Education and Skills: Strategies for Accelerated Development in Asia and the Pacific

Read in this book:
- The complete report on ADB’s comprehensive study of education in the Asia and Pacific region
- Evidence reaffirming development of education at all levels as essential for sustained and inclusive economic growth and social development
- Chapters on basic education, technical and vocational education and training, and higher education—covering current status, significant developments, emerging trends and issues, and a strategic framework for ADB support of accelerated development of human resources
- Strategic recommendations and operational implications for ADB

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to two thirds of the world’s poor. Nearly 1.7 billion people in the region live on $2 or less a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance. In 2007, it approved $10.1 billion of loans, $673 million of grant projects, and technical assistance amounting to $243 million.
Education and Skills: Strategies for Accelerated Development in Asia and the Pacific

June 2008

Asian Development Bank
# Contents

<table>
<thead>
<tr>
<th>Acronym and Abbreviations</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>vii</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>ix</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Chapter 2: Basic Education</td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>The Basic Education Landscape in the Region</td>
<td>7</td>
</tr>
<tr>
<td>Central and West Asia</td>
<td>7</td>
</tr>
<tr>
<td>South Asia</td>
<td>8</td>
</tr>
<tr>
<td>East Asia</td>
<td>8</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>9</td>
</tr>
<tr>
<td>The Pacific</td>
<td>9</td>
</tr>
<tr>
<td>Major Issues in Basic Education</td>
<td>10</td>
</tr>
<tr>
<td>Changing Context and New Challenges</td>
<td>10</td>
</tr>
<tr>
<td>Review of Lessons Learned</td>
<td>10</td>
</tr>
<tr>
<td>Emerging Areas of Strategic Focus</td>
<td>14</td>
</tr>
<tr>
<td>Strategic Priorities for Basic Education</td>
<td>16</td>
</tr>
<tr>
<td>Low-Income Countries with Predominantly Agrarian-Driven Economies</td>
<td>16</td>
</tr>
<tr>
<td>Low-Income Countries Reliant on Factor-Driven Growth, Principally Low-Cost Manufacturing</td>
<td>17</td>
</tr>
<tr>
<td>Transitional Economies, Moving from Central Planning to a Market Economy</td>
<td>17</td>
</tr>
<tr>
<td>Middle-Income Economies Reliant on Investment-Driven Growth</td>
<td>18</td>
</tr>
<tr>
<td>The Pacific and Other Island Economies</td>
<td>18</td>
</tr>
<tr>
<td>The Role of ADB in Basic Education</td>
<td>19</td>
</tr>
<tr>
<td>ADB Experience in Basic Education</td>
<td>19</td>
</tr>
<tr>
<td>Lessons from Experience</td>
<td>19</td>
</tr>
<tr>
<td>Strategic Approaches for Basic Education</td>
<td>20</td>
</tr>
<tr>
<td>Implications for ADB</td>
<td>22</td>
</tr>
<tr>
<td>Chapter 3: Technical and Vocational Education and Training</td>
<td>24</td>
</tr>
<tr>
<td>Introduction</td>
<td>24</td>
</tr>
<tr>
<td>The TVET Landscape in the Region</td>
<td>25</td>
</tr>
<tr>
<td>Economic and Social Rationales for TVET</td>
<td>26</td>
</tr>
<tr>
<td>Main Categories of TVET</td>
<td>27</td>
</tr>
<tr>
<td>Development Issues in the Region and Their Implications for TVET</td>
<td>28</td>
</tr>
<tr>
<td>Major Issues in TVET</td>
<td>29</td>
</tr>
<tr>
<td>Economic Relevance</td>
<td>29</td>
</tr>
<tr>
<td>Social Relevance and Equity of Access</td>
<td>29</td>
</tr>
<tr>
<td>Quality of Instruction</td>
<td>29</td>
</tr>
<tr>
<td>Organizational and Management Effectiveness</td>
<td>30</td>
</tr>
<tr>
<td>Internal Efficiency and Sustainability</td>
<td>30</td>
</tr>
<tr>
<td>Strategic Priorities for TVET</td>
<td>30</td>
</tr>
<tr>
<td>Agrarian, Low-Income Countries</td>
<td>31</td>
</tr>
<tr>
<td>Countries Characterized by Factor-Driven Growth and Low-Cost Manufacturing</td>
<td>31</td>
</tr>
<tr>
<td>Transitional Economies</td>
<td>31</td>
</tr>
<tr>
<td>Countries Characterized by Investment-Driven Growth</td>
<td>31</td>
</tr>
<tr>
<td>Countries Characterized by Innovation-Driven Growth</td>
<td>32</td>
</tr>
<tr>
<td>Small Island Countries</td>
<td>33</td>
</tr>
</tbody>
</table>
The Role of ADB in TVET
ADB Experience in TVET
Lessons from Experience
Strategic Approaches for TVET
Implications for ADB

Chapter 4: Higher Education
Introduction
The Higher Education Landscape in the Region
Shifting in International Support for Higher Education
The Role of Higher Education in National and Regional Development
Context and Recent Developments
Challenges and Issues in Higher Education
Internal Efficiency
External Efficiency
Access and Equity
Administration and Governance
Cost and Financing
The Role of ADB in Higher Education
ADB Experience in Higher Education
Strategies for Higher Education
Summary Analysis of Strategies for ADB Support of Higher Education
Implications for ADB

Chapter 5: Recommendations and Implications for ADB
Strategic Recommendations
Implications for ADB

Appendix 1: Education Economics: Emerging Issues in the Asia and Pacific Region
Appendix 2: ADB Loans, Grants, and Technical Assistance in the Education Sector
Appendix 3: The EFA Development Index and its Components in Selected ADB Developing Member Countries
Appendix 4: Definition and Scope of Technical and Vocational Education and Training
Appendix 5: The Technical and Vocational Education and Training Landscape in the Asia and Pacific Region
Appendix 6: Main Issues in Technical and Vocational Education and Training in the Asia and Pacific Region
Appendix 7: ADB Support for Technical and Vocational Education and Training
Appendix 8: Supplementary Data on Higher Education
Appendix 9: Summary of Recent ADB Loans for Higher Education
Appendix 10: Research and Development Performance by Sector in Selected Countries

References
### Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>DMC</td>
<td>developing member country</td>
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<td>EDI</td>
<td>EFA Development Index</td>
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<td>EFA</td>
<td>Education for All</td>
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<tr>
<td>GDP</td>
<td>gross domestic product</td>
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<td>GNP</td>
<td>gross national product</td>
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<td>HSC</td>
<td>high school certificate</td>
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<td>ICT</td>
<td>information and communication technology</td>
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<td>ILO</td>
<td>International Labour Organization</td>
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<td>Lao PDR</td>
<td>Lao People’s Democratic Republic</td>
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<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>NER</td>
<td>net enrollment ratio</td>
</tr>
<tr>
<td>NFE</td>
<td>nonformal education</td>
</tr>
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<td>NGO</td>
<td>nongovernment organization</td>
</tr>
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<td>NQF</td>
<td>national qualification framework</td>
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<td>NWFP</td>
<td>North West Frontier Province (Pakistan)</td>
</tr>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
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<td>PNG</td>
<td>Papua New Guinea</td>
</tr>
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<td>PPP</td>
<td>public-private partnership</td>
</tr>
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<td>PRC</td>
<td>People’s Republic of China</td>
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<td>PTP</td>
<td>private training provider</td>
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<tr>
<td>SSC</td>
<td>secondary school certificate</td>
</tr>
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<td>TVET</td>
<td>technical and vocational education and training</td>
</tr>
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<td>UNESCO</td>
<td>United Nations Educational, Scientific and Cultural Organization</td>
</tr>
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<td>VET</td>
<td>vocational education and training</td>
</tr>
</tbody>
</table>

**NOTE**

In this report, “$” refers to US dollars.
This study analyzes education sector issues and strategies in the Asia and Pacific region (the region). The study report is expected to guide the Asian Development Bank (ADB) operations in the education sector and help ensure they remain responsive and relevant to the needs of its developing member countries (DMCs). The study reaffirms that the goal of inclusive growth depends on continuous development of an adequate human resource base, and provides a strategic framework for ADB’s work in the education sector in support of that development.

ADB’s education sector policy, approved in 2002, provides a flexible and forward-looking framework for ADB assistance. In formulating the scope of this study, the ADB Education Committee reviewed current policy and confirmed that it remains valid in the medium term. However, the committee saw the need for a sector strategy study to guide ADB in adjusting its assistance strategies within the framework of existing policy. The study report will help ADB continue to respond effectively to demand for assistance in education, and in particular to new needs arising from evolving labor markets and rapid economic and social development in the region.

Preparation of the study coincided with work on ADB’s long-term strategic framework 2008–2020 (Strategy 2020), and the process provided valuable inputs to preparation of Strategy 2020. While the study is forward-looking, it also draws upon lessons learned in the education sector. In addition to an extensive desk study, it incorporates feedback from consultations with government officials, education sector staff, and a wide range of stakeholders in several DMCs. ADB has a strong track record of providing efficient and effective support to education in DMCs, and has gained a comparative advantage in several areas. This experience provided valuable lessons that are reflected in this study.

The study was initiated by the ADB Education Committee, which prepared the terms of reference for a team of consultants, reviewed draft reports, and organized in-house workshops with the consultant team. The study was drafted by a consultant team comprising Victor Ordoñez (team leader responsible for overall coordination and for preparing the draft chapter on basic education), Richard Johanson (responsible for preparing the draft chapter on technical and vocational education and training), David Chapman (responsible for preparing the draft chapter on higher education), and Victor Levine (responsible for preparing the draft appendix on emerging economic issues in education).

Robert Wihtol, chair of the ADB Education Committee, and Jouko Sarvi, cochair, supervised preparation of the study on behalf of the committee. The following staff reviewed and provided constructive comments on the draft study report at various stages of its preparation: Alain Borghijs, Sukhdeep Brar, Kowsar Chowdhury, Wendy Duncan, Leah Gutierrez, Rie Hiraoka, Ayako Inagaki, Wolfgang Kubitzki, Manuela Prina, and Lan Wu. Barry Lanier very capably edited the report, Myla Bonto provided valuable support in finding and analyzing source material and data, and Janelyn Alcantara and Abigail Garrovillas provided efficient administrative support.

We hope that the study report provides useful insights not only for ADB management, staff, and counterparts and stakeholders in DMCs, but also for a wider audience in the education community in the region and beyond. The region is undergoing rapid social and economic change. Investing in and continuously developing the education sector is essential to confront new challenges, and is crucial to facilitate change and ensure the sustainability and inclusiveness of growth.

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Education and Inclusive Growth. Ample evidence shows that education is needed for development and should receive Asian Development Bank (ADB) assistance. Growth in the Asia and Pacific region (the region) has been far from inclusive. The gap between the rich and the poor has widened. The lack of adequately educated and trained workers has been a major bottleneck in growth and economic expansion. ADB’s developing member countries (DMCs) recognize the economic and social returns of investment in education, and seek assistance in optimizing that investment. Except for a few countries, the success of Education for All (EFA) and the increasingly complex demands of globalization require that attention be shifted beyond basic education to technical and vocational education and training (TVET), and to higher education. Priority areas for ADB intervention necessarily differ from country to country. This study provides a framework for identifying the priorities and strategic areas of intervention for different types of DMCs at different levels of development.

Basic Education. The rationale and importance of basic education stems from its function as a precondition for individual development, further education, and social growth. A review of the results in basic education over the past two decades in the region yields five significant lessons from that experience concerning lack of balance. Past attention was focused on

(i) increasing enrollment and improving access, to the neglect of quality;
(ii) getting children to school, to the neglect of keeping them there;
(iii) primary schooling almost exclusively, to the neglect of other dimensions of EFA, such as early childhood education, nonformal education, and adult education;
(iv) providing educational places for the majority, to the neglect of the underserved—e.g., ethnic and nomadic groups, minorities, and those with special needs; and
(v) ministries of education, to the neglect of possibilities for innovative partnerships with other ministries, civil society, communities, and the private sector.

