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## **Institutions and learning capabilities in a development perspective**

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*Published in:*

Systems of Innovations and Development - Central American Perspectives

*Publication date:*

2010

*Document Version*

Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*

Gregersen, B., Johnson, B., & Segura, O. (2010). Institutions and learning capabilities in a development perspective. In B. Johnson, & O. Segura (Eds.), *Systems of Innovations and Development - Central American Perspectives* (pp. 67-102). Editorial de la Universidad de Costa Rica.

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## **Chapter 2**

### **Institutions and Learning Capabilities in a Development Perspective**

*Birgitte Gregersen, Björn Johnson and Olman Segura*

#### **1. New Tendencies in Development Thinking**

**I**n order to specify the role of institutions in the innovation system approach to development, our point of departure is the three recent tendencies in development theory, discussed in Chapter one:

The first of these tendencies is an increasing focus on capabilities rather than resource endowments as the main factors of development. This represents a shift from a perspective in which people are passive recipients of the fruits of development to one in which they actively participate in shaping development. In accordance with this, the United Nations Human Development Report from 1994 states that “[t]he purpose of development is to create an environment in which all people can expand their capabilities, and the opportunities can be enlarged for both present and future generations” (13).

The second tendency is to regard knowledge as perhaps the most important resource in development. It is

becoming increasingly recognized that knowledge is more complex than information, and that the role of knowledge and the problems of knowledge transfer and knowledge utilization have been underestimated in development theory and policy.<sup>1</sup> Expressions like “technology divides” and “knowledge divides between the North and the South” have become common and are used by policy actors such as the World Bank. A focus on differences in knowledge among countries is important since it acknowledges that different forms of knowledge are basic requirements for all human action and all social change.

The third tendency is to highlight the importance of institutions and designate them as the “root” of development. Institutions, defined as vital rules for economic behavior, are increasingly regarded as crucial for development in the sense that they enable or disable all other development factors. Knowledge, for example, can be thought of as operating through institutions which induce it to activate processes of development (or, in the case of destructive institutions, prevent it from doing so).

These three tendencies are, of course, not really new. This is not the place for a discussion of the history of development theory, but capabilities, knowledge and institutions have clearly played essential roles in development thinking in the past. Their newness is relative. Their significance, however, is increasingly emphasized, and they clearly represent an extension and a broadening of more narrow views on economic development, which usually build on an aggregate production function approach.

Nevertheless, as long as their relevance to learning and innovation are not taken into account seriously, their contribution to a better understanding of development remains limited. Insistence on the importance of human

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<sup>1</sup> This is, for example, reflected in several recent World Development Reports (see especially the report from 1998/99).

capabilities and human action is not sufficient if learning capabilities are left out. The importance of knowledge as a development factor weakens if it is not coupled with learning and innovation, and if it is not focused on how knowledge is constantly recreated and put to use. It is true that institutions are at the root of development, but this is primarily because they affect learning and innovation.

Furthermore, the significance of each of these three factors can only be duly appreciated if the relations among them are taken into consideration. They “feed” upon each other. The relations and interactions among changes of capabilities, institutions and knowledge are at the center of the development process.

To argue that the tendency to underline capabilities, knowledge, and institutions has to be extended to include connections to learning and innovation, as well as the interconnections among them, is, in fact, also an argument for a system of innovation approach to development. As argued in Chapter one, this approach represents an effort to emphasize the interactions between institutional change and technical change, and this classical nexus in theories of social change includes all these relationships.

This is especially the case of the broad version of the innovation system approach. In this version, innovation is seen as a process involving not only significant and easily observable innovations but also smaller, everyday ones. The notion of innovation includes the continuous diffusion, absorption, and use of new knowledge. Moreover, a broad set of sources of innovation is taken into consideration. Innovation follows not only from science and R&D but also from interactive learning connected to ordinary economic activities, such as procurement, production, and sales. It is situated not only in high-tech sectors but all across the economy. Thus, it is clear that when innovation system approaches are applied to development problems in the South a broad concept is more relevant than a narrow one.

In a development context such as this, it is also evident that even if all conceptualizations of innovation systems (narrow as well as broad; sectoral as well as territorial) assume that institutions affect innovations, it is essential to utilize a fairly comprehensive notion of institutions and investigate their innovation impact quite broadly. The rest of this chapter addresses that impact as we try to answer the following questions: How do institutions affect learning and innovation capabilities? And which institutions are valuable in this context?

## **2. Institutions, Learning, and Innovation**

Recently, major policy actors such as the World Bank and the IMF have stressed the importance of institutions for development and development policy. One of the first examples was the World Development Report from 1997, which emphasized state institutions and the role of the state in building institutions for development. Most of the World Development Reports that followed thereafter have had institutions as one of their main themes. The IMF has also underlined the institutional question. In the World Economic Outlook from April 2003, for example, even the IMF tried to measure the value of institutions, with quite noteworthy results: for instance, the per capita income of sub-Saharan Africa would increase by 80 percent if the quality of its institutions were to improve to the levels of developing Asia.

However, this tendency to broaden the traditional perspective of economic development, which focuses on investments in physical and human capital, by emphasizing the role of institutions, has its own narrowness. The perspective seems mainly to be confined to transaction costs.<sup>2</sup> High transaction costs are thought to be detrimental

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<sup>2</sup> This way of looking at institutions is inspired by the school of thought called "New Institutional Economics", founded by Ronald Coase (1937) and represented today by, for example, Oliver Williamson and Douglass North.

to development because they weaken incentives and reduce market opportunities. In addition to this, they also reduce the efficiency of government activities and impair the relations between the private and public sectors. This implies that the attention is focused on institutional problems related to inadequate information and, above all, incomplete definition and enforcement of property rights. For example, according to the World Bank (2002), institutions have three main objectives: They channel information about market conditions, goods, and participants; they define and enforce property rights and contracts; and, finally, they increase (or decrease) competition in markets.

