



REGIONAL CONNECTIVITY FOR SHARED PROSPERITY

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PRELUDE

Connectivity is a cornerstone of regional economic cooperation and integration – and has become a major priority for the countries of Asia and the Pacific, especially in the context of efforts to find new drivers of regional economic growth, and to create additional domestic and aggregate regional demand.

To best unlock the potential of ever-more closely interlinked production networks and value chains, a broader perspective on connectivity will be key. This kind of connectivity should not be considered sector by sector, but rather as part of an integrated whole, encompassing the development of corridors of prosperity through networks of trade, transport, ICT, energy, people, and technology.

This 2014 ESCAP's annual *Theme Study: Regional Connectivity for Shared Prosperity* explores strategies for strengthening regional connectivity.

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ABBREVIATIONS

ACSS	ASEAN Community Statistical System
ADB	Asian Development Bank
ADB I	Asian Development Bank Institute
AEC	ASEAN Economic Community
AEH	Asian energy highway
AHSOM	ASEAN Heads of Statistical Offices Meeting
AIF	ASEAN Infrastructure Fund
AIIB	Asian Infrastructure Investment Bank
APAIE	Asia-Pacific Association for International Education
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
ASEAN+3	ASEAN plus China, Japan and the Republic of Korea
ASW	ASEAN Single Window Initiative
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
BRICS	Brazil, Russian Federation, India, China and South Africa
CAREC	Central Asia Regional Economic Cooperation
CLMV	Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam
CO ₂	carbon dioxide
ECO	Economic Cooperation Organisation
ESCAP	Economic and Social Commission for Asia and the Pacific
EU	European Union
EURASEC	Eurasian Economic Community
FATS	Framework for Action on Transport Services
FDI	foreign direct investment
G20	Group of Twenty
GDP	gross domestic product
GMS	Greater Mekong Subregion
GPS	Global Positioning System
GW	gigawatt
HVDC	high-voltage direct current
ICD	inland container depot
ICP	integrated check posts
ICT	information and communications technology
IEA	International Energy Agency
IFC	International Finance Corporation
ILO	International Labour Organization
IMF	International Monetary Fund
IP	Internet protocol
IRU	International Road Transport Union
IT	information technology
ITU	International Telecommunication Union
LDCs	least developed countries
LLDCs	landlocked developing countries
LNG	liquefied natural gas
MDGs	Millennium Development Goals

ABBREVIATIONS *(continued)*

OECD	Organisation for Economic Co-operation and Development
PAA	Pan Asian E-commerce Alliance
PIF	Pacific Islands Forum
PPP	purchasing power parity
PPPs	public-private partnerships
RCEP	Regional Comprehensive Economic Partnership
Rio+20	United Nations Conference on Sustainable Development
SAARC	South Asian Association for Regional Cooperation
SAFTA	South Asian Free Trade Agreement
SASEC	South Asia Subregional Economic Cooperation
SCO	Shanghai Cooperation Organisation
SIDS	small island developing States
SPC	Secretariat of the Pacific Community
TAR	Trans-Asian Railway
TASIM	Trans-Eurasian Information Superhighway
TPP	Trans-Pacific Partnership Agreement
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNNExT	United Nations Network of Experts
UNWTO	United Nations World Tourism Organization
US\$	United States dollar
WCF	World Chamber Federation
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

The role of regional connectivity in supporting economic growth and development

Over the past 50 years, the Asia-Pacific region has experienced unprecedented economic growth. That growth, along with better standards of education and health, has contributed to dramatic falls in poverty. However, the region's growing prosperity has not been shared equally, and there are clear signs of rising income inequality, both within and between countries. Inequality is also becoming more pronounced in other ways, in terms of access to transport, information and communications technology (ICT) and energy resources, for example.

The region's recent economic growth has been driven largely by international trade, foreign direct investment and the emergence of global and regional production networks, as well as global value chains. These drivers, in turn, were facilitated by the progressive liberalization of trade, expansion of the maritime transport sector and diffusion of information and communications technologies and the Internet. These processes enabled multinational companies and smaller producers to connect with each other and develop new types of production and distribution networks. Meanwhile, Governments have supported these processes by investing in infrastructure and human capital development.

Enhanced connectivity has therefore played an influential role in shaping regional integration in Asia and the Pacific. Clearly, the contribution of "hard", or physical, infrastructure networks to economic and social development has depended on "soft" infrastructure, including the policy, legal, regulatory and institutional frameworks in which they are located. In the current study, regional connectivity is regarded as the level and effectiveness of regional networks to facilitate flows of goods, services, people and knowledge. This extends the traditional focus of public policies beyond either physical or non-physical parameters to encompass both dimensions.

Into the future, trade and transport connectivity within the region will continue to be important, particularly as countries look towards regional markets to counterbalance the slowdown in the global economy. At the same time, new drivers of growth are expected to shape future patterns of economic and social development in the region, and with them, other types of regional networks will become increasingly important. Given that the effectiveness of each network is increasingly dependent on the connectivity of other networks, it is clear that any analysis of regional connectivity can no longer be confined to one or other type of network.

Key drivers shaping the future of regional connectivity

Trade and transport connectivity remains a priority: The recent economic slowdown has exposed the region's vulnerability to fluctuations in the global economy and has shifted attention to domestic and regional markets as a means of stimulating growth and raising living standards. Despite significant investment in transport infrastructure at the national level, however, cross-border and regional land transport infrastructure networks remain underutilized for international trade. In addition to increasing investment in "hard" infrastructure, countries in the region can improve the "soft" infrastructure underpinning trade and transport, as well as implement other means of reducing logistics costs. In particular, countries can capitalize on various technological advances – which requires trade and transport connectivity to be pursued in conjunction with other forms of connectivity, such as information and communications technology (ICT).

ICT as an enabler and driver of growth: The Internet and mobile communications connectivity will continue to radically transform ways in which businesses operate and people interact, as they drive productivity and efficiency improvements in almost every sector of the economy. Increased ICT connectivity is also opening doors on knowledge generation and sharing, particularly for people living in remote or rural areas. Instant communications will be increasingly important in determining the efficiency of trade, including financial services, information and data management services and transport and logistics services.

Growth in trade in services: The Asian and Pacific region has become an important player in commercial services exports, broadly categorized as transportation, travel and other commercial services, as reflected in its growing share of world exports of commercial services. Tourism in particular has been expanding rapidly, with the region capturing nearly one quarter of total global tourist arrivals in 2013. As these service sectors will rely more and more on access to fast and reliable Internet and telecommunications systems into the future, they offer alternative sources of growth for countries which are physically located away from regional production and consumption centres.

Energy connectivity and security: The region's recent economic growth and rising affluence has resulted in a growing demand for energy resources and with that expanding demand, higher levels of greenhouse gas emissions. The region accounted for more than half the global total of such emissions in 2010. The Asia-Pacific region as a whole is well endowed with energy resources, but they are distributed unevenly. Access to clean energy also varies widely from country to country and even within countries. Against the backdrop of rising fuel prices, countries need to consider new forms of energy cooperation which will help balance the gaps in supply and demand across countries.

Responding to population dynamics: The Asia-Pacific region is undergoing population change of a magnitude and pace never before witnessed in human history. Although the size of its population has almost tripled in 60 years, nearly all countries in the region are now experiencing population ageing, albeit at different paces. As such, the region has countries with both ageing and shrinking populations, as well as countries with large populations of young people. Meanwhile, improved access to transport and information has led to greater cross-border mobility; the region is now host to 59 million international migrants, or one quarter of the world's total stock of migrants. The implications of these trends are significant for the future social and economic development of the region, and point to the urgent need for effective policy responses.

Transitioning to knowledge-based economies: In order to diversify their economies and move up value chains, countries need people who have the skills and knowledge, as well as the innovative spirit, to develop both new products and processes. Strengthening knowledge networks for tertiary education, knowledge generation and knowledge sharing can help build the region's knowledge and skills base. Sharing of knowledge and research between universities, researchers and industry also contributes to the development of "high-tech" clusters in some industries, such as those developing computer software. Recent economic history shows that "knowledge clusters" initially emerged in lower-cost countries with good availability of skilled labour that responded quickly to the global demand for standardized, less firm-specific knowledge services. By strengthening regional knowledge-sharing networks, more countries could participate in different types of clusters.

Regional strategies for enhancing regional connectivity

The issue for the Asia and Pacific region is not so much whether connectivity will increase across countries, but what forms those connections will take. While countries in the region have made significant progress in improving their domestic connectivity, the future of regional connectivity depends on how closely they can work together to strengthen networks in four critical areas: trade and transport connectivity; ICT connectivity; energy connectivity and people-to-people connectivity.

Regional connectivity is multifaceted, with the connectivity of one sector influenced by the connectivity of others. This gives rise to new challenges in terms of the need for greater coordination, not only across

borders but also across sectors involving all stakeholders, including business and trade associations, social networks and civil society organizations. At the same time, it creates new opportunities for different elements to be combined in ways which will enhance the quality of these networks.

As they are still in the development stage, countries in the Asian and Pacific region have the chance to develop regional networks in an integrated and coordinated manner, which can reduce the costs and spread the benefits to a wider group of countries. Regional approaches can help countries look beyond their national boundaries and consider the “public goods” aspects of networks, while at the same time, help to identify and harness synergies across sectors. In this context, countries in the region need to put into place regional strategies for developing critical regional networks.

Trade and transport connectivity: While there are wide variations across countries in the quality of infrastructure, the region is already relatively well connected in terms of its transport infrastructure networks. However, its transport networks are not fully operationalized or integrated, leading to underutilization of networks, especially railways. Non-physical barriers at borders also persist, increasing trade and transport costs and delaying the movement of goods and people. By investing in intermodal facilities, such as dry ports, as well as in better physical linkages between different modes, Governments could increase transport options for shippers and traders. Regional intermodal transport networks will play a particularly important role in trade from landlocked developing countries and small island developing States, supporting these countries in participating more actively in international and regional trade. Greater use of ICT applications for trade and transport facilitation, both behind and at borders, would also improve the efficiency of freight movements and pave the way for the development of paperless trade and e-logistics.

ICT connectivity: While ICT connectivity is rapidly improving in the region, there is still a large “digital divide” both within and between countries. This is partly due to the region’s reliance on submarine cables and lack of sufficient terrestrial fibre-optic cables. A cohesive “meshed” regional network, combining terrestrial with submarine optical fibre, would provide cost-effective broadband access on both an intraregional and intercontinental basis as it would link Asia to Europe. Such an “Asia-Pacific information superhighway” should be based on a set of common principles; its development would require the active involvement of private sector partners and international organizations. There are also significant opportunities for the “co-habitation” of ICT and transport infrastructure networks. Already, fibre-optic cables are being laid along some national highway and railway systems. Such synergistic approaches can reduce the cost of developing a regional ICT network and facilitate maintenance of the network.

Energy connectivity: With recent advances in high-voltage transmission technology, it is now possible to envisage a regional energy network, which could reduce the gap in supply and demand by transferring power from energy-rich or lower-cost power countries to energy-poor or high-cost power countries. An “Asian energy highway” network could combine different types of energy transmission networks, including pipelines and cross-border power grids. The most efficient may be the development of a regional electricity power grid, connected to a regional electricity market. A regional grid could also link renewable energy sources to a large enough market to justify investments, thereby enhancing the viability of such projects.

People-to-people connectivity: Increased mobility across borders, as well as greater ICT connectivity, would open up vast new opportunities for international labour migration but also raise new challenges. Migrant origin and destination countries need to work together to take advantage of such labour flows and mitigate the risks which may accompany greater labour mobility. Meanwhile, improvements in ICT connectivity and transport links are making it easier for people to study abroad or enroll in distance learning programmes, as well as contribute to the growth of business and civil society networks. By promoting people-to-people connectivity, Governments could help their people access the region’s vast knowledge resources, as well as foster better understanding about the region’s diverse cultures and value systems.

Strengthening institutional coordination and regional cooperation

The private sector has been leading the economic integration of the region, as the individuals, institutions and companies compete to boost productivity, relocate production activities to take advantage of cost differentials between countries, and try to gain access to major markets in the region. Ultimately, however, the main driving force behind regional connectivity is the political will of national Governments. To support the further integration of the region, therefore, Governments must take the lead in establishing robust institutional frameworks to plan and implement the regional connectivity agenda.

Strengthening institutional responses to regional connectivity

The increasingly complex nature of regional networks requires Governments to reach across sectoral boundaries to develop cross-sectoral policies, both at the national and regional levels. To achieve this, they will need to strengthen institutional mechanisms and make better use of existing forums, such as those provided by intergovernmental organizations. The Asian and Pacific region is home to a wide variety of intergovernmental organizations, many of which are already implementing various initiatives relating to regional connectivity. With the emergence of so many subregional initiatives, policy coordination among these organizations has become an urgent challenge. In this regard, regional institutions such as ESCAP have an important role to play in supporting and coordinating subregional integration efforts, as well as in serving as a vital link between subregional and global initiatives.

The experience of ESCAP shows that there are a variety of mechanisms, ranging from formal intergovernmental agreements and international conventions, to voluntary commitments by Governments which can be used to move the region's connectivity agenda at the regional level. Given the significant role played by the private sector and civil society in shaping the region's economic and social development, Governments also need to explore ways to reach out and involve other stakeholders in the development and implementation of such mechanisms.

Statistical standards for strengthened accountability and better policymaking

Official statistics help Governments to track progress and ensure that their decisions are based on evidence. They also enable Governments to develop a shared understanding of trends, issues and bottlenecks, which is fundamental for building consensus on cross-border issues, such as trade, labour mobility, immigration, educational qualifications, transport and tourism. However, in order to be comparable across countries, over time and across different data sources, statistics must adhere to internationally agreed standards.

To move forward the regional connectivity agenda, national Governments are strongly encouraged to adopt global statistical standards and build their capacities for collecting and disseminating their official statistics. They should also work more closely together through established forums, such as the United Nations Statistical Commission and the ESCAP Committee on Statistics, to define the type of statistics needed by policymakers, as well as identify new and innovative sources for these data.

Regional solutions for financing regional infrastructure networks

Infrastructure development invariably involves high capital costs, with benefits accruing over the longer run. The pace of infrastructure development is therefore progressing unevenly across the region and tends to be directed towards satisfying domestic needs. Yet the benefits of regional infrastructure networks extend over and beyond national borders, pointing to the need to reconsider the networks as a type of "regional public good". Such approaches can target the "weakest links" of these networks which affect the efficiency and coherence of the whole network, while at the same time enhancing the connectivity of the disadvantaged countries.

Countries should therefore explore regional mechanisms to pool the region's financial resources, such as a regional infrastructure fund, a regional project preparatory facility, or an "Asian multi-donor platform". There is also scope for greater private involvement in financing infrastructure projects, but most countries still lack the appropriate policy frameworks to develop and manage public-private partnership projects effectively. In this regard, Governments can learn from each other's experiences in such partnerships, as well as how to manage and maintain their infrastructure networks more effectively.

Next steps in strengthening regional connectivity

This report looks at the ways in which better regional connectivity can contribute to the sustainable and inclusive development of the Asian and Pacific region. It finds that regional connectivity is inherently multifaceted, and that the benefits of this connectivity may be enhanced by combining different elements. Moreover, it suggests that networks are likely to become more integrated and interdependent as they evolve. Governments therefore have to develop cross-sectoral policies on connectivity, at national, subregional and regional levels.

Into the future, connectivity will certainly increase across countries. But what forms will those connections take and who will they benefit? The aim should be to ensure that they open new opportunities for all, especially for the region's disadvantaged countries – the least developed countries, the landlocked developing countries, and the small island developing States.

These countries may wish to consider how to use their current endowments to build up their capacities in those industries which have the potential to grow. By taking advantage of new technologies, disadvantaged countries can become more integrated into the global economy. In particular, they should make greater use of communications technology, and particularly the Internet, to develop commercial services, such as transport, telecommunications, and financing, as these sectors in turn can support trade and manufacturing. Meanwhile, all countries in the region can support the disadvantaged countries by enhancing people-to-people connectivity – for example, by encouraging more interactions between students and workers.

As globalization continues, the region's future will depend on how countries work together. Developing and managing regional networks therefore requires cross-country consensus. Governments need to further study and refine the strategies outlined in this study, and agree on the most appropriate sequencing of actions. And to better respond to the rapid evolution of these networks, national Governments and international organizations alike will have to strengthen institutional coordination. This should extend to people-to-people networks involving academia, the private sector and civil society – which can influence the direction and effectiveness of intergovernmental cooperation.

Ultimately, national Governments must take the lead in forging regional connectivity, both by making the necessary changes in their national policies, as well as by actively participating in regional initiatives on connectivity. ESCAP can support their efforts by providing a neutral platform for frank and informed discussions among relevant stakeholders. In this regard, the multi-sectoral Expert Working Groups being established in accordance with the 2013 Ministerial Declaration on Regional Economic Cooperation and Integration in Asia and the Pacific can help Governments to identify the best approaches for implementing these regional strategies.



REGIONAL CONNECTIVITY FOR SHARED PROSPERITY

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The Asia and the Pacific region has grown rapidly, with the intensification of its networks of trade, production and people. However, these networks are denser and more productive in some parts of the region than in others. Over the coming decades, countries across Asia and the Pacific will be looking for ways to expand connectivity and to ensure that the region's growing prosperity is more widely shared.

INTRODUCTION

Asia and the Pacific is the world's most dynamic region. Over the past 50 years it has experienced unprecedented economic growth, much of which has been export driven, initially among the newly industrialized economies, but more recently also in China and in India. This growth, along with better standards of education and health, has contributed to dramatic falls in poverty. The region's achievement in poverty reduction has been remarkable: despite an overall population increase of about 900 million people, the population living below \$1.25 per day dropped from about 1.6 billion in 1990 to under 750 million in 2011.¹

However, as noted by the Asian Development Bank, ESCAP and the United Nations Development Programme in the publication entitled *Asia-Pacific Aspirations: Perspectives for a Post-2015 Development Agenda*, the region still has unacceptable levels of poverty.² According to this report, almost two thirds of the world's poor, as measured by the \$1.25 poverty line, live in this region. Indeed, reflecting the large populations of China, India, Indonesia and Pakistan, there are currently more poor people living in middle-income countries than in low-income countries. There are also large numbers of people living just above the extreme poverty line, or in "near poverty": if \$2 per day is used as a benchmark, the number of poor people doubles from 743 million to 1.64 billion. In other words, about 40% of the region's population subsists on less than \$2 a day.³

Furthermore, the region's growing prosperity has not been shared equally, and there are clear signs of rising inequality, both within and between countries. As discussed in part I of the *Economic and Social Survey of Asia and the Pacific 2014*, inequality has declined in some countries since the early 1990s, but has increased in some larger economies, including China, India and Indonesia. Just as significant is the extent of inequality between countries. A recent study concluded that, in Asia, "the gap between advanced economies and the least developed is the largest of any region of the world".⁴

Connecting countries creates new opportunities for development

One of the most important contributors to the region's economic growth has been infrastructure development – particularly in the transport, energy and telecommunications sectors.⁵ At the national level, public investment has been shown to have a direct impact on GDP growth, with some analyses suggesting that, on average, a 1% increase in the stock of infrastructure lifts GDP by 0.08%.⁶ These critical infrastructure networks have stimulated growth by providing domestic enterprises with access to a greater pool of resources and markets, thereby enabling them to scale up their production and reach a broader consumer base. Recent research also shows that improved telecommunications have enhanced the access of rural communities to information and financial services.⁷

At the regional level, progress has been made in forging linkages between countries through the development of regional infrastructure networks, thereby opening up both physical and virtual access to regional and global markets. Today, most countries in continental Asia are connected through the Asian Highway and Trans-Asian Railway networks, while coastal countries and small island developing States are linked through maritime services. Moreover, in most of the region's capitals and major cities, it is now possible to connect to broadband Internet.

These linkages have driven the region's economic success by facilitating international trade, foreign direct investment (FDI) flows, and the establishment of global and regional production networks and global value chains. These new systems for manufacturing, distribution and consumption have helped many countries in the region to diversify their economies, reducing their dependence on traditional sectors, such as agriculture and natural resource extraction, and creating new jobs, particularly in labour-intensive sectors, such as garments and electronics.

Emerging economies in particular have benefited from regional and global value chains. In China, for example, the income derived from trade flows within global value chains, measured as "export of domestic value added," increased six-fold between 1995 and 2009, and the number of jobs generated

by export of value added increased from 89 million in 1995 to 146 million in 2008.⁸ However, not all countries in the ESCAP region have been as successful in terms of expanding trade and attracting more investment to their economies.

It is therefore timely that the Commission selected the theme of “Regional connectivity for shared prosperity” for its seventieth session, held in 2014. On one hand, it is evident that countries and people in the ESCAP region are becoming more and more connected in a variety of ways. On the other, it is less evident how this increasing connectivity has shaped the region’s recent development, and what kinds of connectivity will be needed to help to reduce poverty and to achieve more balanced and inclusive growth across the region. This year’s Theme Study, which constitutes part II of the *Economic and Social Survey of Asia and the Pacific 2014*, explores these questions and presents a set of regional strategies for strengthening regional connectivity in Asia and the Pacific.

Understanding “regional connectivity”

In recent years, the concept of “connectivity” has broadened and entered into mainstream development discourse. A good example is the Master Plan on ASEAN Connectivity, which was one of the first comprehensive strategic policy frameworks to explicitly address the issue of connectivity in various sectors. ESCAP has also promoted connectivity as a necessary and integral aspect of regional integration and has identified a number of key regional networks at the core of regional connectivity, namely trade and transport, information and communications technology (ICT), energy infrastructure and people-to-people networks.⁹ These regional networks reinforce each other and as such their simultaneous development is critical in achieving effective regional connectivity and in maximizing its benefits.

It is becoming evident that regional connectivity will offer best results if it enhances the effectiveness of regional networks to facilitate flows of goods, services, people and knowledge. It is therefore necessary to look beyond traditional analyses of connectivity, which were focused on the physical dimensions of networks, to consider also their qualitative aspects. Given that the effectiveness of each network is increasingly dependent on the connectivity of other networks, the multisectoral nature of these networks also needs to be considered.

The present chapter begins with a discussion of recent drivers of economic growth in the ESCAP region. It traces the evolution of international trade and FDI and the role of trade and transport connectivity in supporting these flows. It then contains a discussion of future drivers of growth that have the potential to transform the spatial pattern of the region’s economic and social development, and the types of connectivity that will be needed in order to benefit from these drivers.

THE ROLE OF REGIONAL CONNECTIVITY IN SUPPORTING GROWTH AND DEVELOPMENT

Various factors have shaped the pace and pattern of the region’s economic and social development. Some are related to geography – in terms of location and topography, as well as natural factor endowments and population densities. Other factors are related to domestic government policies or the occurrence of wars or natural disasters. However, numerous studies suggest that the main drivers behind the region’s economic success have been international trade, FDI and the establishment of global and regional production networks and global value chains.¹⁰

Regional integration efforts drive initial trade growth

Trade in the ESCAP region has expanded as a result of a combination of converging and mutually enhancing factors. One of the most significant has been the acceleration of regional integration, driven primarily by government efforts to liberalize trade. The 1997/98 Asian financial crisis served as a catalyst for countries in the ESCAP region to pay greater attention to the benefits of regional economic integration and to make stronger political commitments to trade liberalization.¹¹ For example, the Association of Southeast Asian Nations (ASEAN) began formalizing ties with China, Japan and the Republic of Korea, resulting in the first annual ASEAN Plus Three Summit in 1998. At about the same time, member States of the South Asian Association for Regional Cooperation (SAARC) started developing the Agreement on South Asian Free Trade Area (SAFTA), which came into force in 2006.

Countries that recognize the potential gains from regional connectivity typically start by reducing border trade barriers. Since the mid-1990s, many countries have also been actively negotiating trade or broader economic partnership agreements on a bilateral basis. Today, there are 149 preferential trade agreements, bilateral and plurilateral, in force in the Asian and Pacific region (see figure 1.1). Another 73 agreements are at various stages of negotiation. Further liberalization is expected following the ongoing negotiation of several “mega-bloc agreements,” such as the Trans-Pacific Partnership Agreement, led by the United States of America, and the Regional Comprehensive Economic Partnership, led by ASEAN and six of its major partners: Australia, China, India, Japan, New Zealand and the Republic of Korea.

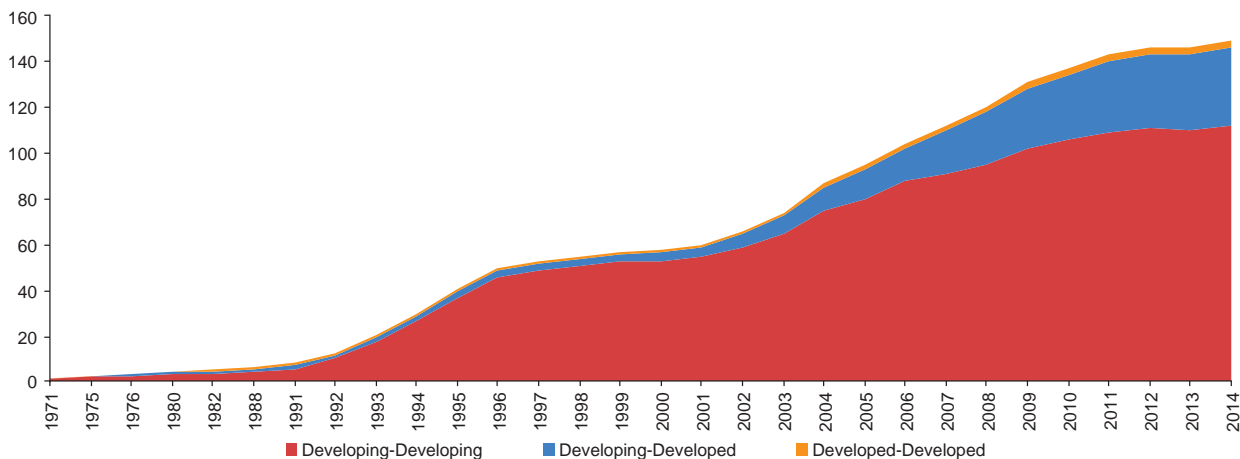
ESCAP has estimated that the welfare gains associated with region-wide liberalization through the expansion of existing trade agreements or the implementation of new ESCAP-wide agreements may amount to as much as \$140 billion.¹²

While a detailed discussion of trade policy and preferential trade agreements is beyond the scope of this publication, it is important to keep in mind that they provide the institutional foundation on which regional connectivity may be achieved.¹³

Emergence of regional production networks and value chains

Progress in trade liberalization contributed to the rise and the reach of FDI flows, which, together with technological changes in manufacturing processes and the diffusion of ICT, created conducive conditions for regional production networks.¹⁴ Industries were able to divide their value chains into portable components and relocate parts of those industries in other countries – leading to the emergence of “global production sharing”.¹⁵ This process is essentially a reflection of “efficiency-seeking industrial restructuring”, or the spatial fragmentation of industry across borders to exploit economies of scale, specialization and savings in labour and material costs.¹⁶

Figure 1.1. Trade agreements in Asia and the Pacific



Source: ESCAP calculations, based on data from the ESCAP Asia-Pacific Preferential Trade and Investment Agreements Database.

Thus, starting in the 1980s, businesses from Europe, Japan, North America and the Republic of Korea began relocating their industrial production first to Hong Kong, China; Singapore; and Taiwan Province of China, and then in the late 1990s and 2000s to China and South-East Asia, particularly Indonesia, Malaysia, the Philippines and Thailand. As production costs rose in these economies, investors began turning to Viet Nam and other ASEAN member States as potential destinations. As a result, in 2012, ASEAN members comprised the only area in the ESCAP region to experience positive growth in FDI inflows.¹⁷

The changing spatial distribution of regional production networks partly explains why, since 2009, intraregional trade has been growing faster than trade with the region's more traditional trading partners in Europe and North America – and also why in 2012, East and North-East Asia and South-East Asia accounted for about 75% of total intraregional trade (see table 1.1).

This growth in intraregional trade reflects the increase in the trade of intermediate goods. The emergence of these networks also explains why intraregional FDI flows, mostly originating in East Asian countries but also increasingly from within ASEAN, have increased significantly in the last 10 years.

Clearly China has played a pivotal role, emerging as a critical link in the assembly of products coming from East Asia and South-East Asia and consumed in global markets. In 2011, nearly 50% of China's imports of intermediate goods were from developing Asian and Pacific economies and Japan.¹⁸ This explains why East Asia has the deepest degree of trade integration of all subregions, as measured by intra-subregional trade. This is followed by South-East Asia, where countries such as Malaysia and Thailand have become important players in electronics and automobile production networks.

Table 1.1. Trends in intraregional merchandise trade of developing Asia and Pacific countries (2000, 2008 and 2012)

Share of intraregional exports by destination (percentage of intraregional exports)

Exports to	East and North-East Asia			South-East Asia				South and South-West Asia				North and Central Asia			Pacific
	Total	China	Rest	Total	Singapore	ASEAN5	Rest	Total	India	SAFTA excl. India	Rest	Total	Russian Federation	Rest	
2000	46.0	13.8	32.2	40.2	13.8	25.0	1.4	9.1	3.1	3.0	3.0	4.2	2.4	1.8	0.5
2008	45.9	16.2	29.7	31.4	8.4	21.8	1.1	13.4	5.8	3.0	4.7	8.5	4.4	4.0	0.8
2012	46.6	12.5	34.0	32.3	7.1	23.5	1.7	13.3	5.6	3.4	4.3	7.2	3.8	3.4	0.7
Change from 2011 (percentage points)	-2.0	-5.3	3.3	1.0	0.0	0.7	0.2	0.0	-0.8	0.7	0.1	1.5	0.3	1.1	-0.4

Share of intraregional imports by source (percentage of intraregional imports)

Imports from	East and North-East Asia			South-East Asia				South and South-West Asia				North and Central Asia			Pacific
	Total	China	Rest	Total	Singapore	ASEAN5	Rest	Total	India	SAFTA excl. India	Rest	Total	Russian Federation	Rest	
2000	50.4	31.4	18.9	37.0	11.1	25.3	0.6	6.2	2.7	0.8	2.7	6.2	4.5	1.7	0.2
2008	48.7	31.9	16.8	32.8	8.8	23.1	0.8	10.0	4.4	0.6	5.0	8.4	6.5	1.9	0.2
2012	49.4	30.8	18.6	32.9	8.0	24.2	0.8	8.7	3.9	0.7	4.1	8.9	6.2	2.7	0.2
Change from 2011 (percentage points)	-0.4	-1.0	0.6	-0.9	-0.3	-0.7	0.1	-0.7	-0.6	0.0	0.0	1.6	1.0	0.6	0.0

Source: ESCAP calculations, based on data from the United Nations Commodity Trade Statistics Database (2013).