Four trends also emerged from the review of experience that are expected to characterize basic education assistance in the future:

(i) an expanded vision of basic education, widening its scope to include secondary education, and recasting its content to better meet the demands of the workforce and other levels of education;
(ii) greater use of information and communication technology for administrative purposes, teacher training, classroom instruction, and other delivery mechanisms;
(iii) more articulation with TVET, higher education, and the world of work; and
(iv) innovations in alternative financing, private sector participation, and partnerships.

Progress toward universal access to primary education has generally been laudable in the region. However, in a handful of countries the Millennium Development Goal of universal access will not be achieved by the target year of 2015. Policy priority in these countries must continue to be on accelerating progress toward universal primary education. For the remaining countries, the success of EFA has created considerable pressure on secondary education systems to absorb greater numbers of primary education graduates. In all countries primary and secondary education must be judged according to the extent they contribute to individual development and social growth. A sense prevails, however, that education is of inadequate quality to sufficiently prepare individuals for either the world of work or for further education. The quality and relevance of education programs and their outputs demand high priority in education policy if those programs and outputs are to be building blocks for inclusive growth.

ADB has accumulated significant experience supporting development of basic education. While grant financing from bilateral development partners will continue to be available for basic education, it is likely that financing gaps will remain in many
DMCs. With its experience and financing resources, ADB will continue to have a comparative advantage in the subsector.

Common issues cut across all country types in the region. ADB’s future work in basic education will likely feature

- renewed emphasis on quality,
- retooling and reorientation of teachers,
- developing capacity in national and subnational education bureaucracies,
- an explicit strategy to reach out to the underserved and guarantee equitable access,
- strengthening early childhood education and expanding nonformal learning, and
- development of new partnerships and modalities.

For this work to be optimally effective, a number of improvements internal to ADB may have to take place, as outlined at the end of this section.

Technical and Vocational Education and Training. Several factors are focusing new light on the importance of effective systems for technical and vocational skills development. The growing number of graduates of basic education entering the labor market without marketable skills is creating social and political pressure to expand access to training. The demand for skills is increasing, sometimes exponentially, due to a combination of technological, structural, and organizational changes. Trade openness and foreign direct investment—i.e., globalization—are contributing to capital deepening, with its complementary requirements for more and better human capital.

Systems for skills development in the region are ill prepared to meet these challenges. The essential requirement for successful skills formation is close alignment of training systems with the needs of the labor market. However, training systems in the region tend to operate in isolation of labor market demand and with little or no employer participation.

The purpose of skills training is to impart knowledge and competencies. In most cases, however, the ingredients for quality—occupational standards, qualified instructors, necessary equipment, and quality assurance mechanisms—are lacking. Skills development arguably is the most difficult subsector to organize and manage in the education sector. It cuts across organizational boundaries, caters to diverse clients, involves multiple delivery mechanisms, and keeps changing in market characteristics.

Many outstanding issues in the TVET subsector derive from its fragmentation and its inappropriate and unclear organizational structure in DMCs. Getting the organizational structure right is one of the first essential steps toward effective TVET. Skills development can be expensive because of small classes and the need for equipment and materials for effective training. This makes it all the more important to use resources efficiently and monitor performance progress. All too often the costs fall exclusively on constrained public budgets, resulting in chronic underfinancing. Financial diversification is essential.

ADB has been a traditional supporter of TVET. Emphasis in its assistance has shifted, rightfully, from support for the construction of facilities in the early years, to support of curriculum and instructor development in recent years. The objectives of recent projects are appropriate to the recipient economies and generally are compatible with their stage of economic development and national priorities. In view of its successful track record in the face of growing economic and social demands, and the need for reform of TVET systems, ADB should continue to support TVET. ADB has a comparative advantage in TVET given that only a few bilateral development partners support TVET in the region and their financing volume is relatively low. However, further evolution of priorities in ADB support, toward system-wide reforms, is recommended. With appropriately adjusted priorities, future ADB assistance is likely to make the greatest impact in four areas:

1. improvement of organizational and management structures, with support from apex organizations and national training authorities, where possible;
2. development of occupational standards through the design of efficient vocational qualification frameworks and the setting of minimum training standards;
3. establishment of financial incentives by setting performance standards, devolving responsibility with accountability for results, and establishing competitive training funds; and
4. expansion of private training provision and establishment of more efficient regulatory frameworks for it while facilitating adherence to standards.

In terms of levels and types of training, greater attention should be devoted to continuous in-service training of adults and to enterprise-based
training. This contrasts with past exclusive focus on institution-based, preemployment training. Training for the informal sector should be given prominence to support inclusive development, particularly in countries that are less industrialized with limited wage jobs. In DMCs where economies are moving up the value chain, postsecondary technical training should have high priority in view of its seminal role in leveraging improvements throughout training systems. ADB should be cautious with support for “vocationalizing” secondary education in view of its poor record in developing countries. ADB should also be aware of the difficulties of supporting overly ambitious vocational qualification frameworks.

Higher Education. Over the next decade, expanding and strengthening higher education will be a priority concern in nearly all DMCs. Governments face strong social demand for expanded access. Most see a need to increase the supply of highly trained personnel. Virtually all DMCs seek to incorporate advances in information and communication technology to improve delivery of higher education.

The growing demand for higher education is a product of the convergence of several powerful dynamics. One is the growth of enrollment at primary and secondary levels, which is fueling sharply increased social demand for access to postsecondary opportunities. At a broader level, the increased economic interdependency among countries aspiring to become knowledge-based economies, the speed of communications, and the importance of technology have created escalating demand for higher-level technical, managerial, and administrative skills. Strong empirical evidence also demonstrates that the highly educated are enormously important to social and economic development. Evidence consistently shows that countries that invest in improving quality and equitable access in higher education benefit economically and socially. Every dollar invested in expanding the pool of workers with higher qualifications results in a greater reward through economic growth. Such investment provides tangible benefits to all of society, not just to the individuals who benefit from greater educational opportunities.

Higher education contributes to national development in three principal ways. First, it prepares the primary and secondary teachers that shape the dimensions and quality of the overall education system. Second, those teachers train the high-level technical and administrative personnel needed in government, business, and industry. Third, higher education institutions operate as incubators of the innovation and creative thinking that are needed for an economically competitive society.

In many DMCs, however, the ability of higher education to fulfill these roles is under considerable pressure. The rapid growth of higher education has often come at the cost of quality. Low quality is the biggest problem and greatest challenge facing many DMC higher education systems. Areas needing greatest attention to improve the quality of higher education include

- aligning the knowledge and skills of secondary school graduates with the entrance requirements of higher education,
- linking higher education preparation with labor market demand,
- diversifying the sources of financing of public higher education institutions,
- financing private higher education,
- increasing the emphasis on cost-sharing by students and families, and
- resolving staff compensation issues.

Success in the continuing development of higher education will be defined in terms of raising quality as well as extending equitable access.

ADB can play three important roles in support of higher education development in the region:

(i) lending for infrastructure and policy development aimed at expanding access to postsecondary education, both public and private;
(ii) serving as a source of knowledge creation, synthesis, and sharing with regard to the management and operation of higher education systems and institutions; and
(iii) serving as a source of technical assistance in support of capacity development of system and institutional administrators and instructional staff.

The knowledge management and sharing roles might take the form of funding national and regional hubs devoted to information sharing, brokering international and regional twinning arrangements, and operating as a clearinghouse for technical and managerial expertise.

Science and technology as a focus of investment in higher education should be viewed with caution. The development of science and technology is based on the convergence of inputs from numerous sectors. The principal factors that promote science and technology development are not the activities of universities. Higher education
can effectively support development of science and technology when comprehensive policies and cross-sectoral national development frameworks exist in this field in DMCs.

**Recommendations and Implications for ADB.** The recommendations for all three subsectors emphasize the importance of aligning ADB assistance in education with the development and inclusive growth needs of DMCs. In many cases this means supporting the growth of human resource capacity to levels beyond basic education to furnish the skills and competencies needed to bring DMCs to the next stage of development. Nevertheless, inclusive growth depends on quality at all levels of education, and a priority focus on quality emerges as an overriding recommendation of this study.

Continued reliance on comprehensive sector analysis and broad-based sector reform is another area where ADB can make a significant contribution. In light of the fast-changing environment, ADB must continue to pursue innovation, explore new modalities of operation, and pursue partnerships with the private sector, local communities, education ministries, and a broad range of other ministries and line agencies.

All this implies several internal modifications within ADB. If ADB is to be a knowledge management organization in education, it must establish its capacity to serve as a knowledge base in key areas in basic education, TVET, and higher education. ADB has considerable experience from past projects, but in its current organizational arrangement the accumulated knowledge from that experience is not always used effectively for the benefit of new projects or DMCs. A more formal clearinghouse mechanism, or a structural reorganization, may be required, aimed at improving knowledge collection and dissemination in the sector.

ADB must be seen as having a core of expertise in the priority areas of education. This means retooling and upgrading existing staff and, if needed, recruiting additional staff in areas where ADB has not been extensively involved. It also means that in areas where staff expertise is not available, ADB must actively cultivate networks of individuals and groups of specialists.

Finally, ADB must take a more active role as a knowledge disseminator, sharing its accumulated experience and wisdom more widely, both internally and externally.
Chapter 1
Introduction

The Asia and Pacific region (the region) has distinguished itself in the past decade as the world’s most rapidly developing region. The recent Asian Development Bank (ADB) Eminent Persons Group\(^1\) report highlights the fact that the fast pace of economic expansion of the People’s Republic of China (PRC) and India has placed those countries among the world’s 10 largest economies. The region now accounts for more than 35% of world gross domestic product (GDP) in purchasing power parity terms, and rapid economic expansion is expected to continue. While in 1990 35% of the people in the region lived on less than $1 a day, by 2003 the figure was down to 19%. The report maintains that by 2020, widespread absolute poverty in most countries of the region will be conquered, with more than 90% of the people living in middle-income countries (ADB 2007h).

Despite impressive progress, a growing body of evidence points to serious education and human resource–related problems that require urgent attention if the region is to sustain its progress and complete the job of eradicating poverty. Several of ADB’s developing member countries (DMCs) remain mired in poverty, and even in rapidly growing DMCs there are substantial pockets of poverty and unemployment. Optimistic forecasts mask a limiting factor that seriously threatens these projections: an inadequately prepared human resource base to drive and support continued progressive growth. Many DMCs see this as a serious bottleneck that will hamper their development. Some of the critical human resource constraints are:

- Growth throughout the region has been non-inclusive; in rapidly growing DMCs, the gap between the rich and the poor has been widening.
- In some DMCs, up to half of those who have completed primary education revert to functional illiteracy, making them unfit for further study or the work force.
- In more than half of Asian DMCs, only 7 out of 10 children entering the first grade complete the primary cycle, and only 4 complete the secondary cycle.
- Many DMCs are suffering an acute and worsening shortage of skills. Some businesses are forced to scale back plans for expansion because they cannot find enough workers with the needed skills.
- Except for the most dynamic economies and growth areas, most DMCs will not be able to generate enough jobs to accommodate the growth in the supply of labor. Most new labor market entrants will have to work in the informal sector, and they lack the technical and business skills needed to grow and prosper there.
- Demand for higher education is booming, and is expected to double in 5 years and triple in less than 10 years in many DMCs. But this expansion will continue to be haphazard, spawning many institutions of inferior quality.

Human capital is an essential component of economic growth and development. However, education sector progress in the region has not kept pace with the fast-changing demands of an increasingly complex and rapidly developing world. Clearly, this needs priority attention. The economic case for investing in education has been long established. Widely accessible quality education has been a characteristic—indeed a precondition—of the phenomenal growth of the tiger economies of Asia.

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\(^1\) “The Eminent Persons Group [comprising seven prominent individuals] was established in June 2006 to provide views on the future of the region and recommendations on the role of ADB. The Group studied the changes that have occurred in the region and considered the key driving forces of future development. It then developed a set of recommendations for consideration when refining ADB’s long-term strategy” (ADB 2007h).
Human resource development and education play an increasingly important role in ensuring the sustainability of growth performance as DMCs move up the economic and technological ladder. As the role of the industrial and services sectors expands, as economies open up, and as production technologies become more advanced, education and skills development must become increasingly flexible and responsive to changing labor market needs. The complex demands of a global competitive economy require more advanced skills and the ability of the workforce to adjust to shifts in not only domestic demand, but also in the global economy and labor market. As economic development advances, the higher education system must cater to the growing need for technical and managerial expertise, innovation, and leadership.