When the World Bank argues today that good institutions and good governance are the main sources of development, they are reformulating the Washington Consensus on a different level. Getting prices, exchange rates, and government budgets right (the old consensus) are still important, but in order to make such policies effective, institutions have to be put right, too (the new consensus). According to the World Bank, the right institutions are the ones that bring low transaction costs. The problem with this strategy is that it presumes a developmental quantum jump; it recommends the institutions which would let markets flourish if the economy was already developed and industrialized. It ignores institutions supporting knowledge and learning which would make development (including market development) possible in the first place.

It should be noted that the World Bank has lately tried to include a broader set of institutions into the picture. The 2003 World Development Report describes how institutions related to transparency, voice, and forums for negotiation may balance different interests and reduce conflicts. It also discusses how institutions and policies affect each other. Moreover, it is acknowledged that the

institutional set-up is, to a great extent, country specific; this reduces the value of standard solutions applicable in all countries.

The institutional trend in the way the World Bank and the IMF understand development contains important new insights. Still, the main focus is on transactions, property, and markets, and this seems to prevent the crucial question of how institutions affect learning and innovation from being raised. In such a perspective, a number of different institutions become important. The impact on learning and innovation of labor market institutions, financial institutions, social security institutions, economic policy regimes, and a large number of social norms affecting the “learning culture” need to be addressed.

At the present time, almost everybody seems to agree that institutions have a crucial influence on development. The consensus decreases, however, when the question is raised regarding the types of institutions which are the most important in a specific context. This is not surprising since “institution” is a vague concept, which is defined differently by different scholars and in different connections. The word “institution”, is commonly used with two different meanings: one refers to concrete things like post offices, police stations, etc.; the other refers to regularities of behavior, such as common habits, ways of doing things, which are common to many people, traditions, etc. This dual meaning of institutions can also be found in the social sciences. The concept seems to have different meanings in the different social sciences. In political science, institutions are normally rather concrete and tangible entities like parliaments, ministries, courts, town halls, etc. Often a political institution is, therefore, also an organization. Intangible political institutions in forms of laws and regulations also exist in political science, but the term is confined to aspects of the formal political system such as

the constitution, election laws, and so on. If a broad entity like “democracy” is referred to as a political institution, the focus is usually on the formal rules defining and regulating it.

If institution in political science is a rather straightforward and narrow concept, which generally does not invoke many misunderstandings, the situation is quite different in sociology. Here, institutions almost exclusively refer to intangibles. When “the family” is called a social institution, it does not denote a concrete family living around the corner; instead, it refers to the set of rules and social and moral norms which shape how people live “in families” in a specific society. Some of these are formal laws like the ones that more or less precisely define the legal consequences of marriage. Others, which may indeed be the most important ones, are quite informal. Social and moral norms are the typical institutions to be encountered in sociology. In fact, Emile Durkheim referred to sociology as the science of institutions.

“Homo sociologicus” may be dictated by social norms, but this is certainly not the case for “homo economicus.” He is guided by instrumental rationality and, therefore, does not need the support of informal rules and norms. An assumption of total instrumental rationality implies that political economy only needs institutions in the form of certain ground rules for market transactions. In order to maximize utilities and profits in a market economy, the ability to sell and buy goods and factors of production is need must exist. Property rights and contracts should be defined and enforced, but that is about all that is necessary. It is not surprising, therefore, that institutions have played a quite insignificant role in neoclassical economics.

Coase has explained, however, that this neglect of institutions is only meaningful in an economy without transaction costs. As soon as such costs are introduced, institutions have an essential role to play—the role of



reducing and controlling transaction costs in order to facilitate market exchange. Today there are at least two strands of mainstream economics: one that continues to ignore institutions, and one that analyzes how institutions affect transaction cost. New institutional economics seems to continue to focus on the institutions of property rights, and, to the extent that the concept is broadened, it is still confined to the rules, regulations, and norms that directly influence the efficiency of markets.

This, of course, is significant and continues to be so, but in such a universe of (bounded) rationality in a market context, learning and innovation have tended to be left out. It is after all, not easy to define what rationality means in a context in which information and knowledge change as a result of the decisions that are made.

There is, however, another strand of economics which has a broader notion of institutions and fits better with a focus on learning and innovation in the process of development. Classical institutional economics goes back to Thorstein Veblen. It is critical to the idea of instrumental rationality as a dominant form of rationality, and it emphasizes the importance of habits and routines in the economic process. Institutions are identified as outgrowths of habits (including habits of thought) and routines, and they include both formal and informal entities. Within this tradition institutions have been defined in different ways, but the essence is that institutions are sets of common habits, routines, established practices, rules, or laws that regulate the relations and interactions between individuals and groups. Institutions may be formal or informal. They may be enforced by political authorities or be self-sustained by the feelings and reactions they cause when violated. They form a type of system in which basic and “constitutional” rules may be complemented by other, less important rules, which change more easily. It has also become common in

this tradition to distinguish between institutions and organizations, or at least single out political and economic organizations as specific kinds of institutions.

With such a broad concept of institutions, the statement that “institutions matter to development” can only be the starting point for a more specific analysis. In the overall conceptual framework of this book, institutions constitute an important aspect of innovation systems, which, in turn, are essential for sustainable development. First of all, this means that we need to know something about how institutions may support the creation and sustenance of learning capabilities in different parts of society. We also want to know what kinds of institutions may ease the utilization of learning capabilities in processes of innovation. Finally, we need to know if there are specific institutional arrangements which endorse environmental and social sustainability in the development process.