Notes: ASEAN5: Indonesia, Malaysia, Philippines, Thailand and Viet Nam. SAFTA: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

Rest: rest of the world.

Explaining differences in subregional performance

In contrast, other subregions have participated much less in intraregional trade and investment. As table 1.1 shows, in 2012, South and South-West Asia accounted for only 13% of exports and 8.7% of imports, while North and Central Asia had even smaller shares at 7.2% and 8.9% of exports and imports, respectively. Intraregional FDI followed similar patterns. Meanwhile, intra-subregional trade and investment flows in these subregions have been dominated by two large countries, namely India in South and South-West Asia, and the Russian Federation in North and Central Asia.

Almost all countries in the ESCAP region have taken significant measures to liberalize their markets. The differences in subregional trade performance are therefore only partly explained by preferential and regional trade and investment agreements. Other factors, particularly trade costs, significantly influence business decisions on where to invest and trade. This result is confirmed by the ESCAP-World Bank Trade Cost Database (see table 1.2).¹⁹

This database provides a comprehensive aggregate measure of all costs involved in trading goods internationally with another partner (that is, bilaterally) relative to those involved in trading goods domestically. It therefore captures not only international transport costs and tariffs but also other trade costs, such as the direct and indirect costs associated with cumbersome import or export procedures and inefficient logistics or payment services, as well as differences in currencies and languages.

According to the above-mentioned ESCAP-World Bank database, comprehensive trade costs between South Asian economies (SAARC-4: Bangladesh, India, Pakistan and Sri Lanka) and South-East Asian economies (ASEAN-4: Indonesia, Malaysia, Philippines and Thailand) are higher than those between either subregion and the European Union or the United States. Meanwhile, the data also suggest that trade costs between Pacific island developing economies and all other subregions are significantly higher than those between other subregions, while trade costs between ASEAN-4 economies and North and Central Asia are also relatively high.

Table 1.2. Intraregional and extraregional comprehensive trade costs (excluding tariff costs) in the Asian and Pacific region, 2006-2011

Region	ASEAN-4	East Asia-3	North and Central Asia	Pacific Islands Developing Economies	SAARC-4	Australia-New Zealand	EU-3
ASEAN-4	77 (10)						
East Asia-3	77 (8)	52 (-8)					
North and Central Asia	387 (6)	220 (-11)	141 (0)				
Pacific Islands Developing Economies	263 (31)	268 (36)	308 (17)	107 (-31)			
SAARC-4	124 (2)	124 (2)	270 (-10)	342 (13)	107 (4)		
Australia and New Zealand	99 (2)	91 (-2)	323 (-5)	137 (48)	144 (5)	54 (4)	
EU-3	111 (8)	86 (-4)	166 (-3)	327 (38)	114 (7)	110 (1)	46 (0)
USA	84 (13)	63 (-1)	189 (2)	228 (19)	107 (8)	97 (2)	67 (1)

Source: ESCAP-World Bank (2014).

Notes: Trade costs may be interpreted as tariff equivalents. Percentage changes in trade costs between 2000-2005 and 2006-2011 are in parentheses. ASEAN-4: Indonesia, Malaysia, Philippines and Thailand. East Asia-3: China, Japan and Republic of Korea. EU-3: France, Germany and United Kingdom of Great Britain and Northern Ireland. SAARC-4: Bangladesh, India, Pakistan and Sri Lanka. Pacific island developing economies: Fiji, Papua New Guinea, Tonga and Vanuatu. North and Central Asia: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan and Russian Federation.

The analysis shows that trade costs within several of these subregions are also high. For example, trade costs within North and Central Asia, Pacific island developing economies and SAARC-4 economies are more than double the trade costs between China, Japan and the Republic of Korea. Bringing these costs down within subregions is therefore as important as addressing costs between subregions.

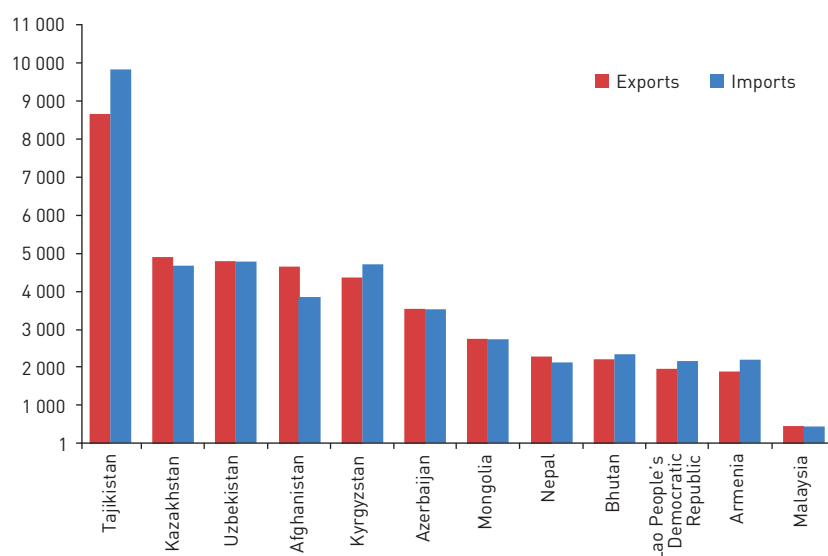
The role of trade and transport connectivity

Given that over 80% of global merchandise trade by volume is carried by sea transport, access to maritime shipping services has been an important factor in facilitating countries' participation in global and regional production networks. For example, China's participation in the global economy depended on reaching international markets, particularly in North America, Europe and Japan. The Government's policies were strategically geared to supporting industries in the country's special economic zones, located first in coastal areas and then extended to other major cities and regions. Government

investment in maritime and other transport infrastructures positively reinforced these policies, as they made it cheaper and faster to transport imports and exports between China's maritime ports and major production centres.²⁰

Conversely, landlocked developing countries remain at a competitive disadvantage. This is due to the extra costs and time goods spend in transit and at border crossings before reaching their nearest ports. Studies have found that international investors are discouraged from investing in landlocked developing countries because of the high costs and poor quality of transport services.²¹ For transport operators, long travel times imply fewer turnovers for a given vehicle over a given period, while cabotage restrictions and other domestic regulations result in most vehicles returning empty, thereby adding to transport costs. Thus, as figure 1.2 shows, in 2013 the average cost of exporting goods from a landlocked country in the region was 8.5 times higher than it was from Malaysia, a country with one of the lowest trade costs, while the average cost of importation was 9.2 times higher.²²

Figure 1.2. Average cost of importing and exporting containers: comparison of ESCAP landlocked developing countries and Malaysia



Source: World Bank, Doing Business 2014 (Washington, D.C., World Bank, 2014).

Notes: Cost in United States dollars of getting one container of exports or imports to or from the nearest port, excluding tariffs. Based on business surveys in each country's largest business centre.

Meanwhile, numerous studies have also identified the poor quality of transport infrastructure as a major barrier to trade in the region.²³ In South Asia, for example, the poor quality of roads, as well as missing sections and limited capacity near border crossings, reduces the connectivity of countries.²⁴ Thus, the quality of infrastructure, as well as availability, has been an important determinant of trade and transport connectivity.

Economies of scale in transport, competition and non-physical barriers to trade²⁵

The export-oriented growth of East and South-East Asian economies coincided with the rise of containerized transport. Containers revolutionized the way goods were packed and shipped. Not only did they reduce the costs of transporting goods and make it economically viable to spread production and assembly activities across borders, they also enabled different modes of transport to be integrated into seamless systems by simplifying the transfer of freight between modes (see box 1.1).

Containerization also allowed the volume of freight to be expanded. The competitiveness of maritime transport is based on the principle of economies of scale: ships can carry more volume than other transport modes at lower costs per unit. As container ships grew in size, the average price of container transport fell, offsetting the increase in fuel prices.²⁶ The principle of economies of scale also partly explains the configuration of shipping liner services, which are typically based on hub-and-spoke systems: feeder ships from small ports carry goods to larger hub ports for consolidation, before large liner ships carry the freight to major consumption centres.

Thus, by investing in the development of container ports and shipping facilities, economies in East Asia and South-East Asia were able to take advantage of cheaper and more efficient modes of transport. This is reflected in the remarkable growth of container throughput in Asia's maritime ports: the container ports of China (including Hong Kong, China), Taiwan Province of China, Japan, the Republic of Korea (Busan) and Singapore between them accounted for

Box 1.1. Containerization and the growth of international trade

The history of containerization holds several important lessons for the region's connectivity agenda. Improved interoperability between transport modes transformed the economic geography of manufacturing, as low shipping costs made it economically feasible to manufacture many more goods in one country and consume them in another. Combined with ICT connectivity, this also led to the evolution of just-in-time manufacturing processes, with further savings in logistics costs.

The impact of containers was rooted in the fundamental principle of standardization. As early as 1961, the International Organization for Standardization set standard sizes for all containers, which enabled the shipping industry to develop and invest in new types of ships, containers and port facilities, and to expand into such new businesses as logistics. A recent study which looked at the effects of containerization on international trade found that containerization accounted for a 790% rise in bilateral trade between 22 industrialized countries over a period of 20 years, leading *The Economist* magazine to conclude that "the container has been more of a driver of globalization than all trade agreements in the past 50 years taken together."

Thus, containers had far-reaching impacts on the evolution of international trade, manufacturing and logistics practices, demonstrating that relatively simple innovations can make a great difference to connectivity if all the relevant stakeholders agree to adopt them.

Source: "The humble hero," *Economist* (May 2013).

more than 40% of the global total in 2012, while other ports in the region also experienced significant growth in container throughput between 2008 and 2012 (see figure 1.3).

This explains why it is difficult for shipping operators to offer regular shipping services for small countries such as small island developing States. Despite being linked to international maritime shipping routes, the small scale of operations, remoteness and geographic spread of islands, as well as various institutional and organizational constraints, contribute to the high cost of transport for these countries. For small island developing States in the Pacific, these issues are compounded by imbalanced cargo flows, low unit values for exports, irregular traffic volumes and low port capacity.²⁷

Finally, the experience of East Asia and South-East Asia also shows that the simplification and harmonization of documents involved in international trade and transport helped businesses in these subregions to engage with each other.

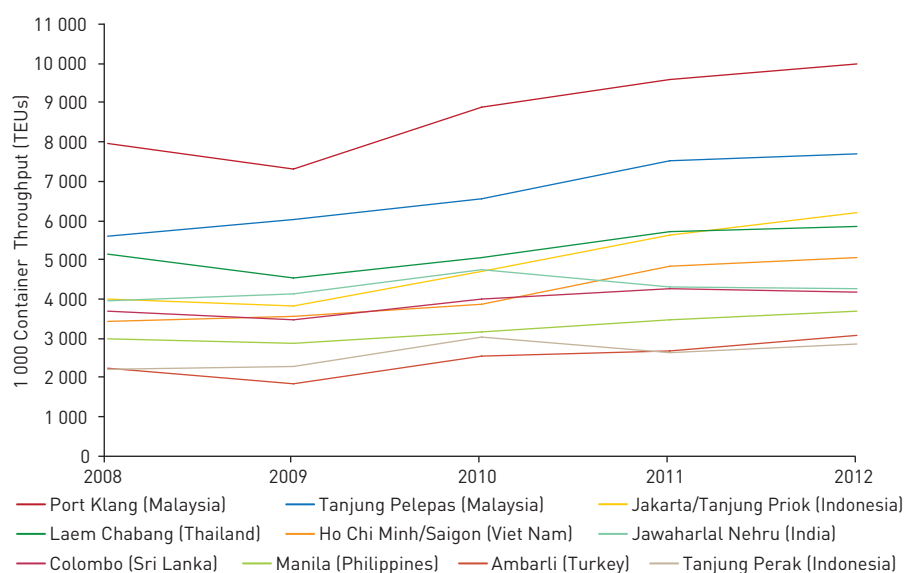
In fact, research done by ESCAP has found that many types of trade costs can be addressed through appropriate policy and regulatory reforms. For example, research suggests that 60-90% of trade costs are now derived from policy-related non-tariff costs, including costs at borders, the regulatory environment, maritime connectivity and services, trade procedures and currency fluctuations.²⁸ In other words, in addition to tariffs and “natural” trade costs derived from geographical and cultural factors, there are many other types of policy interventions that can help to bring down the costs of trade.

NEW DRIVERS OF GROWTH SHAPING DEVELOPMENT PATTERNS INTO THE FUTURE

Trade and transport connectivity remains a priority

The recent economic slowdown has exposed the region’s vulnerability to fluctuations in the global

Figure 1.3. Growth in container throughput, selected ports in Asia



Source: Containerisation International, *The Containerisation International Yearbook*, various years (London, Informa plc). See *Containerisation International Yearbook 2013* for the most recent year.

Note: TEU: twenty-foot equivalent unit.

economy, in particular to spending and investment policies of the United States and of European countries.²⁹ Thus, attention is shifting to the development of domestic and regional markets as a means of stimulating growth and raising living standards, while creating new trade opportunities for the region's poorer and smaller countries.

Nevertheless, the spreading of growth opportunities from the region's more dynamic middle-income countries to their smaller and poorer neighbours cannot be taken for granted. Despite significant investment in transport infrastructure at the national level, cross-border and regional land-transport infrastructure networks remain underutilized for international trade. In many countries, the poor quality of infrastructure, lack of maintenance and unregulated use of roads by heavy vehicles also add to costs and reduce the efficiency of these networks.

At the same time, thanks to technological advances, trade and investment are now determined less by geographical distance and more by other factors, such as competitiveness, timeliness and security. This has led to a growing interest in improving "soft" infrastructure underpinning trade and transport, as well as other means of reducing logistics costs. Both ASEAN and the Asia-Pacific Economic Cooperation, for example, focus on trade and transport facilitation as part of their "institutional connectivity" agendas, while the Ninth World Trade Organization Ministerial Conference, held in Bali, Indonesia, from 3 to 6 December 2013, attempted to address the issue through its Agreement on Trade Facilitation.³⁰

Thus, one of the region's main priorities should be to enhance trade and transport connectivity. For this purpose, countries can capitalize on various technological advances. At the same time, trade and transport connectivity can be pursued only in conjunction with efforts to enhance other types of regional connectivity. As the region attempts to consolidate its position in the global economy, as well as to lessen the development gaps between countries, Governments need to consider ways to harness new drivers of growth.

ICT connectivity as an enabler and driver of growth

Continuous advances in ICT, in the form of mobile telecommunications and the Internet, are accelerating regional economic integration in Asia and the Pacific. ICT is both a new engine of

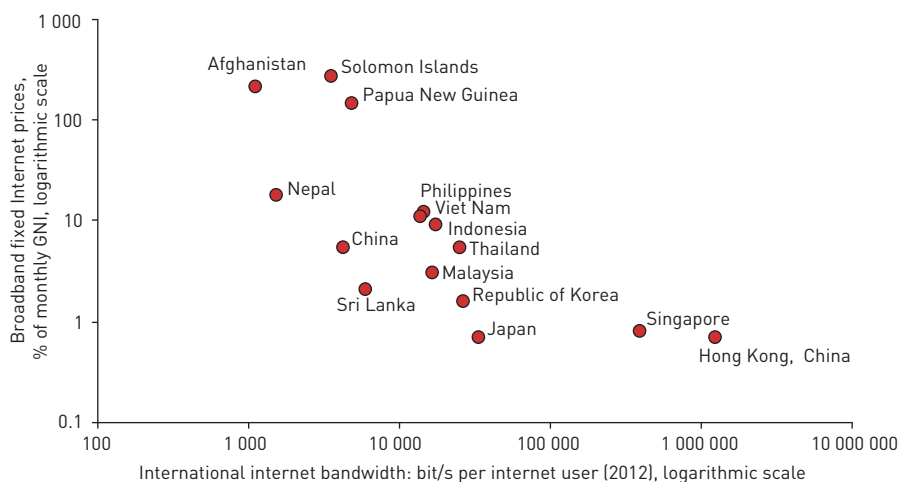
economic growth in its own right and a valuable source of innovation across all economic sectors. Access to the Internet is transforming the conduct of business and the delivery of social services. Instant communications are becoming increasingly important in determining the efficiency of trade and services, including financial services, information and data management services, and transport and logistics services.

New forms of ICT connectivity are opening doors to knowledge generation and sharing

Meanwhile, the foremost tool for people-to-people connectivity across cities, countries and regions is the Internet. New forms of ICT connectivity are opening doors to knowledge generation and sharing: distance learning and broadband-enabled classrooms are increasing educational opportunities, bringing digital textbooks and teachers to remote cities and villages. Nowhere has this been more evident than in the Pacific, where islanders now have new opportunities to participate in tertiary education through distance learning courses (see box 2.8 in the next chapter). Through the Internet, knowledge networks and communities of practice are emerging in every field, ranging from scientific research platforms to disaster management networks to cultural interest groups.

However, Asia and the Pacific remains the most digitally divided region in the world. The high cost of international bandwidth has made Internet access unaffordable for much of the region. It is estimated that roughly 30% of people in Asia and the Pacific use the Internet, while only 7.4% are believed to have access to high-speed fixed broadband.³¹ Paradoxically, low levels of international bandwidth correlate with the high prices of basic monthly broadband Internet packages in most developing economies in Asia and the Pacific (see figure 1.4). Particularly disadvantaged are least developed markets, such as Myanmar and the Lao People's Democratic Republic, where domestic user prices are more than 10 times higher than those of Singapore.

In 2014, ESCAP undertook a study to assess the contribution of broadband to economic growth and found that broadband penetration had a positive impact on growth in GDP per capita

Figure 1.4. Broadband indicators, selected Asian and Pacific economies, 2012

Sources: International Telecommunication Union, Measuring the Information Society (Geneva, ITU, 2013). International Internet bandwidth for Nepal: World Bank and International Telecommunication Union, The Little Data Book on Information and Communication Technology 2013 (Washington, D.C., World Bank and ITU, 2013).

Box 1.2. Measuring the contribution of broadband to economic growth

In 2014, using the World Bank's methodology, ESCAP assessed the contribution of broadband to economic growth by replicating the cross-country growth model and data for 35 developing economies in Asia and the Pacific, from 1997 to 2012 (see annex I). Both growth models are based on the endogenous growth theory.

The results for the developing economies in the ESCAP region show that broadband penetration has a positive impact on growth in GDP per capita. On average in ESCAP developing countries, a 10% growth in broadband penetration was found to be associated with a 1.34 percentage point increase in GDP per capita growth. The estimated impact is strong for some countries, notably Kazakhstan, which experienced an increase of \$162.40 in per capita GDP, while for Turkey and Malaysia the corresponding figures are \$142.90 and \$139.80 respectively. Even such small island developing States as Maldives and Tonga experienced increases of \$88 and \$60.20, respectively.

Moreover, beyond certain thresholds of a critical mass in broadband penetration, the positive impacts of broadband access increase progressively, probably due to network externalities and productivity gains across various sectors of the economy.

Source: ESCAP calculations, based on C.Z-W. Qiang, C. Rossotto and K. Kimura, "Economic impacts of broadband", in Information and Communications for Development 2009: Extending Reach and Increasing Impact (Washington D.C., World Bank, 2009).

Notes: Results were statistically robust with a positive and significant coefficient at a 1% level. The R-squared was 0.4349, while the coefficient of broadband penetration impact on GDP growth between 1997 and 2012 was positive at 0.134.

(see box 1.2). On average, a 10% growth in broadband penetration was found to be associated with a 1.34 percentage point increase in GDP per capita growth for ESCAP developing countries, amounting to an average of \$49.60 in GDP per capita. ESCAP further

estimated that a sizeable impact on GDP per capita can be achieved by increasing Internet access, as measured by target 4 of the Broadband Commission for Digital Development which states: "By 2015, Internet user penetration should reach

60% worldwide, 50% in developing countries and 15% in LDCs".³²

Businesses and markets are driven and rewarded by the uptake of new technology and the speed at which information can be accessed. Similarly, individuals who can access broadband Internet are increasingly at an advantage over those who cannot. Thus, the "digital divide" is translating into new types of inequality that cut across geography, gender, age groups and levels of income and education. For example, even among the new "digital natives," or those young adults who have interacted with digital technologies throughout their lives, there are enormous disparities between countries: in the Republic of Korea, 99.6% of young people have been active on the Internet for at least 5 years, while in Timor-Leste this figure is less than 1%.³³ This stark divide – young people in the region living in two vastly different digital worlds – has enormous implications for the future. The key challenge for countries in the region will be to develop physical infrastructure to strengthen ICT connectivity, as well as to make the Internet accessible for all.

Expanding the region's trade in services

During the recent period of global and regional recovery, global trade in goods has been outpaced by global trade in services, particularly in developing economies. Since the early 2000s, the Asian and Pacific region has been performing better than the rest of the world. Between 2002 and 2012, its share of global exports of services rose from 23% to 28%, while its share of imports of services also rose, from 27% to 31%.³⁴

In particular, the region is becoming an increasingly important player in commercial services exports, broadly categorized as transportation, travel and other commercial services. Notably, the export growth of the region's developing economies is faster than that of the region's developed economies.³⁵ Today, China; Hong Kong, China; India; the Republic of Korea; and Singapore are the region's leading exporters of commercial services, while some nontraditional services exporters, such as Azerbaijan; Georgia; Kyrgyzstan; Macao, China; and Mongolia have increased their share in total Asian services exports.³⁶

Services, in particular so-called infrastructural services, have wide-reaching effects on other

sectors. Recent research has led to changes in the way that services are estimated (in value added terms) and to a recalculation of the role of services in global trade, including in the production of goods.³⁷ This research suggests that services that support better connectivity, namely transport, logistics, communications, finance, and business and professional services facilitate the expansion of trade in goods, as well as travel and international tourism.³⁸

The region's most dynamic commercial services sector is travel, with growth driven by intraregional demand

Meanwhile, the region's most dynamic commercial services sector is travel, with growth driven by intraregional demand. In 2013, the Asian and Pacific region captured close to 23% of total global international tourist arrivals, with South-East Asia and South Asia leading the way in increasing their market share (see table 1.3). Improved air connectivity has supported this growth. According to statistics on airport passenger numbers, in 2012 the region registered nearly 1.69 billion passengers, an increase of 8% from that of the previous year. This number exceeds the total number of passengers arriving and leaving airports in Europe and North America, excluding transit passengers.³⁹

For many least developed countries, landlocked developing countries and small island developing States, tourism is a significant and growing source of foreign exchange. The formation of the proposed ASEAN Economic Community in 2015 is expected to provide the ASEAN region with an additional boost in tourism, especially in Cambodia, the Lao People's Democratic Republic, Myanmar and Viet Nam, the so-called CLMV economies. Tourism can also be seen as a form of cultural exchange that contributes to greater respect and understanding among the region's diverse peoples.

In the future, these service sectors will offer alternative sources of growth for countries that are distant from major regional production and consumption centres, including landlocked developing countries and small island developing States. However, as services increasingly rely on fast and reliable Internet and telecommunications systems, their growth will depend on the availability of broadband connectivity.

Table 1.3. International tourism trends, 1990-2012

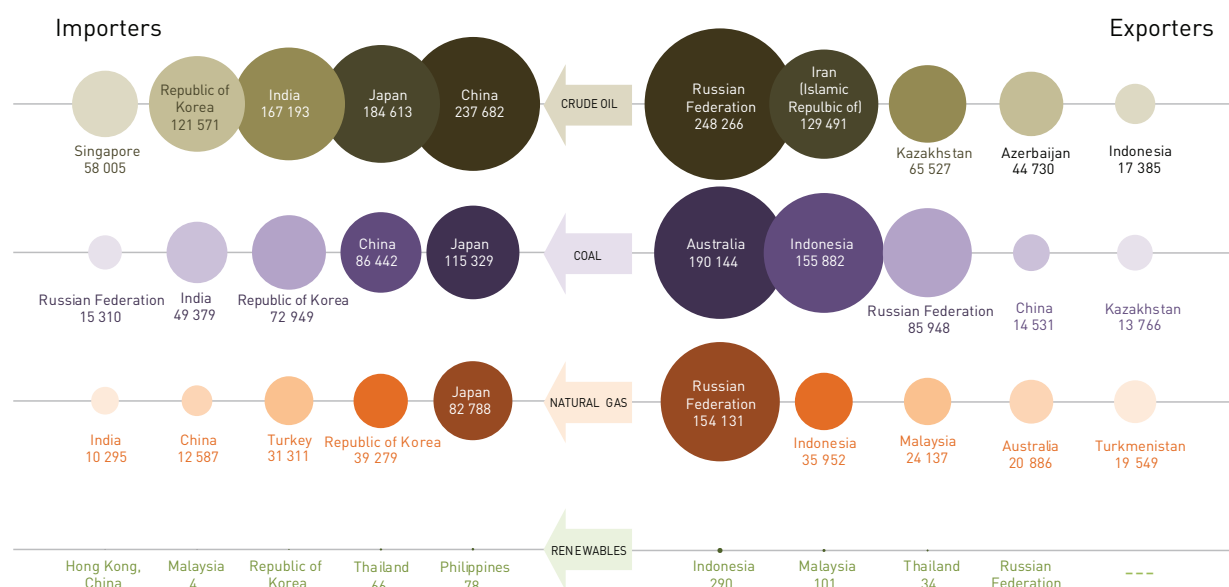
	International tourist arrivals (millions)							Market share (per cent)	Average annual growth
	1990	1995	2000	2005	2010	2011	2012	2012	2005-2012
World	436	529	677	807	949	995	1 035	100	3.6
Asia & the Pacific	5.8	82.0	110.1	153.6	205.1	218.2	233.6	22.6	6.2
North-East Asia	26.4	41.3	58.3	85.9	111.5	115.8	122.8	11.9	5.2
South-East Asia	21.2	28.4	36.1	48.5	70.0	77.3	84.6	8.2	8.3
Oceania	5.2	8.1	9.6	11.0	11.6	11.7	12.1	1.2	1.4
South Asia	3.1	4.2	6.1	8.1	12.0	13.5	14.1	1.4	8.2

Energy connectivity and security

Asia and the Pacific remains heavily dependent on fossil fuels. In 2011, the region accounted for about 40% of global oil and gas consumption, and 70% of global coal consumption.⁴⁰ The situation is unlikely to change as the region's economic growth and rising affluence is resulting in a growing demand for energy resources. For example, the Asian Development Bank has estimated that, by 2035,⁴¹ the region will consume more than half of the world's supply of energy, with electricity consumption more than doubling between now and 2035. Because the

region is heavily reliant on fossil fuels, its energy use is contributing to climate change, with its share of global carbon dioxide emissions increasing from 38% in 1990 to about 50% in 2008.⁴²

While several countries in the region are net exporters of energy, only a few countries satisfy their energy needs from their own resources (see figure 1.5). The region as a whole is a net importer of primary energy. Notably, some countries are both major importers and exporters of energy, suggesting that even energy-rich countries are dependent on others for energy security. Meanwhile, other countries,

Figure 1.5. Top five importers and exporters by energy resource in Asia and the Pacific, 2010 (ktoe)

Source: ESCAP, *Statistical Perspectives: Focus Areas for Realizing Enhanced Energy Security* (2013)

particularly in the Pacific, are heavily dependent on imports of fossil fuels for their energy needs. The uneven distribution of energy supplies results in significant differences in power generation costs.

Meanwhile, access to energy varies widely from country to country, and even within countries. As of 2010, there were still 628 million people in the region without access to electricity and 1.8 billion people using traditional biomass – a distinctive characteristic of poverty.⁴³ Populations with low electricity access are concentrated in South Asia and in the Pacific, where more than 70% of their populations still lack access to on-grid electricity.⁴⁴

Sustainable human development depends on adequate, reliable and affordable supplies of energy, that is, energy security. Without energy security, the region will miss significant growth opportunities, and the impact will be on both energy-poor and energy-rich countries. It is therefore critical to optimize the region's available resources.

In this regard, many countries in the region, particularly those that have grown rapidly in recent years, are involved in cross-border initiatives to secure energy from other countries (see box 1.3). These initiatives can be divided into three main groups: infrastructural projects of inter-subregional or subregional significance; infrastructural projects of bilateral significance; and maritime energy trade projects. Previous ESCAP studies have described the status of these initiatives, as well as longer-term plans for subregional and multi-country cooperation in energy.⁴⁵

What is needed now is greater energy connectivity at the regional level, along with measures to improve energy efficiency and to adopt greener options. This would reduce the gaps between supply and demand. One important measure would be to transfer power from energy-rich or lower-cost power countries to energy-poor or high-cost power countries, which would help to bridge the growing energy divide and to ensure energy security for the region as a whole.

Box 1.3. Growing energy demand fuels China's regional energy connectivity efforts

China's rapid economic growth is reflected in the country's swift expansion of energy production and consumption. In 2010, China's energy production (solid, liquid, gas and primary electricity) was estimated to account for about 36% of the region's total production, while its share of total regional consumption was estimated to account for about 41%. Although total energy imports into China amount to only approximately 4% of its total energy demand, the country depends on imports for approximately 50% of its liquid fuel (oil and petroleum products) and 10% of its gaseous fuel.

The Government has therefore followed a variety of strategies to improve energy connectivity. Starting with neighbouring countries, such as the Russian Federation, it has expanded its trade in energy to the Democratic People's Republic of Korea, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam. On 21 May 2014, Gazprom in the Russian Federation and the China National Petroleum Corporation signed a 30-year contract on Russian natural gas supplies to China via the eastern route worth a total of \$400 billion. The deal involves the supply of 38 billion cubic metres of natural gas to China annually. A number of power trade agreements with Kazakhstan and Mongolia are under negotiation.