These dynamics highlight the close link between economic growth and education and skills development. Appendix 1 reviews the latest findings regarding the economic returns and benefits of investment in various levels of education, some of which are summarized below:

Education and human capital and their impact on technological change, in particular, have featured prominently in economic growth models since the 1950s. Studies of the Asia and Pacific region have demonstrated the critical role of education in economic growth. In the transition from basic production to technical diffusion “...a sophisticated educational base is needed to absorb and upgrade primary innovations and foreign technologies effectively” (Porter et al. 2002). There is also evidence of the positive impact of secondary education on growth. Growth is clearly related to national capacity in scientific research and development.

ADB started investing in the education sector in 1970, and education lending during the ensuing decade focused on facilities and equipment for technical and vocational education and training (TVET). This approach was consistent with human resource planning and the emphasis at that time on economic growth. To support the gradual increase in the volume and the broadening scope of education sector lending in the 1980s, ADB published its first education sector policy paper in 1988 (ADB 1988). The policy paper recognized the importance of investing in primary and secondary education in the context of broader human and social development. Since 1990, ADB has been a strong supporter of Education for All (EFA). The focus of lending and technical assistance in the 1990s thus shifted to basic education, with increasing attention to curriculum, education materials, teacher development, and developing capacity for policy reform, strategic planning, and management.

Poverty reduction was adopted by ADB in 1999 as its overarching objective (ADB 1999a). In 2003, ADB published a second education policy and strategy paper, which highlighted the importance of education at all levels as a tool for poverty reduction (ADB 2003a). Also stressed in the second policy paper was the importance of recognizing differences between countries, the rapidly changing conditions in the region, and the need for education projects to respond to particular needs and conditions. The planning of investment in education in the context of an overall sector policy framework was also emphasized. The region has continued to develop and change rapidly, and in ADB’s second medium-term strategy, covering 2006–2008, education is identified as one of six priority sectors for assistance (ADB 2006b).

ADB’s DMCs are diverse, but the chief challenges they face in the education sector fall in three broad categories:

(i) a continuing need for better access to quality EFA, especially for the poor and disadvantaged;
Two themes cut across the three broad challenges cited above. First is the need to develop new and innovative approaches to education financing, including the development of public-private partnerships. Second is the importance of information and communication technology (ICT) as a means to improve education content and delivery. These challenges and crosscutting themes are discussed briefly below.

Access to and Quality of Basic Education. The goal of EFA was first articulated in Jomtien, Thailand, at the 1990 World Conference on Education for All, and was subsequently reinforced by its inclusion in the Millennium Development Goals (MDGs). Since then, considerable progress has been made in the region in achieving EFA and the education MDGs, with support from ADB and other external partners. Some DMCs have made significant gains in improving access and have achieved universal primary education. However, progress has been more limited in several low-income DMCs, mainly in South Asia, in part of Central and West Asia, and in the Pacific. Many children in these DMCs still do not have access to primary education. In Afghanistan and Pakistan, for example, net enrollments are below 60%, while in Bhutan and Nepal they are below 70%, and are about 75% in the Lao People’s Democratic Republic. To comprehensively achieve EFA and the education MDGs, many DMCs will continue to need ADB support, not only to improve access, but also to improve quality and completion rates in primary education. In a number of DMCs where access has improved significantly, inadequate attention has been devoted to quality and completion.

The Growing Shortage of Skilled Workers. Rapid economic growth has been accompanied by widespread urbanization, expansion and diversification of economic activities, and a significant move up the technology ladder in many DMCs. This has led to a rapid expansion of demand for vocational, technical, and managerial skills. Severe skill shortages are apparent in several DMCs, and are expected to worsen in the short and medium term (The Economist 2007). In the PRC, for example, an estimated 140 million rural workers—most with limited education and few vocational skills—have migrated to urban areas in search of jobs and income opportunities. The flow of unskilled workers from rural to urban areas is expected to continue at the rate of at least 10 million a year. At the same time, many industries in the PRC face severe production constraints due to a shortage of skilled workers. Other DMCs are suffering shortages of workers with vocational and technical skills, and with qualifications in such critical areas as ICT and accounting.

Higher Education for Science and Technology. Skill shortages also extend to graduates of higher education—particularly doctors, lawyers, engineers, and professional managers. The expanding demand for qualified graduates in these fields far outstrips the capacity of higher education institutions to produce them. The knowledge economy is expanding rapidly, and many DMCs are moving quickly up the knowledge and technology ladder. Higher education plays a vital role in developing human resource capacity in science and technology. Such capacity is essential for DMCs to attract foreign investors at the high end of the technology scale, and to support research and development and innovation as local firms continue to advance technologically. Higher education will be of increasing importance in ensuring the longer-term competitiveness of the region’s economies.

Education Financing and Partnership with the Private Sector. The financing of education poses challenges at several levels. In basic education, there is scope for innovative planning and financing mechanisms that will help with access and efficiency concerns in the face of constrained public budgets. In TVET and higher education, the growing emphasis on the relevance of education outcomes in the labor market will increasingly require policy planners, TVET and higher education providers, and the development community to explore new and innovative partnerships with the private sector and other stakeholders. The potential for such partnerships ranges from (i) cooperation between vocational schools and industry to run in-plant

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2 Millennium Development Goal (MDG) 2: “Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.” MDG 3: “Eliminate gender disparity in primary and secondary education, preferably by 2005, and in all levels of education no later than 2015” (ADB, United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP], and United Nations Development Programme [UNDP] 2006).
training programs, to (ii) development of high-end fee-charging vocational programs responsive to industrial needs; (iii) twinning, partnership, and faculty exchange programs between universities; and (iv) innovative public-private financing and management partnerships.

ICT and Education. ICT is playing an increasingly important role in education at all levels. It has become an essential element of making education outcomes relevant to the labor market. Equally important is the potential it offers to revolutionize education content and delivery. In basic education, ICT can provide pupils with computer literacy as a foundation for subsequent education, and train teachers. For pupils in remote or disadvantaged areas, ICT can provide access to education. In TVET and higher education, particularly in science and technology, ICT plays a vital role in the teaching and learning process. In the region’s fast-growing economies, the expansion of ICT skills has been unable to keep pace with the galloping demand for ICT workers, and is a key element of skills shortages. ICT policies and strategies at national and sectoral levels must be strengthened in many DMCs to provide an adequate framework for efficient use of ICT in education institutions and schools.

The Study. The main study report is presented in three chapters, one each for basic education, technical and vocational education and training, and higher education. A final brief chapter presents recommendations and implications for ADB. The study addresses four questions. First, how can ADB most effectively help DMCs attain quality EFA and achieve the education MDGs? Second, how can ADB help the DMCs tackle the need for vocational and technical skills, and the growing skills gap in the region? Third, how can ADB help develop higher education and the scientific and technological knowledge needed for the progressive competitiveness of DMCs? And finally, what internal issues, including staff skills and operational modalities, does ADB need to deal with to answer these three questions?
Introduction

Basic education is the bedrock upon which all human resource development is founded. Basic education must be available to everyone for growth and development to be inclusive. Without this foundation, no society can develop effectively. Not only must education be universally accessible, it also must be good, relevant, and sustainable to equip citizens to improve society and to benefit from social and economic progress. Basic education provides the foundation for continuous and lifelong learning, whether for life or for specific professional and leadership positions.

The rationale for investment in a basic education, however, stretches beyond basic education being the foundation for economic development and inclusive growth, a Millennium Development Goal (MDG), and a basic human right. Significant positive social externalities—associated with fertility, public health, and social and civic stability—are linked with investment in basic education and are essential for national development and economic growth.

The catalyst provided by the Education for All (EFA) decade (1990–2000) produced an increase in awareness and an outpouring of effort and resources by the world education community, with a focus on basic education. Beginning with the 1990 World Conference on EFA, governments, civil society, and international agencies reaffirmed basic education’s highest priority, increased resource allocations, and launched initiatives in pursuit of EFA goals. Several countries formulated ambitious EFA action plans, and increased the percentage of their gross domestic product (GDP) devoted to basic education. International agencies likewise shifted priorities away from other subsectors of education to make basic education their principal focus. The World Bank, for example, increased lending levels for basic education from $250 million in 1990 to $980 million in 1993. ADB lending for basic education during 1990–1999, at $1.4 billion, was eight times more than lending for basic education during the two decades before that. The increase in ADB technical assistance was even more rapid: the aggregate amount of technical assistance for basic education during 1990–1999 was 64 times the amount provided to basic education before 1990. (See Appendix 2 for data on ADB loans, grants, and technical assistance for education.)

Commitment to basic education leveled off in the second half of the 1990s for a number of reasons, including donor fatigue and the lack of absorptive capacity in recipient countries. However, while the fundamental importance of basic education continued to be recognized and pursued, a renewal of the commitment to EFA was clearly called for.

In April 2000, the World Education Forum was held in Dakar, Senegal, to reaffirm commitment to EFA. At the forum, the world community, led by 151 governments, hundreds of civil society partners, the UN Secretary General, and the heads of the World Bank; the United Nations Educational, Scientific and Cultural Organization (UNESCO); the United Nations Children’s Fund (UNICEF); and the United Nations Development Programme (UNDP), reiterated the primacy of EFA. Drawing upon the experience of the previous decade, the EFA strategy was reaffirmed and refined. In a related development, the world community committed to achieving eight MDGs, two of which were universal primary education, and gender equity within that (footnote 2).

After the forum, a surge in priority attention and resource allocations once again took place, with more targeted initiatives drawn up based on lessons of the past decade. The international development community doubled its resources for basic education, the Fast Track Initiative for countries in greatest need was formulated, and a Global Monitoring Team for EFA was established. Basic education was included in the regular agenda of meetings of Group of Eight countries.
Between 2000 and 2004, international development assistance to developing countries for basic education rose from $2.6 billion to $4.4 billion. Overall, the percentage of public expenditure for education as a share of gross national product (GNP) in developing countries rose from 4.3% to 4.7%. Low-income countries in particular increased spending for education, as did DMCs in Southeast Asia. However, expenditure levels on education as a share of GNP stagnated in South Asian DMCs (UNESCO 2007).

Since 2000, progress has indeed been significant, but EFA has continued to be an unattainable goal in a number of countries. The region, which had two thirds of the world’s out-of-school children 35 years ago, now has less than one third—25 million children—out of the world total of 77 million children out of school. East and Southeast Asia, largely because of great strides in the PRC, have registered the most dramatic progress toward universal primary education. On the other hand, South Asia continues to be one of two regions of the world (the other being Sub-Saharan Africa) where the MDG of universal primary education is not likely to be met by the target year 2015.

The Basic Education Landscape in the Region

EFA progress monitoring indicates that, in general, countries doing well on one EFA goal tend to do well on the others. This implies, however, that countries with low levels of EFA achievement face multiple challenges, complicating the tasks they must carry out to achieve EFA as a whole. The EFA Development Index (EDI) is used globally to assess achievement of EFA in a more integrated fashion. Due to data limitations, EDI still focuses on the four most easily quantified EFA goals: universal primary education, adult literacy, gender parity and equality, and quality of education. The range of EDI scores in the region is wide (Appendix 3), from higher scores (mainly in Central Asian DMCs), to medium scores (mainly in Southeast and East Asian DMCs), and to low scores (mainly in West and South Asian DMCs). The vastness and diversity of the region have resulted in quite different results among subregions. A brief description of the situation in each subregion is provided below. Where possible, other EFA dimensions that have not yet been integrated into UNESCO's calculations of EDI scores due to data limitations—such early childhood education—are discussed (ADB 2006a; UNESCO 2004, 2005a, 2006a, 2007; Ordoñez and Sack 2005).3

Central and West Asia

This subregion is finally emerging from the difficult transition decade of the 1990s, a period of dramatic social shifts resulting from sudden independence and self-reliance, and the reconfiguration of many social services. In Azerbaijan, the net enrollment ratio dropped from near universal primary education in 1990 to only 80% by 1998, but subsequently climbed back to 85%. Similarly, other countries of Central and West Asia recorded setbacks in enrollment in the early 1990s, but

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3 The quality and timeliness of data, though much improved as a result of the Dakar assessment exercise standardizing definitions and formulas, leave much to be desired. Normally, countries do not compile information on a school year until the following year, and only some time after that is the information relayed to the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Institute of Statistics for compilation, further verification, and analysis. Needless to say, the reliability of information is only as good as the reliability and competence of the national data gathering mechanisms in individual countries, which vary greatly within the region. Data can be as much as 3 years old. Nevertheless, they give a fair indication of trends and progress.
registered recovery in the latter part of the decade. Due to its strong resource base, primary education remained a priority in the subregion and gross enrollment ratios increased from 75–100% in 1990 to 95–103% in 2000. The current decade also saw the subregion’s already low repetition rate of 1% drop further to 0.5%. School retention, traditionally high, remained so with survival rates at 95% or above in these countries.

