

Knowledge Economy and Globalization

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Over the last decade, business, technology, and innovation have become globalized, leading to development of a global knowledge economy. This development is changing the roles traditionally played by advanced economies as well as by the emerging and developing economies. However, not all innovation comes from the advanced economies, nor are emerging and developing economies merely a source of resources. They are a true partner for collaboration and knowledge sharing.

This chapter discusses the new globalization and explores how it has been addressed by the Finnish innovation system. It highlights the need for new forms of collaboration both nationally and internationally.

Reasoning Behind: The New Globalization of Innovation

The early 2000s brought about sweeping changes in the global economic system, encapsulated in the concentration of high economic growth in developing countries and in plateaus and grinding financial problems in developed countries; inevitably, relationships between the two groups of countries began to change. Deep transformations in the nature, focus, dynamics, and geography of innovation processes, networks, and systems constitute key elements in this ongoing global transition, prompting incumbent innovation leaders, such as Finland, to reconsider their strategies and approaches to developing countries.

Two phenomena are motivating both developing countries and innovation leaders to forge new types of innovation cooperation. First is the recognition that *innovation plays an important role in development* and that a framework is emerging to guide how innovation systems can support broad-based development in the least-developed countries. While innovation has always been important for development, the adoption of a systemic approach to innovation is new (Lundvall *et al.* 2009). Second, *the emergence of a completely new type of pro-poor business model has recast the approach to low-income countries and people, who are now seen*

to have increasingly important global market potential. Here, too, a pro-poor framework has been established to understand how innovation and business models can and should address the needs of the poor (Prahalad 2010). Combined, these represent a departure from national internationalization strategies focused on off-shoring manufacturing or forging high-tech innovation networks. As such, they entail political, organizational, strategic, and practical challenges, particularly for traditional innovation leaders.

The term “new globalization” as used here recognizes the increasing importance of emerging and developing countries in international affairs, economy, culture, and innovation. It stands in contrast to the globalization that followed the end of the cold war and was characterized, among other things, by off-shoring of manufacturing from developed countries to the developing world and by financial deregulation and integration. That globalization was often perceived as a projection of developed countries’ global dominance.

Although it is difficult to pinpoint a single cause, the new globalization is essentially about the developing world being transformed from an object of globalization to a main actor. This proactive and increasingly important role of the developing countries and emerging economies themselves is transforming the processes of globalization and prompting many developed countries to revisit their globalization strategies and approaches.

The rise of the BRICS (Brazil, the Russian Federation, India, China, and South Africa), as well as other developing countries, is accompanied by a range of phenomena that have broad impact on both developing and developed countries as well as on their interactions. Of these, the relocation of global economic growth poles, the emergence of low-income market (or base-of-the-pyramid, BOP) business models, and innovation, as well as a deeper appreciation of the role of innovation in development, are critical in reframing the relationships between developing- and developed-country innovation systems.

Shift in the Sources of Global Economic Growth

There is little doubt that the global economic system is moving toward multipolar organization, as developing countries and emerging economies become the central sources of economic growth, and many of the rich countries are embroiled in a mix of economic stagnation and financial deficits. Demonstrating this transition, the World Bank (2011) argued, “By 2025, six major emerging economies—Brazil, China, India, Indonesia, the Republic of Korea, and Russia—will collectively account for more than half of all global growth.” Similarly, in its recent analysis of the medium- and long-range outlook for global economic growth, the Organisation for Economic Co-operation and Development (OECD 2012) concluded, “Growth of the present non-OECD economies will continue to outpace that of the present OECD countries, driven primarily by catch-up in multi-factor productivity, but the difference will likely narrow substantially over coming decades.”

At the heart of this transformation is the improved performance across the developing world, not only in the BRICS. Indeed, the United Nations’ *Human Development Report 2013: The Rise of the South* concluded that between 1990

and 2012, all but two of the 132 countries tracked “improved their human development status” and that “progress was particularly rapid in more than 40 countries of the South, whose increases in Human Development Index (HDI) value were significantly larger than predicted for countries that were at a similar level of HDI value in 1990” (United Nations 2013, 12).

Although this unfolding transition is reconfiguring much of the global system, of particular interest here is the future of developing countries. Creation of a multipolar economic world system will give rise to two specific trends. On the one hand, it could fuel knowledge spillovers between emerging economies and developing countries that could benefit agriculture and manufacturing in the latter. On the other hand, it implies tighter global integration, increasing the risks and challenges for developing countries that face difficulties in fostering workable global networks (World Bank 2011, 9–10). Yet integration into global systems has benefited developing countries. Analyzing why the global South has performed better in reducing poverty than ever before, the *Human Development Report 2013* concluded, “Almost all countries with substantial improvement in HDI value over the past two decades have also become more integrated with the world economy” (United Nations 2013, 74).