Meanwhile, the Government has also invested in the region's physical infrastructure, such as pipelines and power grids. For example, the surge in imported gaseous fuel in China is the result of the completion of the gas pipeline from Turkmenistan to China through Uzbekistan and Kazakhstan in 2009. Unlike oil and gas, power grid connection has also provided opportunities for China to export its electricity to other countries. For instance, Viet Nam has signed a power purchase agreement with China Southern Power Grid to purchase 200 million Kwh annually,

Box 1.3. Continued

while Thailand is negotiating with China to have joint investment in hydropower projects in Yunnan and expects to buy electricity from China. Like other rapidly growing economies, China has become one of the major drivers of the region's energy integration and interdependence.

Source:

United Nations Economic and Social Commission for Asia and the Pacific, *Statistical Perspectives: Focus Areas for Realizing Enhanced Energy Security*. Available from www.unescap.org/resources/statistical-perspectives-focus-areas-realizing-enhanced-energy-security

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Responding to population dynamics

A defining feature of the Asian and Pacific region is its demographic heterogeneity. The population is changing on a scale and at a pace never before witnessed in human history: between 1950 and 2013, the region's population nearly tripled, from 1.5 billion to 4.3 billion people.⁴⁶ This unprecedented growth in the population is a manifestation of the demographic transition, where countries move from a regime of high mortality and high fertility to first low mortality and then low fertility.

Since the 1970s, one implication of the demographic transition has been the increase in the proportion of the population of working ages (ranging from 15 to 59 years in most countries but from 15 to 64 years in a few countries).⁴⁷ The number of young people in Asia and the Pacific recently peaked and is projected to decline to 717 million in 2014, with almost half (47%) living in South and South-West Asia.⁴⁸ At the same time, irrespective of their stage in the demographic transition, the populations of all countries in the region are currently ageing.

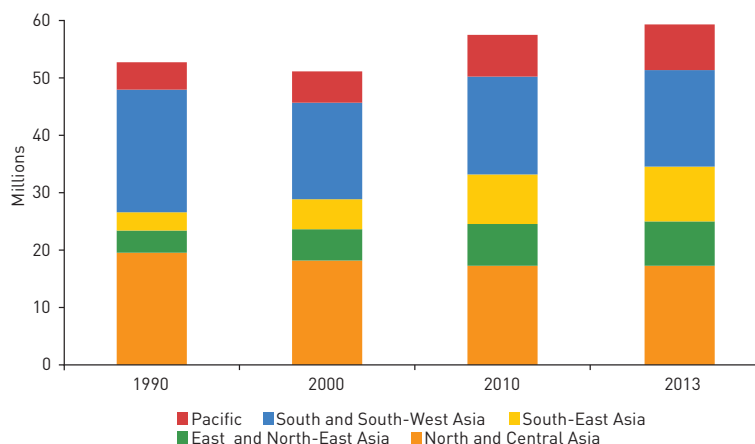
Today, the Asian and Pacific region is host to 59 million migrants – or one quarter of the world's total stock.⁴⁹ Figure 1.6 shows the distribution of migrants across ESCAP subregions, with the largest increases taking place in South-East Asia and the Pacific. In 2013, the largest number of migrants lived in the Russian Federation, followed by Australia, India, Pakistan and Thailand. Furthermore,

international migrants now constitute more than one third of the population in economies such as Macao, China (59%); Brunei Darussalam (49%); Hong Kong, China (39%); and Singapore (43%).⁵⁰

The implications of these demographic trends are significant for the future economic and social development of the region, and point to the urgent need for effective policy responses. For example, countries in the earlier stages of the demographic transition need to expand education and employment opportunities for their growing numbers of young people, while countries that are rapidly ageing need seriously to consider ways to tap into the region's labour supply.

As the region's economies develop and integrate, it is also likely that the demand for migrants will become more diversified. An increasingly important global challenge will be to manage international labour migration in ways that protect migrants, while contributing to sustainable development in countries of origin as well as in host countries.⁵¹

Figure 1.6. Stock of international migrants in the ESCAP region, selected years



Source: United Nations Department of Economic and Social Affairs, “Total international migrant stock” (New York, 2014). Available from <http://esa.un.org/unmigration/TIMSA2013/migrantstocks2013.htm?mtotals>.

Transitioning to knowledge-based economies

Global economies are increasingly based more on knowledge and information and less on physical inputs or natural resources. Knowledge is now recognized as one of the main sources of growth, driving the emergence of knowledge-intensive industries and increasing productivity across sectors. As the region becomes more connected, people in Asia and the Pacific should be able to access a wide variety of educational, training and income-earning opportunities, thereby benefiting from the region’s growing knowledge base.

With the continuing diversification of economic activities in countries in the region, the demand for more highly skilled workers is likely to increase. At the national level, this will require more investment in education, including professional and vocational training. The Asian and Pacific region is already home to many leading research institutions and universities, but countries can also take advantage of the new opportunities for tertiary education, as well as knowledge generation and sharing that are emerging from improved transport and ICT connectivity.

These forms of connectivity are also facilitating the sharing of knowledge and research between universities, researchers and industry. Some countries have successfully replicated the “Silicon

Valley” model of firms with close links to universities, enabling them to benefit from knowledge spillovers generated by the universities. This is contributing to the development of high-tech clusters in some industries, such as computer software development. By strengthening regional knowledge-sharing networks, more countries could participate in different types of clusters.

REGIONAL STRATEGIES FOR STRENGTHENING CONNECTIVITY IN THE ESCAP REGION

Regional connectivity is thus multifaceted: the connectivity of one sector influences the connectivity of others. The experience of East Asian economies suggests that trade and transport connectivity are intricately intertwined, while ICT connectivity is becoming an integral part of all networks. This highlights the need for greater coordination, not only across borders but also across sectors. At the same time, there will be new opportunities for enhancing the quality of these networks by combining the various elements in different ways.

Developing regional networks in a coordinated way can help to spread the benefits from increasing regional connectivity more evenly across countries, particularly to the least developed countries, landlocked developing countries and small island developing States. Given the unique spatial contexts

in which they are located, these countries need to draw on their current endowments and focus on the specific aspects of connectivity that are expected to become important in the future.

With this in mind, the next chapter describes the current status of the connectivity of trade and transport, ICT, energy and people-to-people networks, and outlines regional strategies for strengthening these critical networks. Chapter 3 emphasizes the importance of strengthening institutional coordination and cooperation to address the multifaceted and cross-sectoral nature of regional connectivity, and recommends ways of enhancing regional connectivity for shared prosperity. Chapter 4 concludes the present publication with a summary of key recommendations.

Annex I. Measuring the impact of broadband infrastructure on economic growth

Studies on the contribution of broadband infrastructure to economic growth and income have mostly focused on developed countries, and even then due to the newness of the technology, the timespan of the data and research is not sufficient to refine methodologies and results. Notwithstanding this, the pervasiveness of these technologies and their ever growing potential for wealth creation and transformative development, has given rise to a flurry of studies seeking to better understand the contributions.

In 2009, the World Bank published a study which examined the economic impact of broadband, through a cross-country regression analysis based on the endogenous growth theory. The World Bank model reviewed 120 developing and developed countries. The oft quoted results show a positive impact of broadband penetration on GDP per capita growth rates, with *"a 1.38 percentage point increase [in per capita GDP growth] for each 10% increase in [broadband] penetration"*, in developing countries.⁵²

Additionally, other studies have shown that unless countries strive to dramatically increase their broadband deployment, the impacts will remain below their potential. One study shows that with low broadband access (under 20%) an increase of 10% in broadband penetration contributes 0.08% to GDP growth.⁵³ For countries with medium broadband access (20-30%), GDP increases by 0.14% and with broadband access higher than 30%, the effect 0.23%.

In 2014, ESCAP undertook a study using the World Bank's methodology to assess the contribution of broadband on per capita GDP growth. ESCAP replicated the World Bank's cross-country regression analysis for 35 developing economies of its region, using updated data i.e. data from 1997 - the year when ITU started collecting data on broadband penetration - up to 2012, the latest available. The equation used is as follows:

$$\text{GDP9712} = B_0 + B_1 \cdot \text{GDP97} + B_2 \cdot \text{Literacy97} + B_3 \cdot \text{TELPEN} + B_4 \cdot \text{IY9712} + \mu$$

Definition of Variables

Dependent Variable	GDP9712	Average growth rate of real GDP per capita in US\$ over 1997-2012
Control Variable 1	GDP97	Level of real GDP per capita in 1997
Control Variable 2	Literacy97	Literacy rate in 1997
Control Variable 3	TELPEN - BBND_MOB - BBND_FIX	Average penetration of broadband between 1997 to 2012
Control Variable 4	IY9712	Average share of investment in GDP from 1997-2012

Source: ESCAP

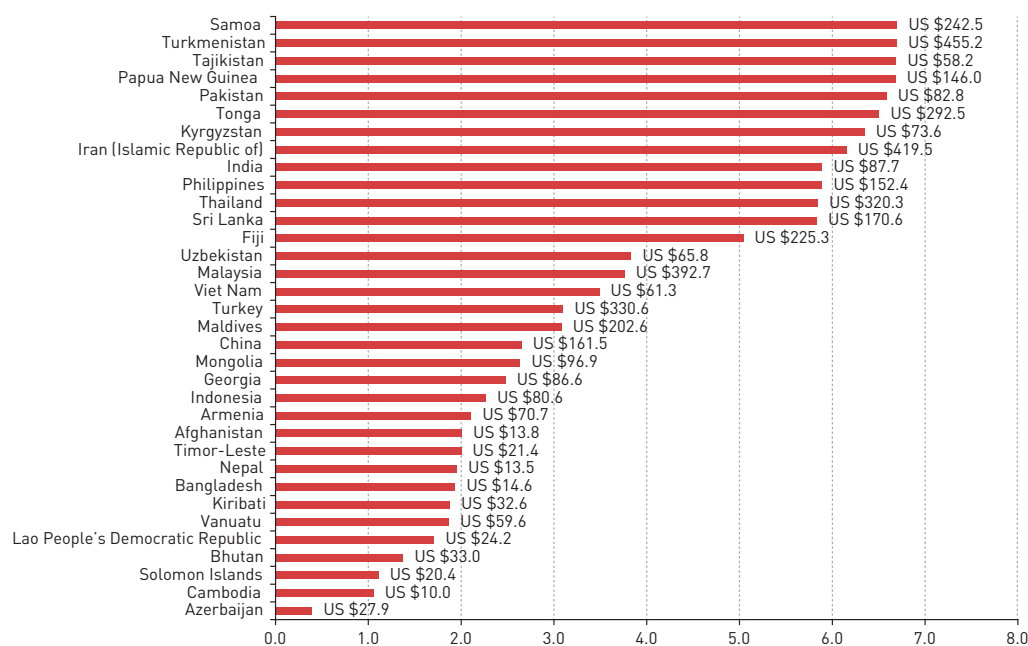
Findings

1. The results for developing countries of the ESCAP region show that broadband penetration has a positive impact on growth in GDP per capita. On average, a 10% increase in broadband penetration is associated with a 1.34 percentage point increase in per capita GDP growth, which amounts to an additional \$49.6 in per capita GDP, on average, for ESCAP developing countries. The impact is strong for some countries, notably Kazakhstan which experiences an increase of \$162.4 in per capita GDP, while for Turkey and Malaysia the corresponding figures are \$142.9 and \$139.8 respectively. Even small island developing economies such as the Maldives and Tonga experience increases of \$88.0 and \$60.2 respectively.
2. Reaching the Broadband Commission target 4 on “Getting people online – by 2015” would translate in an even more sizeable impact on GDP per capita. For ESCAP developing countries on average, attaining the Broadband Commission

Target 4 would yield an increase in per capita GDP of \$133.7 while, as shown in the figure, the impact is even larger for some countries such as Samoa and Turkmenistan. Even in a country such as Azerbaijan that already has a relatively high broadband penetration of 47%, reaching the target would add \$27.9 to per capita GDP. China, which has a penetration rate of 30% would experience an increase in per capita GDP of \$161.5. Fiji, India, the Islamic Republic of Iran, Kyrgyzstan, Pakistan, Papua New Guinea, Philippines, Samoa, Sri Lanka, Tajikistan, Thailand, Tonga, and Turkmenistan would see per capita GDP growth rates increase by more than 5 percentage points.

3. The above results could have a downward bias, due to the relatively low current penetration levels of broadband. Nevertheless, they suggest that broadband penetration has growth benefits. It should also be noted that because demand for broadband increases with wealth, penetration rates are potentially endogenous, possibly overestimating the results.

Impact of attaining Broadband Commission Target 4



Source: ESCAP staff calculations.

Note: Horizontal axis shows the gains in per capita GDP growth, associated with reaching Target 4 of the Broadband Commission, as percentage points. The figures next to the bars show the equivalent US\$.

Policy implications

Beyond certain thresholds of a critical mass in broadband penetration, the positive impacts of broadband access increase progressively, due to network externalities, productivity gains and increases in human knowledge and skills that leave no sector of the economy untouched. Consequently, this should encourage policymakers to prioritize investments in broadband infrastructure deployment at the national and regional levels, and make a big push towards the attainment of the targets set out by the Broadband Commission. In unserved or underserved areas, public-private partnerships would enhance the sustainability of investments and ensure that the goal of affordable and reliable connectivity available to all, at all times, is attained.

Deeper assessment of the linkage between ICT and variables such as market structure, competition and prices together with other measurable aspects of prosperity (income, employment, cost of living) would require more data, including longer time series, that would allow the establishment of multiple data points for each economy in an endogenous growth regression. The Partnership on Measuring ICT for Development, of which ESCAP is a member, would need stepped up support so that it is in a position to continue leading the global efforts in producing more and better data on ICT.

Endnotes

¹ It should be noted that China accounted for the vast majority of this reduction: between 1990 and 2009, the percentage of China's population living on less than \$1.25 per day fell from 60.2% to 11.8%. See United Nations Economic and Social Commission for Asia and the Pacific, Statistical Yearbook for Asia and the Pacific 2013. (United Nations Publication, Sales No.E.13.II.F.1.).

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- ⁴⁹ United Nations Department of Economic and Social Affairs, Population Division, *Trends in International Migrant Stock: the 2013 Revision*. (New York). Available from esa.un.org/unmigration/TIMS02013/migrantstocks2013.htm. Measuring international migration is difficult because each country has its own definitions of who qualifies as a migrant. Migrant stocks consist of people who have resided in a country for at least one year, but were either born in, or remain nationals of, another country. Figures on migrant stock therefore can include long-term residents and their family members, as well as temporary labour migrants and refugees.
- ⁵⁰ United Nations Department of Economic and Social Affairs, Population Division, *Total International Migrant Stock* (accessed 6 February 2014). Available from <http://esa.un.org/unmigration/TIMSA2013/migrantstocks2013.htm?mtotals>.
- ⁵¹ P. Martin, “Labour migration development indicators in the post-2015 global development framework”, in *Migration and the United Nations Post-2015 Development Agenda* (Geneva, International Organization for Migration, 2013). Available from www.iom.int/files/live/sites/iom/files/What-We-Do/docs/Labour-Migrationand-Development-Indicators-in-the-Post-2015-Global-Development-Framework.pdf.
- ⁵² C.Z-W. Qiang, C. Rossotto and K. Kimura, “Economic impacts of broadband”, in *Information and Communications for Development 2009: Extending Reach and Increasing Impact* (Washington D.C., World Bank, 2009).
- ⁵³ P. Koutroumpis, “The Economic Impact of Broadband on Growth: A simultaneous approach”, in *Journal of Telecommunications Policy*. Vol. 33, No. 9., pp. 471-485 (Pergamon Press, New York, 2009).



REGIONAL STRATEGIES FOR STRENGTHENING REGIONAL CONNECTIVITY

2

Regional connectivity requires integrating different types of regional networks, ranging from infrastructure networks to those concerned with knowledge-sharing. As they evolve, these networks are becoming more complex and interdependent. Developing regional networks in a strategic and coordinated way will spread the benefits more evenly across Asia and the Pacific, particularly to the least developed countries, landlocked developing countries and small island developing States. Given the unique spatial contexts in which they are situated, these countries will require different approaches and modalities for strengthening regional connectivity.

One of the most important contributions to economic growth is extensive and efficient infrastructure – particularly systems for transport, energy and communications. Investment in physical infrastructure networks generally results in net income gains at both national and local levels.¹ This is especially true for countries that depend heavily on external trade. Linking national investments to regional priorities in an integrated manner can expand the benefits to a wider group of countries. Regional networks can thus be seen as a type of “regional public good”, whereby the collective benefit for the region exceeds the cost of the individual sections of the network.

Meanwhile, across Asia and the Pacific, countries are exploring new forms of people-to-people connectivity. With the extension of transportation links, people in the Asian and Pacific region are travelling more quickly to more places and at lower costs than ever before. Many are labour migrants travelling abroad to earn money to send home as remittances, providing income and employment in both countries of origin and countries of destination. Others are travelling as academics or students and are contributing to the development of the region’s knowledge economies. Meanwhile, regional business networks and tourist flows are growing rapidly, thanks largely to the expansion of aviation links.

The contribution of these various networks to economic and social development depends on the policy, legal, regulatory and institutional frameworks in which they are located. These frameworks can be considered as “soft” infrastructure and are as important in determining the effectiveness of networks as physical capacities.²

In the past, the development of “hard” and “soft” infrastructure was by and large delegated across authorities that used different parameters and methodologies to analyse and “cost” investments. However, it is evident that “hard” and “soft” infrastructures are fundamentally complementary, and that multifaceted approaches achieve better outcomes.

At the same time, it is becoming evident that connectivity is multisectoral, with the connectivity of one sector influencing the connectivity of others. This interdependence demands greater cross-sectoral coordination.

One final challenge is to extend these networks across borders. There are already examples of cooperative approaches that have enhanced regional connectivity, including both formal arrangements, such as intergovernmental agreements, and less formal approaches, such as the adoption of common principles or codes of practices. However, the benefits of either approach have yet to be fully realized due to weaknesses in institutional collaboration and in capacity for implementation.

The fact that countries in the region are at different stages of development is an opportunity for countries to configure new infrastructure that makes best use of the natural differences between countries and contributes to more sustainable and inclusive forms of development. The future of regional connectivity depends on how closely they can work together to strengthen networks in four critical areas: trade and transport connectivity; information and communications technology (ICT) connectivity; energy connectivity; and people-to-people connectivity.

TRADE AND TRANSPORT CONNECTIVITY

The status of trade and transport connectivity in the region

As noted in the previous chapter, the expansion of trade depends on having appropriate transport infrastructure and an enabling environment for private businesses to engage in trade. Trade connectivity and transport connectivity are thus two sides of the same coin, and both “hard” and “soft” infrastructures need to be improved to enhance access to global and regional markets.

From the perspective of physical transport infrastructure, some countries in the Asian and Pacific region have made major strides in expanding their road networks, with an estimated 300,000 km of roads being added every year over the past decade.³ Furthermore, there has been tangible progress in the development of the region’s railway networks. Australia, China, India, the Islamic Republic of Iran, Japan, the Republic of Korea, the Russian Federation and Turkey have expanded and upgraded their railway networks, while in Mongolia and Turkmenistan, new tracks are being laid to carry mineral exports to international markets.

However, there are still significant gaps in transport infrastructure connectivity. One study estimated that, by 2020, developing Asian countries could gain 6% of real income, or close to \$1 trillion, if the estimated transport investment needs in Asia were met and appropriate infrastructure were constructed.⁴ What is needed in particular are better linkages from landlocked developing countries and least developed countries to the region's maritime ports and airports, as well as the upgrading, integration and operationalization of regional transport networks.

Under the auspices of ESCAP, member States have formulated a number of regional strategies on trade and transport connectivity. The Regional Action Programme for Transport Development in Asia and the Pacific, phase II (2012-2016), for example, identifies 10 thematic areas for developing an integrated, intermodal, international transport and logistics system in the ESCAP region.⁵ Meanwhile, ESCAP is promoting trade facilitation through a variety of channels, including the United Nations Network of Experts for Paperless Trade in Asia and the Pacific (UNNEXt).⁶ Within the framework of these initiatives, countries should prioritize the issues described below to strengthen trade and transport connectivity in the region.

Upgrading and integration of regional transport networks

Many of the principal regional approaches to infrastructure have been facilitated by ESCAP. In particular, these led to intergovernmental agreements on the Asian Highway and Trans-Asian Railway networks – which today comprise 143,000 km of roads and highways, and 117,500 km of rail routes of international importance, including approximately 11,000 km of sections that have yet to be constructed, that is, the so-called “missing links”.⁷ Given that the road transport sector carries the majority of overland freight, the Asian Highway Network is especially important for carrying bilateral trade between contiguous countries.

The establishment of minimum standards under the Intergovernmental Agreement on the Asian Highway Network has helped countries to raise progressively the quality of their major international highways (see figure 2.1). However, there is still scope for upgrading the quality of the network, particularly from below class III to class III. With

almost two thirds of road sections under class III found in Afghanistan, Mongolia, Myanmar, Pakistan and Tajikistan, efforts to upgrade the Asian Highway Network should focus on these countries.⁸

Increasing the share of rail for freight transport would bring substantial benefits

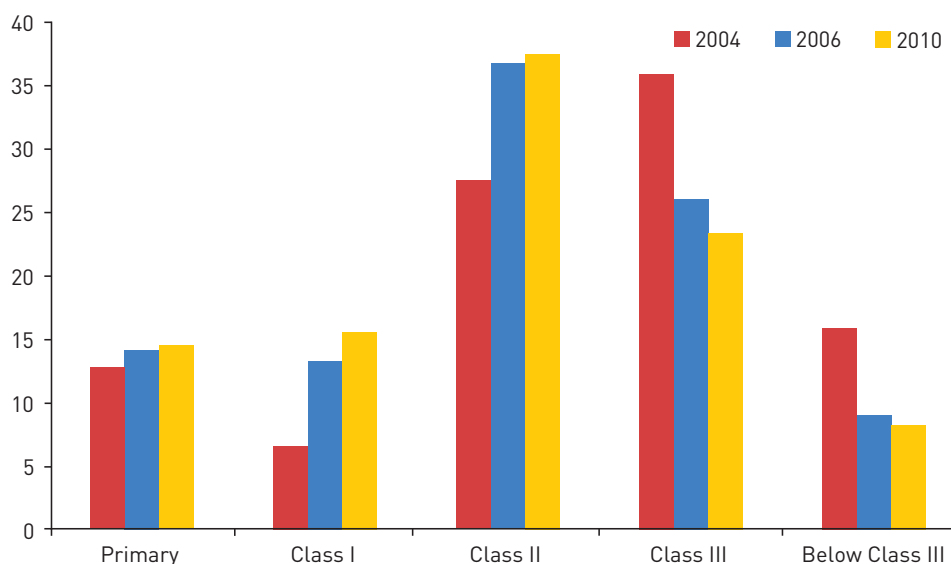
Furthermore, all countries should look at ways to better manage and maintain their road networks. While ESCAP estimates that the cost of upgrading the Asian Highway Network is approximately \$36 billion in total, the cost of maintaining the existing network is also expected to become as costly as building new infrastructure.⁹ Although many countries have improved their maintenance regimes over the past decade, national budgets tend to under-allocate for road maintenance, increasing the long-run costs to Governments as well as vehicle operating costs for road users.

Meanwhile, there is an urgent need for countries in the region to increase the modal share of other modes of transport, particularly for freight. As figure 2.2 shows, the Trans-Asian Railway network connects most countries of continental Asia to Europe and the Middle East, with plans proceeding for the construction of some of the remaining 11,000 km of “missing links”. Despite progress, however, the region's extensive railway network is still underutilized for international freight movements.

Increasing the share of railways in the region would bring substantial benefits in many respects. Freight railways have an operating cost advantage over road transport for long distances (typically greater than 500 km), while often being competitive for medium distances (300-500 km). This is particularly true for heavy industry and where annual transport volumes are high. It is also well documented that railways offer a more environmentally sustainable mode of transport for long distances – one estimate found that carbon dioxide emissions by rail are almost eight times less than they are for trucks and four times less than for inland waterways (barges).¹⁰

To realize the advantages of railways, countries in the region need to improve intermodal connectivity between the various networks. The lack of efficient and properly equipped facilities for transferring

Figure 2.1. Progress in upgrading routes of the Asian Highway Network, 2004-2010



Source: United Nations Economic and Social Commission for Asia and the Pacific, *Review of Developments in Transport in Asia and the Pacific*. ST/ESCAP/2627.

goods between the region's road and railway networks is a major hindrance to promoting a modal shift to rail. Trucks can pick up a container at a factory warehouse and deliver it to the port, but if railways are to participate in container haulage, they must have physical access to an intermodal transfer terminal.

Thus, there is an urgent need for greater investment in intermodal facilities, such as dry ports or inland container depots – at strategic locations where freight can be switched from one form of transport to another without delay or damage.¹¹ With the appropriate control authorities present, dry ports can also act as “extended gates” for seaports, since they are better able to control and adjust transport flows.¹² In this regard, the Intergovernmental Agreement on Dry Ports, adopted in 2013, offers a useful framework for countries to develop dry ports in the region.¹³

Enhancing cooperation at border crossings

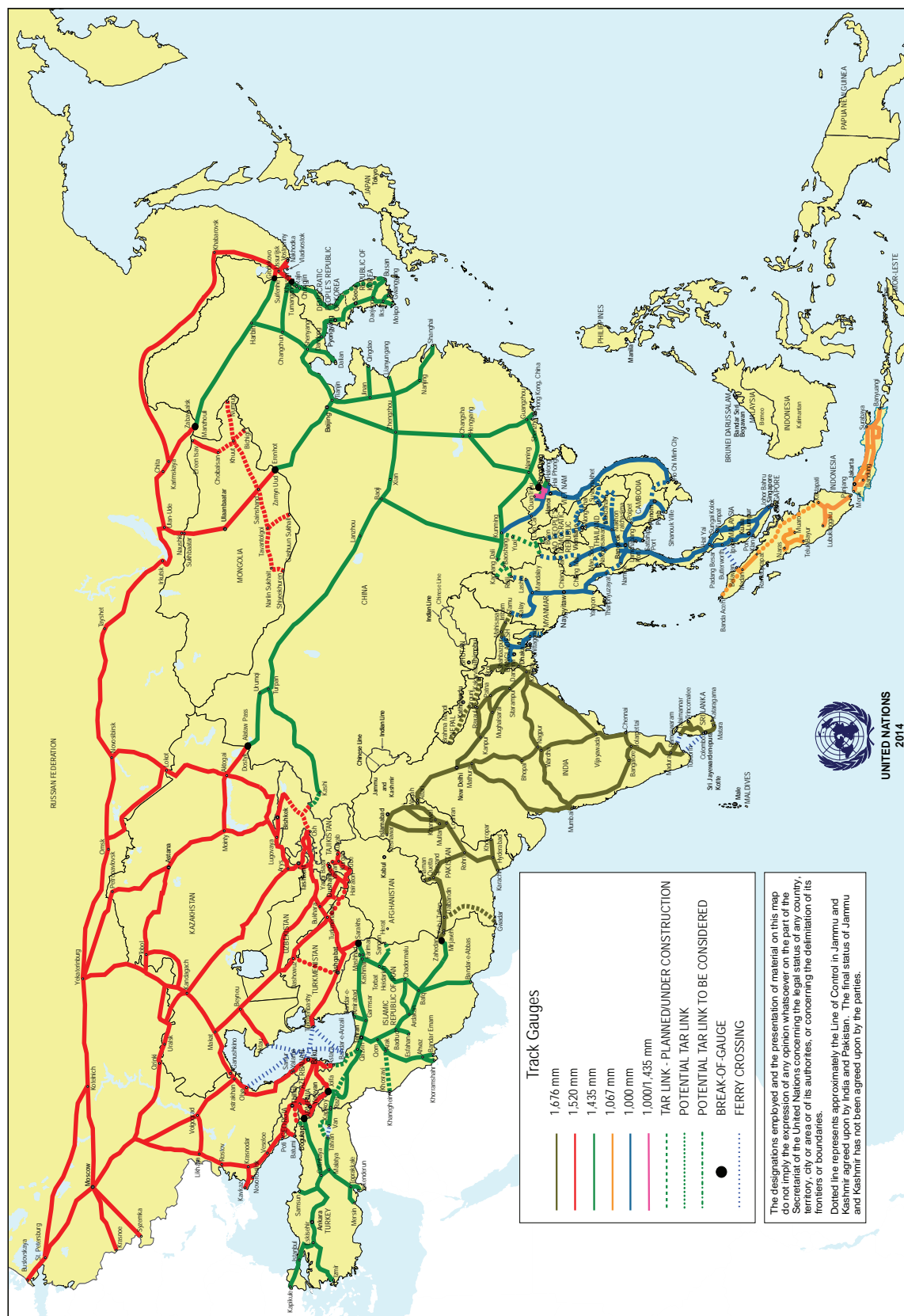
Another major impediment to trade and transport connectivity is the presence of multiple “choke points,” particularly at borders. Border agencies are required to maintain a fine balance: on one hand, they have to facilitate trade and transport; on the other, they have to assert regulatory controls.

They have to combat, for example, the smuggling of illicit, counterfeit and environmentally sensitive goods, money laundering and human trafficking, and more recently, they have had to control health pandemics, such as that caused by avian influenza. This requires a large and diverse number of government authorities and agencies, including immigration, police, customs, quarantine, sanitary and phytosanitary inspection, and transport.

These controls are important, but they add to the cost, time and risk involved in moving freight by land. For example, the International Road Transport Union, through its New Eurasian Land Transport Initiative, found that border waiting times account for about 40% of time lost during transport, and that such a situation encourages corrupt practices that can account for 30% of transport costs.¹⁴ Such costs inhibit the expansion of trade in the region and undermine other important initiatives, such as tariff reductions.

