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Introduction

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Introduction

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Rethinking development within an innovation system approach and at the same time applying the results on contemporary Central American countries may seem like navigating between Scylla and Charybdis. On the one hand is the danger of getting lost in general theoretical and conceptual discussions, and on the other the danger of getting caught by the specific but ever changing details of the "real world". Although throughout the whole SUDESCA research project we have aimed for a balanced journey, the chapters in this book differ in their main focus and approach. Part I includes chapters mainly emphasizing theoretical and conceptual analysis, whereas Part II contains selected empirical analyses using different systems of innovation approaches. The concluding chapter summarizes policy implications.

At first glimpse there seems to be quite substantial overlaps between recent trends in mainstream development thinking and the innovation system approach. Human capabilities, knowledge and

29

institutions are key concepts in both approaches. However, as López and Johnson argue (Chapter 1), mainstream development thinking–at least as seen t up to now in reports from dominating development organizations–has a too narrow and detached interpretation of these concepts. First of all, more focus on the *dynamics* of knowledge and "learning capabilities" is needed and the concept of institutions has to transcend the restraining transaction cost perspective to a broader understanding of how the institutional set-up may influence learning and innovation in both the short and long run.

However, identifying which institutions and institutional set-ups are especially important for creating, maintaining and enhancing learning and innovation capabilities is an important but complex question. Answering this question cannot be done out of context, but a useful starting point may be to try to differentiate between different types of institutions as done by Gregersen, Johnson and Segura (Chapter 2) when they distinguish between i) market driven and market supporting institutions related to the ongoing globalization process, ii) institutions supporting human resource development, and iii) institutions supporting interaction and co-operation. Several of the SUDESCA studies presented in this book confirm that the promotion of innovation systems builds on institutional learning in a combination of top-down and bottom-up processes as well as internal domestic and external knowledge linkages.

Creation of "learning spaces" (discussed further by Arocena and Sutz in Chapter 4) should involve

30

institutions for handling potential conflicts in relation to the distribution of costs and benefits among the many different actors involved (the government, local communities, forest owners, farmers, conservationists, NGOs, the financial sector, domestic and foreign firms, the research and education sector, etc.). Applying an innovation system approach to the Latin American context underlines that the concept of power has to enter the scene if one wants a deeper understanding of the historical dynamics of these systems. Institutional learning that builds on user-involvement, mutual trust and dialog is more likely to develop and be sustained in societies with long democratic traditions and well-developed institutions for conflict resolution than in societies where conflicts more often are "solved" by means of power. Reflecting on the long journey of the SUDESCA research project, we might have downplayed power issues too much. Unfortunately, this is also true for most of the chapters in this book.

Adapting the innovation system approach to studies of small and very different Central American countries was a challenge for the SUDESCA members in many respects. A fundamental challenge relates to shortcomings or less developed aspects of the innovation system approaches when these theories and concepts are applied in a context which is quite different from that of the original setting.[1] It soon became clear that an analysis of innovation systems in

[1] Another challenge is related to lack of reliable and regular data, although important improvements are seen lately as a consequence of the growing interests among scholars, policy makers and development organizations in innovation studies. These data issues will not be treated further here as they are discussed in more detail in several of the chapters in Part II.

a development context is more about identifying key actors and potential linkages between actors than actually studying interaction and collaboration. It is also clear that an analysis of the key actors of the system has to include a more diverse sample than the "usual suspects" in the form of private firms and universities. NGOs, local communities, cooperatives, and foreign aid organizations play a crucial role as change agents. Including these types of actors means opening up for a broader set of institutions that guide the thinking and behavior of key actors.

Applying an innovation system approach to a development context has to take into account various dualities and inequalities characterizing most contemporary developing countries. There are (still) huge differences in living conditions and the dynamic mechanisms between rural areas and the cities. The gap between the rich and the poor is immense seen with the eyes from the North, and it even seems to be increasing despite a growing middle class in some regions.[2] Dualities are also present in the production system and the technologies used. On one side of the road you may find companies that use top-modern and environmentally friendly techniques and take part in the global value chain. On the other side of the road you may find companies using outmoded, labor intensive technologies with damaging effects for both humans and the environment. Overcoming these dualities and inequalities in living conditions are both means and ends for sustainable development.

