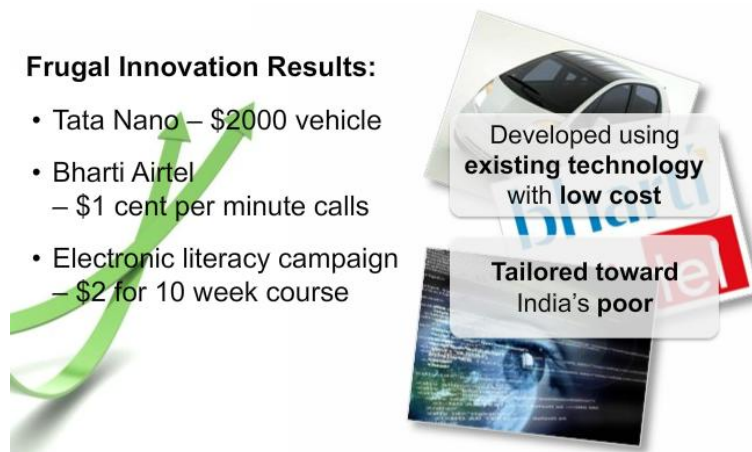
In essence, the Indians opted for innovation processes that are 'frugal' in terms of the resources required and have a 'frugal' impact on the earth's resources.

Inclusive Innovation in India - The Results

India's frugal innovation has produced stunning results in improving lives of citizens. India's inclusive innovation has led to the Tata Nano, the cheapest car to date from Tata motors, 1 cent per minute calls from Bharti Airtel's tower sharing plans, and Electronic literacy campaign that cost only \$2 every 10 weeks.

Frugal Innovation Results:

- Tata Nano – \$2000 vehicle
- Bharti Airtel – \$1 cent per minute calls
- Electronic literacy campaign – \$2 for 10 week course



These innovations all bore important characteristics of inclusive innovation in that they were developed using existing technology with low cost. At the same time, these products were all tailored toward India's poor by solving India's existing problems, illiteracy, weak infrastructure, and transportation bottlenecks, with products that cost as little as possible and reach to as many people as possible.



What's remarkable about these innovations is that they reflect the ability for entrepreneurs, even in a challenging environment like that in India, to innovate for local needs. In essence, they all share the common characteristic of a relentless focus on getting high performance, affordable products to the wider population.

What is Innovation Policy

Which of the following are considered part of the reforms aimed at improving innovation in a country?

Is it

1. Education Reform?
2. Boosting Spending on Public Research and Development ?
3. Building Research and Development Laboratories
4. Improving business and investment environment through more effective regulations
5. Or is it Investing in physical infrastructures such as roads and telecommunication lines

What is Innovation Policy - The Basics

Is it Education Policies? Research and Development Policies? Infrastructure Investments in High Tech products? Well innovation policy involves a lot of everything stated above and more.

Which of the following are considered innovation policies?

1. Education Reform
2. Boosting spending on Public Research and Development
3. Building Research and Development Laboratories
4. Improving business and investment environment through more effective regulations
5. Investing in physical infrastructures such as roads and telecommunication lines





In essence, innovation policy is not just a mechanical derivation of knowledge through research, rather, innovation policy addresses the overall innovation climate, which goes far beyond traditional science and technology policy, and involves many government departments. In a broad perspective, innovation policy goes beyond the core of science and technology policy, and seeks to construct a knowledge based economy, which involves many different components of economy and requires the government to utilize many policies at its disposal.



To put this in plainer terms, fundamentally, innovations are carried out by entrepreneurs who seize on opportunities and the source of their ideas are largely driven by all market force components. In order to entrepreneurs to invent and innovate, a lot of things are needed-the human skills, the government support, the financing, etc, so innovation policy must be designed to address all aspects affecting how innovation is carried out.

What is Innovation Policy - The Gardener

While entrepreneurs and businesses ultimately drive innovation, government play a key role in developing the climate needed for their success. Hence, the process of innovation largely germinates within “innovation systems” composed of private and public organizations and actors that connect in various ways and bring together technical, commercial and financial competencies and inputs required for innovation.



We can think of innovation as a fruit garden, and the government as the gardener. In order for plants and fruits to grow, the gardener will need to attend to all the details of the plants-watering, weeding and removing pests, fertilizing and preparing the ground work.

What, then does each part of the innovation system entail?

What is Innovation Policy - Watering the Crops

Watering the crops, or providing resources for innovators, is a key component of fostering innovation in a country. Often, innovators find that while good innovative ideas are abundant, financial support for these ideas are not nearly so. In addition, financial uncertainty often make innovators unwilling to take risks that are crucial to innovation. With private financing often coming at a steep cost due to inefficient or underdeveloped financial systems in most developing countries, governments must intervene to reduce the financial stress of innovators.