The quality of education in the subregion, however, was sacrificed for quantity. Many teachers were untrained, classes were overcrowded, teacher absenteeism increased, and class contact time was shorter. Average contact time in this subregion was 701 hours per year, well below the average of 800–1,000 hours in other subregions. National education budgets as a percentage of GNP declined from a subregional average of 2.4% of GNP in 1990 to 1.3% in 2000.

The loss of external or central funding for early childhood programs resulted in a dramatic drop in participation in these programs in the subregion, from 40–50% in the early 1990s to 7–27% by 2000. A collective commitment to improve these rates has resulted in a slow reversal of the downtrend in recent years. Participation rates in early childhood programs, though varying from country to country, now average about 35%.

Gender disparity in enrollment has not been a problem in this subregion. However, gender analysis reveals subtle symptoms of discrimination in curriculum content and differential treatment of girls in school.

South Asia

Due to institutional and societal factors, this subregion presents the greatest challenges in reaching both gender equity and universal primary education. Although improvement has been marked, much remains to be done. Rapid rates of population growth in several countries in the subregion have far outdistanced capacity to keep pace with increasing demand for basic education. The number of children in school increased over the past decade by 20 million, to 132 million. However, the number of children out of school also rose by 7 million to 53 million, despite education budget increases over the same period.

Repetition is up to 30% in primary education in some countries in South Asia, and dropouts and frequent absenteeism result in high inefficiency and low completion rates. Disturbingly, as national averages in these countries slowly improve, subnational data show that underserved areas and minority populations are more poorly served than ever, with a growing disparity of access in the same countries.

Significant efforts have been made to narrow the wide disparity in gender enrollment, but gaps will likely remain well beyond the 2015 target date for MDGs. Nepal and Bangladesh have made good progress in recent years in improving gender parity in primary education (UNESCO 2007). However, it is safe to generalize that for this subregion, about two thirds of all out-of-school children are girls.

Nowhere is the link between access and quality more evident than in this subregion. Inadequate facilities, unsafe environments, poorly performing teachers, and irrelevant curriculum content serve to dissuade parents from sending their children—especially girls—to school. If parents do send them, they do not feel compelled to see them complete their primary schooling. The quality of teachers continues to be eroded by low salaries and status, which results in many seeking supplementary income from other jobs. Teaching materials and textbooks are in short supply. Often, communities have established private schools due to the poor quality of public schools. However, the quality of education in private schools often is also low because of the lack of regulation and the weak capacity of ministries of education and communities to monitor school performance.

East Asia

East Asia has the strongest and the oldest tradition of formal education and literacy in the region, dating back centuries. In the latter half of the 20th century, the largest expansion of a public school system in the world took place in the PRC, with remarkable success. During that period, hundreds of millions of children went to school for the first time, and net enrollment ratios at the primary level shot up from less than 20% to 97% by 1990. These ratios have been maintained through the 1990s, with only a slight drop in the current decade. Not only did children enter school, they stayed there. Retention rates were about 96%.

The high priority given to primary education as a national policy is also evident in the rest of this subregion. The Republic of Korea stands out as an example of success in achieving universal education and gender equity. Mongolia is perhaps
the exception in the subregion. There, standard school systems do not always conform to nomadic lifestyles. Gender disparity in Mongolia favors girls, as there are fewer males at every level of the school system. Mongolia is rebuilding its once-decimated early childhood program. Some 36% of its preschool children in urban areas are now in a program of some kind, compared with 15% in rural areas. Class sizes at this level remain quite large, however, averaging 26 children.

The challenge is to sustain gains without sacrificing quality and relevance. Already, because of its huge population, the PRC has experienced a slight drop in the net enrollment ratio since 2000—from 97% to 94%—and class sizes are slowly growing.

Southeast Asia

Combined, Southeast Asia and East Asia have an average net enrollment ratio of 95%, the highest primary education participation rate in the entire developing world. Children in school now number 207 million in Southeast Asia, compared with 181 million a decade ago. The number of out-of-school children has declined from 7 million to 6 million. As in East Asia, gender disparity in enrollment in Southeast Asia is insignificant, although other forms of gender discrimination toward females exist.

Unfortunately, country averages mask continuing disparity within countries, as well as the failure over the last several years to push current high ratios closer to 100%. Part of the reason is the relatively stagnant level of national budget allocations for education. There is a noticeable lack of effort to seek new approaches and paradigms to access the yet unreached minorities, who feel their exclusion from mainstream primary education. Issues of quality and relevance, as well as renewed attention to both preprimary (early childhood) and postprimary (secondary) education as part of EFA, are deservedly drawing more attention. Both preprimary and postprimary education are growing very rapidly, and in half of the countries reporting data, early childhood education was the fastest-growing subsector in education. Only in Cambodia, Lao People’s Democratic Republic (Lao PDR), and Myanmar are preprimary participation rates below 10%.

Unlike East Asia, however, dropout and incompletion rates present a problem in this subregion. Even the Philippines, with a net enrollment ratio of 93%, reports only 7 out of 10 students finishing the primary cycle. Similarly, Cambodia, Lao PDR, and Myanmar report completion rates below 80%.

The erosion of quality and slippage from earlier gains in access continue to be major problems in this subregion. Pupil/teacher ratios hover at about 25, with countries like Cambodia registering double that level. An erosion of teacher salaries in real terms, coupled with low teacher status and a growing number of civic duties for teachers, has made the profession less attractive and, correspondingly, teacher training more difficult. The impact of low motivation, the continuing inroads of the HIV/AIDS epidemic, and inadequate support have made teacher absenteeism and incompetence real problems in many rural areas of this subregion.

The Pacific

Influenced by both colonial heritage and religious initiatives, the Pacific region is likewise characterized by a long tradition of near universal primary education. Participation rates average above 90% in most countries, with Kiribati reporting the subregion low of 83% and Tuvalu reporting the high of 99%. Gender equity is paradoxically reversed in this subregion. Because dropouts are more prevalent among males, a larger percentage of females are enrolled, especially in upper primary and secondary levels.

Dropouts are an increasing phenomenon, especially at the secondary level, where youth problems (school violence, drugs, and HIV/AIDS) are assuming serious proportions. This is symptomatic of more serious concerns about the quality and relevance of a basically imported program of study. In the Pacific islands, questions of cultural identity, migration, and endogenous development are important issues. Because economic opportunities in the small island states are limited, the anticipated benefits of continuing to the secondary level do not hold much potential. Consequently, transition rates have remained comparatively low.

Education in many of the island states is supported to a significant degree by external funding, although this subregion leads the region in terms of percentage of recurring budgets dedicated to education. Marshall Islands, Federated States of Micronesia, Palau, and Vanuatu allocate more than the 6% of national recurrent budgets to education. Still, recurrent expenditures are often taken up by teacher salaries—over 90% in Vanuatu, for example. Few resources are left for purchase of textbooks, materials, and other teaching facilities.
Major Issues in Basic Education

Changing Context and New Challenges

The 1990 EFA Declaration at Jomtien, Thailand, resulted in a shift in priorities, efforts, and resource allocations in the education sector to basic education. Since that declaration, however, there have been remarkable changes worldwide. The context of basic education has changed dramatically, requiring a redefinition and reshaping of the EFA effort.

Many DMCs are moving rapidly toward becoming middle-income countries. The demands of sustaining growth and advancing to the next level of development mean that human resource development must focus more explicitly on higher levels of education. Two elements are critical for successful provision of higher levels of education. First, entrants to higher education need to be of sufficient quality, having attained the necessary foundation and skills for learning from basic education. Second, access to higher education—like that for basic education—must be fully equitable, so that the growth engendered by education is inclusive of all sectors of society, and does not exacerbate the rich-poor divide.

Other issues have arisen. One is the emergence of the private sector as an increasingly important player at all levels of education. This has occurred because of increased demand for education from both parents and society in response to the demands of economic growth, and because of the inability of most governments to meet the demand for education. The second is the rapid internationalization of the education enterprise. This is most obvious in higher education, but is also occurring in technical-vocational and even basic education.

In the light of these challenges, it is useful to review the strategic perspective for basic education in DMCs according to their level of economic and educational development. Accordingly, experience since the 1990 EFA Declaration is assessed, and essential lessons are identified that can help reshape and sharpen the focus of basic education policy. Emerging trends and requirements are examined, as are priority areas for strategic intervention in the future. These analyses are then used to formulate proposed operational guidelines for DMCs.

Review of Lessons Learned

DMCs have made significant progress in many areas of education. But results have been uneven and sometimes were not commensurate with the resources required for their achievement. Desired results have sometimes not been sustained or even significantly achieved. In hindsight, analysis of experience has brought to light gaps in the strategic perspective of many national plans. For purposes of reshaping strategy for basic education, five major lessons are germane.

Quality. Access—increasing enrollment numbers—was overemphasized to the relative neglect of quality.

Throughout the region, even in South Asia where enrollments continue to be far below world averages, the most outstanding characteristic of the past two decades has been the increase in primary school enrollment—from 210 million in 1990, to 386 million in 1999, and to 399 million in 2006. But in broadening access, quality has not always been a prime consideration. The focus on access has been largely driven by pressure to manifest tangible progress in universalizing primary education. This focus has been abetted by the fact that access is easier to quantify than quality. There are readily comparable indicators for access—numbers of students, teachers, and schools, and participation rates—whereas universal measures of quality are harder to come by. Indeed, quality lends itself to various definitions. In this report, however, quality means learning achievement, as measured by various assessment instruments discussed later.

Unfortunately, the emphasis on access has proven to be counterproductive, and has not taken into account that pursuit of access and quality is not a zero-sum game. In prioritizing budgets and programs, there is not necessarily a conflict between quality considerations and access considerations. Better quality leads to more desirable schools and higher percentages of completion. Some DMCs, in their drive to achieve universal primary education, have given priority to building more schools and hiring more teachers, to the neglect of quality. The results have been disappointing. Even when initial enrollments increased, retention rates were poor or declined, resulting in a waste of resources on short-staying students who often eventually returned to illiteracy. Conversely, improving teacher preparation, preschool programs, and curricular content have proven much less costly and more
productive in terms of increasing the number of those who complete school successfully.

New evidence has emerged from recent international studies of student achievement in about 50 countries over several decades. Using proficiency in cognitive skills as a proxy for education quality, higher scores were shown to significantly influence growth of real GDP per capita, and to have a measurable impact on individual earning power. Study results showed that attainment of levels of quality was a more reliable predictor of high rates of return than years of schooling (Hanushek and Woessmann 2007).

Recent study results also emphasized that improvement of quality is not necessarily achieved by merely providing additional resources such as more books, better facilities, and other inputs. The key ingredient to quality turned out to be system accountability, and incentives that motivate students, teachers, and schools to perform well. Accountability, in turn, hinges on a reliable assessment system against which performance can be measured. Different countries will of course define their own standards and educational priorities, but a tested and reliable assessment mechanism needs to be in place. Education systems must distinguish between a testing system that evaluates the student for streaming or promotion, and a testing system that evaluates the education system—in terms of motivating better performance, judging the effects of policy decisions, and diagnosing the need for policy shifts.

It is difficult to compare quality achievement across countries because of variation in country assessment instruments. International monitoring groups, such as the global EFA monitoring team, have to content themselves with comparing the inputs (e.g., qualified teachers) and processes (e.g., absenteeism) of education systems. The following five indicators have been used as proxies or determinants of quality in educational systems: completion rates, average class size, number of trained teachers, level of absenteeism, and current primary education expenditures as a percentage of GNP. Examination of these indicators below highlight shortcomings in the performance of selected DMCs:

- **Pupil/teacher ratio (class size).** In the following countries, the pupil/teacher ratio is 40 or above: Afghanistan (43), Bangladesh (55), Bhutan (40), Cambodia (56), India (40), Nepal (40), Pakistan (44), and Timor-Leste (51).