In a development perspective, the observation of a connection between institutions on the one hand and learning and innovation on the other leads to reflections about a possible need for changes in the institutional set-up. In fact, promoting innovation systems as a part of development policy is to a large extent a question of improved institutions. It is not, though, a question of “getting the institutions right” once and for all. It is more a question of embarking upon a road of continued, reflected, negotiated, and balanced institutional changes. This road includes ongoing processes of minor as well as major institutional adaptations and innovations. This may be referred to as a process of institutional learning and institutional innovation. However, because institutional systems are often both complex and inflexible, this process tends to be complicated, slow, and uncertain with respect to the results.

Arocena and Sutz (2000) have pointed out that innovation systems have been studied mostly in the North,

in countries with comparatively effective institutional support for innovation processes. Furthermore, they have typically been studied as already existing entities. When their histories are pursued, it becomes clear that they have evolved rather than having been intentionally designed. Only in few cases (patent rights, the technical university, etc.) have institutions been deliberately built with the direct aim of supporting technical change. Countries with strong innovation systems have obtained them more by coincidence than by choice. Only on the level of the individual organization do we find something which looks like deliberately designed innovation systems.

Nevertheless, countries in the South which recognize the need to improve their innovation capabilities may need to actively encourage institutional change. Arocena and Sutz refer to this as a need to shift from an *ex post* to an *ex ante perspective*. The viewpoint taken here is that improving learning capabilities is not only a question of making more resources available for education and research but also of improving institutions supporting interactive learning and innovation broadly in society, including individual families, communities, firms, and organizations.

Learning and innovation capabilities are not self-sufficient. It is a fundamental aspect of the capability-based approach to development that different capabilities—political, social, economic, and not the least learning capabilities—are decidedly complementary (Sen 1999). Furthermore, these capabilities depend generally on the institutional set-up of society. To create institutions which support learning and innovation capabilities, it is necessary to take into account the interdependence with other capabilities and the systemic character of the institutional set-up.

It should be emphasized that a “best practice” in institutional learning does not exist. There are no simple

policy principles of general validity in this area. It is impossible to define an optimal institutional set-up, and, therefore, it is futile to search for a best practice in development strategies. In fact, the more the relations between institutions and knowledge creation are emphasized, the clearer it becomes that there are different roads leading to enhancement of learning and innovation capabilities. Each country, to some extent, has to create its own institutional framework for development.

### **3. Institutions Influencing Learning and Innovation Capabilities**

Vast arrays of institutions are necessarily involved in shaping the learning and innovation capabilities in relation to sustainable development. For analytical purposes, we may differentiate between three main types of institutions:

- Market driven and market supporting institutions related to the ongoing globalization process.
- Institutions supporting human resource development.
- Institutions supporting interaction and co-operation.

Although these three types of institutions are interdependent and may be difficult to distinguish in concrete situations, they are discussed one by one below.

#### *Market Driven and Market Supporting Institutions*

As mentioned above, there is a need in development thinking to shift the focus from market supporting institutions to institutions supporting learning and innovation capabilities. This partly reflects requirements from the globalizing learning economy, in which the key to sustainable development is learning and innovation.

This does not mean that market related factors do not influence learning and innovation. The ongoing process of liberalization of international trade and finance, de- or re-regulation, and the privatization of economic activities are crucial institutional changes on the macro level—changes which affect the whole framework for economic growth and development. For example, the changes in labor division and production structure, which follow the current globalization process, have, according to Katz (1999, 2003), propelled most Latin American countries in the direction of “static” comparative advantages due to the use of unskilled labor and natural resources, where countries in the North in the same period have moved towards more “knowledge intensive” activities due to increasing demands for highly qualified labor.<sup>3</sup>

To the extent that the potentials for local learning and innovation capabilities are rooted in the local production structure or specialization pattern and often follow trajectories formed by path-dependency, this “neo-peripheral insertion in the global economy”, as Arocena and Sutz (2004) call it, may be a straitjacket for long-term economic development in these countries. The argument for this is closely related to the innovation system perspective emphasizing linkages among producers, suppliers, customers, and knowledge institutes as crucial for stimulation of interactive learning and innovation activities. In this way, the “learning spaces” which are necessary ingredients of well-functioning innovation systems (Arocena and Sutz 2000) may be diminished by short-term cost-efficiency, standardization, and lack of experimental alternative solutions. An example of the latter is the process of liberalization, deregulation, and

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<sup>3</sup> These arguments are further developed by Arocena and Sutz in Chapter four of this book.

privatization of the energy sector in Latin America. This process has, according to Vargas (2001), both increased energy prices on conventional fuel-based energy and limited the space for and speed of introducing alternative clean-energy systems, such as wind power and solar energy.

Innovation is a process in which decisions have to be made in anticipation of future returns, and, in comparison to normal investment decisions, the level of uncertainty is high. This means that the question of finance is crucial, but developing countries often lack both the financial resources and the financial institutions to elevate their learning capability and innovation activities. Despite the increasing global capital mobility, there are still important distinctions between national financial systems. It is not only a question of rental costs and the balance between internal and external finance for innovating firms, but more broadly of the institutional characteristics of the financial system as a whole. For example, the division of labor between different institutions, the degree of concentration and decentralization, and the financial system's relations to the non-financial sector and to the government vary among countries. Diverse financial systems (for instance, on the one hand the "outsider" models in which shareholders hold power, dominating in the United States and in Great Britain, and, on the other hand, the "insider" models prevailing in continental Europe) influence innovation processes in different ways, for instance in their ability to influence and support selective and lasting borrower-lender relationships and in their ability to support incremental innovations or radical breakthrough innovations (Coriat and Weinstein 2001).