As a result, in order to build an efficient innovation system, building the appropriate resource support system will be essential to success. The general structure of government support should be centered on providing finance, service provisions, and knowledge access to innovators. Module 4 will go into detail as to the mechanisms behind constructing effective support structures for innovators.





What is Innovation Policy - Removing Weeds and Pests

Removing weeds and pests, or removing obstacles to innovative initiatives, is another key component of reform. This component is often the most difficult part of innovation policy and is often the one most governments try to avoid. This difficulty largely stems from the bureaucracy, vested interest, and the general lack of acceptance towards innovative ideas in most developing, and even in some developed nations. In addition, reform in the public space often involves a myriad of actors ranging from large national agencies to individual companies, making coordination and reform exceedingly difficult.

At the same time, overcoming the difficulties associated with regulatory and investment reform, as demonstrated by the success of fast growing developing economies, will bring a big boost to innovation and a country's capacity to develop. In essence, these policies seek to target regulatory frameworks that include, but not limited to trade, governance, investment, law and other institutional changes.

Regulatory and Investment Reform

- Will bring a big boost to innovation and a country's capacity to develop
- Target regulatory frameworks



What is Innovation Policy - Prepare the Ground

The government needs to prepare the ground for innovation, or building up the human resources needed to drive innovation forward. While reforms in regulatory environment, research and finance are important, without human capital, a country will not be able to develop or innovate. Hence building a sound education system is fundamental to forming an effective innovation policy. Education should not be seen as a way with which the government churns out top level researchers or



entrepreneurs who will innovate at the frontier, rather it should be seen as a way to lift the overall quality of human resources in a nation based on market demands.



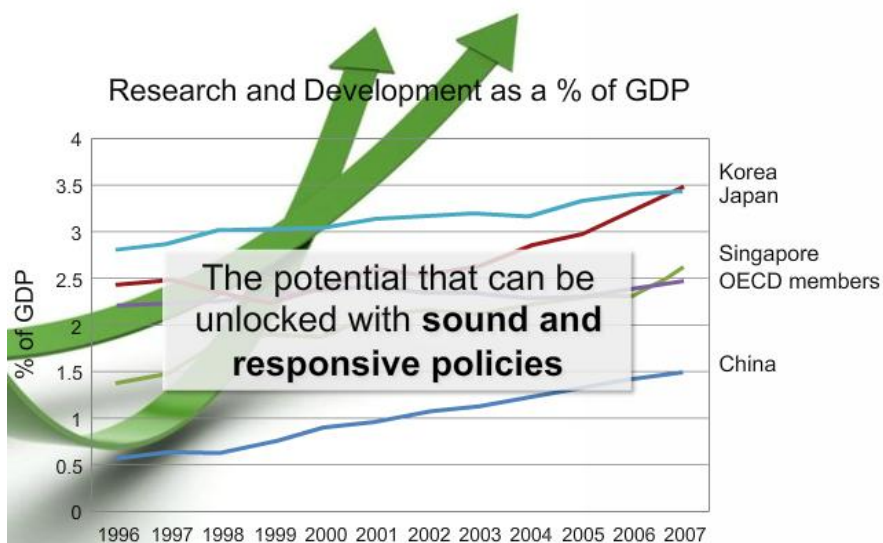
In essence, focusing on basic education, higher education, reeducation, and developing institution that foster the growth of all aspects of the education space to counter brain drain frequent in developing economies will be necessary for innovation to germinate.

What is Innovation Policy - Fertilizing the Soil

Fertilizing the soil, or boosting research and development, and access to most up-to-date information, forms the fabrics of any innovation policy. While increasing spending on Research and Development is very important, it is even more important to cater research to the needs of the market. An effective research policy involves building research facilities that accumulate knowledge based on market needs. Research policy also involves establishing links among researchers and private sector players, through agents such as regional technology centers, or national industrial laboratories, in order to facilitate knowledge dissemination from knowledge creators to knowledge users. Reforms in research and development have a domestic and international framework where aside from regulatory reforms, research policies often involve changes in public and private sector R&D policy, as well as the ways with which international research is integrated. Hence, finding effective ways to tap the global knowledge network, through means such as encouraging foreign direct investment and joint research programs, is also an important part of the overall innovation framework



As seen from the graph below, all of the fast growing emerging economies, as well as the developed world are spending tremendous amount of resources on R&D or are ramping up R&D spending in order to catch up. High R&D spending correlates strongly with the rapid growth of these nation's economy and technology, and offers a glimpse of the potential that can be unlocked with sound and responsive research and development policies





Summary of the Module

In this presentation, we have learned

- What is innovation
- Why is innovation important
- What is inclusive innovation
- What is innovation policy
- What is the government's role in creating innovation policies