- **Teacher training.** In the following countries, less than 80% of teachers are formally trained: Bangladesh (66%), Kyrgyz Republic (45%), Lao PDR (76%), and Maldives (67%). Data are not available for Nepal and Pakistan, but the percentage of inadequately trained teachers in those countries is likewise high.

- **Absenteeism.** While data are unavailable for several DMCs, this is an important indicator. Quality is not possible when either teacher or student is absent. Available data on teacher absenteeism in public primary schools show rates below 5% in most DMCs, but alarming rates of 16% in Bangladesh, 25% in India, and 19% in Indonesia (Tandon 2006).

- **Current primary education expenditures as a percentage of GNP.** In the following countries, less than 1% of GNP is devoted to current primary education expenditures: Bangladesh (0.5%), Cook Islands (0.2%), Indonesia (0.5%), and Myanmar (0.5%). Cambodia, India, and Nepal also register low percentages—between 1.0% and 1.5% (UNESCO 2007).

Completion. The focus on access emphasized getting children to school, to the neglect of measures to keep them there.

If the purpose of basic education and its benefit to the individual and to society are thwarted by the poor quality of schooling, it is even more obviously thwarted by early dropouts. The MDG for primary education explicitly calls for not only participation in schooling, but for completion of the full course of primary schooling or its equivalent. This is particularly relevant in the region. Although over 90% of children are in school, as many as 3 in 10 fail to complete the primary schooling cycle in several countries—many of them reverting to illiteracy after a few years. Students failing to complete the entire primary cycle range from less than 10% in the PRC and Thailand to over 50% in the Lao PDR and Myanmar. Countries having survival rates to the fifth grade of less than 80% are Bangladesh (65%), Cambodia (70%), Cook Islands (51%), India (61%), Lao PDR (62%), Myanmar (60%), Pakistan (77%), and Philippines (79%).

Parents opt to discontinue schooling their children for several reasons, including poverty, distance from school, the need for household or agricultural help from older siblings, and a perception that schools are unsafe, hostile, or at best irrelevant to their needs. But administrative
regulations as well as social pressures play major roles in determining the extent of attrition among primary education students. This is an area ripe for policy review, to ensure a supportive environment and identify explicit measures to combat the avoidable causes of children dropping out of school. In a few countries, experimental and control groups were monitored to measure the impact of four variables on school retention and completion: preschooling, free lunches, parent-teacher groups, and free school supplies. A study in the Philippines revealed that preschooling has the greatest impact on eventual school completion, and led to significant policy changes in that country (Tan 1988).

Forced student repetition is a related issue. Awareness of the danger of generating “pushouts” through repetition and unenforceable standards has been increasingly recognized in recent years. Administrative measures have led to a dramatic decline of repetition in schools. Children continue to drop out, but are no longer forced to repeat in large numbers. For example, in Bangladesh, where this is still a minor residual problem, the repetition rate for the first grade alone was reduced from 45% to 6% in the last decade by changes in administrative attitudes and policies. In only four Asian countries was repetition reported to be above 9% (for all grades): Bhutan (13%), Cambodia (10%), Lao PDR (20%), and Nepal (22%). Policy change to cope with this issue, especially in the Lao PDR and Nepal, should not be too difficult to achieve.

Other dimensions of EFA. The focus on primary schooling tended to divert attention from other vital dimensions of EFA, such as early childhood education, adult literacy, and basic skills development.

Primary schooling is undoubtedly the principal means of achieving EFA, but it should not be the only means. The expanded vision of EFA, espoused by the EFA Alliance and emphasized in global EFA meetings, includes early childhood education, adult literacy, and other aspects of meeting the basic learning needs of all members of society. EFA and empowering all population groups to participate in a productive economy are not possible without programs to prepare children for schooling, for adult illiterates, and for groups and sectors for whom formal schooling is not an option.

Heightened attention to primary schooling has diverted attention from these other dimensions of basic education. Early childhood education is an often-overlooked dimension. It is important not only because the first few years of a child’s development are crucial to further development. Studies have shown that attendance at some form of preschool is a key determinant of the likelihood of completion of primary schooling.

In countries with low adult literacy rates, moving toward accelerated and inclusive growth cannot wait years for the products of the primary system to join the workforce. The untapped potential of the adult population can be released with well-designed literacy programs. In countries such as India, where this problem has been tackled and programs have been mounted, the results were immediate, the participation of local communities and volunteers heartening, and the costs minimal.

Alternative learning systems may be the only realistic choice, even for primary education of school-age children, in countries where rapid expansion of the formal school system cannot be supported because of budget constraints. In countries with comprehensive schooling systems, alternative learning systems may be the solution for groups that find participation in the formal school system impracticable due to geography, lifestyle, or culture.

Underserved and disadvantaged groups. A monolithic and standardized approach to primary school expansion left out certain groups. Where programs targeting these groups were implemented, such as programs for girls or for minorities, mixed results were reported.

There is evidence of a slackening of attention and effort in several countries once net enrollment ratios in primary education reach 90% or over. Even when there is no slackening of effort, most countries have difficulty reaching the remaining 10%. Invariably, children outside school—even in countries with a high level of participation—are from remote areas and disadvantaged population groups. In many countries these include culturally and linguistically diverse ethnic populations and minorities, the growing number of urban slum dwellers, children with disabilities, and those in refugee camps. In a multicultural context, reaching this remaining cohort calls for strategies quite different from simply expanding the mainstream system. Governments have to learn that the excluded will not adapt to mainstream systems. On the contrary, government systems must adapt to excluded groups.

The most effective EFA programs in middle-income countries are those that include programs specifically designed for targeted groups. There are
programs for ethnic minorities, using their mother tongue (e.g., in the PRC); programs for nomadic populations, with teachers from the communities trained and traveling with them (e.g., the “floating schools” for seafaring gypsies in the Philippines); programs for scheduled castes and tribes (e.g., in India); and programs for illiterate women involved in microcredit (e.g., in Bangladesh). In similar fashion, there are promising education programs for street children in a few countries, as there are programs for children in refugee camps.

Greater focus is now given to education of children with special needs. Past policy of segregating these children into specialized schools has given way to a policy of integrating them into the regular school system wherever possible. Training teachers and modifying school programs to accommodate special needs children has the additional benefit of improving teaching and learning, not just for this minority, but also, as it turns out, for the majority as well.

In South Asia, where primary education is far from universal, the largest and most obvious group not adequately served is girls. The cultural and ethnic tradition of keeping the female child at home is but one of many contributory reasons. Parents sometimes fear for the safety and security of daughters in a school where teachers and staff are predominately male. Sometimes they entrust the care of siblings or other household chores to daughters, or see no benefit in education for a child who is to be given away in marriage. This is illustrated dramatically in the contrast in participation rates between South Asia and Southeast Asia.

The problem has long been evident, and a multitude of projects have been launched to tackle it, but with mixed results. Some interventions have short-term effects that do not last once external funding ends. Others, such as intensive training to place more female teachers in rural schools, have much better and longer positive effects on girls’ enrollment. This approach is also much less costly than interventions involving subsidies and infrastructure. There are enough data on such projects over the past two decades to guide policy makers in choices of optimum interventions to attain gender equity in primary schools.

The following DMCs have reported net enrollment ratios in primary education below 90%: Armenia (79%), India (89%), Kyrgyz Republic (87%), Lao PDR (84%), Maldives (79%), Nepal (79%), Pakistan (68%), Papua New Guinea (72%), and Viet Nam (88%). In addition, based on strong secondary evidence, at least Bhutan and Myanmar also are likely to have ratios below 90%. In large countries, high national averages often indicate ratios of over 90% in urban areas, but ratios close to 60% or lower in rural areas. Similarly, nonattendance of girls and gender disparity are evident in roughly the same cluster of countries, and national averages mask even greater gender disparities in rural and remote areas (UNESCO 2005a, 2007).

New partnerships. Education bureaucracies were slow to recognize innovative forms of collaboration with local communities and a wider range of partners. Where these were harnessed, progress was significant.

A positive insight from the collective experience of EFA programs in several DMCs is the importance of involving a wide range of partners. Where the EFA effort remained exclusively or predominantly a ministry of education initiative, progress was limited at best. It is where EFA is characterized by heightened public awareness and involvement, media attention, greater collaboration with other government agencies, and most especially, commitment and dedication of local communities, that progress is sustained and significant.

An example of active community support and links between basic education and another sector is the joint effort of the EFA campaign and Grameen Bank’s microcredit scheme for illiterate rural women in Bangladesh. This effort is designed to provide the numeric and writing skills needed by women borrowers to better manage their loans. Examples in the nonformal education arena abound. Many are anchored in community learning centers operated by nongovernment organizations (NGOs) and spreading with impressive gains throughout Asia. In Cambodia, about 68 such centers are fully operational and effective, mainly with community support. Other countries such as Indonesia, Nepal, and Philippines have developed hundreds of such centers. The Government of Viet Nam has just officially accredited over 8,000 community learning centers. The continuing education programs of the network of community learning centers for prostitutes in Indonesia collaborate closely with counterparts in social and health ministries. The rural community learning centers in the PRC a conduct education

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4 Due to inadequate data, the global UNESCO EFA monitoring team has not calculated specific ratios for these countries.
work in collaboration with agricultural ministry staff and neighboring agricultural universities. The community learning centers that teach skills development in Thailand have links with business and entrepreneurial partners to market and export their produce (Ordoñez 2007). In the Philippines, evidence from innovative pilot projects indicate that local community participation can result in dramatic increases in student achievement scores. Only after parents and communities are committed and involved, demanding accountability from schools, are the other quality inputs (e.g., textbooks and teacher training) brought to bear (Nebres 2007).

Emerging Areas of Strategic Focus

The long-term prognosis for the region is positive. Socioeconomic forecasts anticipate that by 2020, only 10% of the region’s inhabitants will live below the poverty line of less than $1 a day (ADB 2007h) compared with 18% in 2005 and 35% in 1990 (ADB 2007d). However, in a number of countries poverty will continue to be a problem, including Afghanistan, Cambodia, Nepal, and Tajikistan, among others. Another more prevalent problem is the widening gap between the rich and the poor within countries. Still, the rapid pace of development and the impact of greater interconnectedness and globalization will bring about sweeping change in most countries.

It is essential to extract from this scenario the implications for basic education. If basic education is to empower citizens with the fundamental skills and attitudes they need to benefit from and contribute to inclusive growth, then it must impart these skills and attitudes in preparation for a rapidly changing, more complex future. What follows is a brief discussion of the four dominant trends that appear to be redefining the nature and scope of basic education in the region.

Expanding the Definition of Basic Education in an Increasingly Complex Society Characterized by Urbanization and Globalization. If the world is increasingly complex, it follows that the preparation that basic education provides must reflect that complexity. The history of education bears this out. While in earlier times a primary education was adequate to ensure gainful employment, today the world of work demands skills provided at postprimary levels. In the corporate sector, traditional academic subject degrees have given way to a master of business administration (MBA) degree as the preferred path to careers in business.

The purpose of basic education is to meet the student’s fundamental learning needs. It is the prerogative of each country to determine how many years of primary schooling are required to meet those needs, and countries vary in this regard. In the past several years, many countries, including Malaysia and Thailand, have explicitly expanded their definition of basic education to include not just primary schooling, but lower and even upper secondary education. This move was premised on the realization that at their stage of development, a citizen must have at least 9 years of schooling to become a full contributor and participant in the benefits of development. Universal secondary education is now seen as a precondition for countries to move beyond traditional primary commodity–based economies (Porter et al. 2002).

In a similar vein, the delivery of basic education is looked upon with a different sense of urgency and purpose. In the past, basic education was seen as a matter of social equity and a fundamental human right guaranteed to all citizens. Today, it is also seen as part of the foundation for sustainable and inclusive growth, essential for the individual as well as for national social development. Education is no longer concerned with only helping to ensure an equitable distribution of the fruits of development. It is now also concerned with preparing citizens to be active participants in accelerating the national development process. Increasingly, secondary education is seen as necessary to provide the individual with the skills and knowledge to fulfill these broadened expectations.