Many countries in the region are already taking steps to enhance cooperation between their border agencies, mostly on a bilateral basis. Kazakhstan and Kyrgyzstan, for example, began joint customs control and a single-stop inspection of vehicles, goods and passengers at border crossings in August 2012,¹⁵ while Georgia and Turkey also established

Figure 2.2. Current status of the Trans-Asian Railway network, 2014



Source: ESCAP secretariat.

joint customs control. In November 2011, China and Mongolia introduced the pilot implementation of a unified customs manifest. Within one year, the customs authorities processed 180,000 unified customs manifests, and the pilot was extended to other major border crossings between the two countries.¹⁶

The next step is to integrate check post facilities at all international border crossings, starting with those along the Asian Highway and Trans-Asian

Railway networks. For example, India has begun implementing integrated check post (ICP) facilities with its neighbours starting with the Attari border check post with Pakistan (see box 2.1). Early reports show that this has led to a significant increase in the number of vehicles and goods crossing the border and a corresponding increase in customs revenues. India's ICPs also demonstrate another opportunity for enhancing connectivity in the region – the use of ICT to facilitate trade and transport.

Box 2.1. Integrated check post at Attari, India-Pakistan border

In order to facilitate trade with neighbouring countries, the Government of India has launched an integrated check post (ICP) initiative. ICPs are expected to serve as single window facilities covering customs, immigration security and warehousing services. One ICP has been operational since 2012 at Attari on the India-Pakistan border.

Previously, cargo from Delhi to Lahore, Pakistan, was sent in four hops via the Nhava Sheva port in Maharashtra, India, by sea to Dubai, United Arab Emirates, where cargo was trans-shipped and transported to Karachi, Pakistan, and then from Karachi to Lahore over land. The shipment would thus take about 30 days to reach its destination. With the Attari-Wagah land route, the journey has been reduced to three days.

During 2012/13, the first year of operation of the ICP at Attari, imports grew by 81%, and exports registered an increase of 122% in value terms. Meanwhile, the number of trucks carrying export cargo from India through Attari increased from 3,882 to 41,248, while the number carrying import cargo increased from 19,087 to 33,599. This led to a 166% increase in customs revenue. In addition, it is reported that the incremental revenue during the post-project period recovered almost one third of the investment in one year, as taxes were also collected from services provided commercially. Land prices in the area have gone up substantially and a variety of organized commercial activities have sprung up on both sides of the border.

India is planning to open another 12 ICPs with various neighbours: 4 on the India-Nepal border, 1 on the India-Myanmar border and 7 on the India-Bangladesh border. Notably, the opening of the ICP at the border of Raxaul (India) and Birgunj (Nepal), which are linked by both road and rail, means that the ICP is integrated with both networks.

Source: ESCAP secretariat.

Harnessing ICT connectivity for trade and transport facilitation

The greater use of automated equipment and data collection systems is transforming the way border agencies operate. Automated data collection systems reduce overlaps when the same information is collected by more than one agency – and on both

sides of the border. ESCAP has developed several models to demonstrate how automated equipment and new technologies such as radio frequency identification and global positioning system can help in managing cross-border movements of trade and transport more efficiently (see box 2.2).

However, the real breakthrough in Asia's overland trade and transport connectivity will come from

combining trade, transport and ICT applications along the whole trade process. As shown in the “single window roadmap,” developed by ESCAP and the Economic Commission for Europe in collaboration with UNNExT (see figure 2.3), most countries have begun developing their single windows by introducing electronic customs declaration systems. The next step is to integrate other government agencies and their associated document requirements into a national single window environment.¹⁷

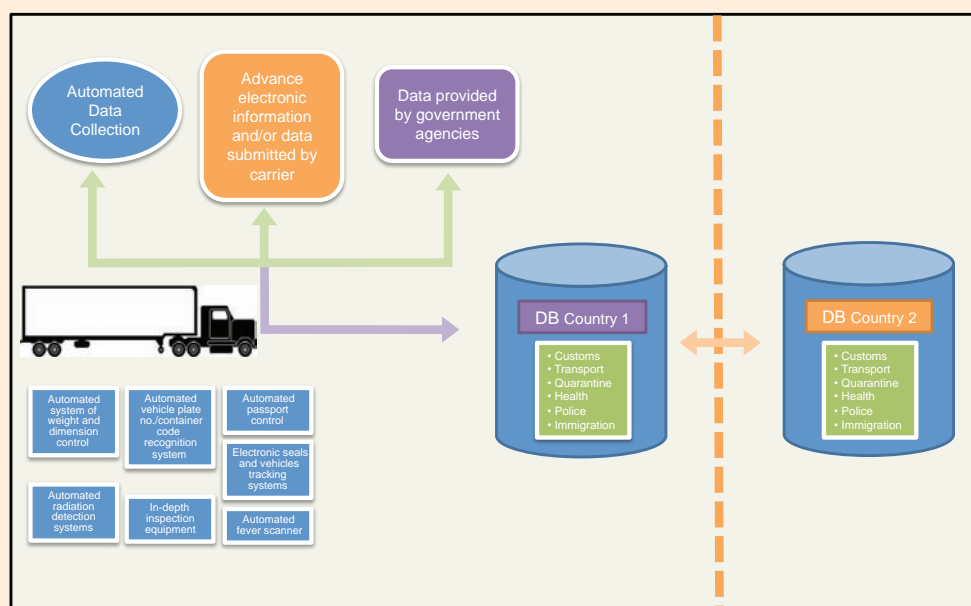
Today, nearly all countries in the region have some

form of automated customs system in place at key border checkpoints, and more than half are developing single windows to enable traders to submit all required information to government agencies at one time and place in electronic form. Notably, the Association of Southeast Asian Nations (ASEAN) has taken steps to develop a regional ASEAN Single Window. The initiative, signed in December 2005, has made some progress: as of March 2013, the exchange of the intra-ASEAN certificate of origin and customs declaration document was tested in a scaled-down ASEAN Single-Window Pilot Project.

Box 2.2. ICT applications for smooth cross-border transport

As part of its efforts to promote efficient cross-border transport, ESCAP has developed several models demonstrating how ICT applications can be adapted and applied by countries to meet their specific requirements. For example, the Border Crossing Management Information System shows how information from automated equipment, advanced information from carriers and data provided by government agencies can be connected to the central border crossing database of a country, and how this information could then be fed to the various border agencies. Such a system could be used in conjunction with various automated equipment and integrated into single window initiatives. Importantly, as volumes of trade and traffic grow, the system could also be scaled up without large additional investments.

Model on integrated controls at border crossings

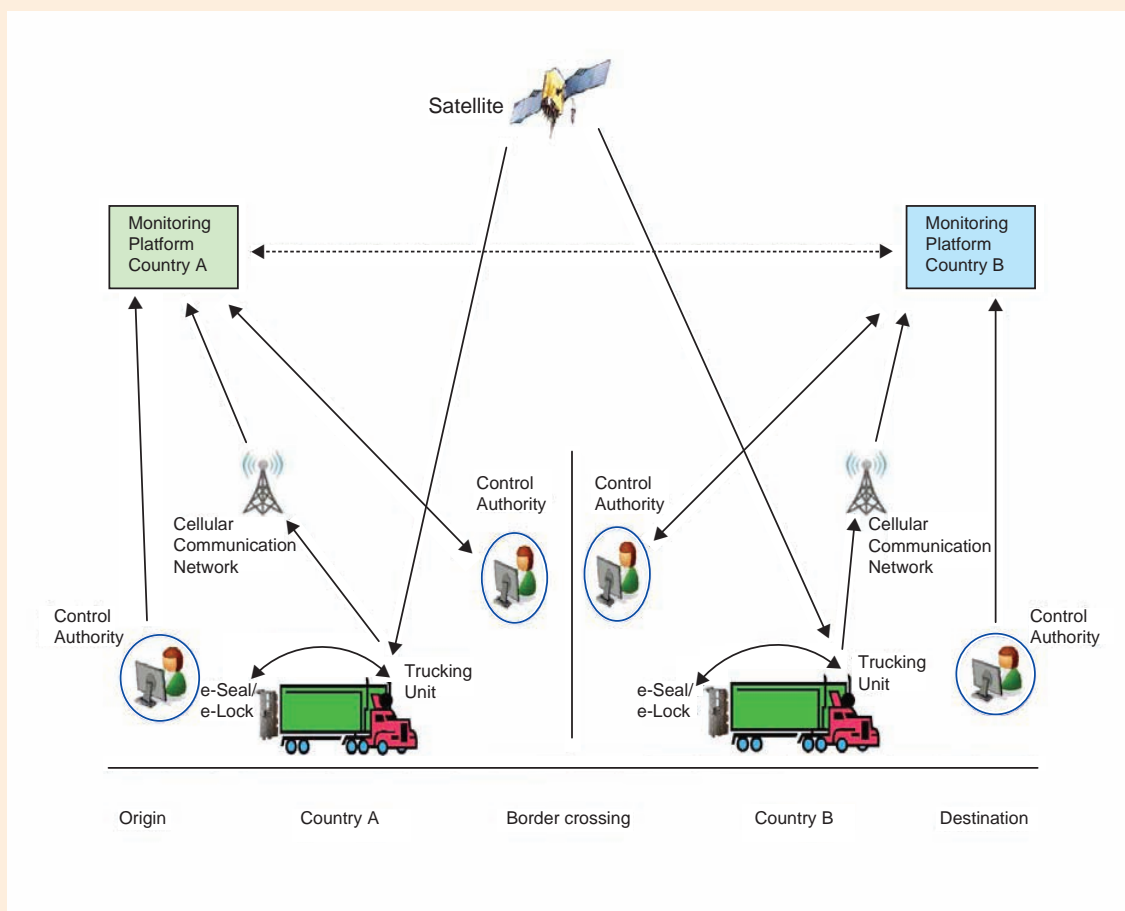


Source: Adapted from United Nations Economic and Social Commission for Asia and the Pacific, “Model on Integrated Controls at Border Crossings” [2012]. Available from <http://www.unescap.org/resources/model-integrated-controls-border-crossings>.

Box 2.2. (continued)

Another type of model is the Secure Cross-border Transport Model, which provides a conceptual and standard basis for the design of a cross-border vehicle monitoring system using new technologies such as ICT, satellite positioning and electronic seals. The model prescribes standardized components, and their interaction and institutional requirements.

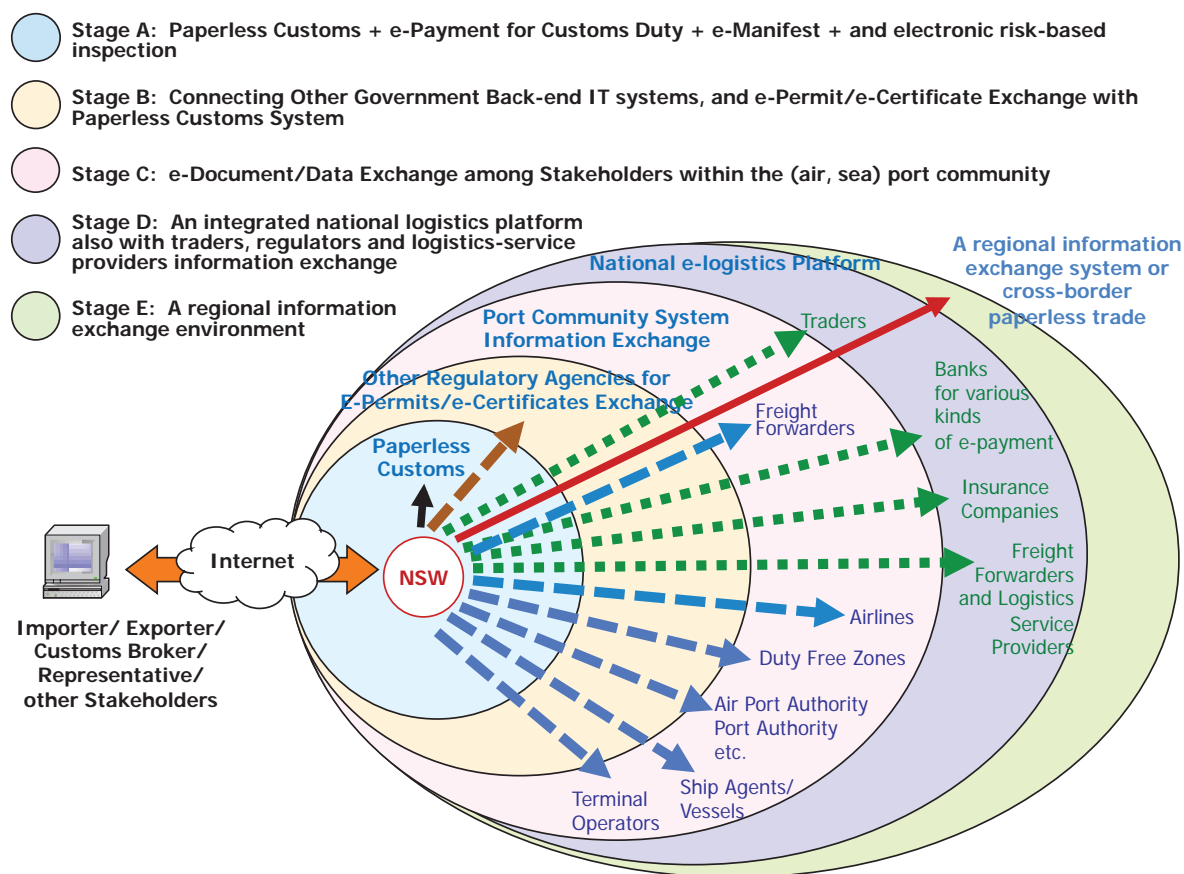
Secure Cross-border Transport Model



Source: ESCAP, Secure Cross Border Transport Model (2012). Available from www.unescap.org/resources/secure-cross-border-transport-model.

This model demonstrates that the integrated use ICT can secure and facilitate trade and transport, while taking care of the concerns of control authorities. A vehicle tracking system based on this model can give control authorities the confidence they need to open up more land routes for international trade and transport, while enabling transport operators to manage their operations efficiently.

Source: ESCAP secretariat. Further details of these and other models are available on the ESCAP website at www.unescap.org/our-work/transport/transport-facilitation-and-connecting-subregional-transport-networks/resources.

Figure 2.3. A single window road map in five evolutionary stages


Source: ESCAP and United Nations Economic Commission for Europe, Single Window Planning and Implementation Guide. ECE/TRADE/404.

Because most ICT applications require some degree of standardization for data transfer, the introduction of electronic platforms for trade and transport facilitation also brings with it new opportunities for countries to simplify and standardize trade documents, as well as processes. These measures will greatly boost connectivity by reducing the time for border clearance and enabling automatic risk analysis, which helps to prevent fraud and non-compliance, as well as to boost revenues for customs authorities.

The development of paperless trade also sets the stage for the transition to electronic logistics, or “e-logistics.” E-logistics comprises a set of communications, computing and collaborative technologies that enables the electronic exchange of data, knowledge and information between supply chain partners. The system eventually enables traders and domestic logistics service providers to

interact and to track the progress of applications and registrations with government agencies.¹⁸ The further integration of paperless trade and transport systems, such as regulatory single windows, port community systems, e-payment or banking systems and national e-logistics systems, can ultimately give rise to national integrated paperless supply-chain platforms – and eventually to integrated systems along an entire chain of import-export operations.¹⁹

This is the ultimate target for regional cross-border paperless trade initiatives, such as the regional arrangements for cross-border paperless trade facilitation of ESCAP (see box 2.3) and the ASEAN Single Window. Initiatives led by the private sector, such as the Pan Asian E-commerce Alliance, which bring together single window operators from several countries, also show promise.²⁰

Box 2.3. Towards cross-border paperless trade in Asia and the Pacific

Recognizing the potential benefits from conducting trade transactions using electronic rather than paper-based data and documentation, a number of countries in the Asian and Pacific region began implementing paperless trade systems in the late 1990s and early 2000s. However, most of these initiatives focused on information exchange between stakeholders domestically, while facilitating international trade inherently requires trade information to flow across borders along international supply chains. As a result, the flow of electronic trade information generated domestically faces both technical and legal barriers beyond the border, turning traders to conventional paper-based trade practices and reducing the overall benefits from paperless trade systems.

To overcome these barriers, the Commission adopted resolution 68/3 on enabling paperless trade and the cross-border recognition of electronic data and documents for inclusive and sustainable intraregional trade facilitation. A study conducted by the secretariat in consultation with national focal points and experts from UNNEXt recommended that an intergovernmental agreement be developed to provide willing countries with an effective and long-term framework to jointly develop and implement cross-border paperless trade facilitation. The draft text of this arrangement is under negotiation and will be further revised over the course of 2014.

Source: United Nations Economic and Social Commission for Asia and the Pacific, *Enhancing Regional Connectivity: Towards a Regional Arrangement for the Facilitation of Cross-border Paperless Trade*. ST/ESCAP/2684. Available from www.unescap.org/sites/default/files/0%20-%20Full%20Report_35.pdf

Developing competitive regional transport and logistics services

The cost and quality of transport services are affected by the level of competition in the transport sector. Research conducted in landlocked developing countries suggests that government regulations that protect domestic road-transport operators can contribute to rent-seeking monopolistic or oligopolistic behaviour, adding to the already high transport costs for traders in these countries.²¹

Experiences from the maritime and aviation sectors show that deregulating transport services can increase competition and reduce prices paid by customers. For example, the liberalization of the aviation sector in South-East Asia and the Pacific helped to lower airfares and provided a boost to tourism, a critical sector for many countries (see box 2.4).

The issue of deregulation is difficult to tackle, especially if it involves the opening of domestic markets to foreign operators. Currently, almost all countries in the ESCAP region restrict the entry of

foreign transport service providers in their domestic markets. These barriers are partly responsible for the high transport costs in the region and they contribute to delays at land border crossings due to the time spent stuffing and unstuffing cargo between vehicles.

However, countries have begun to take steps towards the development of a regional market for transport services and logistics by allowing foreign transport operators to enter or to transit their territories along selected routes. Several countries have established bilateral or trilateral arrangements to allow crossborder movements by road without the need for transport permits. There are such arrangements between Armenia, the Islamic Republic of Iran and the Russian Federation, and between the Lao People's Democratic Republic, Thailand and Viet Nam. China has also taken significant steps to open transport routes through major border crossings with Mongolia and Viet Nam.²²

Progress can also be seen among member States of the Shanghai Cooperation Organization, which are finalizing a draft agreement on facilitating international road transport.²³ Initially, about 15,500 km of roads

Box 2.4. Impact of deregulation on aviation in the Pacific

In Vanuatu and Samoa in the Pacific, the deregulation of the aviation sector has helped to improve regional transportation connectivity and to increase flows of tourists. In Vanuatu, Air Vanuatu was the national carrier, and in the late 1990s and early 2000s it suffered losses. Once the aviation sector in Vanuatu was deregulated in 2004, and low-budget carriers such as Pacific Blue were permitted to enter Vanuatu's skies, passenger traffic between Australia and Vanuatu grew by 19%. Deregulation has allowed fares to drop, increased visitor arrivals and increased airline choices for passengers. Vanuatu is now served by five international airlines.

In Samoa, the nationally controlled carrier – Polynesian Airlines – suffered heavy losses during 2001–2004, and was not financially viable. In response, the Government reformed the aviation sector. It restructured Polynesian Airlines for domestic routes and ventured into a partnership with Virgin Australia. Gains in the tourism sector in Samoa have been attributed to this joint venture.

In both countries, the reforms resulted in more flights to regional hubs such as Australia, Fiji and New Zealand, and more competitive fares. In addition, the restructured national airlines are in better financial positions, reducing the burden on public finances.

Source: Taumoepeau and Kissling, *Economic sustainability of airlines in the Pacific*. Presented at the 31st Australasian Transport Research Forum (2008). Available from www.atrf.info/papers/2008/2008-Taumoepeau_Kissling.pdf

are to be opened under this agreement, including a road from Lianyungang, China, to Saint Petersburg, Russian Federation. Also under the agreement, two seaports in China and the Russian Federation will eventually be accessible for transit traffic from Central Asia.

In the case of railways, cross-border movements are often hampered by institutional differences in operating rules, tariff structures and licensing requirements for train drivers and crew. However, there are also examples of how countries can cooperate to provide regular and competitive international railway services. These include the long-running Trans-Siberian Railway linking the Russian Federation, Mongolia and China to the Far East and Europe; the Economic Cooperation Organization container block train between Istanbul (Turkey), Tehran and Islamabad; and the Chongqing-Xinjiang-Europe railway service between China and Germany via Kazakhstan, the Russian Federation, Belarus and Poland.²⁴ ESCAP is now developing a draft regional strategic framework for the facilitation of rail in the region, which will identify and address the current obstacles to cross-border rail freight movements.

INFORMATION AND COMMUNICATIONS TECHNOLOGY CONNECTIVITY

The evolution of the “digital divide” in Asia and the Pacific

Economies across the world have become increasingly reliant on ICT, including the Internet and mobile telecommunications. These inputs can increase the productivity of both labour and capital, and have become integral parts of international trade and logistics services – linking producers to consumers across borders and providing instant market information.

The ability to take advantage of this technology depends on bandwidth, which affects the speed of transmission – akin to the width of highways in road transport. This depends to a certain extent on physical infrastructure, particularly on cable and sometimes satellite services. Although the infrastructure has been expanding rapidly in Asia and the Pacific, bandwidth is still far lower than it is in North America or in Europe (see figure 2.4).

The majority of the region's people who have little or no access to broadband live in lower-middle-income countries with high income inequality, such as China and India, or in least developed countries or island developing economies. However, poorer communities in urban and rural areas remain underserved even in higher-income economies. This is because legacy telecommunication operators have typically invested primarily in commercially viable areas – mainly in major cities and urban centres. Moreover, incumbent operators often maintain exclusive access to submarine and terrestrial cable networks, limiting potential competition.

There are also significant inequalities between countries – in terms of physical infrastructure and the availability of, and access to, critical Internet exchange points. Moreover, prices tend to be higher where bandwidth is lower. Urban hub areas, such as Singapore and Hong Kong, China, enjoy levels of bandwidth that lead the world, while many developing economies, particularly the least developed countries, landlocked developing countries and Pacific island economies, lag far behind.

Many of these disparities arise from the current configuration of sea- and land-based fibre networks. These have evolved organically over two decades and are not serving to bring affordable ICT connectivity

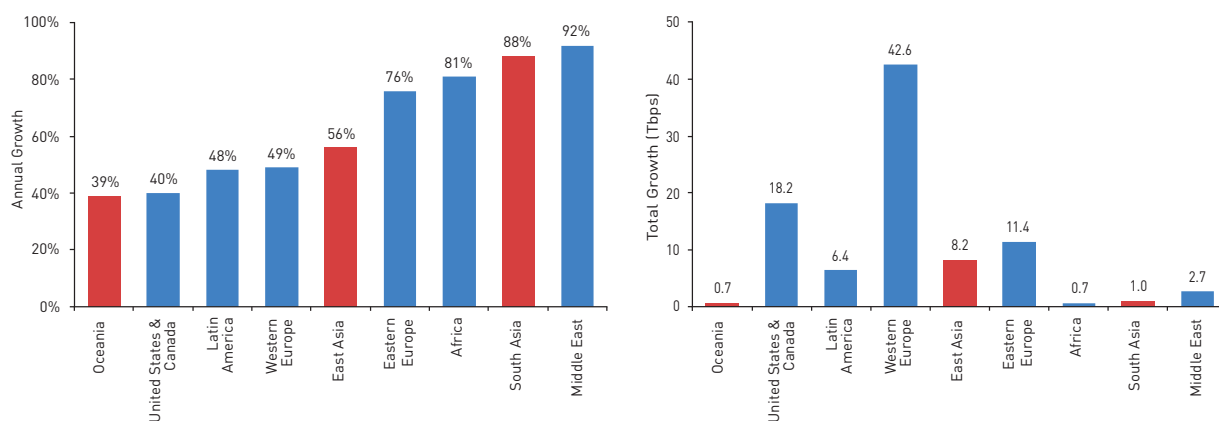
to all. There are, for example, insufficient land-based routes for international Internet traffic in Asia and the Pacific, so the region's traffic is exchanged through submarine cables, and routings that are based on hub-and-spoke configurations. In East Asia, for example, key hubs are Hong Kong, China; Singapore; and Tokyo, or further afield in the United States of America. Thus, international network traffic must pass through multiple Internet exchange points.

Since the Asian and Pacific region relies heavily on submarine cables, it is also vulnerable to natural disasters, marine vessel accidents and even sabotage. For example, in 2009, Typhoon Morakot and a subsequent undersea earthquake damaged at least eight submarine cables and adversely affected voice and data traffic across South-East Asia, as well as in China, India and Japan. The overreliance of the region on submarine cables makes it more vulnerable to extreme weather events and natural disasters, which have been increasing in frequency and potency over the past decade.

Towards an Asia-Pacific information superhighway

In this regard, ESCAP has recently begun promoting the concept of an Asia-Pacific information superhighway: a cohesive “meshed” terrestrial

Figure 2.4. Annual average growth in bandwidth vs. distribution of bandwidth added, by region (2008-2012)



Source: Telegeography, “2013 Telegeography landscape”, presentation at the Pacific Telecommunications Council Annual Conference, Honolulu, Hawaii, 20-23 January, 2013.

Note: The Y-axis shows terabits per second (Tbps). For example, a total of 8.2 Tbps of bandwidth capacity was added in East Asia during the period 2008-2012.

fibre optic network for the region that would provide cost-effective broadband access on both an intraregional and intercontinental basis. A continent-wide terrestrial fibre optic network would complement the existing submarine cable networks.

A meshed network would not only bridge Asia's vast landmass with competitive points of Internet access in Europe, it would also reduce the impact of outages from undersea cable accidents and natural disasters and open up opportunities for value added services. By linking Asia to Europe, the proposed Asia-Pacific information superhighway would enhance the physical ICT connectivity of landlocked countries that are located thousands of kilometres from undersea cables, while competition introduced by the network could lower the cost of international bandwidth and provide Governments with incentives to liberalize international gateways.

The development of an Asia-Pacific information superhighway is a complex process requiring very close collaboration between member States, as well as with private sector partners and international organizations. While more work needs to be done to develop a concrete road map, ESCAP has identified the following principles that should underpin any regional strategy:

- *The network should be fully integrated and coherent.* It should provide robust cross-border connectivity across the continent, with a particular focus on reaching rural and less commercially profitable areas. A mesh configuration would allow for in-network healing in the event of physical cable outages or political instability that may affect network connectivity in individual countries.
- *The network should be of uniform quality.* Currently, some terrestrial networks are patchworks of domestic telecom networks, which provide variable quality and offer vastly different terms and service guarantees. A single uniform network with standard terms and quality of service would alleviate these problems.
- *The network should leverage existing infrastructure* In order to remain cost effective, any pan-Asian terrestrial network would need to be based on the streamlined procurement of rights of way, as well as on uniform construction techniques and parameters. This could be realized through

a partnership with existing long-distance infrastructure networks, such as the Asian Highway, the Trans-Asian Railway or power transmission networks. The proposed Asia-Pacific information superhighway could also build partnerships with ongoing and planned terrestrial links, such as the Trans-Eurasian Information Superhighway.

- *The network must be cost-effective.* If constructed on a proper scale in terms of both geographical coverage and transmission capacity, a pan-Asian terrestrial network could effectively compete with submarine infrastructure at both regional and intercontinental levels. In particular, a terrestrial network dimensioned around 100 Gbps transmission technology would benefit from a "last-mover's advantage" and the recent step changes in 10G and 40G technology.
- *The network should be open access and have non-discriminatory pricing.* For it to achieve development and policy goals, as well as to best serve the region's consumers, all purchasers of capacity must be able to access the network on equal, non-discriminatory terms. In an effort to overcome the high price of bandwidth in least developed, landlocked and Pacific island markets, the concept of non-discrimination should also be carried over on a geographical basis so that countries can receive bandwidth at equal prices.

Governments and the private sector could combine their resources and expertise to adopt a lower-risk model. This would involve sharing the investment cost among multiple telecom operators and Governments, on condition that the network be operated on an open-access basis.

Harnessing cross-sectoral synergies for infrastructure development

Given the low level of broadband penetration in continental Asia, there is a tremendous opportunity for Governments to look at synergistic approaches to developing an Asia-Pacific information superhighway. In particular, examples from the national ICT infrastructure development strategies of India, the Republic of Korea and the United States suggest that the "cohabitation" of fibre-optic cables with road and railway infrastructure networks can save on high capital costs and facilitate access to the fibre-optic cable for maintenance and repair (see box 2.5).

Although it is preferable to install fibre-optic cables while roads and railways are being built, even installing just the necessary ducts and conduits without the fibre would provide significant cost benefits by avoiding multiple excavations. Between 70% and 90% of the costs of developing a terrestrial fibre-optic network are related to the excavation and installation of ducts and conduits through which cables are pulled.²⁵

Rail and power networks already have fibre networks for railway signalling and for their supervisory control and data acquisition systems. Allowing for additional fibre would not add significant costs. Furthermore, as neither railway signalling nor supervisory control and data acquisition systems are bandwidth intensive, the rail and power entities inevitably end up with surplus capacity in their fibre networks. Such captive fibre capacity is attractive to telecom providers who are keen to avoid the costs of trenching fibre in remote locations and of securing new rights of way.

There are also opportunities to integrate power transmission and telecommunications. High-voltage transmission lines are often mounted with opticfibre ground wire to maintain contacts among substations and dispatch centres. If there is spare capacity, transmission companies can lease out the lines to telecommunications providers. The Power Grid Corporation of India Limited, for example, has a fibre-optic network covering 206 cities and towns with about 25,000 km of optical fibre. The network covers many remote areas, including the northeastern part of the country and Jammu and Kashmir, and offers a domestic leg for international long-distance carriers that wish to connect through India to Bangladesh, Bhutan or Nepal.