The distinction between short-termism and long-termism in investment decisions is important not only for the allocation of finance but also for other aspects of technical innovation. Certain technology areas can only be developed profitably by firms which operate with a long-term

perspective. Others might be easier to exploit with a short-term horizon. Likewise, seriously taking into account the ecological factor in development is only possible if a long-term horizon is accepted. Short-termism often creates ecological problems. Tolerating and stimulating a long-term perspective is an essential part of a learning society.

Related to this is the distinction between a static and dynamic world-view. It is perhaps possible to distinguish between largely static and dynamic types of rationality. On the one hand, people's choice of activities and occupations in society may be viewed as determined by either traditions or by rational behavior within a given set of possibilities. Both ways are basically static. The set of possibilities on which traditions or rational choice can operate is given. On the other hand, the set of possibilities can be looked upon as changing all the time, as evolving. This is a dynamic view in which learning plays a role for how people decide which activities to pursue and how to carry them out. The actual mix of static and dynamic rationalities in the economy may influence innovation and development.

There is a risk that the growing interest for intellectual property rights as a market supporting institution may add to the problem of vicious circles in developing countries. The increasing tendency to treat information and knowledge as commodities introduces a basic contradiction in the learning economy. On the one hand, firms try to capture knowledge economies through intellectual property rights. On the other hand, knowledge is socially produced in groups and networks, which may be destroyed or damaged when knowledge is treated as a commodity. The commodification of knowledge is accompanied by increasing costs for developing and maintaining an adequate knowledge infrastructure. As a result, business consultancy is one of the fastest growing activities in some high-income countries and public organizations, and government agencies are

increasingly charging for their supply of information and knowledge services.

Seen from the perspective of the developing countries, the knowledge commodification process is therefore mainly adding more barriers to innovation and capability building. Formal institutions such as the Trade Related Aspects of Intellectual Property Rights (TRIPs) agreement under the World Trade Organization may further add to this.<sup>4</sup> The developed countries dominate the scene, and most developing countries have only a weak capacity to participate in TRIPs agreements (Rasiah 2002).

#### *Institutions Supporting Human Resource Development*

~~The quality of and the access to institutions and organizations directly involved in the knowledge production and distribution—like the school system, the universities and research centers, the vocational training system, the system of technological service center, research councils, telecommunication networks, libraries, and databases—form a basic resource for the learning capability of both individuals and firms. Despite the growing consensus that human resource development is one of the most important keys to promote the capability to learn, there is still—even in rich countries—a big gap between public and private investments in human resource development on the one hand and the actual need for upgrades on the other. In developing countries this gap is of a totally different~~

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<sup>4</sup> By integrating a number of international IPR conventions, the TRIPs agreement aims to introduce more order and predictability in the system and to settle disputes more smoothly (Rasiah 2002: 12). The agreement covers: copyrights and related rights, trademarks (products and services), geographical location, industrial designs, patents, layout-designs of integrated circuits, and undisclosed information (including trade secrets). For an overview and discussion of these different areas and their potential consequences in different types of developing countries, see Rasiah (2002).



dimension, and in addition, access to information, education, and training is very unevenly distributed. Furthermore, many developing countries suffer from “brain drain” to the rich countries, which tempt graduates from the developing countries with opportunities of high income, wealth, security, and first-class research conditions with the possibilities of creatively applying and further developing their knowledge in relevant areas. Improving the opportunities for people with a higher education to use their knowledge in a productive way within their home country is a crucial key to strengthening innovation and capability building in developing countries. One directly related aspect of the lack of demand for more highly educated labor is that universities and research institutions often live a relatively isolated life with very little collaboration with the private enterprises and other actors of the innovation system. However, large national differences in the pattern of collaboration between firms and universities exist and this may reflect that the various knowledge organizations play diverse roles in the different national systems of innovation. This suggests that a broad system perspective including firms, universities and research organizations, and the technological service system is required if we want to understand the specific national pattern of collaboration between firms and universities and research organizations.

The effectiveness of labor market institutions is usually judged mainly from a static allocative perspective. From a development point of view, there is a need to focus more on how the labor market supports competence building of people and firms. The characteristics of the unemployment benefit, for instance, influence firms’ ability to hire and fire employees as well as the mobility of the employees. Agreements concerning vocational training and education will, of course, influence learning and innovation activities. The relations between competence, responsibility,

participation, flexibility, and wages may either promote or hamper the development of learning and innovation capabilities of individuals and firms. The division of labor between public training and education and firm-specific competence building may play a role, too.<sup>5</sup>

Learning is ever-present in the learning economy, but it is not always cumulative. Knowledge which is not used tends to be forgotten. Forgetting and “de-learning” is an inherent part of many learning processes, and often the “creative destruction” of knowledge helps the introduction of new knowledge in the economy. Forgetting, for example, through the closing-down of activities, organizations, and firms is an integrated part of the processes of learning and innovation. It is often difficult to handle in practice, however, since it usually affects the distribution of employment, income, and power. This may lead to conflicts which tend to restrain learning and innovation.

The fast rate of change in the learning economy incessantly creates conflicts; consequently, there is a need to develop institutions which cope with these conflicts and make “creative forgetting” easier. Social and distributional policies need to pay attention to the distribution and redistribution of learning capabilities. It becomes more and more difficult to redistribute welfare, ex post, in a society with an uneven distribution of competence. There is a need for policies and institutions that give people, firms, and regions with weak learning capabilities adequate help to upgrade their competences (Lundvall 2001).

