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Science, Technology and Innovation Policy in Developing Countries: Rationales and Relevance

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In a historical UN conference held in 2000, the leaders of 189 countries agreed upon a set of eight major ambitious development goals to be attained by 2015 to reduce extreme poverty, hunger, illiteracy and disease¹. It became apparent that S&T progress was among the main policy areas for action in order to attain such goals given its potential to contribute to increase productivity, facilitate the innovations necessary to create markets, protect jobs, help reduce the consequences of extreme poverty, provide conditions necessary for the prevention and treatment of diseases such as HIV/AIDS and malaria, and help contain and reverse the continuing loss of environmental resources among other problems currently facing developing countries.

Recently, the WB-IMF 2011 Global Monitoring Report concluded that the targets set for hunger and primary education completion will probably not be met by 2015, and that the targets on most health-related issues such as child and maternal mortality and access to sanitation will certainly not be met by then. Furthermore, according to the report, at the present economic trends the number of people living in developing countries on less than \$1.25 will be over 800 million by 2015². This means that if labor demand does not grow enough to meet the increasing supply in these countries, this additional labor force will have to be absorbed at a falling relative wage therefore reducing the rate at which growth decreases poverty. Moreover, the financial crisis that burst out in 2008 and is currently affecting most developed countries will likely affect developing countries in the med-term, risking of deteriorating further the living conditions of the most poor and escalate inequality in those countries.

In this scenario, S&T Capabilities, defined broadly as the set of human, physical, technical, institutional and intellectual resources available in a country to acquire scientific and technological knowledge and skills for addressing with creativity and competence local, national and international needs, are understood to be the basis of economic development and social wellbeing (UNDP 2001; IAC 2004; TWAS 2004; UNDP-S&T 2005; UNIDO 2005). However, as is well known, one of the defining characteristics of

1 See the set of goals and sub-goals as well as the strategies designed to meet them at <http://www.un.org/millenniumgoals/>

2 See full report at <http://siteresources.worldbank.org/INTGLOMONREP2011/Resources/7856131-1302708588094/GMR2011-CompleteReport.pdf>

the so-called developing countries is that they lack such capabilities, a condition that not only affects the countries directly concerned but also the entire world as a result of the 'global' status some of these problems have reached, such as those related with public health, security and environmental quality (Wishart and Davies 1998; Juma, Fang et al. 2001; Weatherall 2003; Harris 2004). For these reasons, the consensus today is that developing countries need to raise the level of their local S&T capacity, and make this goal a priority of their development strategy (OECD 1996; World-Bank 1999; UNDP 2001; UNDP 2005; World-Bank 2005; UNDP 2011).

However, although knowledge of the physical, living, and/or social world has always played an important role in the development of societies in their material, institutional and cultural achievements, policy tools inspired on expectations and theoretical constructs about its promises for improving the standard of living are a rather recent phenomenon. In fact, it was in western industrialized countries where science and technology became first perceived as the critical factor in the process of long-term economic growth and development, whereby the idea of "progress" developed mainly with the Scientific Revolution in the seventeenth century, was reinforced later during the Enlightenment in the eighteenth century, then consolidated during the Industrial Revolution, and gain policy status and started to expand rapidly among developing countries during the current era of Globalization.

All these social and economic changes were fueled by public policies inspired on particular perceptions about "progress," both as an end and as a means. In this process, governments in developing countries have implemented policy tools with the expectation of contributing to better conditions for their society. However, for reasons still not fully understood, some of them have not succeeded at all, and in others the result is a mixed situation where rapid growth of innovative capacity takes place simultaneously with extreme poverty and increased social inequality. This is the case of countries that rely strongly on global markets (trade and investment), explicitly support local "winners," and modernize their local STI infrastructure, but social, economic and political exclusion of large parts of the population persists, where the majority does not benefit from the STI developed both locally and globally. This situation is arguably the result of the implementation of STI policies inspired on conceptual logic models (copied or "imposed" by multilateral lending organizations); on demands from local STI elites; and on institutional constraints that have all resulted in the neglect of local needs, capabilities and "realities."

This paper builds on previous research pointing to a better understanding of agenda-setting processes in developing countries and their socio-economic implications in the long run. In this sense, Rennkamp and Kuhlmann (2010) studied the implementation of

both endogenous as well as exogenous models for innovation policy in South Africa and Brazil, and investigated the international and domestic driving forces of the science and innovation policies that started in the 1990s. They focused on the role of ideas, interests and institutions to better understand the main rationales and trajectories for STI policy making and found that the global ideological and economic-financial environment strongly affects the policy choices in these countries and the frameworks for policy planning, which do not necessarily meet the domestic needs.

The question this paper addresses is *to what extent do these perceptions, expressed in the form of theories, models, concepts, paradigms and ultimately policy tools, are considered relevant and legitimate as source of inspiration for the design of public policies aiming at satisfactorily addressing the challenges developing countries face?* To answer to this question, we analyze the assumptions implied in the most prominent models governing STI policymaking scholarly, and assess their plausibility vis-a-vis the specificity of developing countries. In addition, we rely on the analysis of policy documents, budget allocation, and on interviews to STI policy designers and scholars in a group of developing countries. We analyze the resulting policy dilemmas that policymakers face in terms of seeking competitiveness while dealing with social exclusion.

In fact, one of the main concerns and challenges for the governance of STI in these countries is that if local policies do not address current trends, public policy intervention in STI can lose its legitimacy and fail in advancing sustainable development in the long run. Therefore, STI policymaking needs to innovate and bring balance to the system by broadening its views, scope and role. To achieve this goal, local STI governance capabilities need to develop further. Of course, improvement of competitiveness and poverty reduction are not mutually excludable goals, but to sustain economic competitiveness, governments need to solve the poverty crisis, which paradoxically is not the main goal of STI policy in developing countries. In order to balance this situation, developing countries need to innovate in both, design and implementation of STI policies in the short run.