Similar synergies can be achieved when developing cross-country connections. In particular, under the intergovernmental agreements on the Asian Highway and Trans-Asian Railway networks, and on dry ports, countries have already agreed on a set of

Box 2.5. Laying broadband cable along highways and railways

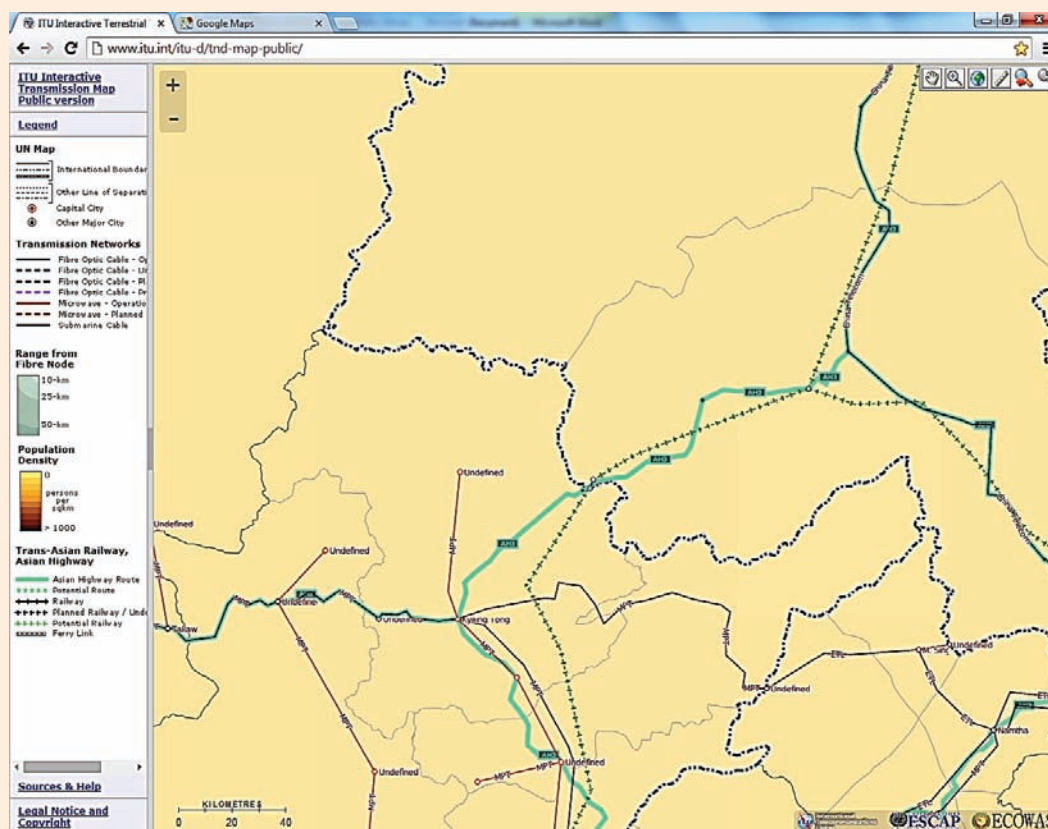
Globally, many countries have started to synchronize the deployment of broadband infrastructure with the new construction or maintenance of roads and railways. In the Republic of Korea, for example, fibre-optic cable infrastructure has been deployed along the highway backbone network. India has also been successful in deploying optical fibre beneath train tracks. As a result, RailTel Corporation of India Ltd. has become one of the region's largest carrier-neutral telecom infrastructure providers and has deployed 45,000 km of fibre-optic cables, connecting more than 4,500 townships and several rural areas.

Together with the International Telecommunication Union, ESCAP has recently developed Asia-Pacific information superhighway maps, a set of online maps of transmission networks. These interactive maps enable the superimposition of Internet transmission infrastructure, such as fibre-optic cables, on the Asian Highway and the Trans-Asian Railway networks, which thus helps to identify where additional fibre-optic cable segments could be laid along highways and railways.

The figure shown is a screenshot from the International Telecommunication Union website, which currently hosts the onlinemaps. The figures show the border areas between China and Myanmar. Given the probable increase in demand for international Internet Protocol by Myanmar, as well as the need to reinforce redundancy within the ASEAN region, a potentially interesting solution could be to lay optical fibre along planned Trans-Asian Railway tracks or Asian Highway route 3, which runs from Kunming, China, via Jinghong (Yunnan Province), into Mong La (Myanmar). From Mong La, the optical fibre could be linked up with the existing Myanmar network in Kengtung, where it meets existing terrestrial connections that run eastwards into the Lao People's Democratic Republic and southward into Thailand (along Asian Highway route 2 and missing segments of the Trans-Asian Railway network route). This would create a regional crossroads for optical fibre to reinforce north-south and east-west redundancy in South-East Asia.

Box 2.5. (continued)

North-eastern Myanmar: a crossroads for connecting China, the Lao People's Democratic Republic and Thailand



Source: ITU Interactive Terrestrial Transmission/ESCAP Asia-Pacific Information Superhighway Maps, accessible at <http://www.unescap.org/idd/maps/asia-pacific-superhighway/>

international border crossings along these regional networks. By linking the development of the proposed Asia-Pacific information superhighway with these existing intergovernmental agreements, countries may avoid lengthy rights-of-way negotiations, which often become a source of contention and delay for major cross-border

infrastructure projects. From the perspective of the managers of this infrastructure, income from providing access to the fibre-optic cables along their networks can become a valuable source of revenue, which could be used to finance recurrent maintenance costs.

Figure 2.5. Fibre-optic ducts and conduits are placed alongside a highway in the Republic of Korea



Source: Korea Telecommunications

Given the complexity of these sectors, the benefits and risks of such cross-sectoral approaches require further research. In this regard, the secretariat is planning to conduct further analytical work through the establishment of an expert working group on “seamless connectivity,” as proposed by the Ministerial Conference on Regional Economic Cooperation and Integration in Asia and the Pacific, which was held in Bangkok from 17 to 20 December 2013. This expert group could also work with United Nations system partners, notably the International Telecommunication Union, as well as tap into the expert analysis provided by research companies and regional institutions with similar objectives.

Strengthening the ICT connectivity of Pacific island economies

Pacific island economies offer many examples of how ICT connectivity is transforming economies and societies for the better. These include mobile telephone connectivity, access to financing and banking services and access to educational opportunities through distance learning. The spread of mobile telephones in the Pacific has been spurred by regulatory reforms over the last decade, particularly in Fiji, Papua New Guinea, Samoa, Tonga and Vanuatu. These Pacific island economies undertook specific reforms that led to introducing competition (at least one other private competitor) in domestic markets previously dominated by public enterprises. As a result, subscriptions (per 100 people) increased noticeably in these economies (see figure 2.6).

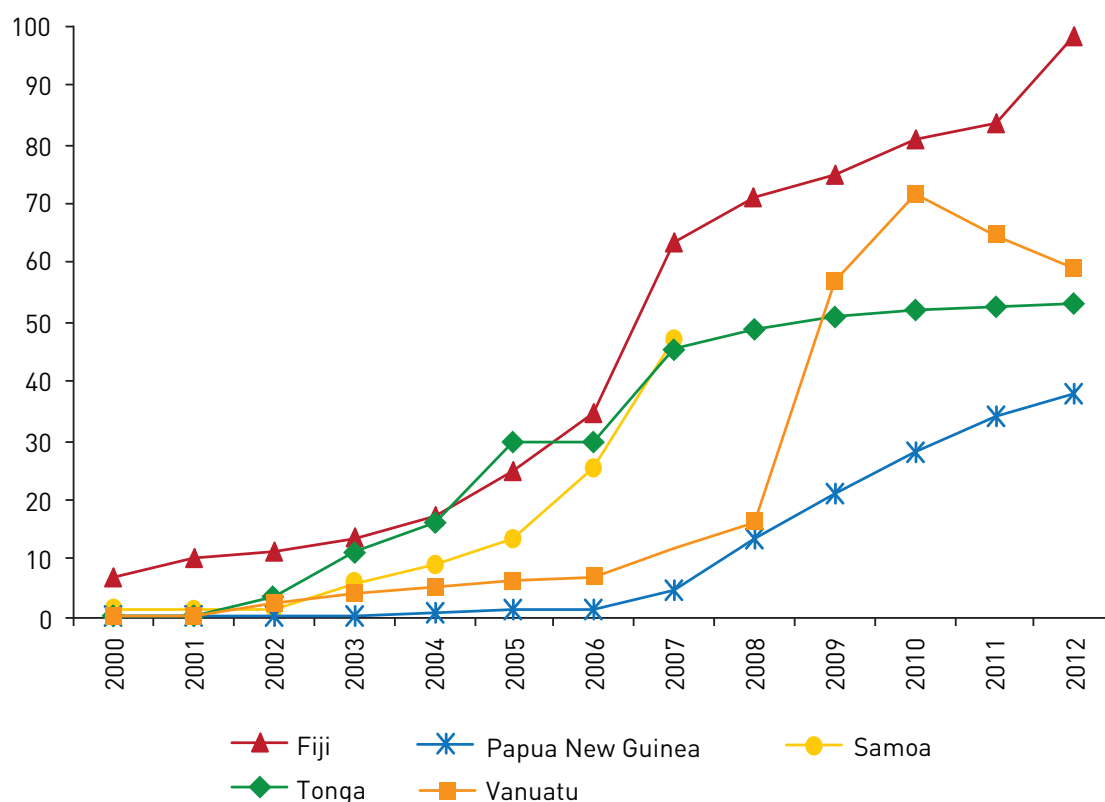
The benefits from expanding mobile communications to the population while lowering prices has been well documented. Surveys of both rural and urban respondents in Vanuatu, for example, showed that access to mobile telephones reduced business costs, increased sales of goods and services, improved transport and logistics, and enhanced interpersonal contacts.²⁶ Mobile communications are also stimulating innovations in financing services, which had remained out of reach for a large proportion of their populations.

However, broadband penetration in the Pacific remains very limited. Only 5 economies (Cook Islands, Fiji, Palau, Tonga and Tuvalu) have more than 1 fixed broadband subscription per 100 inhabitants. Broadband prices are also still prohibitively expensive: for example in 2012, fixed broadband costs approximately \$19.5 in Fiji and \$185.6 in Papua New Guinea, corresponding to 6.4% and 150.5% of Gross National Income per capita respectively.²⁷

A number of technological solutions can overcome the high costs and the lack of data connectivity and Internet bandwidth. For example, a next-generation medium Earth orbit satellite constellation, O3b Networks, was launched in 2013.²⁸ O3b is aimed at combining the ubiquitous reach of satellites with the speed of fibre to deliver satellite Internet services and mobile backhaul services to emerging markets in the Pacific. Another programme is the Pacific Regional Connectivity Program, financed by the World Bank, the Asian Development Bank, participating member countries and other private and public sector partners.²⁹ This programme is aimed at connecting Tonga, Samoa, Solomon Islands and Vanuatu by submarine fibre-optic cables to a global communications network and is designed to attract private investment in ICT infrastructure development, based on open-access principles.

Technological solutions, such as the O3b satellite, will to a great extent still be reliant on international bandwidth from land- and sea-based optical fibre, so their success will depend on the wholesale Internet Protocol transit prices in such hubs as Singapore and Hong Kong, China. The proposed Asia-Pacific information superhighway could therefore help to expand competition, even for economies in the Pacific, thereby reinforcing the case for a regional approach to ICT connectivity. In the meantime, efforts should

Figure 2.6. Mobile subscriptions per 100 people in selected Pacific island economies, 2000-2012



Source: International Telecommunication Union, "Mobile cellular subscriptions per 100 people". Available from www.itu.int/en/ITU-D/Statistics/Documents/statistics/2013/Mobile_cellular_2000-2012.xls.

continue on ways to further develop economic opportunities offered by mobile connectivity.

The experiences from the Pacific highlight the importance of a conducive regulatory environment to attract both consumers and private investors. In particular, Governments need to establish credible and transparent rules for the sustainable development of ICT operations. For example, one study found that, at the early stages of reform in Fiji, Papua New Guinea and Samoa, the independence of regulatory authorities was challenged by pressure from certain interest groups and Governments.³⁰ The study also highlighted the limited financial and technical capacities of these newly established regulatory authorities to handle effectively the full scope of regulation.

ENERGY CONNECTIVITY

Current status of energy connectivity in the region

Sustainable human development depends on adequate, reliable and affordable supplies of energy – that is, energy security. However, the Asian and Pacific region remains heavily dependent on fossil fuels. In 2011, the region accounted for about 40% of global oil and gas consumption and more than 70% of global coal consumption.³¹

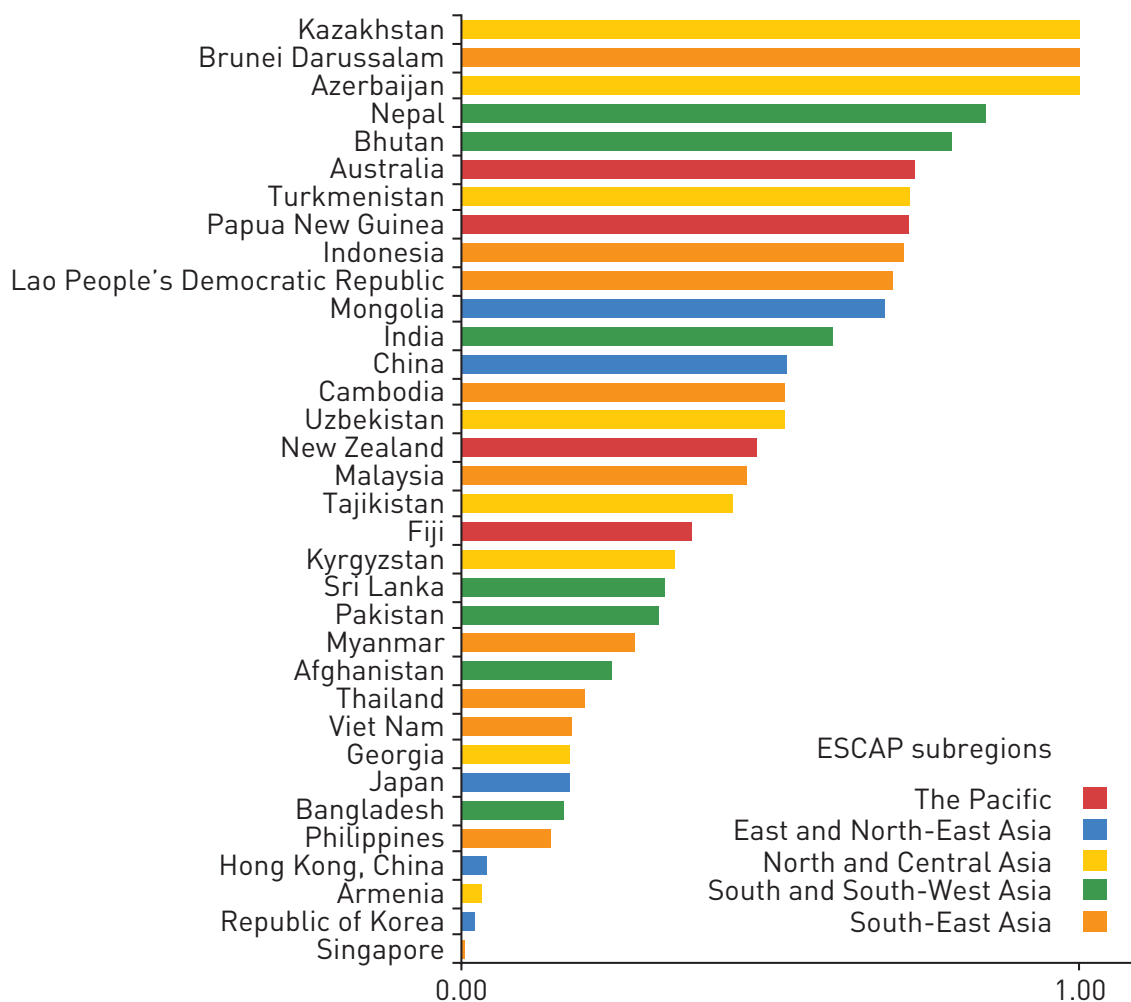
The region also relies heavily on traditional energy sources: despite recent progress, more than 1.8 billion people are still using biomass, and more

than 628 million lack access to electricity.³² While several countries in the region are net energy exporters, only a few countries satisfy their energy needs from their own resources (see figure 2.7). The region as a whole is a net importer of primary energy.

There are numerous opportunities for oil, gas and electricity trade in Asia and the Pacific. They can

be divided into three main groups – infrastructure projects of regional or subregional significance, infrastructure projects of bilateral significance and maritime energy trade projects. For hydrocarbon infrastructure, the region already has a number of existing and planned pipeline projects.³³ Meanwhile, a number of multi-country initiatives have focused on electricity and power grid integration (see figure 2.8).³⁴ These include the following:

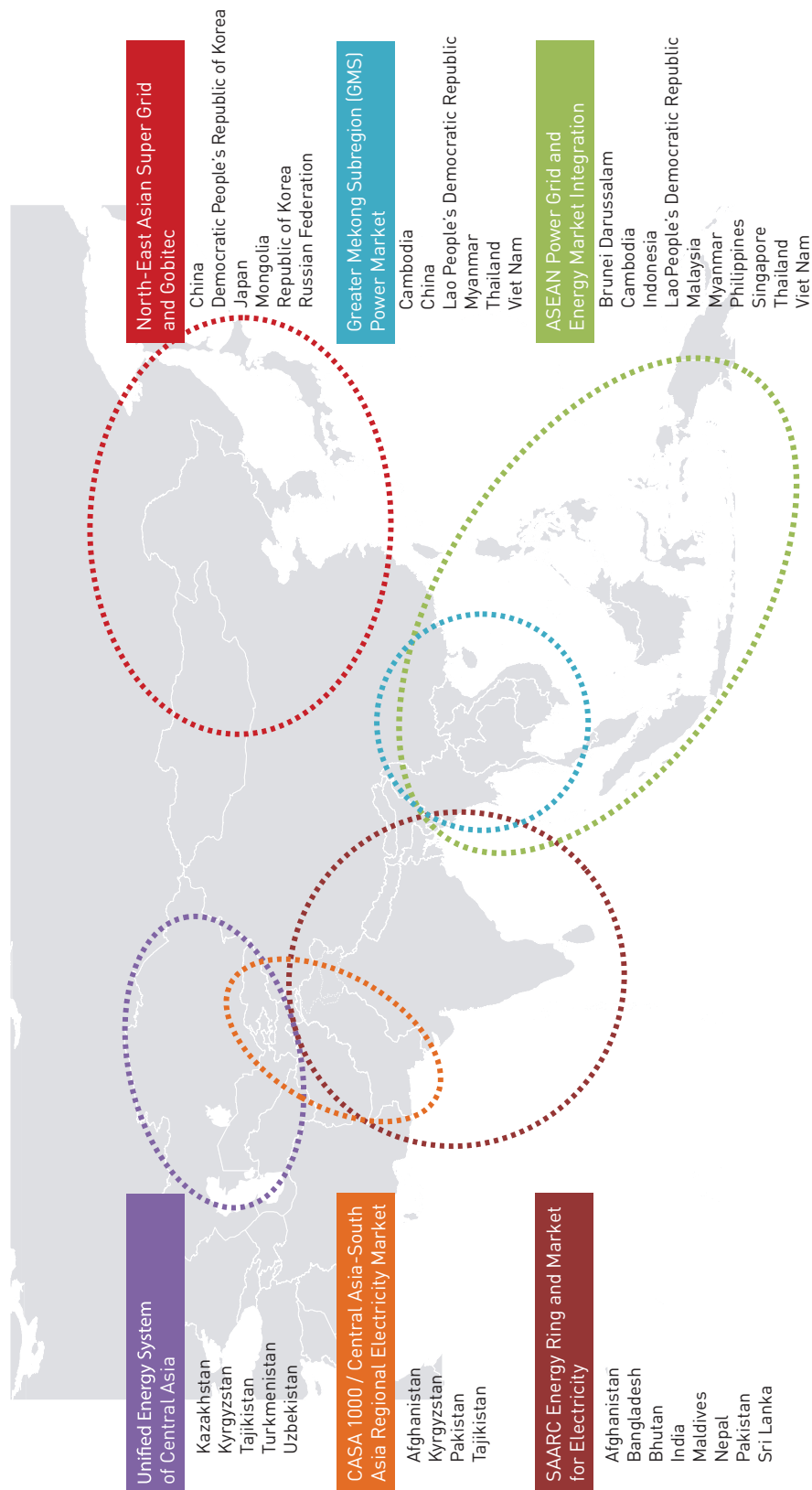
Figure 2.7. Energy self-sufficiency indices for selected ESCAP member States and associate members, as projected for 2035



Source: Adapted from ADB (2013) Asian Development Outlook 2013: Asia's Energy Challenge.

Note: The self-sufficiency index (a score of 1.0 equating to self-sufficiency) incorporates projected renewable resources availability with the projected net balance of conventional fuels using forecasted depletion rates.

Figure 2.8. Subregional initiatives on power grids and markets projected for 2035



Source: Adapted from ESCAP Statistical Perspectives: Focus Areas for Realizing Enhanced Energy Security (2013). Available from www.unescap.org/resources/statistical-perspectives-focus-areas-realizing-enhanced-energy-security.

- *ASEAN Power Grid* – An intergovernmental programme that has been optimizing energy trading opportunities within the region since the 1990s. Identified power interconnections are at various stages of progression.
- *CASA-1000* – This flagship project for the Central Asia-South Asia Regional Electricity Market will use surplus hydropower from Kyrgyzstan and Tajikistan to meet power deficits in Afghanistan and Pakistan.
- *Greater Mekong Subregion Power Market* – This programme has identified opportunities for an integrated regional electricity market to align available supplies with demand requirements.
- *SAARC Market for Electricity* – This is a main component of the South Asian Association for Regional Cooperation (SAARC) Energy Ring, an intergovernmental programme to reduce power supply disruptions and delivery.
- *Gobitec and an Asian super grid for renewable energies in North-East Asia* – In North-East Asia there are multiple initiatives to utilize super grids to align abundant renewable supplies in the Gobi desert with demand in East Asia (see also box 2.6).
- *Unified Energy System of Central Asia* – Built in the 1970s in the former Union of Soviet Socialist Republics, the Unified Energy System network is a synchronous grid extending across the Russian Federation and Central Asian countries.

Countries in the region are using these initiatives to address energy supply imbalances and to improve the reliability of electricity distribution. However, most are based on unilateral or bilateral trading arrangements. Countries have yet to realize the economies of scale that would come from linking these subregional initiatives through a regional energy cooperation framework.

Towards an Asian Energy Highway

The region's energy security could be enhanced by promoting cooperation between the region's energy importers and energy exporters – by harmonizing policies and by exchanging knowledge, particularly in the areas of energy efficiency and renewable energy technologies. This would not only lead to

better physical connectivity between countries but also promote institutional cooperation, including the development of financial energy markets.

A regional energy arrangement could also explore low-carbon paths that place more emphasis on efficiency and take greater advantage of renewable resources. In addition, it could develop deep, liquid and transparent markets for crude oil, petroleum products and gas – while giving a higher priority to pipeline security and safety.

*The region's energy security
could be enhanced by promoting
energy cooperation like
the Asian Energy Highway*

To move in this direction, in 2012 ESCAP member States accepted the concept of an integrated regional power grid, which could be termed the "Asian Energy Highway."³⁵ The highway would involve an integrated electricity grid based on a range of primary energy sources, whether fossil fuels, nuclear sources or renewables. The following encouraging developments are making such an integrated grid more feasible:

- Several mutually beneficial power-trading arrangements are progressing at various levels of subregional integration.
- High-voltage transmission systems, in particular high-voltage direct current (HVDC) systems, are improving the economic range for interconnecting power grids and unlocking access to remote energy resources. HVDC transmission systems are becoming cost competitive with more conventional modes of energy resource transportation – by rail, road and pipelines.
- "Smart grid" communication and management technologies are providing opportunities for improved load balancing and enabling greater optimization of energy flows. These are also more capable of absorbing intermittent renewable energy resources, such as solar and wind.

An Asian Energy Highway would not only connect physical infrastructures but also involve integrated market mechanisms to dynamically and efficiently

move power more sustainably and reliably across the region, as well as optimize the allocation between supply and demand centres. Such a regionally integrated market would enhance energy security since greater diversification of national energy supplies would reduce exposure to potentially volatile markets.

An Asian Energy Highway would also provide a platform for energy pooling and spot-market pricing. In a competitive environment, a transparent purchasing framework would limit the exposure of deficit countries to distorted pricing, and thus help to reduce the potential for geopolitical conflict.

From the perspective of sustainable energy

production and use, an integrated grid would increase the opportunities for balancing peak loads in previously isolated systems using larger transmission grids across different time zones – with opportunities for reducing net energy investment. Furthermore, a regional grid would boost the opportunities for using energy from renewable resources generated at specific sites – such as geothermal, solar or wind sources – which could then be made available to a wider population.³⁶ This in turn would boost investor confidence in developing large-scale renewable energy projects in more remote areas far from centres of demand, which is the main driver behind Gobitec and the proposed Asian super grid for renewable energies in North-East Asia (see box 2.6).

Box 2.6. Gobitec and the Asian Super Grid

Gobitec refers to the proposal to produce energy in the Gobi desert. In Mongolia alone, wind and solar energy from the Gobi desert could produce about 2,600 GW – more than 7 times the amount of electricity generated globally from nuclear power. This energy could be transmitted through a proposed Asian super grid for renewable energies in North East Asia. By utilizing high-voltage direct current and smart grid technologies, it would form the backbone of the overall North-East Asian power grid and could thus transmit energy from the Gobi desert to electricity demand centres in North-East Asia, including China, Japan and the Republic of Korea.

To realize the Gobitec and Asian super grid concept, investments are needed for the full range of generation, transmission and distribution systems. A study conducted by a group of partners has estimated the total costs for solar and wind projects totalling 100 GW, over the period 2015–2030, at \$293 billion, with yearly maintenance costs of \$7.3 billion. The estimated benefits include 880,000 new jobs in Mongolia and 560,000 new jobs outside Mongolia. In addition, there would be \$17 billion per year in economic benefits from the cost advantages of electricity production – and a reduction in carbon dioxide emissions of 187 Gt per year.

Currently, there is no clear lead institution or intergovernmental framework for this promising concept. However, there is a strong foundation of partners that could work together with a common vision and bring in more key stakeholders. In addition to ESCAP, currently active stakeholders include:

- *Intergovernmental organizations* – Energy Charter Secretariat, International Renewable Energy Agency.
- *Civil society organizations, especially research institutions* – China Renewable Energy Society, DESERTEC Foundation (Grenatec also affiliate), Energy Systems Institute (Russian Federation), Japan Council for Renewable Energy, Japan Renewable Energy Foundation, Korea Energy Economics Institute (Republic of Korea) Korea Photovoltaic Society (Republic of Korea), Mongolia Energy Development Association.
- *Private companies* – Newcom Group (Mongolia), SoftBank Corp (Japan).
- *Government* – Ministry of Energy (Mongolia).

Source: ESCAP Secretariat; Energy Charter secretariat and others, Gobitec and Asian Super Grid for Renewable Energies in North-East Asia (2014).

The need for a strong institutional framework

An Asian Energy Highway is now more technically feasible as a result of advances in energy generation and transmission technologies.³⁷ However, its success will depend upon institutional and technical harmonization among electricity industries. One concern is that member States may wish to maintain energy independence. Therefore, it would be important to overcome such hesitations by developing an institutional framework for intergovernmental cooperation in a progressive manner.

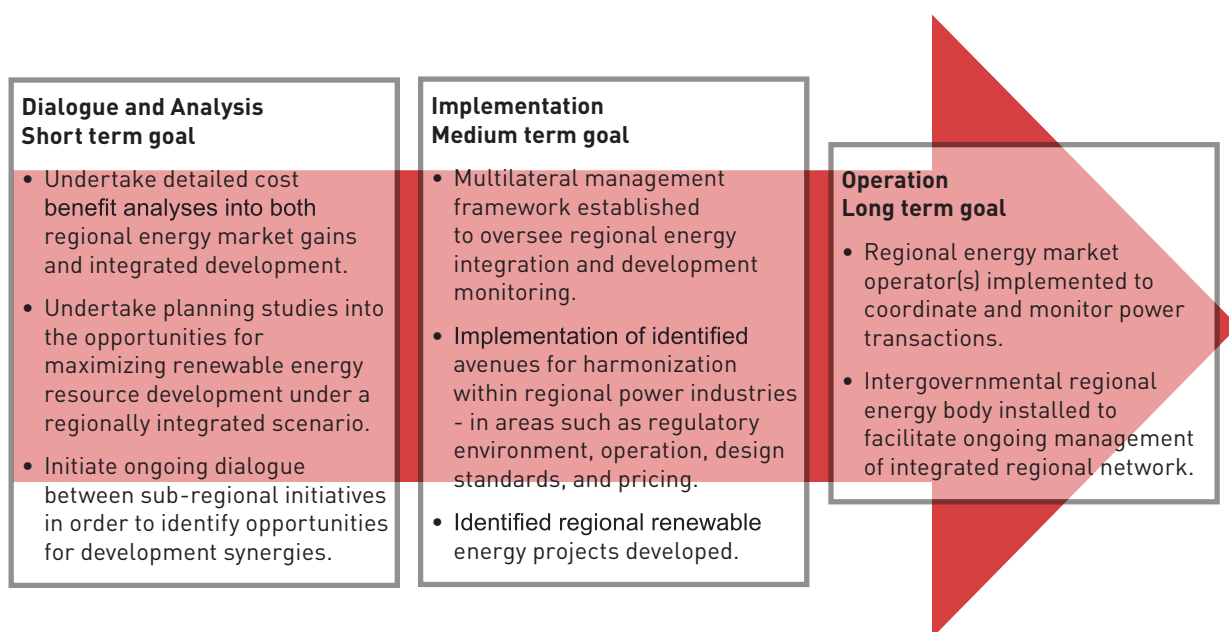
Furthermore, the most immediate benefits of regional energy connectivity are likely to be captured by those industries that have greater access to stable and inexpensive electricity. It is therefore necessary to ensure that the benefits from enhanced energy connectivity are equally shared. Participating countries should agree from the outset on mechanisms to levy user charges on the grid, with the possibility of ring-fencing some revenues to finance community development, particularly rural electrification projects. For example, the CASA-1000 project, which is aimed at

building the Central Asia-South Asia Regional Electricity Market by exporting power from Kyrgyzstan and Tajikistan to Afghanistan and Pakistan, incorporates benefit-sharing by imposing a surcharge on energy generation to finance priority development projects identified by local communities along the route of the transmission line.

There are also concerns about capacity. National and subregional capacities are limited and there are incompatibilities between countries. A number of countries have weak systems for national power generation and management and face chronic power shortages. If existing national power generation and distribution systems are chronically loss-making with unrealistically low tariffs, there is little prospect for participating in regional schemes.