Of course, forgetting is not always “creative.” Much economically useful knowledge is regularly lost when educated individuals are unemployed or otherwise prevented from upholding or developing their competences

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<sup>5</sup> Chapter seven in this book provides a study of similarities and differences between the labor markets in selected Central American countries.

over extended periods of time. Knowledge is also “unproductively” lost when transnational firms move R&D activities from developing countries to the North. To prevent or at least retard this process is also a challenge which calls for institutional learning. There are many ways in which institutional learning and innovation may hold back harmful de-learning. Technological service systems, support systems for entrepreneurial activities and upstarts of new firms, and support for firms to hire unemployed people with higher education have been useful in some small countries in the North and may prove adaptable to the South, too. Educational efforts to improve language and communication skills broadly in the population would increase employment options and not only support interactive learning but also retard de-learning of competences.

There is a tendency towards polarization built into the learning economy, and in the long run, this may hamper learning and innovation capabilities if pro-active policies are not implemented. The distribution of the benefits and costs of economic development has become more uneven during the last decade, with the low-skilled labor force as the main loser (see OECD 1994). Inequality between rich and poor countries, as well as within many poor countries, has increased (UNDP 2003). In many developing countries there is a lack of capability for conflict management, negotiating, and consensus building. Such capabilities are basic components of a learning economy, and without new institutions to cope with these issues, developing countries may be unable to handle the requirements and challenges of the globalizing learning economy.

\* *Institutions Supporting Interaction and Cooperation*

Innovation is interactive and systemic—interactive in the sense that people, firms, and organizations usually

innovate in collaboration with others and not as isolated islands. Innovators use many sources of innovation, such as training, suppliers of capital goods, consultants, customers, conferences, trade fairs, and their own and others' R&D. The relative importance of the sources varies across sectors, but everywhere they interact and lead to synergies. In some sectors (for instance, pharmaceuticals) and for some firms (for instance, large research-intensive firms), there are strong links to the science system and the knowledge infrastructure, in others (for instance, furniture) the links are much weaker.<sup>6</sup> The relations among departments in firms, among different firms and organizations, between the business sector and the science sector and between private firms and government agencies (e.g. the interactions within the system), form processes in which new knowledge is created. Systemic here means that innovation capability cannot be adequately understood at the level of the individual firm or organization. It depends on interactions and feedback within the organizational and institutional set-up of the economy. That territorial and sectoral clusters and long-term relations between firms are important for innovation capability is a reflection of this.

The interactive and systemic character of innovation implies that institutions fostering collaboration, dynamic linkages, and networking are crucial for stimulating learning and innovation capabilities. In this perspective, innovation system building is to a large extent a question of promoting collaboration, linkages, and networking. Learning is a social process; and the formation of common habits, routines, established practices, rules, or laws—in other words institutions—regulating patterns of interaction are decisive.

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<sup>6</sup> On the sector level, the picture is, of course, more diversified. For instance, agriculture does, on the one hand, rely strongly on the knowledge infrastructure in relation to the developing of new types of crops, but, on the other hand, most farmers do not have strong direct collaboration with the science system.

Experiences from organization studies tell us that bureaucratic and hierarchic organizational forms often hamper internal and external communication and mutual learning, whereas flatter and more organic forms are often more suited to support flexibility, openness for new ideas, and interactive learning. However, since organizational structures and cooperation forms are embedded within a broader socioeconomic context, reflecting both historical and cultural trajectories, establishing and maintaining formal and/or informal innovative cooperation and networks among central actors is evidently a long-term process, which may be quite difficult to establish and maintain.

Regardless of whether such innovative co-operation or networks are supported by formal arrangements, such as R&D contracts, joint ventures, ownership or “clans”, or only rely on informal relations, trust is an important ingredient, which in turn develops on its own through interaction and cooperation. Trust is a complex concept referring to different kinds of expectations and beliefs which agents have regarding each other’s intentions, actions, and revelation of information. If there is trust between the parties, they will interact and cooperate better in many long-term processes of interactive learning. There is always a risk that individuals or firms may try to appropriate for themselves as much as they can of the fruits of long-term cooperation among several firms. Without trust, R&D cooperation may be practically impossible.

It may be difficult, then, to develop learning and innovation capabilities in societies characterized by conflicts and low trust. Trust is not a scarce commodity in the traditional sense, but since it, like knowledge, tends to grow when used and to erode when, misused or not used at all, it is possible to get trapped in a condition of low trust. This seems to be the case in many developing countries, which often have a very uneven distribution of income, wealth,

and power. There also tends to be very little cooperation between the government sector and private interests, and the relations that do exist may be tainted by corruption. This is not a good environment for institutional learning and policy learning, and may be the deeper reason why so many problems in the public-private interface remain unsolved even when there is no lack of resources or competence in a traditional sense.

Within economics, it is normally assumed that instrumental rationality dominates the scene. Economic transactions in the form of single, isolated exchange acts in a capitalist environment also tend to depend on behavior corresponding to instrumental rationality. However, when we take into account the importance of interactive learning, it is no longer the only relevant kind of rationality. If instrumental rationality were completely dominating the behavior in all types of learning situations, including when engineers from R&D-labs belonging to different firms cooperate, very little learning would take place. Innovation systems in which communicative rationality plays a major role in activities related to learning and innovation in the private sector may, therefore, be better off in the long run.

