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# The role of Innovation in Development – could lessons be drawn for Ethiopia?

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**Abstract**

Innovation is thought to be an engine of social and economic development, particularly in developing countries. However, it is often overlooked in the development process. This paper reviews the concept of 'innovation' (as conceptualized in Schumpeterian Economics) i.e. it builds on recognition that 'innovation' is a social and economic as well as a technical process and the knowledge or technology transferred does not need to be necessarily new, nor does it consist only of 'formal' knowledge. The tale of Ethiopian shoemaker Bethlehem in Ethiopia is presented to illustrate the huge untapped potential of innovation for development in Ethiopia. Key constraints/barriers to innovation were highlighted. Finally, as a way of tackling barriers to innovation, the following policy suggestions were forwarded, particularly for developing country governments, including Ethiopia:(a) develop pro-innovation policies and promote new ideas and thoughts, (b) remove certain restrictive policies and allow free flow of information, (c)support cooperation, production and sharing of information, (d) gear education and research to provide evidence-based case studies of good practice, success stories and lessons learnt, and the factors promoting and impeding innovation, (e) human capacity-building to promote innovation, (f)promotion of a wider awareness and public understanding of innovation at the practitioner, programme and policy levels to ensure innovation gets effectively onto the Development Agenda.

*Key Words*: Innovation, Development, Knowledge, Ethiopia

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# 1. Introduction

In the first chapter of his book entitled 'Economic Development', Michael Todaro, a leading contemporary Development Economist, asked the seemingly known but a question that remains elusive for many – "*What do we mean by Development*?" (Todaro, 1998, p.13). Development has traditionally (esp. in the 1950s and 1960s) been defined and measured by an increase in the GNP per capita. However, in the last 2 decades or so (since the 1980s) development has been conceived as a multidimensional process involving major changes in the social, economic, attitudinal, and institutional changes that encompass the social system as a whole instead of a simple per capita income growth. Todaro (1998) summarised the three objectives of development as to: increase the availability and widen the distribution of basic goods (food, shelter, health and protection); raise levels of living (e.g. employment opportunities and better education); and increase the range of economic and social choices.

As the term 'development' may mean different things to different people, the importance of having a common perspective and an agreed measurement criteria should be emphasised, without which we would not be able to determine policy measures to tackle the problem. Now a consensus is emerging that most economists, other scholars, international organizations and national governments recognize that development is multidimensional (at least development and growth are not the same). Just as there has been lacks in common understanding of the term 'development', there appears no consensus on the remedies for the problems of development. Economist, particularly, in the second half of the 20th century have postulated myriads of remedies for the problems of development. These vary from the Hard-Domar model of 'financing gap' to the Nurkse's 'balanced growth' (a model of the synchronized application capital to a wide range of industries) and Hirschman's 'unbalanced growth' (a theory that focuses on key industries to maximize forward and backward linkages) to those considering foreign aid as panacea for development.

With regard to the emphasis on the specific factors for development, economists' view vary significantly – some advocate existence of natural resources such as oil reserves and fertile land as the major factors for the development. For some, lack of physical capital and infrastructure is considered as the key bottleneck for development. Few others put their blame on geographical and weather factors as the impediments for development. In recent times there has been an increasing tendency to recognize that education, human capital formation, technology and knowledge as the key element of development. Our interest in this paper is to examine the role that knowledge, technology and particularly innovation plays in countries' development process.

# 2. Innovation for Development

## 2.1 Innovation – understanding the concept

The concept of 'innovation' has been defined in slightly various ways. The OECD, for instance, defined innovation as "the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (OECD and European Communities,
2005, p. 46). Onodera and Kim (2008, p. 112) think that innovation "is about the successful exploitation of new ideas and the invention, development and

commercialization of new technologies, services, business models and operational methods. Innovation is thus related to a process connecting knowledge and technology with the exploitation of market opportunities for new or improved products, services and business processes compared to those already available on the market."