In this context, developing countries need to forge smart globalization strategies—that is, tighter integration into global networks that selectively support competitive advantages inherent in them. In this regard, developing countries have acquired another competitive advantage over the last decade: fast-growing, low-income markets for products and services.

With the poor less poor and some achieving modest middle-class status for the first time, developing-country populations constitute one of the fastest-growing markets in the world. However, they have such special needs and structural circumstances that a whole new category of business and innovation has emerged in response. Thus when it comes to innovation, the co-creation processes between innovation actors from developing and developed countries provide some of the greatest potential opportunities for global networks, disregarding traditional one-way traffic of North-South cooperation.

Policies for Internationalization

Although the public and private sectors that participate in the innovation system are closely interlinked, they extend internationally according to very different logic and principles. Since the early 2000s, Finnish policy makers have sought to devise policies and instruments to address these differences. Since 2000 the Science and Technology Policy Council (STPC), renamed the Research and Innovation Council (RIC) in 2009, has addressed internationalization as one of the key themes in its regular reviews and outlooks for Finnish innovation policy. In its 2003 review, the council identified the challenge of internationalization as twofold: “On the one hand, the Finnish system must be *able to compete*, ... and, on the other hand, Finnish players must be *able to enter and make use of the opening markets [italics in original]*” (STPC 2003, 15). Furthermore, the council argued that the innovation system is at the core of the overall internationalization

of Finland, calling for public policies to accelerate Finland's globalization and for incentives to encourage the international activities of the private sector.

While Finnish internationalization efforts in the 1990s and early 2000s sought to integrate with Europe's emerging research system and to strengthen links with U.S. innovation hubs, the focus shifted in the early 2000s, when the notions of "globalization" and "emerging economies" gained currency in public policy. An important impetus for the shift was a series of studies on globalization and its implications for Finland's competitiveness by the Prime Minister's Office (2004).

These studies documented how globalization was fundamentally altering the foundation of the Finnish economy. This included how the rise of emerging economies was changing global markets and demand as well as how globalization was altering the business and earnings logic of traditional Finnish export industries. The studies concluded that innovation and innovation policy should be placed at the center of Finnish globalization efforts, particularly in relation to the emerging economies. The efforts of Finnish information and communication technology (ICT) and machinery and equipment companies to enter the Asian, in particular Chinese, markets and to create an active research and development (R&D) base there intensified these conclusions (Ali-Yrkkö and Palmberg 2006).

The STPC reiterated the theme in subsequent policy reviews and recommendations. Its review in 2006 called for an enhanced presence in the emerging markets, particularly in China, Russia, India, and the new European Union (EU) member states, and pointed out that several activities along these lines had already been launched, such as the Finnish Innovation Center in China and the Asia Action Plan of the Ministry of Education (STPC 2006, 31). In subsequent years, the STPC continued to expand and intensify its international strategy and has placed more focus on the emerging economies.

The RIC's guidance for research and innovation policies in 2011–15 called for a national strategy in internationalization and identified the key change driving globalization as the rise of Brazil, China, India, as well as other African, Asian, and South American economies. The council called for reinforcing efforts to network and connect with innovation centers in the emerging economies (RIC 2010, 15). Indeed, whereas developing countries and emerging economies have traditionally played a relatively marginal role in the international dimension of the Finnish innovation system, recent years have seen a definitive shift in interest and possible activities. Several ministries, agencies, universities, as well as companies have actively explored the significance of these regions for Finland.

For practical implementation of Finland's internationalization strategy, which involves geographic orientation, choice of instruments, and cross-ministry coordination, these high-level policy reviews and guidance have played a critical role. The Prime Minister's Office, as well as the RIC, chaired by the prime minister, has worked to consolidate policy views into a broader framework of action for Finnish globalization efforts. At the heart of this framework has been the distinction between public and private sector globalization, and policies have explicitly sought to activate and enable the internationalization of companies. This division of labor, or objectives, has also been evident in the work of ministries and

agencies, as they have devised practical instruments and programs in support of Finnish internationalization.

New Globalization, New Forms of Collaboration

The new globalization has entered the sphere of development policies, which has affected its underlying objectives and operational models. This section looks at the opportunities and challenges of globalization for Finnish innovation and development policies and describes the recent activities that have been undertaken.