#### **4. Nurturing “Interactive Learning Spaces”- Examples from Costa Rica**

In a crude way, we may define a learning society as a society:

- where learning, creativity, and innovation are valued;
- where investment in education and possibility for life-long learning are given high priority;
- where time and other resources for learning and innovation are available;

- where interaction, co-operation, and knowledge synergies among people, organizations, and disciplines are stimulated;
- where participation is encouraged by giving learners voice and legitimacy in decision-making;
- where learning opportunities are created and shared equitably among all citizens; and
- where processes exist for a socioeconomic sustainable distribution of the values created, including institutions and policies to compensate victims and handle conflicts related to structural changes and “creative destruction of knowledge.”

*reworded*

Although referring to different analytical levels, these characteristics of a learning society are similar to those of “learning organizations”, “learning cultures”, or what Arocena and Sutz call “interactive learning spaces”; that is, spaces: with a “gathering of different people, knowing different things, that interact in the search for solutions to problems and, in so doing, learn, that is, acquire new knowledge” (Arocena and Sutz 2004: 8). It is clear that fostering a learning society or a learning culture or creating and maintaining interactive learning spaces is a complex, long-term process calling for a multifaceted group of instruments with a synergy between bottom-up and top-down policies.

The overall picture is that most countries in the North are moving rapidly towards a learning society, while most countries in the South are not only lagging behind but are also losing momentum compared to the North. With this in mind, both the formation of forest-based eco-markets and the creation of the National Biodiversity Institute (INBio) in Costa Rica are constructive examples illustrating the comprehensive package of institutions involved in the process of creating new areas and maintaining existing

interactive learning spaces related to sustainable development. These two cases are, of course, not prescriptive, but they illustrate and stress that the promotion of innovation systems in the South, to a great extent, builds on institutional learning. In particular, these two cases seem to indicate that the planning and implementation of learning supporting institutions has to be done both from a top-down and a bottom-up perspective, and that both internal (domestic) and external knowledge linkages need to be supported.

*The Case of Forest-Based Eco-Markets*

Eco-tourism, environmental management certification (for example, EMAS), recycling of by-products turning waste into valuable products, carbon sequestration, water resource protection, and bio-diversity protection are all examples of products and services in an emerging “eco-market.” The creating of forest-based eco-markets is an interesting case showing how interactive learning spaces may be nurtured. There are many ingredients in this process, but the following seems to be among the most important:

First, there was an obvious, visible problem: “something more” needed to be done to stop the increasing deforestation. During the 1960s and 1970s, Costa Rica experienced steady deforestation—mainly due to increasing agricultural activities. In 1950, 72 percent of Costa Rica’s land was natural forest; in 1983, the number declined to 49 percent; and in 1994, to 35 percent.

Second, the political and socioeconomic climate was appropriate. Since the 1970s, there has been an increasing environmental awareness combined with a rising acceptance of the idea that nature has a value in itself, and also that eco-tourism could be a more attractive and sustainable source of income than timber and farming requiring extensive land use. As a consequence, policies began to



change towards reforestation, conservation, and management of natural resources. Various laws and regulations were passed to stimulate reforestation by economic incentives, such as Income Tax Deduction (1979), Soft Credits (1983), Forest Payment Titles (1986 and 1998), Forest Management Payment Titles (1996), Forest Conservation Certificates (1996), and Funds for Forest Development (1998) (Segura 1999).

Third, a legal framework to create and regulate the new market related to Payment for Environmental Services was implemented. The 1996 Forestry Law (No. 7575) created a totally new kind of incentive by giving forest owners the possibility of requesting Payment for Environmental Services (PES) for their forest. The law established four key forest commodity services: a) mitigation of greenhouse gases (fixation, reduction, sequestration, and storage); b) watershed protection; c) protection and development of the biodiversity; and d) the protection of natural forest ecosystems with especially beautiful scenery or of particular interest (Art. 3, K).

Fourth, incentives to stimulate learning and innovation including compensating de-learning costs were provided. Economic incentives made it interesting for the forest owners to stop cutting down the trees and opt for various commodified forest services instead. The 1996 Forestry Law empowered forest authorities to make contracts with landowners and pay them for providing the society with these services as long as they complied with the requisite of presenting a forest management plan signed by a licensed forester. The compensation to the private landowners could be given either for maintenance of primary forests, establishment of forestry plantations, or forest management.<sup>7</sup>

<sup>7</sup> From 1997 to end of 2000, the PES program included more than 250,000 hectares of private landowners (nearly 5 percent of Costa Rican territory). Forest protection

Fifth, knowledge-sharing links were established among key actors (or “stakeholders”) such as forest owners, conservationists, civil servants, local communities, NGOs, research and education institutes, and policy makers. Although the legal framework is most often a top-down process, the success of PES implementation has depended heavily on the active participation of the local communities in forest protection, management, and plantation.

Sixth, financial resources were provided both from national and international sources although not to a sufficient degree and tempo according to some critical voices. The National Forestry Finance Fund (FONAFIFO) operates with funds provided by international donors and the national government, for instance, from taxes on fossil fuel consumption.

The payment for forest services has prepared the ground for a new learning space based on local assets and institutional capacity building. Payment for Environmental Services is still a relatively new idea. It has not yet been utilized widely, and many possible applications probably remain to be developed and tested. However, it is also quite controversial since environmentalists often regard the commodification of nature with much skepticism. It is still much too early to make conclusions regarding its potential, but the idea of payment for environmental services clearly illustrates that institutional learning is a vital part of the development of new resources and learning spaces.

#### *The Case of INBio*

The Costa Rican National Biodiversity Institute (INBio) is a non-governmental, non-profit, public interest organization established in 1989. The overall purpose of

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accounted for 85 percent of this land, forest management, 9 percent; and plantations, 6 percent.