Aside from the basic literacy tools of reading, writing, and numeracy, tomorrow’s individuals will need knowledge and skills that will equip them to participate productively in their societies. Curriculum revision, even of basic education, is badly needed. It should be undertaken, guided not only by traditional academic disciplines, but also by the pressing issues facing society—environmental degradation, health pandemics such as HIV/AIDS, social inequities, ethnic strife and violence, and threats to good governance and democratic space. Basic education in the future could well be reorganized around these issues rather than around traditional subject areas.

Greater Use of ICT and Other Innovative Delivery Mechanisms. Just as the content of basic education will change in response to the environment of the future, so will the delivery modes of that content.
have to change. As technology becomes more and more accessible, education systems will make increasing use of the advantages it provides. The potential that ICT holds for enhancing learning and improving the delivery of educational content has only recently begun to be appreciated. In ADB-supported ICT projects, students were more interested and motivated, absenteeism was reduced, standardized test scores were higher, collaboration and teamwork was enhanced, and communication and computational skills improved (ADB 2004a). ICT has proven beneficial beyond the confines of the classroom. It has improved interoffice communication for principals and administrators. It has been used to adapt curriculum and customize it to student needs. It has been a welcome vehicle for in-service teacher training, especially in remote areas. It facilitates contact and collaboration with the business sector and the community. It is a tool in the ongoing evaluation and assessment exercises of schools.

Increased interest and investment in ICT for education call for careful assessment of policies, strategies, costs, and benefits. Efficient use of ICT in education institutions and schools requires support from coherent and coordinated ICT frameworks at both national and education sector levels. ADB’s studies and experience demonstrate the importance of optimizing ICT for improved education to suit specific circumstances and the development needs of individual DMCs (ADB 2008).

There also will be changes in the modality of delivering basic education that are quite independent of technology. Child psychologists and neuroscientists are learning much more about how the child learns and how his or her brain absorbs inputs—advances that have implications for teaching pedagogy. The impact of media has conditioned the younger generation to learn from a surfeit of information inputs, sometimes simultaneously, rather than from deduction from a limited number of facts, as in traditional learning settings. Pedagogies of the future will have to take this into account.

Articulation with TVET, Higher Education, and the World of Work (Lifelong Learning). If basic education is to fulfill its role, it can no longer be looked upon as an absolute good for its own sake. Basic education graduates must be adequately prepared for the next stage of their lives, whether that is further secondary education, vocational-technical education, higher education, or the workplace. Consequently, those responsible for basic education will have to be guided by the need to equip students for that next stage. In every case, basic education must lay the foundation for an individual’s orientation toward lifelong learning.

In a rapidly progressing society, the content of all formal learning, even at advanced skill and higher education levels, has built-in obsolescence. The individual must therefore be equipped to know how to continue to learn and adapt as the demands of society and the workplace change and become more complex.

As countries progress toward EFA, and as the need to further support higher levels of education become apparent, there may well be a shift of priority attention and resources beyond the basic education subsector to other subsectors. This needs to be carefully managed. The mutually reinforcing nature of interdependency among the subsectors must be taken into account. For example, the efficacy of higher education depends on the quality of its entering students, which is dependent on the quality of basic education. Universities complain that the biggest bottleneck to improving their quality is the low capability of their entrants. Conversely, the effectiveness of basic education depends to a large extent on the availability and quality of teachers, who are produced by the higher education system.

Innovations in Financing and the Growing Role of the Private Sector and Partnerships. The inability of most governments to provide sufficient funding for education in the face of rapidly rising rates of enrollment at all levels has led to an increasing role for the private sector in education. Because of the success of the EFA effort, many DMCs are faced with large increases in elementary school graduates and a corresponding rise in demand for places in public secondary schools. Secondary schools have traditionally catered to much smaller cohorts, and are often inadequately equipped and understaffed. They are not ready to handle large increases in enrollment. Enlistment of the private sector or community initiatives has been the response to this increased demand, and interesting forms of public-private collaboration—such as service contracting—have emerged.

Broadened roles and responsibilities for local communities also are likely in the future. The importance given to early childhood education as one of the pillars of education, for example, has led to an increase in participation at this level. With the exception of the Central Asian DMCs, Mongolia, and Viet Nam, national governments typically do not finance or administer this level in the same way they do the formal primary school system. As a result, local communities, sometimes with
the help of nongovernment organizations, often have assumed responsibility for delivering early childhood education.

**Strategic Priorities for Basic Education**

DMCs vary significantly as to their stage of development and their policies for future development. The state of basic education in each country also varies widely. Consequently, a generalized strategic approach for basic education in all DMCs is not appropriate. Each country will require its own assessment, and countries at different stages of development will have different priorities and policy requirements. However, helpful strategic guidance can be provided by clustering DMCs by stage of development. What follows is such an analysis. Understandably, some countries, such as India, will fall into more than one group due to their size and different levels of development in different areas. Other countries, while manifesting characteristics typical of their cluster, may also simultaneously have to deal with problems typical of a cluster at an earlier stage of development.

**Low-Income Countries with Predominantly Agrarian-Driven Economies**

DMCs in this group requiring increased assistance from development partners are those that have not come close to achieving universal primary education, such as Afghanistan, Cambodia, Lao PDR, Mongolia, Nepal, Pakistan, Papua New Guinea, and Timor-Leste. They are at risk of not meeting the MDG for universal primary education by 2015. It is incumbent on the world community, including ADB, to help these countries accelerate their progress. Lessons from past efforts need to be absorbed, and more focused and effective strategies found. More support for comprehensive sector analysis is needed in these countries to determine the best strategies to tackle the bottlenecks that impede progress.

International agencies and bilateral donors will need to collaborate to ensure effectual assistance to these DMCs. In Bangladesh, such collaboration has been evident in primary education over several program cycles. Increasingly coordinated support from the Government and development partners has contributed to good progress toward universal primary education. The design process of the current comprehensive primary education sector program, with participation of a large group of development partners under ADB’s leadership, has been recognized internationally as a good example of donor collaboration and harmonization. Cambodia, one of the target countries for the global Fast Track Initiative in education, has established elaborate collaborative mechanisms in the sector. These include joint working groups, and procedures for regular consultation between the Government, development partners, and stakeholders. ADB is one of the lead development partners in this process. In Mongolia, the Ministry of Education prepared, with ADB support, a comprehensive education sector development plan in consultation with stakeholders. The plan was jointly appraised by the development community and adopted for financing, also from Fast Track Initiative resources.

Efficient coordination between government and development partners is particularly critical in DMCs that have large funding gaps—as that in the basic education subsector of Cambodia—to avoid unnecessary duplication of effort and to maximize the impact of technical assistance and financing. Cambodia has made progress in enrollments in the last 5 years, from about 83% to 92%, and has narrowed the gender gap from 8% to 3%. However, completion rates for primary schooling remain a dismal 64%, and repetition rates are high at 14% (UNESCO 2006a).

A strategic imperative in low-income countries is more explicit focus on the issue of dropouts, repetition, and completion rates. This relates directly to upgrading the quality and the relevance of the basic education delivery system, which in turn depends on the quality of teaching staff, the pedagogies used, and the participation and involvement of local communities.

The education of girls is another strategic imperative. For example, in Cambodia, the narrowing gender gap at the national level masks the fact that in remote areas and areas of minority groups the gender gap remains between 15% and 20%. Numerous projects have tackled this issue in low-income countries with mixed results and limited sustainability. Reviewing this experience and identifying the more successful interventions would provide operational guidance. Costs and benefits of implementing stand-alone projects supporting development of female teachers and enrollment of girls should be assessed and compared to projects and programs in which such dimensions are one
component among several. Circumstances in certain DMCs call for the more intensive stand-alone project approach—for example in areas where parents hesitate to send their daughters to schools where all the teachers are male. ADB has experience in both stand-alone projects and larger programs in this field. This experience will continue to inform ADB’s gender development strategies for future assistance in education.

Another strategic imperative for low-income countries is the need to upgrade the professional and managerial competency of the education bureaucracy. In many low-income DMCs, competence at the higher levels of the political and managerial system has improved. Professional training has been acquired abroad and sufficient experience has been attained to support system administration and governance. The systems also have dedicated teachers and workers, but at the middle management level (division and bureau directors, superintendents, supervisors, and ministry planners, assessors, and financial managers), the need remains to upgrade competency and skills. The best projects and plans often falter due to the lack of capacity at the middle level.

**Low-Income Countries Reliant on Factor-Driven Growth, Principally Low-Cost Manufacturing**

Many of these countries have made progress toward universal primary education. Included are such countries as Bangladesh, Maldives, Sri Lanka, and Viet Nam. An emerging crisis, for which these countries are generally ill prepared, is the burgeoning demand for secondary school places as a result of their successful EFA campaigns. Assistance is needed as they gear up to meet this demand.

At the primary level, the emphasis on access has often been at the expense of quality, and measures to improve quality should now be pursued. Test has always been a part of school systems, but its use has focused on testing students rather than diagnosing the school system for strengths and weaknesses. Diagnostic sector analysis is required, involving community participation to the extent possible. Specific goals should be articulated, as should corresponding measures of teacher improvement toward those goals. This should be followed by curriculum and textbook reviews, and installation of assessment mechanisms.

Viet Nam is an example of a country that has made good progress toward universal primary education in recent years. The elimination of gender disparity and the broadening of access have been the result of strong political will and coordination with international partners. However, high national averages hide disparities between the majority of the population and remote and underserved groups. A mid-decade evaluation of Viet Nam’s EFA Plan of Action is under way. Together with key partners, ADB has focused in recent years on the development of secondary education in Viet Nam. Typical of countries recently achieving universal primary education, there is now tremendous pressure from expanded demand for secondary education. This is a strategic perspective common to countries in this category, and potentially represents the next major EFA crisis.

A key to Viet Nam’s success in expanding enrollment and significantly improving enrollment rates has been its extensive preschool and early childhood education program. Up to 70% of 3–5-year-olds participate in some form of preschool care, ensuring their readiness for school and increasing their probability of completing school. This proportion is far above the average of even those countries with a long history of universal primary education. Vietnamese education officials still worry, however, that their early childhood programs are no longer responsive to the times, and that teachers are badly in need of upgrading to improve the effectiveness and quality of their services.

**Transitional Economies, Moving from Central Planning to a Market Economy**

Included here are the Central Asian DMCs, which have enjoyed universal primary education for decades. However, the transition of these countries to independence and market systems has created a new environment for their education systems. Most Central Asian countries have struggled to maintain high participation rates. Some have experienced a slight drop in primary education participation rates, and a significant drop in early childhood education as support from the former Soviet Union for social services disappeared. Education quality in these countries is difficult to assess, as education objectives were formerly heavily politicized. Adjustment to new economic and political realities required a serious review of education programs.
Reorienting and upgrading the managerial mind-set of the education bureaucracy is a major task, as is the empowerment of school administrations so that accountability, commitment, and responsibility at the school level are supported and strengthened.

Kazakhstan is one country where much progress in this regard has taken place. Curricula have been reviewed and revised, and a comprehensive textbook revision, production, and distribution process has been undertaken with support from ADB in collaboration with other donor partners. The reorientation of teachers, and the upgrading of teaching skills with extensive use of ICT modalities have taken place. Neighboring countries are embarking on similar paths.

Middle-Income Economies Reliant on Investment-Driven Growth

DMCs in this group, including the PRC, Indonesia, Malaysia, Philippines, and Thailand, have enjoyed universal primary education for some time. The challenge now is twofold: to sustain the gains that have been attained, and to see beyond current enrollment numbers and appreciate that a business-as-usual approach to primary schooling will not serve the future. Opportunities exist for innovative arrangements, and involvement of the community sector and the private sector. One such example is the Philippine education service-contracting scheme, under which high school entrants that cannot be accommodated in the public school system are sent to private schools, which are paid by the Government. This scheme meets student demand while using the private school system to serve the country’s needs.