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[2] The Gini Index is 52.4 (2002) for El Salvador, 43.1 for Nicaragua (2001), and 49.8 for Costa Rica (2003). In comparison, it is 24.7 for Denmark (1997). Source: HDR 2007/2008.

A crucial but highly neglected duality in living conditions has to do with the relatively large informal sector in most developing countries. It is difficult to get precise figures of the size of the informal sector, but according to Müller (Chapter 3) estimates indicate that between 30 and 50 percent of rural income in Latin America stems from informal activities. Neglecting the informal sector gives a misleading understanding of the dynamics of learning and innovation, and consequently hazy guidance for innovation policy. A coherent analysis of national systems of innovation in the South, therefore, include the informal sector and recognize the mutual dependencies existing between the formal and informal sectors as well as between exogenous and endogenous technological dynamics. For further discussion of these issues, see Chapter 3.

Rethinking contemporary development within an innovation system perspective has to reflect ongoing globalization processes. Arocena and Sutz (Chapter 4) address this important question: "whether or not globalization is an opportunity for underdeveloped countries to change their productive structures and some of their social structures in ways that reinforce development (not only economic growth)." In a long-term historical perspective Latin America has moved from a first phase of traditional export-led growth based on primary products to a second period of inward-looking development based on import substitution, and then to the contemporary third phase that Arocena and Sutz refer to as *the neo-peripheral insertion into the global knowledge economy*. Such insertion is characterized mainly by primary or manufactured

products with low value-added associated with a diminishing proportion of jobs requiring advanced scientific and technological capabilities. On the contrary, the centers of the present world economy are knowledge-based and innovation-driven. To bridge this "learning divide" between the center (located primarily in the North) and the periphery (located primarily in the South) requires that endogenous knowledge generation, learning processes, and innovation capabilities in the South are fostered to a much higher degree than is currently the case.

In Latin America, public universities are the main contributors to knowledge generation, while on average the contribution of other public institutions, private universities, and private firms is much smaller, and historically the links between public universities and the productive sector have been quite week. As discussed by Arocena, Gregersen and Sutz (Chapter 5), there is a pressing need to strengthen a constructive integration of universities in the enhancement of learning and innovation capabilities in small Latin American countries. A fundamental problem is the lack of opportunities for knowledgeable persons to apply their knowledge to solve relevant problems. A key component in the basket of "gardening policies" is, therefore, to increase the social demand for high quality knowledge addressed to the national universities and to the internal actors in general. For this to occur, "interactive learning spaces" must be detected, protected and promoted by help of a "gardening-type" from bottom-up policies combining less inequality with stronger innovative capabilities.

34

As indicated above, the five chapters in Part I address a broad palette of issues in a search for a better understanding of the processes generating sustainable development. Although the various issues covered are both complex and intertwined, each of the five chapters has its own main focus. Chapter 1 (Lopez and Johnson) opens Part I with a discussion of the concept of innovation systems in relation to theories and policies of economic development. Chapter 2 (Gregersen, Johnson and Segura) is a direct follow-up on the relationship between institutions, learning and innovation introduced in Chapter 1. Chapter 3 (Müller) stresses the importance of informal sector systems of innovation and the issues of endogenous generation of technological innovation. In Chapter 4, Arocena and Sutz elaborate on the demand for "gardening policies" in the Latin American context of a neo-peripheral insertion into the global knowledge economy. Finally, Chapter 5 (Arocena, Gregersen and Sutz) discusses challenges and opportunities for universities to play an active role in stimulating learning and innovation capabilities.

Despite the fact that the SUDESCA project revealed several critical points in the construction of the ship while navigating between Scylla and Charybdis, all five chapters in Part I support our point of departure that an innovation system approach with its strong focus on nurturing institutions that support learning and innovation capabilities is a basic for fruitful rethinking of development issues.

35