“Discovering” the Emerging Economies and Developing Countries

The rise of developing countries and emerging economies in the globalization strategy of the Finnish innovation system has sparked several organizational and strategic changes that are still unfolding. This reflects in part the recognized role of developing countries and emerging economies as the key sources of global economic growth in the postcrisis world, but also the maturation of R&D-related relations between them and Finland. The 2009 evaluation of the Finnish innovation system argued that the “rapidly changing geography towards developing countries” should motivate Finland to move beyond its historical internationalization strategy and reach emerging economies and developing countries more effectively (Aiginger, Okko, and Ylä-Anttila 2009, 131).

However, given that the Finnish internationalization strategy and organizations for its implementation were built for very different purposes, there are also challenges. While large Finnish companies have actively forged global innovation networks, particularly in China and the rest of Asia, Finland is a latecomer. Indeed, compared with the international research collaboration networks of Africa or Brazil, Finland’s interactions are still weak, despite recent efforts (Toivanen and Ponomariov 2011). From the perspective of innovation policy and system development, Finland is only now beginning to forge substantial relations with the developing countries and emerging economies.

The international dimension of Finland’s innovation system has always reflected its internal phase of development as well as the broader international context. For this reason, it has passed through successive, overlapping phases. Access to the major European R&D programs and organizations since the mid-1980s marked the beginning of Finland’s internationalization and continues today. Access in 1985 to Eureka, the European Economic Community’s industrial R&D cooperation program, followed soon by the European framework agreement on research cooperation as well as membership in the European Laboratory for Particle Physics, marked a definite orientation toward the innovation system emerging in Europe, a development strongly reinforced by Finland’s 1992 entry into the EU.

Whereas these developments integrated Finland into the European research and innovation system and laid the foundations for the national system, subsequent choices and strategies have approached the internationalization of science,

technology, and innovation (STI) in a more instrumental and utilitarian way. With the big questions solved, policy makers and industry leaders have evaluated international activities with the objective of improving the national innovation system, the country's economic competitiveness, and the ambition to forge a stronger role in the global innovation landscape, including improved relations with the developing countries and emerging economies.

New Forms of Collaboration within the Finnish Innovation System

Since about 2010, Finland has sought to reposition its innovation system better in regard the global growth markets in emerging economies and developing countries. Although an umbrella framework for internationalization exists, various Finnish actors and organizations of the public innovation system forge their strategies and activities independently. Many of the sectoral ministries set up specialized internationalization agencies, units, or task forces a relatively long time ago, creating some legacy issues as the nature of Finnish internationalization has changed. Thus a wide variety of activities reflect the interests and capabilities of different organizations. Consequently, there is a relatively high degree of specialization, and some organizations have placed much more emphasis on emerging economies and developing countries than others.

Naturally, the Ministry for Foreign Affairs, the Ministry of Education and Culture, as well as the Ministry of Employment and the Economy (MEE) share responsibility for internationalizing the Finnish innovation system. Key government agencies that fund and create the enabling infrastructure for internationalization include Tekes (the Funding Agency for Technology and Innovation), the Academy of Finland, Finpro (the national trade, internationalization, and investment development organization), the Technical Research Centre (VTT), and the National Fund for Research and Development (Sitra). In addition, other public actors are involved: universities, polytechnics, regional development associations, and the strategic centers for excellence in STI (SHOKs).

Recently, these ministries and agencies have recognized the need to facilitate the internationalization of small and medium companies, as well as the converging interests in higher education, research, innovation, and trade. Indeed, so many organizations are implementing international activities in emerging economies and developing countries that several government task forces and initiatives have been established to improve coordination and cooperation over the last couple of years. Of these initiatives, perhaps the most significant is Team Finland, a network established jointly by the MEE, the Ministry for Foreign Affairs, and the Ministry of Education and Culture to promote external economic relations, internationalization of companies, and so forth (described in box 8.1). While still to be formed, it will function as a broad umbrella to coordinate different types of activities, including the globalization of innovation in developing countries.

Bottom-of-the-Pyramid Markets

The concept of "bottom of the pyramid," coined by C. K. Prahalad in his seminal book, *The Bottom of the Pyramid*, is premised on the observation that some

Box 8.1 Team Finland and FinNode

Team Finland brings together publicly funded activities. It has four main objectives: to support internationalization of businesses, to influence the external environment, to promote foreign direct investment in Finland, and to promote Finland's country brand.