Concerns are voiced in the labor market and the higher education subsector about the inadequacy of the products of the basic education system—for meaningful work, further training, or higher education. Even in countries with a long history of universal primary education, such as the Philippines, achievement results show a lack of basic competencies among school leavers. They are ill prepared for either further study or the world of work. Quality is again the issue. Some of these countries have put in place reliable assessment mechanisms to track progress in quality in specific areas, but others are still in the process of doing so. This is a strategic area where further support and assistance will be required. Greater articulation with higher education, employers, agriculture, industry, and the entrepreneurial world are also essential to more effectual basic education in these countries.

Recognizing these requirements, Thailand has recently reformulated its National Education Plan. The emphasis in basic education is now on improvement of the teaching-learning process, and on decentralization to empower school-based management. Education service areas have been identified for piloting. Clusters of schools have been given autonomy and responsibility, allowing them to embark on innovations aimed at greater relevance to actual needs and new teaching-learning processes. ICT is also being introduced for teacher training and classroom use. Special concern is devoted to small and multigrade schools serving outlying areas, where quality is lagging. Given its stage of development as a middle-income country, Thailand has defined basic education as including upper secondary education, making 12 years of schooling compulsory and free of tuition.

The potential offered by ICT for education is attracting more attention. In the Philippines, the Text2teach project has developed interactive multimedia packages—including the use of text messages via mobile phones—to improve science teaching in grades five and six. The project has spread to seven provinces and is seen expanding further in 2008 under the innovative partnership of the Department of Education, the Ayala Foundation (an NGO), INNOTECH (a regional institute of the Southeast Asia Ministers of Education), Nokia (a multinational corporation), and Globe Telecom (a local communications corporation). This innovative public-private partnership is a good example of using such partnerships to suit local circumstances and potential.

The Pacific and Other Island Economies

This group of DMCs has unique characteristics, given their extremely small and dispersed populations and their isolation. While enrollment looks good in most of these countries (even Kiribati and Vanuatu have increased their participation rates to catch up with their neighbors), the issue of quality and relevance is particularly acute. Pacific education programs are basically modeled on Western prototypes. Graduates often do not find their studies relevant for work locally and tend to seek a future outside their home countries. Because of their small populations, their secondary education and vocational education sectors grapple with their mandate to serve a very small number of students, with cost per student inordinately high.
The Fiji Islands is among the larger of the Pacific Island countries and has for some years been reforming its educational programs to better reflect local needs, cultural roots, and local economic and work environments. This has meant a departure from Western prototypes of academic subjects and curricula. A major administrative impetus of this reform was implemented about 10 years ago, giving greater autonomy at the school level. The Government handed over school management, and even ownership in many instances, to incorporated local communities. Schools were then free to articulate their educational expectations, taking into account traditional culture and harmonious ways of integrating the indigenous and the Indo-based halves of the population. Appropriate work skills, attitudes, and values for integrated, harmonious development of a fragile society were the expected outcomes. This model of school-based autonomy, founded on local culture and needs and resting on local community responsibility, may be appropriate in other Pacific DMCs.

The Role of ADB in Basic Education

ADB Experience in Basic Education

ADB has been working in the education sector since 1970 (Appendix 2). Before 1990, much of ADB lending was for post-basic education. However, after the World EFA Conference in Thailand (where ADB was one of the sponsors), operations shifted significantly from post-basic to basic education. While the priority of basic education continued, in recent years the demand for assistance has increasingly shifted beyond the basic education subsector. In 2000–2004, about 60% of ADB financing in the education sector was for basic education. During 2005–2006, however, it was 24%, as demand for assistance in other education subsectors increased (ADB 2007b). Since 1970, basic education loans have ranged from less than $10 million to over $300 million. Most are Asian Development Fund (ADF) loans, but ordinary capital resources financing for basic education has been granted to Indonesia, Kazakhstan, Pakistan, Philippines, and Uzbekistan.

There are countries in every subregion that have benefited from a basic education loan from ADB. In Central and West Asia, Afghanistan, Kazakhstan, Kyrgyz Republic, Pakistan, Tajikistan, and Uzbekistan all have had at least one education sector loan focusing largely on basic education. In South Asia, Bangladesh is the recipient of the largest number of loans for sector programs in basic education and for secondary education. Nepal and Sri Lanka have also used loans to support secondary education development. In Southeast Asia, Indonesia and Viet Nam have been the major recipients, while Cambodia, Lao PDR, Philippines, and Thailand have received loans to support strategic sector planning and reform, with basic education (including secondary education) a major element in loan support. In the Pacific, aside from a strategic regional plan for education, countries such as Papua New Guinea, Samoa, and Tuvalu have benefited from education loans.

Many recent ADB education loans support broader sector policy reform as well as specific subsectors. In the last 10 years, 14 DMCs have accounted for 27 such loans. Seven countries have used 14 loans to deal with various aspects of secondary education, such as capacity development and teacher training. Other areas that have received attention in education loans are teacher development, adult literacy and continuing education, early childhood care and education, social services, science education, ICT, school improvement, and madrasahs in Indonesia. There is a discernible shift from project-specific loans to sector development loans, and from project modalities to program and policy reform modalities. Analysis of pipeline projects confirms continuation of the shift beyond basic education to other subsectors, and to skills development and TVET in particular.

Lessons from Experience

Project completion reports and project performance evaluation reports highlight some of the difficulties encountered in implementing loan projects in basic education. There is a striking commonality in the difficulties recorded for different projects across different subregions. Among the most frequently mentioned are (i) delays in procurement; (ii) inadequate management capacity of local counterpart implementation units; (iii) changes of country priorities, often the result of changes in national policy makers; and (iv) lack of a clear national education policy framework.

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5 Muslim school, college, or university that is often part of a mosque.
Other difficulties highlighted are (i) overplanning, resulting in a long lead time, an excessively rigid plan, or an excessively complex design; (ii) projects that attempt to be overly comprehensive and are diffused, or include too many subcomponents; (iii) difficulty in establishing reliable measures of performance and targeted outputs; (iv) inadequate monitoring and supervision by ADB staff, especially in countries where ADB has no field office; and (v) emphasis on short-term outputs, resulting in inadequate attention to sustainability and lasting viability.6

Recognition of these lessons and application of countermeasures is evident in recent projects. Sustained support for the education sector is now often achieved by a sequence of loans, or by combining related loans for processing as a cluster of loans, as done in Nepal. The sector development program modality, in which both a program loan (budgetary support linked with a reform agenda) and a project loan (supporting investment-level implementation of the reform) are provided, is another mechanism that has ensured long-term commitment and sustainability. Greater emphasis on sector studies has helped identify specific interventions—such as early childhood education, adult continuing education, and madrasahs—within the national policy framework and has facilitated donor coordination. The program loan approach, tying disbursements to implementation of a policy reform agenda, represents a welcome shift from stand-alone interventions to improvements in overall efficiency of the basic education subsector. Program loans have a catalytic effect beyond project objectives, creating enabling environments and supporting needed reform. There is a healthy recognition that “effective assistance must evolve, as circumstances and needs of the nations of the region change” (ADB 2003a).

Strategic Approaches for Basic Education

Countries where Primary Education is not Universal and MDGs are not within Immediate Reach. For low-income countries such as Cambodia, Lao PDR, Papua New Guinea, and much of South Asia, the primary strategic recommendation is closer collaboration with existing networks and groups working upstream to crystallize the comprehensive national EFA plan of action. This will help to focus efforts on accelerating progress to reach the MDGs of universal primary education and gender equity.

ADB is participating with governments and partner agencies in target setting and sector reform, bringing to the table its experience and expertise in sector analysis and sector reform. Examples of ADB’s leading role in this regard have increased in recent years. The design process of a comprehensive primary education sector program in Bangladesh, with participation of a large group of donor agencies under ADB’s leadership, has been recognized internationally as a good example. In Cambodia, the two current education sector development projects were the result of productive collaboration, and comprise a mix of budgetary support for policy reform and project support to deal with identified gaps. As a logical next step, ADB is providing support through an integrated follow-up project to help the Government enhance education quality, improve sector planning and management, upgrade teachers, and expand access to secondary education. In Mongolia, ADB supported the Government with stakeholder preparation of a comprehensive sector plan, which was jointly appraised and adopted for financing by the Government and the donor community.

The most obvious strategic area of focus in these countries is expanding the capacity of education systems to widen access toward universal primary education. Included would be identification of optimum areas for additional classrooms and physical facilities, expansion of budgets for additional teachers, and provision of textbooks and other learning materials.

Another strategic recommendation is support of improvements in basic education delivery systems. This would include support for both capacity development of ministry staff, and training or retraining of teachers in curriculum content and pedagogy.

Also recommended is assistance in formulating support for alternative education delivery systems that complement traditional primary schools. Nonformal education, adult literacy programs, and basic skills development programs are often underused avenues with potential for considerable impact. A successful example is the expansion of community learning centers, which serve as literacy centers, community livelihood promoters, adult skill centers, and out-of-school learning venues. Finding ways of supporting community learning centers through the training of facilitators, introduction of simplified and adapted ICT, and networking should be considered (using radios, cameras, cell phones

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6 Various ADB project completion reports and project performance audit reports cited in References.
and other appropriate and practical, hand-held ICT equipment).

Countries Where Universal Primary Education Has Recently Been Reached or Almost Reached. Included in this group are DMCs where the dominant concerns must be quality, and measures for its improvement. The focus in these countries should be on teacher improvement—not just in terms of additional qualifications or years of preparation, but improvement in teaching and learning methods. This will entail less emphasis on traditional rote learning and more on interactive, induced learning. Examples of this approach are the ADB project involving madrasahs in Indonesia, the teacher reform projects in Uzbekistan, and the capacity development projects in Viet Nam. In Viet Nam, project support for capacity development at the secondary level includes upgrading teachers, mentors, and principals in new teaching methods, and providing handbooks and guidebooks as well as workshops. Use of ICT to expand access to teacher training in remote areas, as well as to enhance teaching methodology, has proven beneficial in these countries.

Another area of concern in these countries is the need to expand and improve the secondary school system. This is not simply an extension of the primary school cycle. New problems and parameters apply. Adolescent problems and youth disenchantment with outdated education must be dealt with. Expectations of the labor market—which most of the graduates will enter—must be tackled, and capacities need to be supplemented with innovative partnerships with the private sector and communities.

Special initiatives targeting underserved populations present opportunities for strategic intervention in these DMCs. Where interventions of this nature are not of adequate scale on their own to justify an independent project, they can be incorporated as components of larger projects, such as those for secondary education.

Countries Undergoing Transition to a Market Economy and Middle-income Countries. For countries in transition, strategic recommendations rest on support for continuing reorientation of the education system so that outcomes are more appropriate to the demands of the labor market and the global market economy. This means support for restructuring curricula and textbooks—as in Kazakhstan and Uzbekistan; for capacity development in education ministries—as in Kazakhstan; and for reorientation of teaching styles, conditions, and accountabilities, often using ICT.

In middle-income countries, where the focus of education has shifted to building human resource capacity to advance the economy to the next stage of development, basic education may be getting less attention. Despite the relative success of EFA in these countries, education ministries continue to warn against the danger of neglecting the disadvantaged, as it exacerbates inequity and militates against inclusive and sustainable growth. Attention must continue to be given to interventions targeting underserved groups.

Quality also needs continued attention in middle-income countries. The recent deterioration of achievement scores of basic education graduates, even in countries where universal primary education has long been established, such as the Philippines, has led to increased levels of activity from the private sector and business community aimed at improving schools.

The Pacific and Other Island Countries. For these countries, strategic recommendations focus on support for reforming curricula, liberating their education systems from inappropriate Western prototypes, and helping them respond to the needs of their economies and societies—taking into account local culture, as done in the Fiji Islands’ reform initiatives.

A second area of strategic focus is support for solutions to the problems presented by the small number of students, often isolated and spread across great distances. As basic education now includes secondary education in these countries, which often do not have a critical mass of students for standard secondary schools, support is needed for innovative delivery systems, often using ICT.

Conclusions. Six areas of strategic priority emerge as common denominators in the analysis of DMC groups and the evolution of demand for basic education:

(i) Emphasis on quality and helping DMCs manage the risk of quantitative expansion undermining quality improvement in basic education. Renewed focus on quality improvement through curriculum reform is important in many countries where enrollments are already high. In countries with lower enrollments, the strategic framework for support of basic education must emphasize both quality improvement and manageable, sustainable system expansion.
(ii) Retooling and upgrading teachers’ skills in basic education, using innovative means and incentives to support quality improvement, especially feasible ICT technology. This is important in both preservice and in-service teacher training, as well as in permanent teacher development programs.