For these reasons, the vision of a regional energy network should be tempered with realism. The pragmatic solution is to consider this not as a regional superinfrastructure proposal but rather as an ongoing and phased process of capacity-building and development. The Asian Energy Highway may thus be achieved through a twin-track approach of supporting reforms at the national level, in conjunction with improvements in regional power connectivity (see figure 2.9).

Figure 2.9. Road map for an Asian Energy Highway



Nevertheless, it is important to ensure that near-term investments are compatible with a longer-term agenda of integration. Countries can reduce development costs and improve environmental performance by identifying at an early stage the opportunities for harmonization – in areas such as the regulatory environment, operation and design standards, energy pricing and ultimately development planning.

PEOPLE-TO-PEOPLE CONNECTIVITY

Increasing mobility in the ESCAP region

One of the most evident signs of connectivity in the ESCAP region is the movement of people across national borders. Whether it be for work, study, business or other purposes, international migration is an issue of concern for both countries of origin and countries of destination because it involves people's lives and welfare. In many countries in the ESCAP region, migrants are not officially recognized. Existing national governance structures do not have well-defined spaces that delineate the relationship between government responsibilities and the rights and obligations of public citizenship.

*International labour migration
brings many benefits
but also new risks*

However, with increasing regional connectivity, it can be expected that the movement of people across national borders will increase. Furthermore, the region is undergoing a dramatic demographic transition, with some countries ageing so rapidly that their populations are expected to shrink, while others have a large youth population concentrated in prime employment ages.

Given that inclusive and sustainable human development is ultimately about widening people's capabilities and opportunities, increased and better-managed international migration is an opportunity for the people of the ESCAP region to take advantage of the region's economic growth and to enhance their skills, training and knowledge. In this regard, it is necessary to consider a broad range of policy options for facilitating the movement of people, while also minimizing the potential negative impacts.

Some frameworks for facilitating and managing the flow of people already exist. For example, under the ASEAN people-to-people connectivity framework, member States are planning ways to enhance tourism, education and cultural exchanges.³⁸

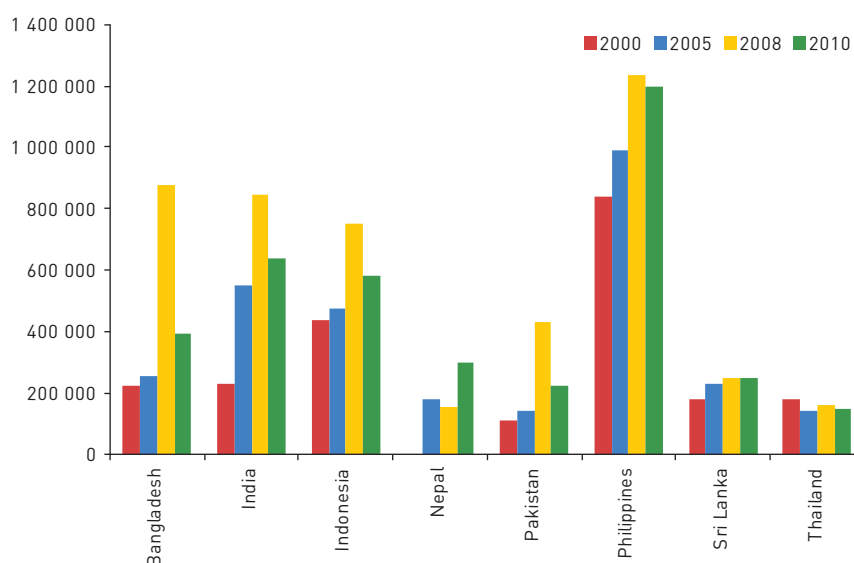
Benefits and challenges of international labour migration

Increased regional mobility through managed, and sometimes temporary, labour migration can lead to shared prosperity in the region by addressing labour market needs, improving skills acquisition and serving as a risk mitigation strategy for households. A large part of the quantitative evidence on the benefits of shared prosperity that both countries of origin and countries of destination gain through migration is focused squarely on labour migration. This section therefore centres on international migration for the purpose of employment, as migration flows primarily driven by other factors may lie outside the scope of the present publication.

In Asia and the Pacific, international migration flows in recent years have predominately comprised temporary labour migrants. Figure 2.10 shows the number of temporary migrant workers deployed from the region's main countries of origin, namely Bangladesh, India, Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka and Thailand. If maritime workers are included, the Philippines deployed 1.2 million migrant workers in 2010. India and Indonesia have regularly deployed more than half a million workers annually in recent years. Large proportions of these deployments are directed to countries of the Gulf Cooperation Council, Jordan and Lebanon. However, many countries in the region, such as Thailand, are simultaneously origin, destination and transit countries for migrants. The volume of temporary labour migration flows indicates that the recruitment and placement of Asian and Pacific migrant workers is a large industry in itself.

One of the principal benefits of labour migration for both households and the countries of origin is the flow of remittances. In 2013, India, China, the Philippines, Bangladesh, Pakistan and Viet Nam were in the world's top 10 remittance-receiving countries in value terms, with India ranking first. Meanwhile, as a proportion of GDP, 5 Asian and Pacific countries were among the world's top 10 remittance-receiving countries in 2012: Tajikistan (48% of GDP – the highest percentage in the world);

Figure 2.10. Migrant workers deployed from selected Asian countries (2000, 2005, 2008 and 2010)



Sources: Organisation for Economic Co-operation and Development, *International Migration Outlook 2012* (OECD, 2012), p. 169; and ESCAP Labour Migration Database (accessed 14 February 2014)

Note: 2008 data for Nepal and Thailand are from 2007; 2010 data for Nepal, the Philippines and Thailand are from 2009; 2000 data for Nepal are not available.

Kyrgyzstan (31% of GDP); Nepal (25% of GDP); Armenia (21% of GDP); and Samoa (21% of GDP).³⁹

Remittances generate a number of benefits for the receiving households. Recent analysis confirms that, in several countries in the region, remittances from migrants are associated with better economic performance and a reduction in poverty.⁴⁰ For example, many Pacific island economies send workers to New Zealand through its Recognised Seasonal Employer programme.⁴¹ One study found that, over a two-year period from 2007, households with workers hired through the programme saw their per capita incomes increase by between 34% and 38% in Tonga, and between 35% and 43% in Vanuatu. As a result, households were able to raise standards of living, accumulate more assets, and in Tonga, improve school attendance for older children.⁴²

A country's nationals who have worked overseas can contribute to development in their home country not only by sending remittances but also by investing in or using their expertise to establish businesses. Some countries have engaged their

diaspora in community development projects. Experts working overseas can also contribute to their country through academic exchanges and consultancies.

However, migration can have negative impacts on sending countries. For example, countries can suffer from a "brain drain" if they lose workers whose skills would have been valuable at home. There is also the danger of "brain waste" if those skills and qualifications are not recognized by destination countries. Meanwhile, having one or both parents in a family migrate overseas clearly puts many pressures on the family and the roles of individuals in it. High-quality research on these impacts is limited, however, and has yielded mixed results.⁴³

At the receiving end, destination countries generally benefit significantly from labour migration. At various points in time, high-income countries in the region, such as Australia, Brunei Darussalam, Japan, New Zealand, the Republic of Korea and Singapore, have filled gaps in their labour markets with migrant workers. Several studies document the

key role of labour migration in GDP growth in Singapore, suggesting that this growth would not have been possible in the absence of migrants because employment growth outstripped the national labour supply.⁴⁴

*As migrant flows increase,
social protection for migrants
is becoming an urgent issue*

Middle-income countries have also seen an increasing demand for foreign workers. In Malaysia, Maldives and Thailand, for example, the construction, manufacturing, tourism and several other sectors depend heavily on foreign labour. In certain industries, increasing the supply of labour through the employment of migrant workers can also help to keep wages relatively low, thus maintaining a country's competitiveness.

The rapid growth of labour migration flows in the region has raised the issue of social protection, including access to health care and reproductive health services, and income security. Social protection schemes are often limited to the formal sector and the non-migrant population, while those workers who are covered by social protection schemes in their countries of origin may lose their entitlements once they take up residence in a new country. A particular challenge to women migrants is the lack of recognition of domestic work as an occupation. The recent extension of weekly rest to migrant domestic workers in Singapore and Thailand might be an indication of future efforts, stimulated by the Domestic Workers Convention, 2011 (No. 189), to improve legal protection.

Cooperative approaches to managing international labour migrant flows

ESCAP has identified migration as an “emerging opportunity for development,” but one that needs to be managed through both national action and multilateral dialogue and cooperation.⁴⁵ Given that migration entails both benefits and risks for countries of origin and countries of destination, the responsibility for managing migration lies with both parties.

There are currently several examples of bilateral agreements between source and destination countries.

Malaysia, the Republic of Korea and Thailand, for example, have bilateral agreements with many migrant-origin countries in the region. These may be formal agreements, which set out each side's commitments and may provide for quotas, or they may be less formal agreements, such as memorandums of understanding, between countries of origin and countries of destination. Most destination countries prefer memorandums of understanding, probably because as non-binding agreements they are easier to negotiate and implement.

As the region's economies become more integrated, there will be pressure on Governments to develop a geographically broader framework for managing migration. Such frameworks can begin at the subregional level and be expanded. For example, ASEAN has adopted the ASEAN Economic Community Blueprint, which is aimed at allowing for managed mobility or facilitated entry for the movement of natural persons engaged in trade in goods, services, and investments. Its member States are pursuing this goal through the progressive relaxation of visa requirements and institutional harmonization of categories of workers, although to date mutual recognition agreements have been negotiated for only a few priority professions – accountants, architects, dentists, doctors, nurses, surveyors and those of the tourism industry.

Furthermore, there is an urgent need for regional cooperation to establish common standards to protect the rights of migrants, as well as to prevent the trafficking of persons, which is increasingly taking place under the guise of consensual migration. At the global level, the principal instrument is the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families.⁴⁶ That convention, which entered into force in 2003, establishes minimum standards that States parties should apply to migrant workers and members of their families, irrespective of their migratory status. To date, however, the convention has been ratified by only eight countries in the ESCAP region (Azerbaijan, Bangladesh, Indonesia, Kyrgyzstan, the Philippines, Sri Lanka, Tajikistan and Turkey), while Armenia, Cambodia and Palau have signed but not yet ratified it.

There is a growing trend towards regional and subregional efforts to formalize the rights of migrant workers. For example, in 2007 ASEAN member States adopted the ASEAN Socio-Cultural Blueprint, which proposes several detailed actions

towards the protection and promotion of the rights of migrant workers.⁴⁷ Additionally, in 2009 ASEAN established the ASEAN Intergovernmental Commission on Human Rights, which includes as one of its mandates the protection of human rights of migrant workers.⁴⁸ Meanwhile, to discuss coherent approaches to migration management, SAARC member States established the South Asia Migration Commission, involving civil society, academics, government officials, policy institutes, non-governmental organizations and human rights organizations.

Strengthening knowledge networks of people and institutions

As noted in the previous chapter, there is growing interest among countries in the region to transition towards knowledge-based economies. It has previously been shown in ESCAP studies that the countries with the highest sustained growth are those that have managed to diversify their exports. While producing a broad spectrum of goods, they have also entered exclusive production segments in which few others produce or export, typically in knowledge-based sectors.⁴⁹

Achieving this transition required increased global and regional connectivity, and with it the smoother flow of knowledge and people. Successful innovation needs skilled workers who are familiar with both local cultural characteristics and international business practices and who are well connected through realtime communications and access to information.

Promoting student and academic exchanges can strengthen regional knowledge networks

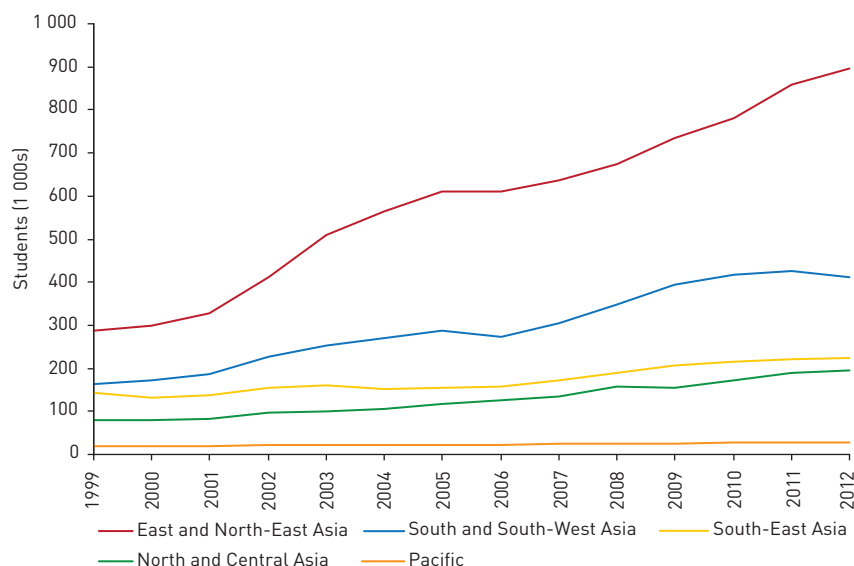
With education becoming more and more globalized, an increasing number of students are seeking tertiary education abroad. Many are going to countries in the Asian and Pacific region, which is home to numerous leading research institutions and universities. In 2012, Australia was the fourth largest host for international students globally, with 6% of mobile students, the Russian Federation was sixth with 4%, Japan seventh also with 4% and China ninth with 2%.⁵⁰

Moreover, the region is a major source of students. As can be seen in figure 2.11, the region's number of outbound international students has been steadily increasing over the last 15 years, and it is currently the source of approximately 50% of internationally mobile students. This has been mostly due to the rapid rise of students from China: with almost 700,000 students going abroad, China supplies more internationally mobile students than the next 7 countries combined.⁵¹

Tertiary education offers significant opportunities for cross-border linkages, knowledge generation and knowledge-sharing. The ESCAP region has numerous associations and organizations that promote such linkages, including the Asia-Pacific Association for International Education, the Association of Pacific Rim Universities and the South Asia Foundation.

ESCAP also actively promotes regional research networks. It contributed to the establishment of ARTNeT, the Asia-Pacific Research and Training Network on Trade, a network of leading trade research institutions and think tanks from the region that attempts to increase the quality and amount of relevant trade research and to share lessons on knowledge creation and knowledge management.⁵² Another recent initiative launched under the auspices of ESCAP's Centre for Alleviation of Poverty through Sustainable Agriculture is SATNET Asia, or the Network for Knowledge Transfer on Sustainable Agricultural Technologies and Improved Market Linkages in South and South-East Asia.⁵³ With members ranging from national and international research organizations, representatives of the private sector, agricultural foundations, farmers' organizations and non-governmental organizations, SATNET Asia facilitates the transfer of knowledge on sustainable agricultural practices and intraregional trade for the benefit of poor and marginalized farmers.

In addition, new doors are opening via the Internet for knowledge generation and sharing. This includes distance-learning courses, which have the advantage of scalability and can be accessed by those who previously had limited educational opportunities. The Pacific subregion has demonstrated what can be achieved. The University of the South Pacific is widely regarded as a success story for delivering higher education through distance education (see box 2.7). In this regard,

Figure 2.11. Number of outbound internationally mobile students, 1999-2012

Source: UNESCO Institute of Statistics, data on international student mobility in tertiary education downloaded from UIS.stat on 1 April 2014. Available from <http://data.uis.unesco.org/>.

ICT connectivity is expected to expand the reach and effectiveness of the region's knowledge networks. Universities are increasingly regional in their operations and outlooks and are also important sources of innovation. Taking advantage of the Internet, these networks can contribute to "knowledge clusters" – networks of individuals in academia, the private sector and Governments, for project planning, joint research and the exchange of ideas. Knowledge clusters initially emerged in lower-cost countries with good availability of skills and expertise – serving a growing global demand for standardized, less firm-specific knowledge services, such as software development, engineering support and analytical services. The best-known examples include Bangalore in India and Shanghai in China.

More recently, high-tech industries have also benefited from knowledge clusters. Building on the "Silicon Valley" model, many are linked to renowned universities and research institutes. To encourage such clusters, many countries in the region have established science parks and are encouraging the development of networks of researchers and business people living in different countries, sometimes drawing on their diasporas abroad (see box 2.8). Firms in the science parks generally

conduct more research and development than firms not located in such parks, perhaps because the close interaction with local universities enables firms to build on their knowledge.

In the future, there will likely be more cross-border collaboration between these types of knowledge clusters. Some countries in the region, including China, Japan, the Republic of Korea and the Russian Federation, are among the world's leaders in terms of expenditure on research and development as a share of GDP, while almost 40% of all researchers in the world are located in Asia and the Pacific.⁵⁴ With such a rich resource base, Governments, academic institutions and the private sector can work together to develop knowledge industries. Countries in the region may gain from the experiences of Japan, Malaysia and the Republic of Korea, which have actively promoted this type of cooperation.

Strengthening business networks and associations

Business networks and associations constitute another important type of people-to-people network. Business networks and associations are usually composed of private enterprises within an industry or sector, or from various industries and sectors.

Box 2.7. ICT connectivity enhances educational opportunities in the Pacific

The University of the South Pacific is a multi-country university with a membership of 12 Pacific island economies: Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu and Vanuatu. In its early years, some courses were conducted via USPNet, a satellite communications network set up in 1973 as a means of distance education for students who could not study at the main campus in Suva.

In 2006, the Suva hub was upgraded to create an Internet Protocol platform. USPNet is now a stand-alone network with interactive video conferencing between all campuses. It provides an efficient means of delivering academic programmes through seminars, discussion groups, debates, lectures and tutorials. These forms of communication can be delivered simultaneously to students located in the network of campuses. The audio and video lectures are now loaded onto servers at the campuses and can be viewed by students at a time convenient to them. The availability of the Internet has made it possible to deliver online courses using course management software, which provides lecturers and tutors with online access and allows for the sending and receiving of assignments, and for participation in student discussion groups.

Thanks to continuous advances in ICT, the number of students enrolled in distance education increased from 90 students enrolled in 16 courses in 1976, to 5,400 students enrolled in 1996, to more than 10,000 students enrolled in over 200 courses in 2008. To reach an even larger number of students, the University is currently redesigning USPNet and introducing new mobile technologies to facilitate online learning.

Source: R. Duncan and J. McMaster, "The role of USPNet in capacity development in the South Pacific region", Capacity Development Series (Mandaluyong City, Philippines, Asian Development Bank, 2008). Available from http://lencd.com/data/docs/25-USPNet_web.pdf; also University of South Pacific, "2013 Annual Report", available from http://www.usp.ac.fj/fileadmin/scripts/AnnualReport/USPAnnualReport_2013/index.html#/Chapter_1

While originally they were a means of bringing together domestic private enterprises, many international networks and associations have been established over the past few decades. Among the best known are the International Chamber of Commerce, the World Chambers Federation, the ASEAN Chambers of Commerce and Industry, the Confederation of Asia-Pacific Chambers of Commerce and Industry, and the SAARC Chamber of Commerce and Industry.

Such chambers advocate for and foster private sector development, as well as facilitate trade. The World Chambers Federation, for example, administers the ATA Carnet globally and also works with national chambers of commerce in issuing and attesting certificates of origin, which are required documents for international trade.⁵⁵ Meanwhile, the SAARC Chamber of Commerce and Industry has worked with the SAARC secretariat to promote trade facilitation.

In the context of regional connectivity, business associations and networks help businesses in less developed countries to connect to businesses in other countries. Within the transport and logistics sector there are, for example, the International Road Transport Union, the International Air Transport Association, the International Federation of Freight Forwarders Associations and the International Chamber of Shipping.

In every sector, these associations raise the level of professional standards. In particular, business associations support the development of small and medium-sized enterprises, which by some estimates account for nearly 50% of all value addition within Asia and the Pacific.⁵⁶ Networking among small and medium-sized enterprises in different countries helps them to identify common barriers to participation in regional and global production networks and markets.

Box 2.8. The “global Argonauts” of Hsinchu, Taiwan Province of China

In the early 1960s, the GDP of Taiwan Province of China was similar to that of Zaire. Despite having a highly educated population, high-skill jobs were scarce, and the economy's engineers were leaving to work abroad rather than at home. In particular, the number of Taiwanese people living in the United States grew rapidly, with many of them joining companies in Silicon Valley in the early years of the ICT revolution.

Helped by the expansion of the economy's shipping sector, Taiwan Province of China got a foothold in the production networks of Japanese and United States electronics companies. This started as simple manufacturing activities, based on equipment specifications sent from overseas firms. However, as the traffic of engineers and business representatives between Silicon Valley and Taiwan Province of China built up, manufacturing companies moved into higher value added areas such as design.

This was supplemented by official policies, whereby the companies were supplied with lists of qualified Taiwanese people living in the United States; their flights to return home to the island economy were paid from official sources. These people, dubbed “the new Argonauts,” came with valuable connections and know-how. Their efforts were supplemented by creating institutions for technology transfer, venture capital and a fruitful environment for investment. The combination of these policies helped to create a vibrant cluster of technological innovation in Hsinchu, Taiwan Province of China, which later gave birth to highly successful high-tech companies, such as Acer Inc., and helped the economy to transition into a knowledge-based one.

Source: A. Saxenian, *The New Argonauts: Regional Advantage in a Global Economy* (Cambridge, Massachusetts, Harvard University Press, 2006).

Putting individuals at the heart of people-to-people connectivity

The various networks described above require different sets of policy responses, but ultimately they are all linked by the individuals within them. Within people-to-people connectivity there are therefore areas of similar or overlapping concern, where stakeholders can cooperate with each other and with other interested parties to discuss and design appropriate policies.

With regard to international labour migration, a comprehensive regional framework for managing labour migration for shared prosperity should include: protecting and promoting the rights of all migrants; more legal channels for labour migration; increased skills-recognition schemes; and further regional normsetting and cooperation on managing migration. At the same time, regional approaches are not a substitute for structural reforms at the national level, or for the ratification of international conventions and instruments to protect the rights

of migrants. Countries of origin can protect their workers by regulating recruitment agencies, ensuring that skills are properly assessed, requiring standard contracts, setting minimum wages and deploying more labour attachés abroad. Host countries can also provide migrant workers with greater protection through, inter alia, in-country orientation programmes and more effective labour inspection and by allowing greater flexibility in access to the labour market.

Meanwhile, Governments should support the efforts of the region's universities and research institutions to build new knowledge networks and to promote student exchange programmes. For example, the Network of East Asian Think-tanks Working Group on Enhancing People to People Connectivity – Education, Tourism and Cultural Exchange recommends the systematization of regional quality assurance and credit transfer systems of higher education in ASEAN Plus Three.⁵⁷ Another interesting proposal is the establishment of transnational collaborative higher education and research institutions, such as the ASEAN Cyber

University, initiated by the Ministry of Education of the Republic of Korea in 2009, which links universities in Cambodia, Lao People's Democratic Republic, Myanmar and Viet Nam with students in the region through a virtual learning platform.⁵⁸

The future direction of people-to-people connectivity in the ESCAP region will also depend on better information about actual movements of people. At the national level, there is an urgent need for better data and analysis to underpin coherent policies, for example on the numbers of students studying abroad and the impact of labour migration on the development of countries of origin and countries of destination. International organizations, subregional organizations, business associations and academic networks also need to share information and discuss optimum approaches to promoting the mobility of people while mitigating negative effects, including human trafficking. In this regard, ICT connectivity, with its potential to link networks of different holders, presents tremendous opportunities for strengthening people-to-people connectivity.

Endnotes

¹ For a survey of the literature evaluating impacts of infrastructure development, see A. Estache, "A survey of impact evaluation of infrastructure projects, programs and policies", ECORE Discussion Paper No. 2010/16 (Brussels, ECORE, 2010). Available from www.ecore.be/DPs/dp_1270557731.pdf.

² Asian Development Bank, Asian Economic Integration Monitor July 2012. (Mandaluyong City, Philippines, ADB, 2012). Available from http://aric.adb.org/pdf/aeim/AEIM_2012July_FullReport.pdf.

³ United Nations Economic and Social Commission for Asia and the Pacific, *Review of Developments in Transport in Asia and the Pacific*. ST/ESCAP/2627.

⁴ The Asian Development Bank Institute has developed a computable general equilibrium model to simulate the quantitative gains to countries from investing in regional transport infrastructure. Available from www.adbi.org/files/2010.06.30.wp223.regional.infrastructure_investment.asia.pdf.

⁵ United Nations Economic and Social Commission for Asia and the Pacific, The Regional Action Programme for Transport Development in Asia and the Pacific, Phase II (2012-2016), Ministerial Declaration on Transport Development in Asia and the Pacific (Bangkok, 12-16 March 2012). Available from www.unescap.org/sites/default/files/Booklet_B_RAP2012-2016.pdf.

⁶ UNNEXT is a regional community of experts that conduct research and provide support on paperless trade and the single

window. For further information, see www.unescap.org/tid/unnext/default.asp.

⁷ A "missing link" is (a) the absence of physical linkages between the railway networks of neighbouring countries or (b) the absence of continuous railway infrastructure within one country, often due, in this latter case, to local geography, for example Lake Van in eastern Turkey. Such missing links between networks of neighbouring countries arise because the link was never there in the first place or because they ceased to exist due to political events. For an update on the status of missing links in the trans Asian railway network, see chapter 1 of United Nations Economic and Social Commission for Asia and the Pacific, *Review of Developments in Transport in Asia and the Pacific*. ST/ESCAP/2627.

⁸ The road classes under the Asian Highway classification and design standards define class III as the minimum desired standard, being a narrow two-lane road with double bituminous surface treatment. For full specifications, see annex III of the Intergovernmental Agreement on the Asian Highway Network (United Nations, Treaty Series, vol. 2323, No. 41607). Available from https://treaties.un.org/doc/source/RecentTexts/XI_B_34_E.pdf.

⁹ According to ESCAP estimates and country reports: upgrading 12,000 km of roads from below class III to class III standards would require \$3.5 billion; strengthening the pavement of 31,500 km of class III roads to asphalt concrete (class II) without widening and geometrical improvements would require \$7 billion; and upgrading 45,500 km (excluding roads in mountainous and hilly terrain) of class II roads to four lanes (class I) would require \$25.5 billion.

¹⁰ International Union of Railways and Community of European Railway and Infrastructure Companies, *Rail Transport and Environment: Facts and Figures* (Paris and Brussels, UIC and CER, 2008). Available from www.uic.org/homepage/railways&environment_facts&figures.pdf.

¹¹ According to the Intergovernmental Agreement on Dry Ports, "a dry port of international importance ('dry port') shall refer to an inland location as a logistics centre\connected to one or more modes of transport for the handling, storage and regulatory inspection of goods moving in international trade and the execution of applicable customs control and formalities". It may be distinguished from an inland container depot (ICD) in that it can accommodate all types of cargo, whereas an ICD specializes in the handling of containers and containerized cargo.

¹² J. Woxenius, V. Roso and K. Lumsden, "The dry port concept: connecting seaports with their hinterland by rail", ICLSP Conference Proceedings, Dalian, China (Goteborg, Sweden, Department of Transportation and Logistics, Chalmers University of Technology, 2004), pp. 305-319. Available from www.pol.gu.se/digitalAssets/1344/1344857_2004_iclsp_dalian_woxros-lum.pdf.

¹³ ESCAP, together with its member States, worked for several years on the development of the Intergovernmental Agreement on Dry Ports. Under this agreement, countries nominated important nodal points between the Asian Highway and Trans-Asian Railway networks to develop into dry ports.

¹⁴ NEA Transport Research Institute and International Road

Transport Union, New Eurasian Land Transport Initiative: Final Report – Analysis of Monitoring Data Collected on NELTI Project Routes in 2008-2009 (2009). Available from www.iru.org/cms-files/systemaction?file=events_2009_almaty/NELTI-report-EN.pdf.