Projects are carried out in cooperation between state and private actors. State actors consist of three ministries—the Ministry of Employment and the Economy, the Ministry for Foreign Affairs, and the Ministry of Education and Culture—and their publicly funded bodies in Finland and abroad. Abroad, more than 70 teams represent the Team Finland network. Publicly funded actors make up the core of the network, but cooperation with enterprises and universities is seen as highly important.

An important instrument for globalizing the Finnish innovation system has been the build-up of the FinNode Innovation Center network (recently reorganized under the name of Team Finland Future Watch, administered by Tekes), a direct outcome of the globalization studies conducted by the Prime Minister's Office. The FinNode network is charged with opening up markets and innovation systems for Finnish actors, attracting foreigners to Finland, and disseminating information about the Finnish innovation system.

Founded by the key innovation government organizations—Tekes, Finpro, the VTT, Sitra, and the Academy of Finland—the network was launched in 2005 with the inauguration of its first center in Shanghai, China. The network also includes centers in India, Japan, the Republic of Korea, the Russian Federation, and the United States. Besides its official funding organizations, the network relies on extensive domestic and global stakeholders, including the Confederation of Finnish Industries, the strategic centers for science and technology, universities, polytechnics, regional development companies, and professional associations.

The network seeks to bypass possible organizational legacy issues by spearheading new approaches to internationalization. Each center has a highly specialized focus on innovation and small and medium companies, working with research communities and innovative companies in particular. While the network has been regarded as something of a success and its expansion, say into Brazil, has been discussed, recent economic pressures have prevented this.

FinNode India in New Delhi aims to bridge Indian and Finnish innovation communities, including universities, research institutes, large firms, start-ups, co-creation hubs, final users, and consumers. Its main areas of focus are clean technology (renewable energy and clean water), education and learning, health care and well-being, as well as bottom-of-the-pyramid markets. The center caters to almost 100 Finnish firms active in India as well as to Indian firms interested in working in Finland. Finnish-Indian research cooperation is relatively modest, but an important part of the center's activities and focus. For additional information, see the Team Finland Future Watch website (<http://www.tekes.fi/ohjelmat-ja-palvelut/kasva-ja-kansainvalisty/team-finland-future-watch/>).

4 to 5 billion global poor are “unserved or underserved by the large organized private sector” (Prahalad 2010, 6). The BOP business model framework that has ensued seeks to improve the livelihoods of this consumer group by activating the profit motive of the private sector; as Prahalad put it, “Our goal should be to build capacity for people to escape poverty and deprivation through self-sustaining market-based systems” (Prahalad 2010, 8).

The BOP, in combination with developments such as microfinance, caused a sea change in the approach to poverty alleviation and low-income markets in the early 2000s. Whereas the private sector and “tied interests” were the traditional sore spot of development cooperation and global poverty alleviation efforts, the BOP helped to reinvent the role and meaning of the private sector as something that works more efficiently than government and, perhaps more important, addresses the issue of aid dependency. This, of course, requires a completely different approach and business model from the private sector too.

The BOP has reinforced the global “discovery” of low-income markets and their global importance. Going beyond corporate social responsibility and donor-funded demonstration programs, successful BOP companies and notable cases, such as M-Pesa (Foster and Heeks 2013) and Tata’s Nano car (Wells 2013), have demonstrated the market’s global business potential (for other success cases, see Hart 2010; Prahalad 2010). After these and other successes, companies from everywhere should be seeking ways to develop and introduce technologies, products, and services to the BOP market.

Despite its attractiveness, there are several barriers to entry into BOP markets. First, the global BOP sector is huge and diverse, and no single definition can do it justice. As Prahalad (2010) noted, “For those who want to engage in this opportunity, there is no single universal definition of the bottom of the pyramid that can be useful.” BOP markets are highly diverse and differentiated in their local aspects, undermining attempts to scale up business models across countries. Another key barrier is insufficient market information about different BOP markets and their key constituents.

While other barriers exist, such as regulation, finance, and infrastructure, the diversity of global BOP markets and need to understand them more deeply are of particular importance in the context of the networks comprising developing and developed countries (Ramani, Sadre, and Geert 2012). Successful BOP cases typically involve sensitivity to local culture and social institutions, often realized through intermediaries who channel user and consumer feedback to developers and who introduce and spread the new services and products in user communities through social mediation, training, or other forms of capacity building. For example, Ramani, Sadre, and Geert (2012) describe the case of comprehensive pre- and post-delivery training and capacity practices followed by Indian sanitation entrepreneurs as they diffuse the Sulabh and Ecosan latrines in the Indian BOP markets.