The UNESCO (2009) – Summary report on 'Innovation for Development – Converting Knowledge to value' seems inclined to associate innovation with 'information in science and technology. According to this report "Innovation relates to the introduction of a new idea, product or process to a user or user group, and refers particularly to the transfer and application of knowledge, R&D and information in science and engineering, often embodied or embedded in technology. Innovation is a social and economic as well as a technical process, and knowledge or technology transferred does not need to be absolutely new, nor does it consist only of 'formal' knowledge. Innovation more commonly involves *incremental* rather than radical change, based on engineering research, design, development and 'learning by doing', rather than scientific research."

In a more broad sense, innovation can be conceptualized as the ***creative use of knowledge*** to allow individuals, groups, organizations and governments – "to go farther, faster, deeper and cheaper" (Friedman, 1999). In most instances, innovation will involve a rise in factor productivity and, hence, other things being equal, improvement in living standards.

## 2.2 How does innovation contribute to development?

In the 'Innovation for Development Report 2010-2011' Report, Augusto López-Claros and Yasmina Mata, in their seminal work entitled 'Policies and Institutions Underpinning Country Innovation: Results from the Innovation Capacity Index', highlighted the historical evolution of the roles of various factors in the development process and the recent role-shift to innovation:

> "*Our understanding of what drives national prosperity has evolved over time. Natural resources, population growth, industrialization, geography, climate, and military might have all played a role in the past. We also know that the relative importance of these drivers has shifted over time, and that in recent decades, more importance has been given to the coherence and quality of policies and the development of supporting institutions. A relative newcomer to this debate –identified as perhaps one of the most important modern engines of productivity and growth –has been the* ***innovation excellence*** *of a country; that is, its industries, researchers, developers, creative thinkers, enlightened politicians, managers, and clusters*." (Lopez-Carlos and Mata, 2010)

Innovation is considered as the engine of social and economic development, in both developed and developing countries. The World Bank's World Development Report (WDR) 1998/99 – Knowledge for Development – asserts that "knowledge is like light. Weightless and intangible, it can easily travel the world, enlightening the lives of people everywhere. Yet billions of people still live in the darkness of poverty – unnecessarily." Though this report's focus was on 'knowledge' and it did not explicitly use the term 'innovation', in the context of this paper, we consider 'knowledge' as an integral part of 'innovation'. The WDR focused on two important sorts of knowledge and two types of problems that are crucial for developing countries:

'Knowledge about technology' (i.e. technical knowledge or know-how e.g. about farming or health) and 'Knowledge about attributes' (such as product quality, market information, or credibility of a borrower). The Report claims that developing countries have less technical Knowledge than industrial countries, and the poor have less than the non-poor. According to the Report, this unequal distribution of know-how across and within countries is termed as 'knowledge gaps'. Developing countries also face myriads of problems related to incomplete 'knowledge of attributes' which the Report termed as 'information problems'. Mechanisms to alleviate information problems, such as product standards, market information, and credit reports are fewer and weaker in developing countries than the developed ones. Information problems and the resulting market failures especially hurt the poor.

## 2.3 What factors determine innovation?

As technology and innovation are becoming major drivers to development process; economic output is no longer mainly a function of capital and labour but, increasingly of innovation and the acquisition of knowledge. Based on these considerations, Lopez-Carlos and Mata (2010) posed certain central issues such as: the factors, policies and institutions conducive for innovation; their relative importance; how they do interact with each other; and how successful countries have been in identifying and adopting them." Some of the key areas identified by Lopez-Carlos and Mata were:

- Education and human capital – levels of spending in education, research and development, and in information and communication technologies.
- Good governance – Is the regulation of labour market appropriate? Or does it provide perverse incentives for workers and employers? Do the government policies encourage the arrival of skilled workers and highly qualified professionals?
- Uncorrupted system (transparency) – Are the public procurement policies and systems open and do they encourage the adoption of new technologies and reward
  innovation? Are government tax incentives well-targeted and applied transparently
  or do they distort the incentive
  system?
- Regulatory framework – Questions such as: What is the legal basis for property
  (including intellectual and contract design? Where is it easier or more difficult to enforce contracts? Which countries make it easy to get licenses? Where investors are provided the greatest protection? Which countries have the most restrictive labour legislation? etc.
- Does the financial system allow easy access to finance and the emergence of venture capital?
- Does the trade system open and encourage competition?
- What is the degree of collaboration between university and industry? Is the university system delivering to the business community adequately trained graduates?