INBio is “to promote an enhanced awareness of the value of biodiversity to achieve its conservation and improve the quality of human life” ([www.inbio.ac.cr](http://www.inbio.ac.cr)). This implies generation, organization, and dissemination of knowledge and information about biodiversity, in order to promote a sustainable use of biological and genetic resources. At the moment INBio’s main activities include the following: inventory and monitoring of diversity, conservation, communication and education, biodiversity informatics and bio-prospecting. INBio’s activities are principally financed by donations from international (and, to a lesser extent, national) governments and NGOs. Private business or institutions provide for 15 percent of the budget.

The Biodiversity Prospecting program is one of the key activities of INBio, aiming at promoting innovation, learning, and an increase in national scientific capacity.<sup>8</sup> The bioprospection processes are carried out in conjunction with research centers, universities, and national and international companies. These projects involve the location, detailed description, and collection of biological resources (plants, insects, mollusks, fragrances, microorganisms, and in some cases, genetic material of the latter). The activities are carried out in Costa Rica’s protected wildlife areas in close collaboration with the Ministry of Environment and Energy (MINAE) and through a formal agreement. Extracts prepared from the samples collected are tested for biological activity in several national and international laboratories. The components are then analyzed to determine their potential usefulness in pharmaceuticals, cosmetology, agro-industrial, and biotechnological industries.

The idea is that these networks of associations make state-of-the-art technologies available for Costa Rica and

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<sup>8</sup> Bioprospection is the search for new sources of chemical compounds, genes, proteins, microorganisms, and other elements existing in biodiversity which possess real or potential economic value.

provide the opportunity to train Costa Rican scientists as well as laboratory and field personnel. Another intention is that these collaborations and agreements generate financial resources to be used to fund Costa Rica's conservation activities and other INBio activities including further research projects. Since 1991, several agreements have been made with public research institutions and commercial entities. Among the latter are large multinational companies as Merck & Co. and Eli Lilly and Co. ([www.inbio.ac.cr](http://www.inbio.ac.cr)).<sup>9</sup>

Learning how to negotiate and use intellectual property rights as a tool for getting access to strategic alliances in order to promote technology transfer and better use of natural resources is an important challenge for developing countries. This form of combined institutional learning process—including the development of the legal framework for these agreements and the training and experience in negotiation, implementing, and controlling the collaboration and agreements—is also part of the INBio strategy. However, it is a complex issue to assign value to the accumulated knowledge of biodiversity, the knowledge and technology transfer, and the enhanced capacity building.<sup>10</sup> It is incorporated in the agreements that if the bioprospection process leads to a successful product, INBio will obtain royalties. It is clear that this is a very difficult (if not impossible) and resource demanding activity to check up on in reality, not to mention the resources it would take to bring a large multinational company to court if a

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<sup>9</sup> From 1992 to February 1998, INBio conducted bioprospection agreements worth over US\$6 million. Out of this 1.2 million has been distributed to MINAE and the conservation areas and 3.5 million to investments and research expenses at INBio (Sittenfield et al. 2002: 212).

<sup>10</sup> For further discussion of these aspects, see for instance, Dedeurwaerdere (2003). The Convention on Biological Diversity (CBD) homepage ([www.biodiv.org](http://www.biodiv.org)), provides several case studies on access to genetic resources and bioprospection contracts.

suspicion of a contract breach occurs.<sup>11</sup> However, some success stories are emerging. Since the beginning of 2005, a small Costa Rican pharmaceutical company (Laboratorios Lison S.A.) has paid the first royalties to the National System of Conservation Area (SINAC) and to INBio ([www.inbio.ac.cr](http://www.inbio.ac.cr)).

Hitherto most of INBio's bioprospection activities have been concentrated on the development of pharmaceutical products, but new initiatives in other areas—for instance, agriculture—are in the pipeline. Another potentially important income source could be to make more value-added products instead of the lower market valued “raw” biological samples. Both diversifying into new areas and augmenting the value of the biological resources are important strategies in further learning and innovation capability building.

During the late 1980s and 1990s, Costa Rica developed a National Strategy for Biodiversity Conservation and implemented a set of national biodiversity laws. The Costa Rican conservation strategy is based on three interrelated steps: *Know, Save, and Use*. First, knowledge about biodiversity is a prerequisite. Second, valorization and attitudes of respect for all forms of life motivate action and conservation; and third, the strategy emphasizes a sustainable use of biological resources. These three elements are supposed to provide a virtuous circle related to the idea that people must know about and “value” the resources in order to conserve them, and they should also use them in order to “value” them. Therefore, increasing the knowledge

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<sup>11</sup> This specific “playing with the multinationals” has been one of the critical points and topics of debate about these types of agreements. One statement is that a country should not commodify its biodiversity and sell it to large multinational corporations (“biopiracy”). The counter argument is that it is better that these bioprospection activities are regulated since the multinationals will carry these activities out anyway: for instance, in other countries like Nicaragua similar biodiversity exists but is not regulated.

about the various species and their use in an everyday context is an important strategy to carry through conservation initiatives (Segura and Gregersen 2003).

Together with the Ministry of Public Education, INBio established a Biodiversity Education Program (ProEBi) in 1995 in order to enhance “bio-literacy” broadly in the society. In Vargas et al. (2002) bio-literacy is defined thus:

Bio-literacy is defined as an ongoing experimental learning process that allows the individual to value biodiversity, to adopt an ethic respectful of life and to assume responsibility in the management and conservation of all living things and their ecosystems with the purpose of promoting behavioral changes that favor a harmonious relationship with nature for sustainable human development.