Successful development of technologies, products, and services for the BOP market necessitates a solid understanding of the structural conditions of developing-country markets as well as the diverse social and cultural factors shaping the uptake of new innovations.

Most recently, the Ministry for Foreign Affairs and the MEE have launched a joint task force development group to explore the possibilities to foster inclusive innovation and business cooperation between Finnish and developing-country organizations as well as to improve coordination between other Finnish initiatives (box 8.2). The task force group broadly engages relevant stakeholders in developing funding and other services, including actors in the field, public agencies, enterprises, nongovernmental organizations (NGOs), research institutions, and universities. The results of this work were published in December 2013. The group proposed setting up a new program and fund for supporting innovation and business in developing countries.

Box 8.2 Advancing BOP Business

One particularly potent area in the new globalization has been the base-of-the-pyramid business model, which is particularly suited to small and medium enterprises (SMEs). It fosters the activities of a new population of firms, as large companies have been responsible for much of Finland's globalization (Halme and Lehtonen 2012).

In particular, Tekes has been funding research exploring the possibilities of BOP business, developing-country, and co-creation models. A series of research projects has explored the nature of BOP markets, structural shifts in the global innovation landscape, and the nature of developing- and emerging-country innovation systems, often carried out by the Aalto University or VTT. Moreover, Tekes has included Africa, Brazil, and India in its programs, with its information and communication technology (ICT), medical instrument, and bio-energy programs undertaking activities in these countries. Tekes's renewable energy program Groove has addressed internationalization and generated a wealth of information and material about the business and innovation possibilities in Africa, Asia, and Latin America, including targeted projects to network small Finnish companies with African counterparts. For more information, see the Tekes Groove website (<http://www.tekes.fi/ohjelmat/Groove/Aineistot>).

In addition, Finpro has initiated several projects exploring business and innovation opportunities in the developing countries and at the base of the pyramid. An important recent project was the Africa project implemented during 2010–11 by Finpro, which sought to raise Finnish awareness of opportunities in Africa for Finnish SMEs. For more information, see the Finpro, Africa project website (<http://www.finpro.fi/web/english-pages/africa>). Another project addressed BOP mobile ICT business and was closely aligned with the InfoDev's Creating Sustainable Business for Knowledge Economy, which was supported by the Ministry for Foreign Affairs.

This string of projects exploring developing-country and low-income market opportunities still continues, the latest one being Finpro's Weconomy Project, which offers tailored business development services for companies interested in BOP markets. See the Finpro Weconomy Start website (<http://www.finpro.fi/web/english-pages/weconomy>). Networking at the institutional level also continues, as the Ministry for Foreign Affairs and the Ministry of Employment and the Economy are collaborating with the World Bank on its Inclusive Innovation India Project.

Best Results through Joint Doing and Learning

Recognizing the importance of emerging-economy and developing-country innovation systems for Finland in the early 2000s, innovation policy makers faced two practical challenges. First, within the official public innovation system there were hardly any capabilities or expertise about what innovation is either in low-income markets or in developing countries. Second, there were no explicit policies or refined instruments in support of innovation aimed at developing-country markets or BOP markets in general. Yet a small nucleus of such expertise was being formed in a series of innovation and ICT-focused development cooperation programs funded by the Ministry for Foreign Affairs (Ainamo and Lindy 2013).

The learning and experience gained about innovation in developing countries have played an important role in the new globalization approaches of the Finnish innovation system since 2010, and policy makers have found practical solutions for forging new innovation partnerships between developed and developing countries.

Framing Development and Innovation

Finnish development programs that focus on knowledge, skills, innovation, and ICT for development commenced in the late 1990s and the first decade of the 2000s. By and large, this cluster of programs was created within the confines of development cooperation, and it did not attract systematic interest or support from government agencies until the early 2010s.

An important watershed in the approach to innovation and ICT in Finnish development cooperation occurred in 2004, when the themes of information society (IS) and communications technology emerged as a distinct sector in Finnish development policy (Ministry for Foreign Affairs 2004). The following year, the ministry issued “Development Policy Guidelines for ICT and the Information Society,” which broadened the Finnish approach to include the concept of knowledge society (Ministry for Foreign Affairs 2005). The guidelines made explicit the departure from an infrastructure- and technology-focused IS, emphasizing the key objective of using ICTs to generate society-wide impacts. “Access to information, knowledge, and human welfare,” the guidelines argued, were fundamental to all development issues.