## 2.4 Innovation capacity index (ICI)

Now a day, it has been increasingly common to construct composite indices in an attempt to measure the performance and trends of various social and economic

indicators of countries. The UNDP's Human Development Index (HDI), the inclusive Wealth Index (IWI), the gross national happiness index (GNHI), and the international transparency's corruption perception index (CPI) are some of the examples. In attempt to measure the extent, performance and trend of 'innovation' at a national level, Lopez-Carlos and Mata, have constructed an innovation capacity index (ICI). In constructing the Index, they managed to strike the balance between broad coverage factors that affect a country's capacity for innovation, on the one hand, and a certain degree of economy, on the other, as there may exist potentially large number of variables which could determine a nation's ability to innovate. After identifying a wide range of variables (see appendix 1), they clustered these factors into five categories or pillars (figure 1). These are:

1. Institutional environment
2. Human capital, training and social inclusion
3. Regulatory and legal framework
4. Research and development
5. Adoption and use of information and communication technologies

Lopez-Carlos and Mata have ranked countries on the basis of the ICI. In 2010-2011, they constructed ICI for 131 countries. In this ranking Sweden received the 1st the rank and Ethiopia the 108th place out of the 131 countries considered in ICI ranking, among the lowest in ICI.

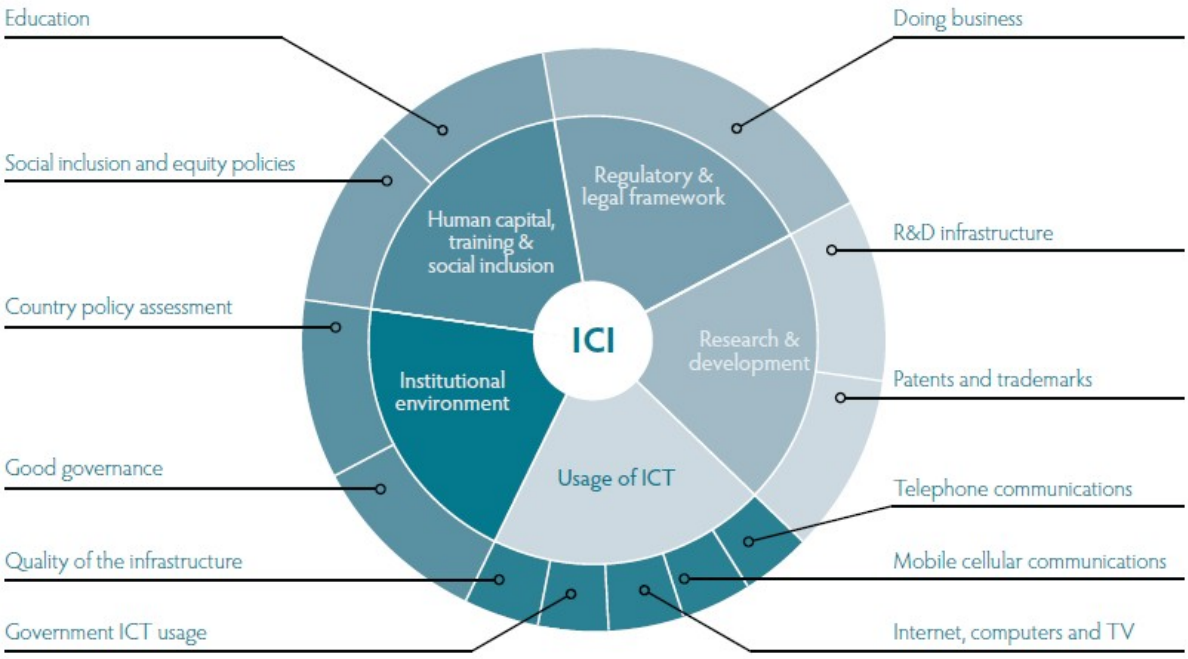


Figure 1. The innovation capacity index (Source: Lopez-Carlos and Mata (2010), p.18. In: the Innovation for Development Report 2010-2011).