- ¹⁵ The opening of the joint customs control was the result of the Agreement between the Government of the Republic of Kazakhstan and the Government of the Kyrgyz Republic on Joint Control at the Kyrgyz- Kazakhstan Borders, signed in 2006.
- ¹⁶ United Nations Economic and Social Commission for Asia and the Pacific, Review of Developments in Transport in Asia and the Pacific. ST/ESCAP/2627. Chapter 2.
- ¹⁷ See United Nations Centre for Trade Facilitation and Electronic Business, Recommendation and Guidelines on Establishing a Single Window to Enhance the Efficient Exchange of Information between Trade and Government – Recommendation No. 33 (United Nations publication, Sales No. 05.II.E.9).
- ¹⁸ United Nations Economic and Social Commission for Asia and the Pacific and United Nations Economic Commission for Europe, Single Window Planning and Implementation Guide. ECE/TRADE/404.
- ¹⁹ The development of integrated systems was the focus of the joint United Nations Regional Commissions' Global Trade Facilitation Forum, held in Bangkok on 18 and 19 November 2013. See <http://unnex.unescap.org/gtfc13.asp> for details.
- ²⁰ See www.paa.net/.
- ²¹ J.F. Arvis and others, Connecting Landlocked Developing Countries to Markets: Trade Corridors in the 21st Century (Washington, D.C., World Bank, 2011). Available from <https://openknowledge.worldbank.org/handle/10986/2286>.
- ²² China and Mongolia renewed their agreement on international road transport, together with its protocol, in June 2011, opening 36 transport routes through 13 border crossings; the agreement also introduced longterm multiple-entry permits for the carriage of goods, in addition to short-term, single-entry permits. Meanwhile, China and Viet Nam amended their bilateral agreement on road transport in October 2011 and signed a new protocol for the implementation of the agreement in May 2012, allowing Chinese vehicles to travel to Hanoi and the seaport of Hai Phong in Viet Nam, and allowing Vietnamese vehicles access to important economic centres in China, such as Guangzhou, Shenzhen, Kunming and Nanning.
- ²³ United Nations Economic and Social Commission for Asia and the Pacific, "Creating the silk super-highway in Central Asia", Press Release, News Number G/73/2013, 29 November 2013. Available from www.unescap.org/news/creating-silk-super-highway-central-asia.
- ²⁴ ESCAP has proposed extending this corridor to other parts of South Asia beginning with Delhi-Kolkata-Dhaka. It has been argued that the Istanbul-Tehran-Islamabad – Delhi-Kolkata-Dhaka container trade corridor could become an important trade route for intraregional trade, as well as help to make the subregion a hub of East-West trade.
- ²⁵ Industry estimate; see for example the website of the United States of America, Office of Science and Technology Policy, which estimated that timing "broadband deployment activities to periods when streets are already under construction... can reduce network deployment costs along Federal roadways by up to 90 percent". Available from www.whitehouse.gov/blog/2013/09/16/accelerating-broadband-infrastructure-deployment-across-united-states.
- ²⁶ More than 1,000 households, representatives of Government, businesses, non-governmental organizations and youth were surveyed by the Pacific Institute of Public Policy. See S. O'Connor, A. Naemon and B. Sijapati- Basnett, *Net Effects: Social and Economic Impacts of Telecommunications and Internet in Vanuatu – Research Findings Report 2011-2012* (Port Vila, Pacific Institute of Public Policy, 2012). Available from www.pacificpolicy.org/wp-content/uploads/2012/05/PiPP-Net-Effects-2011-Vanuatu-Telecomms-report1.pdf.
- ²⁷ International Telecommunications Union, Measuring the Information Society 2013.
- ²⁸ O3b Networks, "Fulfilling the promise: innovative satellite capacity for the Pacific's", paper presented at the APT/ITU Pacific Forum 2013, Apia, 22 April.
- ²⁹ World Bank, *Program Appraisal Document for a Regional Adaptable Program Loan for a Pacific Regional Connectivity Program*. (Washington D.C., 2011)
- ³⁰ S. 'Ofa, *Telecommunications Regulatory Reform in Small Island Developing States: the Impact of the WTO's Telecommunications Commitment* (Newcastle upon Tyne, United Kingdom, Cambridge Scholars Publishing, 2012).
- ³¹ International Energy Agency, IEA World Energy Statistics and Balances database (2013). Available from www.oecd-ilibrary.org/energy/data/iea-world-energy-statistics-and-balances_en?stats-data-en.
- ³² International Energy Agency, World Energy Outlook 2012 (Paris, OECD/IEA, 2012). Available from www.iea.org/publications/freepublications/publication/WEO2012_free.pdf.
- ³³ These include the East Siberia-Pacific Ocean oil pipeline, the Central Asia-China gas pipeline, the Turkmenistan-Afghanistan-Pakistan-India pipeline, the Islamic Republic of Iran-Pakistan-India pipeline and the Trans-ASEAN gas pipeline. There are also such projects as the Bangladesh-India/India-Bangladesh pipeline; the Indonesia-Philippines gas pipeline trade; Myanmar-India, Myanmar-Bangladesh, Myanmar-China pipeline gas; and the Malaysia-Thailand pipeline gas trade. In addition, there are opportunities for the maritime trading of liquefied natural gas. These include Malaysia to Bangladesh, India and China; Brunei Darussalam to China, India and Hong Kong, China; and maritime liquefied natural gas supplies of Pacific island countries.
- ³⁴ Further examples of subregional energy cooperation initiatives can be found in United Nations Economic and Social Commission for Asia and the Pacific, *Growing Together: Economic Integration for an Inclusive and Sustainable Asia-Pacific Century*. ST/ESCAP/2629.
- ³⁵ In Commission resolution 68/11 on connectivity for energy security, the Executive Secretary was requested to "identify options, in consultation with member States, that member States may choose on regional energy connectivity, including an intergovernmental framework that could be developed for an integrated regional power grid, which could be termed as

- the “Asian Energy Highway”, to analyse the socioeconomic and environmental benefits of each option as well as the challenges and opportunities towards the realization of each option”. See United Nations Economic and Social Commission for Asia and the Pacific, *Official Records of the Economic and Social Council, Supplement No.19* (E/2012/39-E/ESCAP/68/24).
- ³⁶ World Energy Council, *Regional Energy Integration in Africa* (London, World Energy Council, 2005). Available from www.worldenergy.org/documents/integrationii.pdf.
- ³⁷ Most notably, related to the high-voltage direct current transmission, such as: (a) improvements in their efficient ranges; (b) reduced footprint through reduced right-of-way requirements; (c) opportunities to interconnect grids by either land or sea (using=cables); (d) the development of hybrid high-voltage direct current breakers that can respond to power interruptions and emergency situations, also providing an increased opportunity for network augmentation; (e) opportunity for asynchronous interconnections; and (f) developments in smart grid technology (with high capacity converter feeder transformers) that enhance opportunities for improvements in the geographical scale of grid interconnectivity, including improved renewable energy management through load smoothing. United Nations Economic and Social Commission for Asia and the Pacific, “Meeting report: Expert Group Meeting on Conceptualizing the Asian Energy Highway, 3-5 September 2013, Urumqi, China”. Available from www.unescap.org/sites/default/files/EGM-AEH-meetingreport_0.pdf.
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- ⁴⁴ For an overview of such studies, see M. Rahman, “Foreign manpower in Singapore: classes, policies and management”, *Asia Research Institute Working Paper No. 57* (Singapore, Asia Research Institute, 2006). Available from www.ari.nus.edu.sg/showfile.asp?pubid=509&type=2.
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- ⁵⁰ United Nations Educational, Scientific and Cultural Organization, *Global Flow of Tertiary Students* (2014). Available from www.uis.unesco.org/Education/Pages/international-student-flow-viz.aspx.
- ⁵¹ Ibid.
- ⁵² More information on ARTNeT is available from <http://artnet.unescap.org>.
- ⁵³ More information on SATNET Asia is available from www.uncapsa.org/theme2.asp.
- ⁵⁴ United Nations Economic and Social Commission for Asia and the Pacific, *Statistical Yearbook for Asia and the Pacific 2013*. (United Nations Publication, Sales No. E.13.II.F.1.)
- ⁵⁵ ATA Carnet is an international customs document that permits the duty- and tax-free temporary import of goods for up to one year, which is useful for commercial samples, professional equipment, and goods for use at trade fairs, shows and exhibitions. In the ESCAP region, China; Hong Kong, China;

India; the Islamic Republic of Iran; Japan; Macao, China; Malaysia; Mongolia; Pakistan; the Republic of Korea; the Russian Federation; Singapore; Sri Lanka; Thailand; and Turkey accept and use ATA Carnets.

⁵⁶ United Nations Economic and Social Commission for Asia and the Pacific, Policy Guidebook for SME Development in Asia and the Pacific, (United Nations publication, Sales No. E.12.II.F.2).

⁵⁷ Network of East Asian Think-Tanks, NEAT Working Group on Enhancing People to People Connectivity: Education, Tourism and Cultural Exchange – Final Report (NEAT, 2013).

⁵⁸ ASEAN Cyber University, “History”, 2014. Available from www.aseancu.org/about/history.jsp.



STRENGTHENING INSTITUTIONAL COORDINATION AND REGIONAL COOPERATION

3

To plan and implement joint strategies for regional connectivity, countries need robust institutional frameworks. To strengthen institutional coordination and regional cooperation, intergovernmental organizations and programmes can serve as neutral platforms not only for policy coordination to establish regional norms but also for implementing global statistical standards for joint planning and monitoring, and for exploring new modalities for financing.

There is no single formula for regional integration, with different forces driving the process in different regions. In the case of the European Union, for example, the rationale for integration was that economic interdependence would foster regional peace while at the same time increase the region's productivity and competitiveness. Based on this premise, member States of the European Union worked towards a single common market by harmonizing policies and market rules. These would be enforced by pan-European institutions, backed up by substantial financial resources.

Regional integration in Asia and the Pacific has followed a less uniform trajectory. Integration has progressed at different rates from one subregion to another, and in different ways, depending on the sector. Bilateral and plurilateral agreements have liberalized trade, reduced tariffs and opened markets in almost all countries. However, apart from investing in maritime ports, Governments have concentrated on national rather than regional infrastructure. Indeed, overall integration has been driven less by Governments than by the private sector, led by multinational corporations which, in collaboration with local enterprises, established global and regional production networks.¹

Nowadays, however, national Governments are seeking a more active role, looking beyond national borders and developing transnational strategies for strengthening regional connectivity. They can, for example, shape regional spatial development through their infrastructure investments and policies. They can also link domestic businesses and supranational regulatory bodies by establishing common standards and rules for business. National Governments also control the framework for cross-border flows of capital and labour.

With this in mind, Governments must take the lead in establishing robust institutional frameworks and reaching out to other countries to develop and implement joint strategies. In this regard, many subregional organizations are developing their own programmes or "road maps" for strengthening connectivity. The present chapter contains a discussion of some of these strategies, and a description of how ESCAP can push forward a regional connectivity agenda which complements and supports those efforts.

STRENGTHENING INSTITUTIONAL RESPONSES TO REGIONAL CONNECTIVITY

The ESCAP region is home to many intergovernmental organizations, operating at different levels and around different interests or themes. In the past, many subregional initiatives were launched in response to issues of common concern, or with specific sectoral objectives, particularly on trade and economic cooperation. Over the past decade, however, there has been a convergence of these different initiatives towards a more comprehensive subregional integration agenda. This appears to be the result of a deepening level of political commitment of the respective member States. For example, the Treaty on the Establishment of the Eurasian Economic Community was signed in Astana in October 2000 and came into effect in June 2001, with Belarus, Kazakhstan, Kyrgyzstan, the Russian Federation and Tajikistan, as the founding members.² The Customs Union of Belarus, Kazakhstan and the Russian Federation came into effect in July 2010, while the Common Economic Space involving the three countries began operating on 1 January 2012. Spurred by the removal of trade barriers and the implementation of various other integration policies, trade between Belarus, Kazakhstan and the Russian Federation grew from \$12.9 billion in 2009 to more than \$24 billion in 2013.³

*Subregional organizations
are currently working
to enhance their connectivity*

Also in 2012, the Eurasian Economic Commission was established to support the functions and development of the Customs Union and the Common Economic Space. In May 2014, Belarus, Kazakhstan and the Russian Federation signed the Eurasian Economic Integration Agreement, for the purpose of launching the "Eurasian Economic Union" in 2015. That union is expected to further integrate the three countries, for example by giving citizens of all members equal access to education and employment across borders.⁴ The new common market is expected to have further growth-promoting and trade-creating effects, both within the union and with outside partners.

Meanwhile, organizations such as the Association of Southeast Asian Nations (ASEAN) and, more recently, Asia-Pacific Economic Cooperation (APEC), have focused on connectivity as part of their regional integration agendas. Both organizations are addressing physical connectivity – the availability and interconnection of hard infrastructure necessary for the movement of goods, people and information. They are also addressing institutional connectivity – the policies and regulations that enable the efficient movement of goods and services across borders. In addition, they are improving people-to-people connectivity – policies and regulations facilitating the movement of people and increased understanding between them (table 3.1).⁵ Indeed, the Master Plan on ASEAN Connectivity is one of the first comprehensive intergovernmental strategy documents to address the issue of connectivity.

Moreover, other subregional organizations are also improving connectivity between their members, even if they do not have such explicit connectivity agendas. The South Asian Association for Regional Cooperation (SAARC), for example, has launched several relevant initiatives. These include: the Agreement on the Establishment of the South Asian

Regional Standards Organisation, which came into effect in 2011; the SAARC Visa Exemption Scheme; and the SAARC Energy Ring.⁶ The connectivity activities of SAARC are also promoted among non-State actors: the SAARC Chambers of Commerce and Industry, for example, provides practical inputs for facilitating regional trade, while the South Asia Migration Commission involves academics, policy institutes, government officials and a wide range of civil society and non-governmental organizations.⁷

Many other institutional groupings contribute to the integration and connectivity of their member Governments. These include the Economic Cooperation Organization (ECO), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), Greater Tumen Initiative, the Pacific Islands Forum, Secretariat of the Pacific Community (SPC) and the Shanghai Cooperation Organization. ECO, for example, has the ECO Transit Transport Framework Agreement and the ECO Transit Trade Agreement, while SPC has the Framework for Action on Transport Services.

In recent years, connectivity programmes have been supported by the multilateral development banks. The Asian Development Bank (ADB), for

Table 3.1. Key elements of the ASEAN and APEC connectivity frameworks

"Categories" of connectivity	ASEAN Master Plan on Connectivity	APEC Policy Document on Connectivity
Physical connectivity	Transport	
	Information and communications technology (ICT)	Transport (ports, airports, roads, and railways)
	Energy	
Institutional connectivity	Trade liberalisation and facilitation	Free Trade Areas/Regional Trade Areas
	Investment and services liberalisation and facilitation	Behind the border barriers
	Mutual recognition agreements/arrangements	Trade facilitation and non-tariff barriers
	Regional transport agreements	Also includes customs modernization, the single window initiative, structural reforms, transport and logistics facilitation
	Cross-border procedures	
People-to-people connectivity	Capacity building programmes	International business travel
	Education and culture	Cooperation between regional scholars
	Tourism	Educational linkages
		Tourism promotion
		Increased mobility of professionals

Source: ASEAN (2010). *Master Plan on ASEAN Connectivity: One Vision, One Identity, One Community*; APEC (2013). *Improving Connectivity in the Asia Pacific Region: Perspectives of the APEC Policy Support Unit*.

example, has supported the programmes of Central Asia Regional Economic Cooperation, the Greater Mekong Subregion and South Asia Subregional Economic Cooperation. These programmes have taken corridor approaches to trade and transport connectivity – combining investment in “hard” infrastructure with agreements on “soft” measures, such as trade and transport facilitation.⁸ The World Bank, European Bank for Reconstruction and Development, Eurasian Development Bank, Islamic Development Bank and other international financial institutions also fund projects related to connectivity, though usually for national infrastructure and industrial development.

As organizations move towards more integrated approaches to connectivity, one of the key institutional challenges is to ensure that different sectoral ministries work together, within Governments as well as across borders. To achieve this, clearly defined strategies or “road maps”, with agreed milestones, are essential. For example, the ASEAN Economic Community Scorecard is a useful monitoring tool to track progress towards the ASEAN Economic Community in 2015 (figure 6.1). Based on country reports, this “tracking” tool is also supported by bilateral donors, highlighting the fact that institutional coordination may require external support, especially for low income countries. The reliability of such tools also depends on the

availability of comparable data – as considered later in this chapter.

Coordination at the regional level

Experience gained from implementation of referential trade agreements and transport facilitation frameworks suggests that, as subregional initiatives multiply, they require greater policy harmonization. To avoid overlapping or conflicting rules which create new obstacles to connectivity, member States and organizations will need to coordinate their activities. For this purpose, they can turn to regional institutions such as ESCAP which can support and coordinate subregional integration, thus facilitating communications between subregional actors and analysing the impact of those initiatives from a regional perspective. Regional institutions can also link subregional and national connectivity policies with global initiatives and standards. Some examples are described below.

Formal frameworks relating to regional connectivity
In some cases, regional coordination can best be achieved through a formal framework. In the ESCAP region, the prominent examples relating to regional connectivity are the intergovernmental agreements on the Asian Highway and Trans-Asian Railway networks, and on dry ports. Developed under the

Figure 3.1. Example from the ASEAN Economic Scorecard, Competitive Economic Region (Pillar II)

Key areas	Phase I (2008-2009)		Phase II (2010-2011)		Total measures	
	Fully implemented	Not fully implemented	Fully implemented	Not fully implemented	Fully implemented	Not fully implemented
Competition policy	2	0	2	0	4	0
Consumer protection	2	0	5	4	7	4
Intellectual property rights	-	-	4	1	4	1
Transport	15	10	6	8	21	18
Energy	0	0	2	1	2	1
Mineral	1	0	7	0	8	0
ICT	2	0	4	0	6	0
Taxation	-	-	0	1	0	1
E-commerce	-	-	1	0	1	0
Total number of measures	22	10	31	15	53	25
Implementation rate	68.7%		67.4%		67.9%	

Source: ASEAN (2012). “ASEAN Economic Scorecard 2012”.

Note: Implementation rate is calculated as the ratio of measures that are fully implemented to total number of measures targeted. A hyphen (-) indicates no measures targeted for this phase.

auspices of ESCAP, these intergovernmental agreements have delineated routes and established basic infrastructure standards. Moreover, some subregional organizations, such as ASEAN, BIMSTEC and ECO, have used the Asian Highway as the basis for formulating their own road networks. Another formal framework currently under negotiation among ESCAP members in support of greater regional connectivity is a regional arrangement on the facilitation of cross-border paperless trade [see box 2.3 in the previous chapter].

Infrastructure projects benefit from intergovernmental agreements because they can have significant repercussions on neighbouring countries, which should be analysed and discussed before construction is begun. They also have long gestation periods so need continuing commitment. The annual working groups under the above-mentioned agreements provide regular forums in which relevant national authorities, along with subregional and other international organizations, can exchange information and negotiate amendments.

Other major formal frameworks with implications for regional connectivity are agreed at the global level. International agreements and conventions cover a wide range of subjects, such as the movement of goods, people and vehicles, and flows of capital.

For trade liberalization, the principal forum is the World Trade Organization. Other relevant agreements are overseen by specialized agencies of the United Nations, such as the International Labour Organization, the International Maritime Organization and the International Civil Aviation Organization, and the various secretariats for multilateral environmental agreements, which also oversee specific agreements. These international agreements and conventions can also be promoted by regional and subregional organizations as part of their norm-setting functions.

Global agreements and conventions can favorably be supplemented on the regional level

International agreements may also be formulated or implemented by private sector associations and non-governmental organizations. For example, the

International Road Transport Union is involved in the administration of the TIR (Transports Internationaux Routiers) Carnet, as mandated by the Customs Convention on the International Transport of Goods under Cover of TIR Carnets (1975).

For certain issues, however, it is easier to build consensus at the regional level. Global agreements and conventions can therefore be supplemented by regional-level agreements. One example is the Asia-Pacific Trade Agreement, which was previously known as the Bangkok Agreement. Serviced by the ESCAP secretariat, this is the oldest preferential trade agreement in the Asia-Pacific region; its scope has been expanded from lowering tariffs to addressing barriers to services, trade and investment among its members.

Further work is needed to promote relevant international agreements and conventions at the regional level, as well as to identify ways to effectively support national Governments in acceding to and implementing these agreements.

Voluntary commitments to regional strategies

Most commitments launched under the auspices of ESCAP are voluntary. The scope of these frameworks and the benefits that can be accrued from them are best achieved through consensus. This “locks in” the commitment of all participating States and discourages the emergence of discontented minorities. As one study noted, however, such an approach also involves “a steep trade-off between commitment and decisiveness.”⁹ This is because such commitments take longer to negotiate than the decisions taken, for example, by institutions or agencies that have more specific or narrower mandates. To accommodate divergent views among member States, these processes may also result in very general or broad types of commitment.

Cross sectoral strategies for increasing connectivity have great potential ahead

In this regard, the most effective approach is to concentrate on specific objectives or sectors, for which it is possible to lay down some basic principles for achieving progress in particular areas. For example, the Regional Strategic Framework for the Facilitation of International Road Transport

contains targets for harmonizing road transport facilitation practices and rules.¹⁰ Nevertheless, these strategies can also be linked to a broader connectivity agenda.

Strengthening cross-sectoral and multifaceted approaches to connectivity

The increasingly complex nature of regional connectivity will require strategies that are crosssectoral. National Governments and international organizations will therefore need to reach out to other stakeholders, including the private sector, academia and civil society organizations, the networks of which form an integral part of the region's connectivity.

One of the most important infrastructure developments will be expanding overland broadband cable. This can be done by laying fibre-optic cables along existing regional transport networks so as to generate an "Asia-Pacific information superhighway".

Further, as energy management systems become increasingly reliant on computers and information and communications technology (ICT), this may, in turn, form the basis of an "Asian energy highway".

Given the complexity of each sector, the benefits and risks of cross-sectoral approaches require further research. Intergovernmental bodies, such as the annual sessions of the Commission and its legislative committees, offer a forum for different line ministries, as well as for experts from other intergovernmental organizations, civil society, the

private sector and other stakeholders. In this way, they can work step-by-step towards developing regional cross-sectoral strategies.

In this regard, many of the strategies described in this study are expected to be refined and developed under the framework of the Bangkok Declaration on Regional Economic Cooperation and Integration in Asia and the Pacific. Through this declaration, ESCAP member and associate member States resolved to cooperate in a number of important areas: the formation of an integrated market; the development of seamless regional connectivity in transport, energy and information and communications technology; financing regional development; and taking initiatives to address shared vulnerabilities and risks.

Meanwhile, Governments can also promote crosssectoral cooperation through national coordination mechanisms. For example, the main challenge in implementing trade and transport facilitation measures is not cost or complexity, but coordination between the various agencies and stakeholders involved. In this regard, national trade and transport coordination committees offer an effective model for agencies and other stakeholders to discuss optimum solutions to facilitate trade and transport (box 3.1).

Planning and implementing regional connectivity strategies also requires two additional ingredients: one is the availability of comparable, accurate and timely information and data; the other is finance. In the remainder of this chapter, these two issues will be examined in more detail.

Box 3.1. Strengthening national trade and transport coordination committees

Cooperation between the various agencies involved in trade and transport can be fostered through a number of mechanisms. The most stable is a permanent coordination institution with a clear long-term mandate and organizational structure. In accordance with its terms of reference, this can coordinate broad and specific facilitation initiatives and measures. Alternatively, for specific initiatives, temporary and case-based coordination mechanisms may be more appropriate. Such mechanisms may eventually be developed into a permanent body to deal with other similar issues on a recurring basis.

Some permanent institutions have been established under subregional trade and/or transport agreements. Examples are the National Transit Transport Coordinating Committees (NTTCC) that have been set up in Cambodia, Malaysia, Thailand and Viet Nam under the ASEAN Framework Agreement on the Facilitation of Goods in Transit. National trade and/or transport facilitation committees have also been established in other Asia-Pacific countries, but some have found it difficult to sustain activities due to funding constraints and lack of operational capacities.

Box 3.1. Continued

As cross-border trade is likely to expand, the need for greater coordination and collaboration among various agencies will only get stronger. Governments and international organizations should therefore increase their support for these mechanisms. In particular, the establishment of national trade and transport facilitation monitoring mechanisms to support decision-making by national coordination committees may be promoted, as has been done by the Asian Development Bank and ESCAP in Bangladesh, Bhutan and Nepal.

Source: ESCAP (2011). *Guidelines on Establishing and Strengthening National Coordination Mechanisms for Trade and Transport Facilitation in the ESCAP Region*. Available from www.unescap.org/sites/default/files/0%20-%20Full%20Report_12.pdf. ESCAP (2014). *Towards a National Integrated and Sustainable Trade and Transport Facilitation Monitoring Mechanism: BPA+ (ST/ESCAP/2683)*. Available from www.unescap.org/sites/default/files/0%20-%20Full%20text_0.pdf.

STATISTICAL STANDARDS FOR STRENGTHENED ACCOUNTABILITY AND BETTER POLICYMAKING

Official statistics help Governments track progress and ensure that their decisions are based on evidence. As noted in the report of the High-level Panel of Eminent Persons on the Post-2015 Development Agenda, statistics are more than a tool for monitoring development results; they are also a means to strengthen accountability and are a central component of achieving the development agenda beyond 2015.¹¹ ESCAP member and associate member States reaffirmed this view in their input to the United Nations Statistical Commission session in March 2014.¹²

As noted by the High-level Panel, better data and statistics provide the basis for evidence-based policymaking. They facilitate bilateral, multilateral and international policy dialogue in arriving at a shared understanding of trends, issues and bottlenecks – enabling them to reach consensus on crossborder issues, such as trade, international migration, education standards, transport and tourism.

Fundamental for this shared understanding is the availability of data that are comparable across countries, over time and across different data sources. For this purpose, statistics need to be produced, disseminated and used according to mutually agreed statistical standards concerning definitions, classifications and methodologies.¹³ Such standards can be either global, such as the System of National Accounts, or agreed at regional or subregional levels. They should also be in line with the Fundamental Principles of Official Statistics, which offer guidance on objectivity,

independence and availability, and which also call for the use of international concepts, classifications and methods.¹⁴

Organizations and countries that adopt common statistical standards are in a better position to analyse the issues. They can also jointly “track” the impact of their connectivity policies at national and subnational levels. Much can be learned from the experience of subregional organizations such as ASEAN, which has established clear frameworks for producing statistics relevant to broader organizational objectives, such as regional integration (box 3.2).

Adherence to common standards and principles for the production of statistics also strengthens the quality, credibility and cross-country comparability of data and fosters mutual trust. One example is the International Comparison Program (ICP),¹⁵ which estimates purchasing power parities, making it possible to compare the output of economies in real terms. Another has been the efforts to improve statistics for monitoring the achievement of the Millennium Development Goals. This has enabled better cross-country comparisons for holding Governments accountable for achieving maximum results from available resources (box 3.3).

Reliable and comparable statistics can also be used by private businesses and individuals. Private sector companies rely on official statistics, as well as their own information sources, to assess market opportunities and make decisions regarding trade, investment, production and distribution. Individuals too can, for example, use labour market statistics to compare employment opportunities and living costs between countries, and thus weigh the potential benefits of migration.

Box 3.2. Statistical connectivity in ASEAN

The work of the Association of Southeast Asian Nations (ASEAN) in promoting statistics can be traced to October 1997 with the first ASEAN Heads of Statistical Offices Meeting (AHSOM) in an official discussion forum. The annual meetings of AHSOM provided direction and guidance to the ASEAN Secretariat's work in statistical standardization among its members. By 2001, AHSOM had adopted the ASEAN Framework of Cooperation in Statistics.

Initiatives that followed over the next decade from the AHSOM meetings included implementation of international standards and concepts in the fields of trade statistics, industrial statistics and foreign direct investment statistics. In 2010, the revised Framework for Cooperation in Statistics and the ASEAN Community Statistical System were created. This body, known as ACSS, replaced AHSOM and added a statistical decision-making body to the ASEAN structure with clear responsibility for improving statistical connectivity among member States.

ASEAN has received considerable support from its dialogue partners on the adoption of international standards and statistical harmonization. From 2009 to 2013, ASEAN cooperated with the European Union in the development of ACSS, as well as in the harmonization of foreign direct investment and trade statistics. Through its cooperation with the European Union and with the United Nations, ASEAN has substantially improved the harmonization of merchandise trade statistics and has improved the dissemination of comparable data. ASEAN also maintains its own country-to-country mutual assistance framework, known as ASEAN-help-ASEAN, which has facilitated partnerships between its members to address issues of capacity development and harmonization.

In placing statistics and data standards at the centre of its integration agenda, ASEAN has illustrated the direct role that it can have in advancing shared prosperity. Notably, "ASEANstats", the ASEAN Secretariat's regional statistical entity, is institutionally located within the office responsible for monitoring ASEAN integration.

Source: Based on information from ASEANstats. See also 2001 ASEAN Framework of Cooperation in Statistics (2001-2010), available from www.asean.org/archive/stat/AFCS.pdf; ASEAN Framework of Cooperation in Statistics (2010-2015), available from www.asean.org/images/2013/resources/statistics/statistical_publication/ASEAN%20Framework_2010-2015.pdf; and Joint Media Statements of the ASEAN Heads of Statistical Offices Meetings, available from www.asean.org/resources/category/asean-statistics-2.

Box 3.3. Measuring progress towards the Millennium Development Goals

The international statistical community rose to the challenges presented by the Millennium Development Goals by working to increase the availability of necessary data on the relevant indicators. Analysing progress towards the targets under the Millennium Development Goals requires at least two data points for each indicator. Asia-Pacific Regional MDG Report 2012/13, which uses 20 indicators to assess data availability, shows that there are only two indicators where every country in the Asia-Pacific region meets the minimum data requirement - the incidence and prevalence of tuberculosis (TB). There are 10 other indicators for which at least 80 per cent of the countries in the region meet the minimum data requirement. For poverty data, less than half meet the minimum requirement.

Box 3.3. Continued

Number of countries, out of 55, meeting minimum data requirements, by indicator

	"No. of countries (out of a total of 55) meeting minimum data requirements, by indicator"			
	2010 dataset		2013 dataset	
	Number	%	Number	%
\$1.25 per day poverty	25	46	25	45
Underweight children	28	51	30	55
Primary enrolment	32	58	38	69
Reaching last grade	26	47	38	69
Primary completion	40	73	44	80
Gender primary	45	82	47	85
Gender secondary	41	75	45	82
Gender tertiary	29	53	42	76
Under-5 mortality	47	86	48	87
Infant mortality	47	86	48	87
Maternal mortality	0	0	41	75
Skilled birth attendance	43	78	46	84
Antenatal care (≥ 1 visit)	28	51	36	65
HIV prevalence	30	55	28	51
TB incidence	55	100	55	100
TB prevalence	55	100	55	100
Forest cover	51	93	53	96
Protected area	52	95	52	95
Safe drinking water	48	87	52	95
Basic sanitation	48	87	52	95

Source: Asia-Pacific Regional MDG report 2012/13.

The preferred source of data for analysis of progress towards achieving Millennium Development Goal targets is national statistics. In countries where the national statistical system does not generate the relevant data, the responsible agency fills the gaps with data collected by international agencies. A report presented to the United Nations Statistical Commission in 2013 showed that, of the 55 indicator series analysed, 29 were based on data from countries, 6 required minimum adjustment and 15 were estimated by international agencies. For one of the indicator series, most data points were derived through a model.^a This led to questions regarding methodological validity and the reliability of these estimates and has highlighted the need to strengthen the capacity of national statistical systems.^b Thus, the availability of comparable data is at the centre of ongoing discussions on the sustainable development goals, which are expected to form the foundation for the international development agenda beyond 2015.

Source: ADB, ESCAP and UNDP (2013). Asia-Pacific Aspirations: Perspectives for a Post-2015 Development Agenda, Asia-Pacific Regional MDGs Report 2012/13. Available from www.unescap.org/sites/default/files/MDG-Report2012-2013%28lowres%29_0.pdf.

^a United Nations Economic and Social Council (2013). Indicators for monitoring the Millennium Development Goals. Report of the Secretary-General to the 44th session of the Statistical Commission, 26 February – 1 March 2013. E/CN.3/2013/21.