The 2004 and 2005 development policy guidelines exemplified a solid understanding of how innovation unfolds and matters in developing countries. At the time, these conclusions were confined to development policy and not considered a part of innovation policy. They did, however, embody an important learning and stock-taking exercise that would eventually affect innovation policy as well. Development policy processes not only created expertise, but also directly funded programs that trained Finnish experts to understand and carry out innovation in developing countries. In addition to conceptualizing an IS and declaring its importance for development, the guidelines provided practical examples and recommendations on how to achieve this in fostering cooperation with developing countries. National poverty reduction strategies should make headway

employing ICT as well as move broadly to benefit from IS strategies. In fact, according to the guidelines, “Partner countries receiving sectoral and budget support must also pay due attention to the mainstreaming of activities linked with the IS in development consultations” (Ministry for Foreign Affairs 2005, 13).

Establishing Capabilities in Developing-Country Innovation Systems

A wave of ambitious Finnish programming in the area of IS and STI took off in the closing years of the 1990s and expanded steadily throughout the early 2000s. Whereas Finland had previously supported these areas mainly through infrastructure programming, if at all, the Ministry for Foreign Affairs launched a series of programs that embodied practical learning about how to implement development cooperation focused on IS, ICT, and STI. The projects emphasized strategy, management structures, and leadership skills more than technological solutions per se, such as e-learning and e-health. In a sense, this set the Finnish approach apart, because at the time technological solutions often dominated project frameworks.

These programs generated a wealth of hands-on experience about innovation in developing countries, practical cooperation models between them and Finland, as well as understanding of the importance of public-private partnerships for innovation. They also created a growing pool of experts who could begin to influence Finnish innovation policy making. In this sense, they continued the tradition of earlier years, in which overseas development assistance investments in forestry or in health and education created a pool of experts in these domains.

Perhaps the most important initiative in this regard was a series of bilateral programs focused on ICT and innovation systems in South Africa—COFISA, INSPIRE, SAFIPA—totaling around €10 million in funding from Finland and substantial contributions from the South African government (Valjas, Farley, and Finlay 2010).

This cluster of programs functioned as a learning platform for both South Africans and Finns, and the project included an ambitious component of African and global dissemination. On the one hand, the programs strengthened nascent knowledge economy institutions and capacities in South Africa; on the other hand, they constituted a nexus of learning by doing about how to implement ICT- and innovation-centered development cooperation.

The programs were initiated at the request of the South African government, which had identified the strengthening of knowledge economy institutions as an important national development objective and then turned to Finland for advice and support (Government of South Africa 2002). The South African request for partnership arrived at a time when Finland was including ICT and innovation issues in its developing cooperation policy, thereby allowing for relatively quick funding, expertise, substantial programming, and learning by doing.

Running for about a decade, the program cluster created thematically and geographically the most substantial and distinct knowledge economy cluster in Finnish development cooperation thus far and ranks internationally as an important accomplishment. More important, it demonstrated to the South African

government, the Ministry for Foreign Affairs, as well as South African, Finnish, and other stakeholders the advantages and challenges involved in a North-South learning exercise in building an innovation system.

The program cluster introduced a range of new instruments, intervention practices, organizations, and people into Finnish development cooperation. In particular, it fostered concepts such as user-driven innovation, co-creation, and living labs (box 8.3), which aimed to empower local people and users to shape technologies and innovations as they were being created. This type of activity, applied in this program cluster as well as in other Finnish-funded ICT and innovation programs, generated awareness about how to develop and introduce technology and innovations in developing countries and enabled local champions to do it instead of international experts.

Box 8.3 COFISA: How to Collaborate with Finland?

The collaboration between Finland and developing countries is based on *national agreements*. These agreements create and facilitate the framework for collaboration (including projects) and are drafted prior to start of the program. Outside of these frameworks, other individual projects and initiatives exist at the level of organizations, nongovernmental organizations, and enterprises.

Typically the agreements produce *targeted collaboration programs*. Traditionally these programs have been sectoral (that is, focused on specific sectors, such as agriculture or health care) and sometimes very narrowly defined (for example, gender equality).