## 2.5 'Innovation' – the 'heart' of Schumpeterian economics

Joseph Alois Schumpeter (1883 – 1950) was an Austrian-American economist and political scientist. He was one of the most influential economists of the 20th century. Schumpeter popularized the term "creative destruction" in economics. In the Schumpeterian economic theory, innovation is closely related to development – economic development is driven by the discontinuous emergence of new combinations

(innovations) that are economically more viable than the old way of doing things (Schumpeter, 1934). Schumpeter's innovation concept covers five areas:

(i) the introduction of a new good or a new quality of a good (product innovation);
(ii) the introduction of a new method of production, including a new way of handling a commodity commercially (process innovation);
(iii) the opening of a new market (market innovation);
(iv) the conquest of a new source of supply of raw material or intermediate input (input innovation); and
(v) the carrying out of a new organisation of industry (organisational innovation).

According to Schumpeter, it is the introduction of new product, new way of doing, and the continual improvements in the existing ones that lead to growth and development. Schumpeter says that 'entrepreneur' is such a factor of production who introduces new combinations of factors of production. An entrepreneur is neither a technician nor he is a finance manager. Entrepreneurs make innovations just for its own sake or influenced by the desire of profit and socio-cultural set-up of the society. In order to perform this economic function the entrepreneur needs two things: (i) technical knowledge so that he could produce new goods and (ii) access to funds/credit.

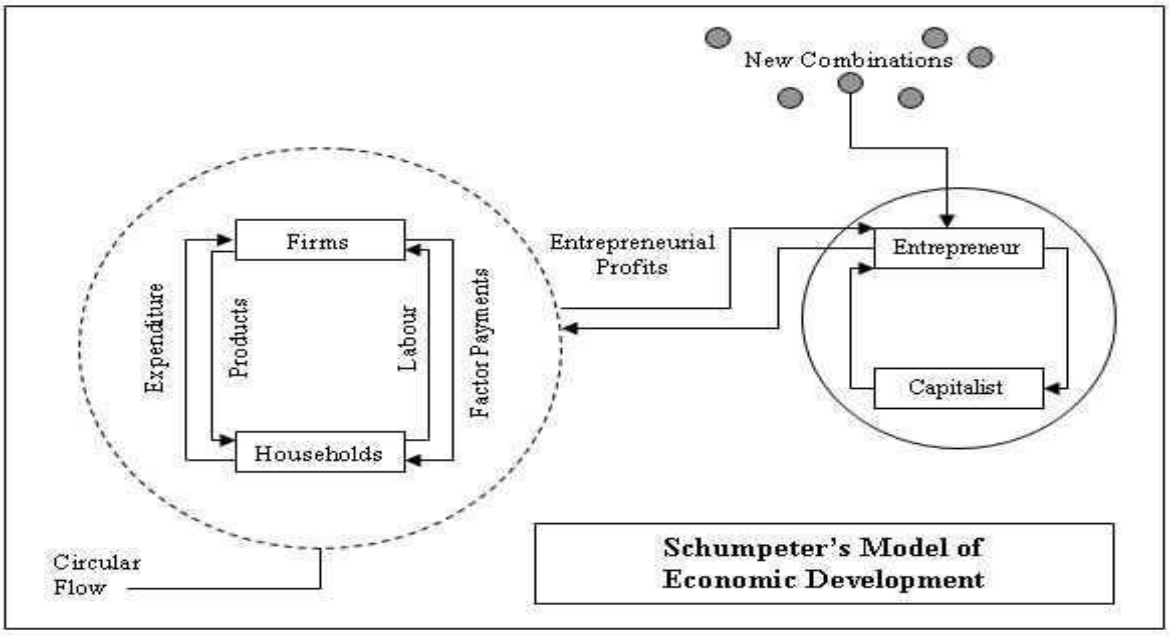


Figure 2. Diagrammatic representation Schumpeterian economic development
Source: A. Pal (n.d.)