^b PARIS 21, Strengthening national statistical systems to monitor global goals. Discussion paper presented at the Committee for the Coordination of Statistical Activities (SA/2013/10). August 2013.

Strengthening statistical capacity in the Asian and Pacific region

Currently, statistics are often unavailable because many Governments lack the capacity to gather and use them.¹⁶ The ESCAP Committee on Statistics is therefore trying to achieve two goals by 2020: to ensure that all countries in the region can provide a basic range of population, economic, social and environment statistics; and second, to create a more adaptive and cost-effective information management environment for national statistical offices.¹⁷

Established forums can help produce the statistics needed to face future challenges

The production of statistics requires the capacity to collect the required information, such as through surveys and population censuses, as well as to make the best possible use of available information, such as administrative records. The “new data revolution” offers great potential, but serious efforts are needed to bridge the gap between the traditional statistics community and new data producers – to allow “non-official” data to complement and add value to officially recognized statistics.¹⁸ Towards this end, the United Nations has launched the “Global Pulse initiative”, which explores how policymakers can use digital data sources and real-time analysis to better understand human well-being and emerging vulnerabilities and protect people from shocks.¹⁹

To move the regional connectivity agenda forward, national Governments can work closely together through established forums such as the United Nations Statistical Commission and the ESCAP Committee on Statistics. This approach can help define the type of statistics needed by policymakers and develop relevant standards, including innovative data sources. National statistical systems of ESCAP member States can also support line ministries in monitoring regional strategies by coordinating data collection and verification.

REGIONAL SOLUTIONS FOR FINANCING REGIONAL INFRASTRUCTURE NETWORKS

Infrastructure development is progressing unevenly across the region and tends to be directed towards satisfying domestic needs. This is understandable since infrastructure development invariably involves high capital costs, with benefits accruing over the longer run. National infrastructure projects are therefore likely to progress faster than cross-border ones since they have lower risk profiles and shorter gestation times. Furthermore, for regional projects the costs and benefits can be unevenly distributed among the participants – or at least perceived to be so. They also require higher levels of regional and sectoral coordination and a commitment from all parties.

To overcome the obstacles to regional project financing, multilateral funding bodies, such as ADB and the World Bank have promoted “corridor approaches”. ADB, for example, has supported corridor development under the Greater Mekong Subregion programme, Central Asia Regional Economic Cooperation programme and South Asia Subregional Economic Cooperation programme. The ADB rationale is that economic corridors not only afford significant benefits to the major economic centres along the corridors, but also offer secondary infrastructural linkages to provide access to markets from rural areas.²⁰ Nevertheless, countries must still borrow on the basis of sovereign loans, so countries may still have concerns over the distribution of costs and benefits.

Regional projects as “regional public goods”

ESCAP has suggested that regional infrastructure networks should be recognized as “regional public goods”, the collective benefit of which for the region are greater than the cost of the individual projects. On this basis, there is a strong case for regional approaches to financing critical infrastructure networks, in particular transport, energy and ICT.

A “regional public goods” approach is particularly relevant for directing investment to the “weakest links” – improving their efficiency and coherence. This can help the landlocked and least developed countries, for example, to increase the quality of their national transport networks so that they are better connected to regional networks. For example,

the recent developments in Myanmar have raised the prospect of better overland links through Myanmar, connecting South-East and South Asia. Such connectivity would not only enhance the mobility of goods and people between these subregions, but also open up new opportunities for access by India's northeastern States.

*Emerging regional networks
need to be designed for future
shared prosperity*

Fortunately, many countries in the region are in a strong economic position to build the necessary infrastructure and institutions. Some countries, such as China, India, Malaysia and Thailand, are already investing in physical infrastructure in neighbouring and other regional countries.²¹ However, they could enhance the benefits of those initiatives if they considered them within a wider regional framework. This would also assist them in adhering to international standards for project management, construction methods and environmental and social safeguards.

As they are still in the development stage, countries in the Asia-Pacific region have the chance to develop regional networks in an integrated and coordinated manner. This would reduce the costs and spread the benefits to a wider group of countries. To do so, however, countries have to agree on how to apportion costs and risks. A complicating factor is that regional projects are likely to have asymmetric impact on participating countries – whether in terms of the financial burden, or pollution or other adverse impacts in transit countries – while the main benefits accrue to neighbours. In order to better distribute benefits among participating countries, it may be necessary to adopt additional measures, such as grants or concessional financing, to the countries affected, or allow them to charge toll fees.

Drawing on previous research, as well as the earlier discussion on a regional financial architecture in part I of this year's *Economic and Social Survey*, the following section offers innovative approaches for financing regional infrastructure.

Regional infrastructure funds

An alternative to national or bilateral financing is to create regional infrastructure funds. By serving as

a kind of “intermediary” between project sponsors and investors, such funds could complement existing forms of investment by mobilizing funds beyond governmental resources – from institutional investors, such as pension funds, sovereign wealth funds or foreign exchange reserves.

Two examples of regional infrastructure funds are the ASEAN Infrastructure Fund and the SAARC Development Fund. The ASEAN Infrastructure Fund has already started disbursing funds for projects (box 3.4). The World Bank also plans to establish a Global Infrastructure Facility, with contributions from the World Bank itself, members, sovereign wealth funds and pension funds, in order to try to channel more funding towards infrastructure development in developing countries. In addition, early in 2014, APEC announced progress in the development of its new APEC Multi Year Plan on Infrastructure Development and Investment, which specifically targets the region's infrastructure through greater private sector investment.²²

Another new actor is also on the steps, as negotiations on the newly proposed “BRICS” development bank are expected to be completed in 2014. The so-called “BRICS” bank was first announced by the five founding members, Brazil, the Russian Federation, India, China and South Africa, in 2012. The bank is likely to focus on infrastructure, with a capital base starting at \$50 billion and eventually increasing to \$100 billion.²³

In parallel with its involvement in the proposed BRICS bank, China has announced its intention to start a new “Asian Infrastructure Investment Bank” in 2014. Reports suggest that the bank will have an initial capital base of \$50 billion, provided by China as well as other participating members.²⁴ Such an “Asian Infrastructure Investment Bank” could cooperate with the World Bank, Asian Development Bank and other financial institutions to help bridge the infrastructure financing gaps in the region.

Regional Project Preparatory Facility

To be successful, regional infrastructure funds rely on a viable pipeline of projects with supportive feasibility studies. Unfortunately, many developing countries lack “bankable” projects because they do not have the legal, project financing and technical expertise. The preparation of regional transport projects is costly and time-consuming, particularly given the lack of data on cross-border traffic flows.

Box 3.4. ASEAN Infrastructure Fund: a possible “best practice” for future regional infrastructure financing

The idea behind the ASEAN Infrastructure Fund (AIF), which was set up by the Association of Southeast Asian Nations (ASEAN) in 2010, is to promote “infrastructures of development” within ASEAN developing country members. To finance AIF, the Asian Development Bank and ASEAN member States provided core equity amounting to \$150 million and \$335.2 million respectively. In addition, bonds will be issued to attract resources from institutional investors, such as central banks, which represent potentially a huge source of funding given the amount of foreign exchange reserves in the region. So far the Fund lends only to public entities, but the intention is to support public-private partnerships in the near future. As of the end of May 2014, the Fund had financed a power transmission project and a sanitation project in Indonesia worth \$65 million; other projects are at advanced stages of preparation.

The Fund has a clause saying that at least 30 per cent of the financing should go to regional projects, including cross-border projects and national projects with significant regional impact. This arrangement can make financing available to regional infrastructure projects which otherwise would struggle to find financing on their own.

In May 2014, Myanmar announced its intention to contribute equity to the Fund, bringing all 10 member States into the Fund. In this regard, the Fund may serve as a useful example to others looking for multilateral approaches to financing infrastructure. Although the value of contributions varies, the fact that all members of ASEAN are providing funds to AIF signals a strong public commitment by Governments. Meanwhile, the Asian Development Bank continues to play an important role not only in terms of financing but also as the administrator of the Fund, which enables it to bring know-how, a pipeline of potential projects and the technical support needed to see projects to completion.

Source: ADB (2010). General Capital Increase V; ADB (2012). ADB Financial Profile 2012; ADB (2012). Proposed Equity Contribution and Administration of ASEAN Infrastructure Fund; ADB (2014) “Myanmar Set to Join ASEAN Infrastructure Fund in 2014”.

Some analysts have therefore called for the creation of a regional infrastructure project preparatory facility to help Governments prepare bankable regional projects. Such a facility could also be an integral part of an Asian multi-donor platform.

Asian Multi-donor Platform

Another possible instrument would be an Asian multi-donor platform. This could collect grants from different donors and allocate them to national or multilateral development banks. The objective would be to use concessional resources to leverage more public and private funding for regional projects. Grant money could be used to lower the hurdle for financial feasibility or to reduce the risk associated with a specific project. Grant money could also be used to finance technical assistance aimed at unblocking, accelerating or improving the quality of regional projects.

For the recipient countries, the platform could serve as a single entry point for submitting project proposals. This would facilitate access to finance while decreasing dependence on a single partner. For the contributing countries such a platform could result in faster project implementation, lower administrative costs and greater impact. By facilitating joint operations, the platform could also enhance collaboration among participating institutions, including at the project level, for example by harmonizing their procedures.²⁵

Public-Private Partnerships

Given the considerable pressure on national budgets, developing countries in the ESCAP region have also been taking measures to promote public-private partnerships (PPPs).²⁶ This has been a particularly promising avenue in revenue-generating sectors, such as energy, ICT and transport,

where user charges can be used to repay the investment. However, in the context of a regional project, the issue of how to charge user fees is complex and is one reason why such models have not been widely applied to cross-border projects.

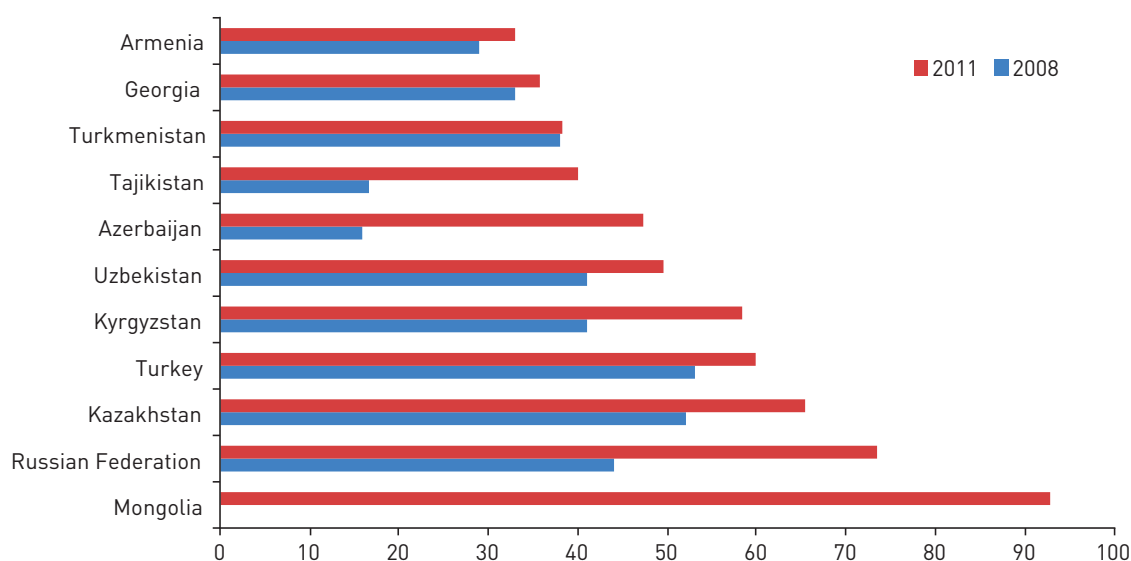
Furthermore, attracting private sector interest requires Governments to take appropriate actions to create enabling environments for PPP development at the macro and sectoral levels, for example, by adopting regulations that will assure private investors that their legitimate rights will be adequately protected.²⁷

Some countries may not yet be able to create an enabling environment, or may lack the capacity to design and manage PPPs. There are many different policy areas which need to be in place for

Governments to enter into successful public-private partnerships, not least a sound legal framework. Figure 3.2 shows the change in “percentage of compliance” of legal frameworks for selected countries in the ESCAP region, conducted by the European Bank for Reconstruction and Development.²⁸ Though the pace is slow, the graph suggests that some countries made progress between 2008 and 2011.

These countries can learn from other countries in the region by participating in PPP knowledge networks, such as those promoted by ESCAP. As a regional platform, ESCAP is well suited for supporting these networking activities, and has already organized several meetings at both ministerial and expert levels to facilitate the exchange of experience.

Figure 3.2. Percentage of compliance of legal frameworks for selected ESCAP countries (2008, 2011)



Endnotes

¹ H. Kuroda, Infrastructure and regional cooperation. Paper presented at the Annual Bank Conference on Development Economics, Tokyo, 2006.

² Ukraine and Moldova have had observer status since May 2002 and Armenia, since January 2003. On 25 January 2006, a protocol was signed on Uzbekistan's accession to the

organization, but in October 2008 it suspended its participation in the work of EURASEC bodies. See *EurAsEC Today 2013*, accessible from www.evrases.com/i/data/item7618-1.pdf.

³ Before the commencement of the Customs Union in 2009, it stood at \$12.9 billion, according to the Ministry of Foreign Affairs, Republic of Kazakhstan (2014).

⁴ *Washington Post* (2014). *Russia, Kazakhstan, Belarus form*

- Eurasian Economic Union*. Published May 29, 2014. Available from http://www.washingtonpost.com/world/europe/russia-kazakhstan-belarus-form-eurasinaeconomic-union/2014/05/29/de4a2c15-cb01-4c25-9bd6-7d5ac93466fd_story.html.
- ⁵ Asia-Pacific Economic Cooperation, *Improving Connectivity in the Asia Pacific Region: Perspectives of the APEC Policy Support Unit* (Singapore, APEC, 2013). Available from http://publications.apec.org/publicationdetail.php?pub_id=1461.
- ⁶ The Declaration of the 14th SAARC Summit, held in 2007, stated that “The Heads of State or Government recognised the importance of connectivity in fulfilling these objectives. It was vital to first have better connectivity within South Asia and then with the rest of the world. They agreed to improve intra-regional connectivity, particularly physical, economic and people-to-people connectivity. They agreed to the vision of a South Asian community, where there was smooth flow of goods, services, peoples, technologies, knowledge, capital, culture and ideas in the region”. See [www.saarc-sec.org/userfiles/Summit Declarations/14](http://www.saarc-sec.org/userfiles/Summit%20Declarations/14).
- ⁷ Institute of Peace and Conflict Studies, Konrad Adenauer Foundation, and India International Centre, *SAARC towards Greater Connectivity*. Conference report, Colombo, 15-16 January 2008. Available from www.ipcs.org/pdf_file/issue/860963938ConferenceReport-SAARC.pdf.
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- ¹² United Nations Economic and Social Council, *Report of the Economic and Social Commission for Asia and the Pacific on Statistics and the Post-2015 Development Agenda, Perspectives from the Asia-Pacific Region*. Statistical Commission, forty-fifth session, 4-7 March 2014 (E/CN.3/2014/15)
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- ¹⁴ United Nations Economic and Social Council, *Report on the Statistical Commission Special Session*, New York, 11-15 April 1994 (E/CN.3/1994/18); and United Nations Economic and Social Council (2013). *Official Records of the Economic and Social Council, 2013, Supplement No. 4* (E/2013/24-E/CN.3/2013/33).
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- ¹⁶ That the capacity is insufficient has been recognized by the Economic and Social Council in its resolution 2006/6 on strengthening statistical capacity and more recently by the UN System Task Team on the Post- 2015 Development Agenda report, entitled “Statistics and indicators for the post-2015 development agenda”. See United Nations Economic and Social Council (2006). Resolution 2006/6 on strengthening statistical capacity. Available from <http://www.un.org/Depts/development/dp2015/taskteam.htm>
- ¹⁷ For example, see United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP), Make every life count: Regional strategic plan for the improvement of civil registration and vital statistics in Asia and the Pacific (E/ESCAP/CST(3)/6/Add.1). Available from www.unescap.org/sites/default/files/CST3_Regional_strategic_planEnglish.pdf; or ESCAP, Proposed regional programme for the improvement of economic statistics in Asia and the Pacific (E/ESCAP/CST(2)/5).
- ¹⁸ For example, the High-level Panel called for a “new data revolution” to enable the recent improvements in information technology to contribute to inclusive and sustainable development.
- ¹⁹ For example, the United Nations Global Pulse initiative is looking at ways to use data gathered from Twitter and Facebook to understand unemployment patterns, and how mobile phone data can be used to understand migration. See www.unglobalpulse.org.
- ²⁰ Asian Development Bank, *Sharing Growth and Prosperity: Strategy and Action Plan for the Greater Mekong Subregion Southern Economic Corridor* (Mandaluyong City, Philippines, ADB, 2010). Available from www.adb.org/sites/default/files/pub/2010/gmsaction-plan-east-west.pdf.
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²⁴ "Asian Infrastructure Investment Bank will guide capital", 3 July 2014, http://news.xinhuanet.com/english/china/2014-07/03/c_126707343.htm.

²⁵ This approach has been recently followed by the European Union in its development cooperation policy where different instruments have been created to use grants from the European Union to leverage loans from several European national and multilateral public financial institutions. For further information, see European Commission, "Promoting investment through the Neighbourhood Investment Facility (NIF)". Available from: http://ec.europa.eu/europeaid/where/neighbourhood/regional-cooperation/irc/investment_en.htm.

²⁶ In the context of infrastructure projects, a publicprivate partnership describes a long-term contractual arrangement between the Government and one or more private companies, whereby the private companies provide building or rehabilitation works in exchange for operating rights. At the end of the period, the asset is usually transferred back to the Government.

²⁷ More detailed information on the enabling environment is available in the ESCAP publication, entitled *Review of Developments in Transport in Asia and the Pacific, 2013: Transport as a Key to Sustainable Development and Regional Integration* (ST/ESCAP/2667) (see pages 66-77).

²⁸ European Bank for Reconstruction and Development. Concession/PPP laws assessment 2011, final report. Available from www.ebrd.com/downloads/legal/concessions/pppreport.pdf.



CONCLUSIONS

4

The countries in Asia and the Pacific are driving the global economy and have become major forces in manufacturing, trade and services. Most of the dynamism has come from individual countries, but the future will be determined by how closely economies can work in combination – taking advantage of extended and more tightly integrated networks. At the same time, as various networks become more and more integrated, it will become increasingly important to have strong institutional coordination and cooperation at different levels. Intergovernmental organisations such as ESCAP can play a role in bringing together Governments and other stakeholders to discuss and implement actions to strengthen connectivity in the region.

Over the past few decades, countries in Asia and the Pacific have recorded major achievements in boosting economic growth, stimulating technological change and reducing poverty. International trade, foreign direct investment and the emergence of global and regional production networks have driven many of those achievements, supported by the expansion of maritime links and the diffusion of information and communications technology (ICT), including the Internet. Trade and transport will continue to be important, but other drivers of growth, particularly ICT connectivity, energy connectivity and people-to-people connectivity, are expected to shape patterns of economic and social development into the future.

Some of these changes will continue to be driven by the private sector, as individual enterprises seek new ways of boosting productivity and relocate production and distribution to different countries across the region. In taking advantage of the progress in ICT and people-to-people connectivity, other types of networks, such as business associations and civil society groups, are also expected to play a greater role in the region's development.

Ultimately, however, the main driving force behind regional connectivity is the political will of national Governments, which are linking together supranational regulatory bodies, international standard setting organizations and their own domestic businesses. They also control the framework for cross-border flows of capital and labour and can shape spatial development patterns through their investments and policies on infrastructure.

As various networks become more and more integrated, it will become increasingly important to have strong institutional coordination and cooperation, both within and between Governments. In the years ahead, Governments will find many more opportunities to work together to strengthen these mechanisms. There is therefore a need to build on the momentum of coordination and cooperation in the ESCAP region, both at the subregional and regional levels. The key findings of the present study are summarized below.

Institutional coordination is key to strengthening regional connectivity

This report contains an examination of the ways in which better regional connectivity can contribute to

the sustainable and inclusive development of the Asian and Pacific region. It was found through the study that regional connectivity is inherently multifaceted, and that the benefits of this connectivity may be enhanced by combining different elements. Moreover, it was suggested in the study that networks are likely to become more integrated and interdependent as they evolve.

Governments therefore have to develop crosssectoral policies on connectivity, at national, subregional and regional levels. To achieve this, they can make greater use of existing intergovernmental forums, notably the annual sessions of the Commission and the legislative committees of ESCAP which can serve as neutral platforms for discussing and refining joint regional strategies.

Such strategies should be based on sound data and analysis, using global statistical standards, such as those promoted by the United Nations. Governments of countries in the region should also work together: to identify the types of statistics needed for joint planning and decision-making on regional connectivity; to build the capacity of national statistical systems to produce and disseminate internationally comparable statistics; and to make statistics more widely available to all users. Regional collaboration also enables joint engagement by countries in Asia and the Pacific in the development and promotion of global statistical standards, ensuring that regional priorities are better reflected in the global agenda.

In recognizing the importance of connectivity, many subregional and regional organizations have developed their own initiatives, such as the Master Plan on ASEAN Connectivity. To build on each other's strengths and avoid duplication, the various organizations involved must communicate more frequently to exchange information and knowledge. Given that many of the longer-term objectives of such organizations are similar, it would also be beneficial to develop joint initiatives and, where appropriate, to pool resources.

Countries in the region differ in many respects – in climatic or geographical conditions, as well as in income levels and technical capacities. To overcome these differences, countries should strive to adopt global and regional standards for both technical issues and procedures. Technical standards form the basis for the integration of networks, particularly

for infrastructure, while procedural standards can greatly reduce delays and costs and thereby enhance connectivity at border crossings, particularly for the movement of goods, vehicles and people.

This work, however, can be effective only through collaboration with all of the relevant stakeholders. Trade and transport facilitation, for example, is primarily achieved through deeper coordination among the relevant agencies, both within Governments and across borders. Such coordination will be more effective if it has a clear focus or goal, such as establishing integrated border management systems and harmonizing procedures for cross-border trade and transport. As the region moves towards a regime of paperless trade, countries should step up efforts to adopt regional and international standards for both documents and procedures.

Regional connectivity is also being intensified by academic networks, business associations and civil society organizations. Not only do they serve as major conduits of people-to-people connectivity, they also help propagate global standards and act as partners in implementing regional strategies. These disparate groups can also work with national Governments and subregional organizations. This can be achieved through the convening power of ESCAP which can chart out some of the steps needed to implement these strategies.

Development of regional networks as “regional public goods”

One of the most important conditions for economic growth is the availability of extensive and efficient infrastructure, particularly transport, energy and communications systems. At the national level, these infrastructure networks provide domestic enterprises and agricultural producers with access to a greater pool of resources and markets – enabling them to scale up their production and diversify their products.

Countries have also made substantial progress in developing infrastructure networks at the regional level. Thus, most countries in continental Asia are connected through the Asian Highway and Trans-Asian Railway networks, while coastal countries and small island developing States are linked by maritime services. Meanwhile, many capitals and

major cities in the region can now connect to broadband Internet. Various cross-border initiatives are also under way in the energy sector, particularly at the subregional level, linking energy-rich and energy-poor countries and enhancing the region’s overall energy security.

There is still much to be done on these networks to improve their reach and quality, and Governments should step up efforts to develop both the “soft” and “hard” infrastructure of these networks. However, this also represents a valuable opportunity. As they are still at relatively early stages, these networks can be developed in an integrated manner, reducing the costs and extending the benefits to a wider group of countries.

Developing and managing regional networks effectively requires cross-country consensus. Governments need to further study and refine the strategies outlined in this study and agree on the most appropriate sequencing of actions. They also need to consider potential negative impacts. These can arise from large infrastructure projects, for example, or from the increased movement of goods and people across borders. These aspects will require the development of appropriate institutions and mechanisms for regulatory oversight, with clear roles and responsibilities appropriately assigned.

Infrastructure development invariably involves high capital costs, with benefits accruing over the longer run. To support investment in cross-border infrastructure, countries can build on the concept of regional public goods to establish regional financing mechanisms. In this way they can identify and target investments in areas that will yield the greatest benefit from a regional perspective, particularly where sections of the networks are weakest. A number of innovative approaches have been proposed in this study, such as the establishment of a regional infrastructure fund, an Asian multi-donor platform and a regional project preparatory facility. These proposals deserve further study and consideration by ESCAP member States.

At the same time, countries should explore the synergies and potential savings which can be accrued from the “cohabitation” of infrastructure networks, particularly the laying of fibre-optic cables along roads, railways and electricity distribution networks. This will require the line ministries in all affected countries to work together

and also have detailed discussions with the private sector. In this regard, it is recommended that, when extending terrestrial fibreoptic networks, countries should try to take advantage of the existing intergovernmental frameworks of the Asian Highway and Trans-Asian Railway networks. This would facilitate negotiations over “rights of way”.

Enhancing regional connectivity for disadvantaged countries

Connectivity will certainly increase across countries. However, what forms will those connections take and who will they benefit? The aim should be to ensure that they open new opportunities for all, especially for the region’s disadvantaged countries – the least developed countries, the landlocked developing countries and the small island developing States.

The development options for these countries often depend on their location and their natural resources. Some landlocked developing countries, for example, have large reserves of natural mineral resources, while others have tremendous hydropower potential which they are already exporting to neighbouring countries. Meanwhile, the small island developing States in the Pacific tend to have small and geographically dispersed populations and are relatively vulnerable to natural and environmental disasters and to the impacts of climate change.

At the same time, these groups of countries have some common characteristics. Typically they have relatively small markets and depend on a few export commodities. Owing to their location, as well as poor infrastructure, they may also be less connected to regional markets. This makes them more reliant on neighbouring countries or, in the case of the Pacific island States, on larger economies in the subregion.

In this regard, these countries may wish to consider how to use their current endowments to build up their capacities in those industries which have the potential to grow. In particular, they should also make greater use of communications technology, particularly the Internet, to develop other commercial services, such as transport, telecommunications and financing, as these sectors in turn can support trade and manufacturing. In this way they can participate more fully in regional production and distribution networks.

By taking advantage of new technologies, disadvantaged countries can become more integrated into the global economy. Most developing countries lack the capacity to create their own new technology. Governments should therefore encourage technology transfer and import – through trade and investment, for example, or via the Internet or through exchanges of human capital. Meanwhile, all countries in the region can support disadvantaged countries by enhancing people-to-people connectivity – for example, by encouraging more interactions between students and workers.

Developing networks of people and knowledge

A country’s greatest asset is its people. Governments can expand the potential of their citizens in many ways. One is to promote greater mobility for both skilled and unskilled workers. The Asian and Pacific region has almost one quarter of the world’s migrants so there would be enormous benefits from developing more coordinated approaches to manage international labour migration. Both source countries and destination countries should gain, while simultaneously protecting migrants and their families from the potential negative effects of migration.

People’s potential can also be developed through academic and civil society networks, which help develop and share knowledge. The ESCAP region is home to many excellent research institutes and universities that employ internationally recognized academics and researchers. National Governments can support these regional knowledge networks by encouraging their students and academics to study and work in other countries in the region. Governments can also contribute to the development of “knowledge clusters” by commissioning research and fostering exchange programmes among the various stakeholders.

Governments should also work closely with the private sector and its representatives, which are likely to be the region’s foremost ambassadors of connectivity. Business associations and networks of chambers of commerce can also help link small and medium-sized enterprises to the global marketplace. Such networks will enhance mutual understanding about different cultures and value systems. At the regional level, international and regional organizations should work with national

Governments to institutionalize and enforce internationally accepted standard business practices and procedures, which would help to create a transparent and non-discriminatory business environment.

Next steps towards regional connectivity

As globalization continues, the region's future will depend on how countries work together. The present study indicates how they have been doing so through regional networks of trade and transport, ICT, energy and people, and how they might intensify these networks in the future. As these networks become more integrated, strategies to strengthen regional connectivity should be considered not sector by sector but as part of a whole

In this regard, the regional strategies discussed in this study can serve as a catalyst for regional connectivity. The aim should be to ensure that these networks open new opportunities for all, especially for the region's disadvantaged countries and for the poorest communities. Further, to better respond to the rapid evolution of these networks, national Governments and international organizations alike will have to strengthen institutional coordination. This should extend to people-to-people networks involving academia, the private sector and civil society, which can influence the direction and effectiveness of intergovernmental cooperation.

Ultimately, however, national Governments must take the lead in forging regional connectivity, both by making the necessary changes in their national policies, as well as by actively participating in regional initiatives on connectivity. ESCAP can support their efforts by providing a neutral platform for frank and informed discussions on these strategies among relevant stakeholders. In this regard, multisectoral expert working groups being established in accordance with the 2013 Bangkok Declaration on Regional Economic Cooperation and Integration in Asia and the Pacific¹ can help Governments to identify the best approaches for implementing the regional strategies discussed in this study.

Endnote

¹ See E/ESCAP/MCREI/3.

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The recent economic success of the Asian and Pacific region has been driven largely by international trade, foreign direct investment and the emergence of global and regional production networks and value chains. These drivers, in turn, were supported by trade liberalization, improved transport links and the diffusion of information and communications technologies. However, the region's growing prosperity has not been shared equitably, and there are clear signs of rising income inequality, both within and between countries.

Looking to the future, the issue for the region is not whether connectivity will improve, but the form it will take and how it can be harnessed to benefit all countries, particularly least developed countries, landlocked developing countries and small island developing States. This year's Theme Study, comprising Part II of the Survey, identifies four types of connectivity shaping social and economic development in the region: trade and transport; information and communications technology; energy; and people-to-people connectivity.

As these networks become increasingly integrated and interdependent, the future of regional connectivity will depend on how closely Asia-Pacific countries work together. Regional strategies presented in the Theme Study can be the basis for this cooperation. However, success will depend on strengthening institutional coordination between Government, both across sector and across borders. Greater cooperation is also needed to identify new sources of finance for developing regional networks. To move the region's connectivity agenda forward, Government should enlist the support of the private sector, academia and civil society, which are the ambassadors and potential beneficiaries of enhanced regional connectivity.

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