One example is the Cooperation Framework on Innovation Systems between Finland and South Africa (COFISA), which was developed jointly by the government of South Africa, through the Department of Science and Technology, and the government of Finland, through the Finnish embassy in Pretoria. COFISA sought to enhance the effectiveness of the national system of innovation, thereby contributing to economic growth and poverty alleviation. COFISA focused on supporting innovation at the national, provincial, and rural levels as well as specifically in Sub-Saharan Africa. Some of COFISA's activities included provincially based forward planning (foresight) exercises in three target provinces (Gauteng, Western Cape, and Eastern Cape), focused on innovation and then on biotechnology.

Several *operational projects* fell within the program's framework. In COFISA, these included support for the development of science parks through awareness creation and feasibility studies and support for living labs to promote open user-driven innovation in rural information and communication technology services and applications. For example, the Siyhakhula Living Lab (SLL) in Eastern Cape was initiated by the University of Rhodes and the University of Fort Hare at the end of 2002 and was catalyzed in 2008–09 by COFISA. SLL has been pioneering new approaches to co-creation and user-driven innovation in Africa and has devised extended methods to involve and empower new user groups. Since its beginning, SLL has strived to advance innovation that benefits poor and marginalized groups, paying increasing attention

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Box 8.3 COFISA: How to Collaborate with Finland? *(continued)*

to social innovation, rural populations, grassroots innovation, and more broadly to employing technology and innovation to empower disadvantaged people. As such, SLL has been instrumental in introducing and, indeed, creating co-creation practices in the context of rural South Africa.

COFISA's role as a catalyst for SLL enhanced its transformation into a recognizable living lab. An important component was the strengthening of SLL's link to the provincial system of innovation and its role in technology, EL Techno Park. Within COFISA, SLL seeks to provide "grounded and instrumented experimentation space" and to open commercial channels for innovation. Furthermore, SLL has been building a regional network of living labs and working within South African and international networks. COFISA strengthened its links to the Meraka Institute and established an association with the emerging living labs in the Southern Africa Network, also supported by COFISA, and the European network of living labs.

The Institutional Cooperation Instrument is an example of organization-level collaboration between higher education institutions in Finland and in developing countries. The Ministry for Foreign Affairs uses it to finance capacity development in higher education institutions. The aim is to strengthen developing-country higher education institutions by enhancing their administrative, field-specific, methodological, and pedagogical capacities through collaboration projects. The overall objective is to support higher education institutions in contributing to the development of society, to build competencies consistent with national development goals, and to contribute to achieving inclusive sustainable development and reducing poverty.

For additional information, see James (2010, 82–85) and the SLL website (<http://siyakhulall.org/>); higher education institution ICI website (http://www.cimo.fi/programs/hei_ici).

Observations from the case:

- The role of partners and the content of collaboration should be integrated thoroughly into the contract. Collaboration requires long-term commitment from a broad range of stakeholders.
- Programs should be seen as a coordinated and systemic set of complementary measures leading, step-by-step, toward common strategic ends. Instead of trying to fit existing solutions to other countries, all programs and projects should be based on an assessment and understanding of each country's situation and policies and planned from the bottom up.
- As part of larger coordinated programs, living labs, with their reasonably light structure, can foster multidisciplinary, open innovation when implemented well.
- Challenges may arise in implementation. In these cases, it is important to focus on the learning process itself rather than on concrete results.

Perhaps the most visible Finnish contribution to global ICT and STI programming is the World Bank's InfoDev Program, which seeks to foster ICT entrepreneurship and innovation in developing countries. This program typifies the possibilities and practical management of public-private partnerships in support of innovation in developing countries. In Finland, knowledge partnerships focused on mobile applications, private sector development, and direct involvement of

the private sector, most notably the Nokia Group. Nokia contributed to the business and innovation expertise of the program and helped to build up its incubator and small and medium enterprise support activities. As defined in the program document, Nokia was expected to be “providing market and technology expertise to the mobile applications concepts and labs, for instance, through providing managers on secondment and a role on the advisory board; providing content for training courses to mobile entrepreneurs at Nokia’s regional research centers; suggesting applications that could be profitably tried at the mobile applications labs; and assisting in developing social networking hubs in selected African cities” (Ministry for Foreign Affairs 2009). InfoDev collaboration enabled the Ministry for Foreign Affairs to access a global network of professionals and knowledge at a time when these capabilities were relatively scarce in Finland. Yet the program also illustrates some of the difficulties involved in developing public-private partnerships in a sector characterized by radical technological upheavals: Nokia’s wholesale abandonment of its Symbian platform in early 2011 in favor of the Windows platform has had a notable effect on early builders of the Symbian mobile application.