The Schumpeterian model of economic growth moves round the 'webs' of inventions and innovations (figure 1). And the actual Schumpeterian model of economic development is represented in figure 2. In Schumpeterian theory innovation is conceptualized as the breaking up of old combination/old order with rising profit. High profits attract imitators who eventually spread the new way of doing things and create a new order. In both the new and old economic order there is a low profit level which ultimately leaves a way for another web of innovation.

## 3. A tale of innovation from Ethiopia - Bethlehem Tilahun Alemu – innovator (shoemaker from recycled materials)

- Motivation (Background)- Bethlehem observed youth unemployment in the area

(poor community) despite their talents; attracted by the hard work of her parents; observed the idea of making things by hand and using local materials by local people were there in Ethiopia for long time; observed potential foreign demand for local products; and observed the potential of 'innovative' venture to change local economic conditions;

- Established the company, SoleRebels, nine years ago(ca.2004).
- Started the company in Zenebe-work area, the poor community in the outskirts of Addis Ababa where she was born with an investment of less than $10,000 (£6,400), put together by her immediate family.
- In 2012 she had 75 full-time employees in the factory and more than 200 local suppliers of raw materials.
- Introduced modern design for local products and take into account the trends followed by consumers in the West.
- The Factory produces around 800 pairs of shoes a day which are sold at a price of on average between $35 and $95.
- Now, one of Ethiopia's most thriving businesses. The company sells its products in 55 countries, (its biggest markets are in Austria, Canada, Japan, Switzerland and the United States); also sells online.
- She uses old tyres, natural fibres and hand-made fabrics - all locally sourced - to manufacture sandals and other shoes which are inspired in the traditional Selate and Barabasso tyre footwear once worn by Ethiopian rebels.
- International Prizes:
    - the planet's first fair trade green footwear firm - certified by the World Fair Trade Organization (WFTO).
    - selected as a Young Global Leader by the World Economic Forum in Davos, Switzerland (2011),
    - One of the winners of the Africa Awards for Entrepreneurship in Nairobi, Kenya.
    - Bethlehem was listed by the US business magazine Forbes as one of Africa's most successful women (2012).
    - She received the Social Entrepreneur of the Year Award at the 2012 World Economic Forum on Africa.
- She now plans to build a bigger manufacturing plant where she hopes to employ up to 300 people. "We are doing well. We are trying to do $2m this year. In 2016, we are planning to do $20m. So that's why we are working hard and we are trying to expand our working facility," Mrs Bethlehem said.

Source: http://www.bbc.co.uk/news/world-africa-18998898

## 4. Conclusion and policy implication

Developing countries such as Ethiopia are facing myriads of challenges – economic, social, governance, and environmental. From the experiences of development paths of many developed and developing countries it can be safely generalized that there is no a 'one-fit-for-all' remedial 'silver bullet' for development. Despite this fact, it has been increasingly evident, particularly in the 21st century, that pursuing 'old way' of doing things may unlikely lead a nation to the destiny of development. Citizens should be able to be innovative – think and act differently. The tale of Bethlehem in Ethiopia illustrates the huge untapped potential for innovation and development in Ethiopia. Yes, Schumpeterian Economics has a place in Ethiopia! However, there are numerous barriers to innovation in Ethiopia – restrictive policies, lack of good governance,

corruption, backward technology (including ICT) etc. From the citizens' side, lots of young people are developing the culture of a 'windfall gain' and very biased view and growing belief/tendency that one has to move abroad in order to 'win poverty'. This tendency need to be averted.

What should be done in Ethiopia to promote innovation? Well, government should understand the underlying constraints to innovations and attempt to find solutions to problems and create conducive environment to innovation. This may include, (a) develop pro-innovation policies and promote new ideas and thoughts, (b) remove certain restrictive polices and allow the free flow of information, (c)support cooperation, production and sharing of information, (d) gear education and research to provide evidence-based case studies of good practice, success stories

and lessons learnt, and the factors promoting and impeding innovation, (e) human capacity- building to promote innovation, (f)promotion of a wider awareness and public understanding of innovation at the practitioner, programme and policy levels to ensure innovation gets effectively onto the Development Agenda.

Appendix 1. Structure of the innovation capacity index (Source: Lopez-Carlos and Mata (2010), p.18. In: the Innovation for Development Report 2010-2011).