Financial support has been provided by SIDA, INBio, World Bank, The Netherlands, and AECI. The ProEBi program includes a broad palette of activities: it provides students and teachers with knowledge generated by INBio; it encourages teachers to provide and promote biodiversity information in their community; it also encourages them to develop new educational materials and new interactive teaching methodologies on biodiversity, based on the philosophy of “learning to learn while having fun.”<sup>12</sup> In addition, the ProEBi program has contributed to the development of alliances and network with other institutions with objectives similar to those of INBio, such as environmental institutes and the Children’s Museum of the National Center for Science and Culture.

A pilot program was completed in 1999 and it has seen nearly 12,000 individuals participating in bio-literacy

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<sup>12</sup> An example of this philosophy is that three compact disks (CD-ROMs) for children have been produced since 1998: *The Tropical Rainforest*, *The Tropical Cloud Forest*, and *The Tropical Dry Forest*, all using interactive games to present information about forest types, characteristics of their species, and their interrelations.

activities, nearly 560 persons from rural communities attending cultural activities and special celebrations, and about 375 teachers participating in 25 workshops. A wide range of activities have taken place since the program began, and new initiatives are still being added, one of which is the opening of the recreational and educational complex INBioparque in 2000. The park is a model for natural exhibition of biodiversity, national parks, and different ecosystems in Costa Rica. The park receives an average of 3500 students per year, its aim being to increase biodiversity awareness and complement studies carried out in schools. Additionally, INBioparque has thousands of national and international tourists as visitors.<sup>13</sup>

The INBio case illustrates how learning and innovation capabilities related to sustainable development can be enhanced, although it has required a complex and resource demanding process. As in the case of forest-based eco-markets, the political and socio-economic climate was appropriate in the late 1980s to start an organization like INBio. It reflected the increasing environmental awareness evolving broadly within the Costa Rican society and among key external donor organizations. Nature was increasingly (re)acknowledged as something with an intrinsic value and, at the same time, as a potential source of future income. INBio is in many respects a learning organization that is gradually expanding and renewing its activity portfolio, including local R&D capacity building. The INBio case illustrates that with a combination of timing, committed key actors (both on the individual and organizational level), and adaptive institutions it has been possible to create and maintain an interactive learning space which may be the

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<sup>13</sup> In 2002, more than 55,000 people (students, tourists, organized groups, and families) visited INBioparque, more than 900 teachers received training associated with biodiversity, and nearly 3000 children attended various workshops on biodiversity. In 2003, the number of visitors increased to 82,000 people.

basis for various innovations related to bio-related products and services.

## 5. Conclusion

In this chapter we have taken as our point of departure three tendencies in development thinking: the increased focus on capabilities rather than resource endowments, the increased awareness of knowledge as a crucial resource in development, and the increased emphasis on the importance of institutions as the “root cause” of development.

As these two cases illustrate, many different institutions influence learning and innovation capabilities in relation to sustainable development. Some of these are market driven or market supporting institutions related to the ongoing globalization process. Examples include the creation and implementation of regulations such as the laws about Payment for Environmental Services that made commodities out of existing nature-given forest activities, or the intellectual property rights agreements related to INBio's bioprospection program. However, the many different institutions whose main purpose is to support human resource development and to stimulate interaction and cooperation are at least as essential for enhancing sustainable learning and innovation capabilities. Although the initial financial support from external donors was important in the start-up phase of INBio, that case clearly illustrates that improving learning capabilities in a country like Costa Rica is not only a question of channeling more resources into education and research areas; it is also a question of building and nurturing institutions that support interactive learning via domestic and foreign knowledge interaction and co-operation.

Besides the general illustration of the complexity of institutions involved in building sustainable learning and



innovation capabilities, what further main lessons may be learnt from these cases mentioned above? Firstly, it is interesting to notice that both cases are strongly related to life sciences and bioinnovations that are strongholds in Latin America. In that sense the cases show that a strong endogenous knowledge base is crucial for a successful implementation of innovation policies.

Secondly, these cases show that institution building, in relation to the creation of interactive learning spaces, involves a broad palette of institutions for handling potential conflicts in relation to the distribution of costs and benefits among the many different actors (state level, local community, forest owners, farmers, conservationists, NGOs, environmentalists, financial sector, domestic and foreign firms, research and education sector, etc.). It may be argued that in a Central American context, Costa Rica is a special case with a long tradition of solving conflicts democratically, and that this is a main explanation for the success achieved in these two cases. It is obvious that institutional learning and capability building based on user-involvement and dialog are more likely to sustain under such circumstances than in an environment of pure power manifestation. In that sense both cases demonstrate that building and implementing learning supporting institutions involves a combination of a top-down and a bottom-up process.

Thirdly, the cases illustrate that in order to initiate sustainable innovations in a broader context it is important to promote and protect spaces for public knowledge generation and to make room for an open discussion of the research agenda. The ongoing trend of privatizing knowledge—which is becoming increasingly persistent also in relation to life sciences and bioinnovations—may turn out to be contra-productive insofar as the long-term development of interactive learning spaces in Latin American is concerned. However, in the INBio case it may

also be argued that the intellectual property rights agreements aim at creating a more fair allocation of rights between the Costa Rican society and the foreign multinational actors. Finding the right balance between, on the one hand, the possibility to create and renew such interactive learning spaces for the long-term benefit of the developing countries and, on the other hand, the creation and maintaining of incentives for private and public, domestic and foreign organizations to invest in R&D activities in these countries is a very important institutional learning process, which deserves much more attention among policy makers and researchers than it has hitherto received.

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