Summary and Key Messages

Since the early 2000s, the proliferation of emerging economies and developing countries as central sources of global economic growth is transforming their relationship with the developed countries, which remain mired in a mix of slow growth and financial problems. One central theme in this unfolding transition, called here the new globalization, is the increasing development of innovations aimed at low-income markets across the developing world. Facilitated by efforts to reconceptualize the role of the private sector in global poverty alleviation and to underscore its ability to leverage change and reduce aid dependency, a range of new approaches to developing business and innovation for low-income markets has emerged.

To succeed in creating and introducing innovations for and in the low-income markets, a deep understanding of highly diverse user needs and requirements is needed. For developing countries, this phenomenon may offer a new competitive advantage, which they can exploit by upgrading their national innovation ecosystems and capabilities, and foster a new type of global network with innovation leaders. For developed countries, the challenge is to reorient their traditional internationalization strategies and establish new types of innovation co-creation models with partners from the developing world.

The economic importance of emerging economies and developing countries as sources of global economic growth and hosts to market segments that are growing rapidly is recasting the process of globalization, including the relationships between innovation leaders and those catching up. The international orientation of countries changes gradually, but the transition inevitably involves broad processes. It is yet to be seen whether the increasing importance accorded to emerging economies and developing countries in the global reach of rich-country

innovation systems amounts to a substantial and lasting change, but an important turning point has been passed. Firms, universities, and governments around the world are placing great importance on the development of innovative products and services that can succeed in the global low-income market; they have realized that they must include the intended users in innovation processes.

The emergence of a new type of global innovation network presents specific opportunities and challenges for developed and developing countries, and both groups of countries need to adopt comprehensive public policy strategies in order to reap the benefits.

The incumbent global innovation leaders, such as Finland, must reevaluate their overall internationalization strategies and approaches and foster new policies, capabilities, and instruments enabling co-creation innovation and business models that extend between rich and low-income countries. This may involve targeting new populations of firms, such as the new emphasis on small and medium firms in Finland, generating a pool of experts in BOP business and innovation, and introducing new targeted instruments, such as the BOP activities within the FinNode network. Such strategies, approaches, and instruments will augment existing public policies in support of internationalization, not supplant them. For the time being, their weight will remain light in the context of a country's overall internationalization strategy.

For emerging economies and developing countries, low-income markets may gain a new competitive advantage. Firms, universities, and governments around the world are rushing to understand this market and to develop innovations that best serve its needs and preferences. It is essential that governments recognize this development and use it to leverage national innovation systems and capabilities.

Participation in co-creative innovation processes is premised on securing mutual benefits, and in this regard developing countries have a lot to gain by opening up for collaboration. Yet careful policies and regulation must be in place to insure against exploitation and harmful practices. More important, and probably more difficult, is to devise policies and practices that contribute to upgrading developing-country innovation systems and capabilities.

The best way for developing countries to benefit from innovation collaboration with rich-country partners is to implement active and forward-looking innovation policy, which includes a range of implementation instruments aimed at localizing benefits. These may include active scouting and selection of international collaboration partners, a strong vision and strategy to create locally strong living labs, harmonization and coordination of collaboration activities, and alignment of broader social objectives as well as higher education programs with collaboration programs. Global companies and universities are scouting for the best places to develop innovations for the low-income market, and national governments can make a big difference in setting up the right environment to innovate for the poor.

The character of developing countries' global interaction is critical in determining the extent to which they can exploit the growing interest in developing and marketing new services and products to low-income markets. With an increasing

Box 8.4 Key Messages

- The traditional roles of advanced economies as well as emerging and developing economies are changing rapidly. This development has prompted Finland, among other innovation leaders, to reconsider its strategies and approaches to developing countries.
 - Development collaboration is about joint learning processes in which both sides should have an active role. Successful implementation of knowledge partnerships presupposes a deep understanding of user needs.
 - The role of the various collaboration programs should be seen as a coordinated, systematic set of complementary measures leading, step-by-step, toward common strategic ends.
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number of actors based in developed countries interested in developing technologies, products, and services for low-income markets, there is important potential for forging new types of partnerships between developing and developed countries, ones that go beyond traditional links between donor and recipient.

The promise of such innovation partnerships lies in mutual interest. Developed countries need to learn—and it is easy to underestimate the amount of learning required—to develop and introduce innovations in low-income markets. Developing countries need to upgrade their innovation ecosystems and capabilities. However, to gain momentum, the build-up of such collaborative mechanisms will take time and require considerable policy making from both developing and developed countries. Box 8.4 presents the key messages of this chapter.

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