The ICI is built upon five pillars composed of a total of 61 variables. For synthetic purposes only, the variables are grouped into conceptual subsections, which may be thought of as subindexes. The ICI ranks countries according to their overall performance and also provides scores by pillars and subindexes which give a general idea of performance in those areas. Variable definitions are presented in the Appendix.

### 1st Pillar: Institutional environment

A. Good governance
- 1.01 Voice and accountability
- 1.02 Political stability
- 1.03 Government effectiveness
- 1.04 Rule of law
- 1.05 Property rights framework
- 1.06 Transparency and judicial independence
- 1.07 *Corruption Perceptions Index* (TI)

B. Country policy assessment

1. Public sector management
   - 1.08 Quality of budgetary and financial management
   - 1.09 Quality of public administration
2. Structural policies
   - 1.10 Financial sector efficiency
   - 1.11 Trade openness
   - 1.12 Foreign direct investment gross inflows (as % of GDP)
3. Macroeconomy
   - 1.13 Debt levels
   - 1.14 Fiscal balance
   - 1.15 Macro stability

### 2nd Pillar: Human capital, training and social inclusion

A. Education
- 2.01 Adult literacy rate (% aged 15 and older)
- 2.02 Secondary gross enrolment ratio (%)
- 2.03 Tertiary gross enrolment ratio (%)
- 2.04 Expenditure in education (as % of GDP)

B. Social inclusion and equity policies
- 2.05 Gender equity
- 2.06 Environmental sustainability
- 2.07 Health worker density
- 2.08 Inequality measure: ratio of richest 20% to poorest 20%

### 3rd Pillar: Regulatory and legal framework

A. Doing business

1. Starting a business
   - 3.01 Number of procedures
   - 3.02 Time (days)
   - 3.03 Cost (as % of income per capita)
2. Ease of employing workers
   - 3.04 Ease of employing workers
3. Paying taxes
   - 3.05 Paying taxes
4. Protecting investors
   - 3.06 Strength of investor protection
5. Registering property
   - 3.07 Number of procedures
   - 3.08 Time (days)
   - 3.09 Cost (as % of property value)

### 4th Pillar: Research and development

A. R&D infrastructure
- 4.01 Research and development expenditure (as % of GDP)
- 4.02 Information and communication technology expenditure (as % of GDP)
- 4.03 R&D worker density
- 4.04 Students in science and engineering (as % of tertiary students)
- 4.05 Scientific and technical journal articles (per million people)
- 4.06 Schools connected to the internet (%)

B. Patents and trademarks
- 4.07 Patents granted to residents (per million people)
- 4.08 Trademark applications filed by residents (per million people)
- 4.09 Receipts of royalty and license fees (US$ per person)
- 4.10 Payments of royalty and license fees (US$ per person)

### 5th Pillar: Adoption and use of information and communication technologies

A. Telephone communications
- 5.01 Main (fixed) telephone lines per 100 inhabitants
- 5.02 Waiting list for main (fixed) lines per 1000 inhabitants
- 5.03 Business connection charge (as % of GDP/capita)
- 5.04 Business monthly subscription (as % of GDP/capita)
- 5.05 Residential connection charge (as % of GDP/capita)
- 5.06 Residential monthly subscription (as % of GDP/capita)

B. Mobile cellular communications
- 5.07 Subscribers per 100 inhabitants
- 5.08 Prepaid subscribers per 100 inhabitants
- 5.09 Population coverage (%)
- 5.10 Connection charge (as % of GDP/capita)

C. Internet, computers and TV
- 5.11 Total fixed internet subscribers per 100 inhabitants
- 5.12 Total fixed broadband subscribers per 100 inhabitants
- 5.13 Internet users per 100 inhabitants
- 5.14 Personal computers per 100 inhabitants
- 5.15 Television receivers per 100 inhabitants

D. Government ICT usage
- 5.16 E-government readiness index

E. Quality of the infrastructure
- 5.17 Electrification rate (%)
- 5.18 Electric power transmission and distribution losses (as % of output)
- 5.19 Roads paved (as % of total roads)

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