(iii) Capacity development in sector policy, planning, and administration, including consolidating the expansion of basic education to include secondary education—even upper secondary—in DMCs requiring a higher level of basic education. Universal secondary education is now widely seen as a precondition for countries to move beyond traditional primary commodity-based economies.

(iv) Emphasis on assuring equity of access to basic education, with special attention to disadvantaged groups. This remains important even in countries where basic education enrollments are already high. It will be important to help governments realize that the excluded will not easily adapt to mainstream systems, and help governments adjust basic education systems to better accommodate disadvantaged groups.

(v) Continued attention to the benefits of other important dimensions of basic education, such as early childhood education, literacy, and adult education programs. This will be important in DMCs where the potential benefits of these dimensions have not been realized.

(vi) Expanded use of innovative modalities and partnerships with private, corporate, and community sectors—tailored to suit local circumstances and potentials—will be increasingly important in basic education in support of all the five priority areas above.

Table 1 summarizes the above strategic areas for each group of countries.

### Implications for ADB

For ADB to meaningfully address these priorities, and for its work to achieve sustainable impact, a number of recommendations for internal adjustment should be given serious consideration.

**Stronger collaboration and dialogue**, not only with host governments, but also with donor partners, are required more than ever due to the changing context and increasing complexity of work in the education sector. Collaborative networks, monitoring mechanisms, and integrated plans of action all require upstream coordination. Successful dialogue and collaboration will help ensure that ADB program and project efforts are firmly positioned within a country’s basic reform agenda in the context of all partners involved, and can be sustained in the long run.

The use of sector development and education reform as the foundation for basic education projects, as evidenced in Bangladesh, Cambodia, Mongolia, Nepal, Sri Lanka, Uzbekistan, and Viet Nam, is commended. The time required for project preparation may be lengthened, but greater project impact is likely in the long run. While maintaining this policy-oriented approach, it is possible (and in some cases advisable) to identify specific areas

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**Table 1: Basic Education Strategic Priorities, by Country Type**

<table>
<thead>
<tr>
<th></th>
<th>Low Income—Agriculture</th>
<th>Low Income—Manufacturing</th>
<th>Transitional</th>
<th>Middle Income</th>
<th>Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream Work</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expanding Capacity</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Teacher Training</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Administrative Retooling</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Quality Improvement</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Secondary Schooling</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Alternatives: ECCE, NFE</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Targeting the Underserved</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Curriculum Revision</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ECCE = early childhood care and education, NFE = nonformal education.  
Source: Author.
of intervention where ADB can make a distinctive impact, and to which a concentration of inputs and commitment to a long-term framework can be made. Such areas could be the use of ICT, early childhood education, or retention measures as a proxy for quality assessment. When pursued, such specific areas of strategic intervention must be firmly embedded in DMC sector policy or in its framework for reform.

**New modalities** linking partnerships with parents, communities, and NGOs will be required. New substantive but cost-effective disbursement modalities also will be needed in priority areas where ADB has not traditionally played a major role, such as literacy programs or programs for disadvantaged groups. This will require flexibility while these new partnerships and modalities are piloted and pioneered.

It is **imperative that ADB develop the staff capacity and expertise** to assure its leadership and credibility in new priority areas of basic education, such as early childhood education, nonformal education, targeting the disadvantaged, and developing quality assessment mechanisms. This calls for a deliberate plan for refocusing and retooling in-house expertise, and acquiring additional staff expertise as needed. It also means cultivating a network of the best experts, organizations, and agencies—regionally and globally—that have specialized knowledge and experience in such fields as ICT, early childhood, or community learning centers.

Creation of more structured venues for **greater sharing of the experience of education staff** operating in different countries and subsectors is a final area for consideration. There should be organized knowledge centers and mechanisms to maximize the opportunity for staff to learn about the diverse experience of their colleagues.
Introduction

The development of technical and vocational skills is vital to economic development for two important reasons. First, technical and vocational skills are needed for enterprise productivity and profitability, as well as for national productivity and wealth creation. Without the necessary technical skills, enterprise and national growth can be seriously hobbled. Technological innovation and economic growth fuel the demand for skilled workers. The need for technical and vocational skills is increasing because of a convergence of factors—technological change, changes in work organization, growing economic openness and competitiveness, and capital deepening (increasing capital per worker). Enterprises consulted in the World Business Environment Survey (World Bank 2000b) identified the quality and supply of skilled technicians as the third-leading constraint on competitiveness, behind concerns about taxes and regulations, and financing. Fifty-five percent of the respondents ranked skills deficits as moderate to severe. About 53% of respondents ranked the lack of high-quality local training suppliers as a moderate or major constraint (Batra and Stone 2004).

Technical and vocational skills have become a principal concern and constraint in the region, especially in fast-developing economies, as highlighted by a recent article in *The Economist* (2007):

Despite its booming economies and huge numbers of people, Asia is suffering a big shortage of skills. And [the Asian talent shortage] is about to get worse...Some businesses are being forced to reconsider just how quickly they will be able to grow, because they cannot find enough people with the skills they need. In a recent survey, chief executives of multinational companies with businesses across Asia said a shortage of qualified staff ranked as their biggest concern...Across almost every industry and sector it was the same...The region’s rapid economic growth has fished out the pool of available talent.

The second reason development of technical and vocational skills is of vital importance is because it is essential for individual prosperity. Skills enable the individual to increase productivity and income. This is especially important for those who are eking out a living in the informal sector of the economy. Except for the newly industrialized economies, virtually all countries in the region will be unable to generate enough wage jobs to accommodate all those entering the labor market. Most new labor market entrants in Central and South Asia and in the Pacific will have no alternative but to work in the informal sector. The same applies to large numbers entering the labor force in People’s Republic of China (PRC), Indonesia, and Viet Nam. Knowledge and technical skills are essential for workers in the informal sector to increase their productivity and incomes, and to break out of poverty.

Skills formation is not only vital, it is also complex. It crosses institutional boundaries, takes place in varied settings (including on the job and in nonformal ways), engages a highly diverse clientele, involves multiple delivery methods, and addresses occupational requirements that change constantly. The challenge is to unravel these complexities and meet the growing economic demand for skills.

This chapter sets out to answer two questions: should ADB support the development of technical and vocational education and training (TVET) in the future, and if so, how? Accordingly, the case for TVET in the context of future development in the region is examined, as are recent developments and major issues in TVET, and the comparative advantage of ADB in TVET vis-à-vis other development agencies.
The TVET Landscape in the Region

Technical and vocational education and training refers to a broad range of preparation at different levels of the education and training system. “Vocational” refers to middle-level, or traditional, trade occupations for semiskilled and skilled workers. “Technical” refers to occupations in the technician category that are usually prepared at the postsecondary level. Vocational and technical “education” refers to exposure to the world of work, and to preparation for entry into further vocational and technical studies. Technical and vocational “training” means preparation for direct entry into, or upgrading in, specific (or clusters of) occupations in the labor market. TVET, as considered in this study, includes education and training delivered at secondary, postsecondary, and first-stage (nondegree) tertiary levels within the formal education system, and nonformal (i.e., organized) TVET outside the education system. (See Appendix 4 for more on TVET definitions.)

TVET serves a wide variety of objectives—political, social, and economic—some of which place unrealistic demands on training potential. Political objectives for TVET include keeping potentially disruptive youths off the streets. Such objectives often stem from a misunderstanding about the relationship between training and jobs—i.e., that providing TVET to jobless youths and adults will automatically reduce unemployment.

The social objectives of TVET are numerous, and may include catering to different student abilities and interests and improving retention—e.g., keeping youths in secondary school by providing practical skills to those with low interest in academic studies or lesser academic abilities. The goal may be to provide a second chance for primary and secondary school dropouts, or to provide alternatives to university education (diverting pressure from entrance to higher education and university). The objective may be to help integrate the young into the world of work, or to combat youth unemployment. Other social aims are to provide access to poor and marginal groups, and to increase the income, productivity, and well-being of the poor (also an economic objective). These latter aims are closely related to the objective of enhancing gender development—providing skills for girls and women. Alternatively, the goal may be to reduce rural-to-urban migration by improving opportunities in rural areas.

Economic objectives may include filling skill shortages (e.g., in the PRC and Cook Islands), or enhancing productivity on the job (as in Malaysia). Two common and important economic goals of TVET are achieving competitiveness in the global economy—by expanding the supply of flexible workers—and attracting foreign direct investment. Raising the productivity of the informal sector is yet another possible economic objective of TVET (Caillods 1994).

Multiple objectives lead to differing demands on TVET systems. TVET, it is often asserted, must be “demand-oriented.” But whose demand? There are two main types of demand: social and economic. Social demand for places in TVET institutions refers to what individuals and their parents want to pursue. This may or may not correspond to actual labor market demand—i.e., job openings in the economy. For example, the Training and Productivity Authority of Fiji reports that there is clearly demand by employers for skills in the construction industry, but the industry cannot fill available places in its training programs. Parents and their children are willing to pay for training as automobile mechanics, for which the labor market is saturated. This underscores the importance of information when making decisions. Better information could help steer individual choices...
toward occupations likely to be in demand in the labor market. By “demand orientation,” this study means job demand in the labor market.

Economic and Social Rationales for TVET

A well-designed and -managed system of skills development can play a significant role in supporting a government’s policy of enhancing national global competitiveness by producing a highly qualified and competitive workforce. It can also serve as a means to reduce poverty by expanding training opportunities and increasing access to skills training that promotes entrepreneurship and self-employment among the poor.

TVET, however, is controversial. Economic arguments can be mobilized both for and against public investment in TVET. Arguments against investment in TVET center on rates of return and the role of enterprises. Some argue that employers do not want people with specific skills. They want people with a solid general education who can communicate, solve problems, and work in teams, among other things. To the extent employers want skilled people, according to this argument, they will train them on the job. Others point to comparisons of the costs and benefits, or rates of return, of general education versus TVET, which do not favor the latter. TVET is always more expensive, yet the labor market outcomes for TVET are not that much better (and may even be worse). In addition, it is argued that people go to vocational schools not to get skills for immediate employment, but as a ladder to further education. Or, if they do go into the labor market, they may enter different occupations than the ones for which they were trained. In either case, the expensive training may be largely wasted. It is also maintained that TVET often takes 2–3 years to impart skills that could be taught in a concentrated fashion in 3–6 months—ergo, more waste of resources. In short, the argument goes, government investment in TVET may not pay off.

Positive arguments and positive rates of return for spending on TVET can be found, particularly in strong economies. Why is skills development important from an economic perspective? There are several reasons, which center on productivity and incomes (for additional information, see ADB [2004a]).

Productivity. Skills enable individuals to be more productive and earn more. Workforce skills make enterprises more productive and profitable, and help national economies raise production and create wealth. When people acquire skills they make themselves more productive, able to produce more in a given amount of time and effort. This applies both to wage employment and self-employment in the informal sector. Training in entrepreneurship as well as in technical skills can help those entering or already in the informal sector to be more productive and gain higher incomes.

Skills and Poverty Reduction. Skills development for the informal sector should be at the center of pro-poor strategies (Johanson and Adams 2004; Bennell 1999; King and Palmer 2006), for reasons of both economy and the environment. First, skills acquisition is crucial to raising productivity and incomes in the informal sector, where most of the new jobs in many economies of the region are created. Training alone cannot guarantee employment or reduce poverty, but improved skills and knowledge are essential for the poor to access decent work or add value to existing subsistence employment. Second, evidence is mounting that skills training is essential for promoting sustainable livelihoods where environments are fragile and informal economic activities often need suitable techniques and practices for resource management.

Capital-skills Complementarities. Human capital (people’s skills and abilities) also help determine the amount of investment in physical capital in an economy. Skills and capital complement each other. A higher level of human capital enables plant and machinery to be used more efficiently, raising the rate of return on capital investment. Similarly, insufficient investment in building human capital skills leads to deficient investment in physical capital and hobbles economic growth.

Technological and Structural Change. The acceleration of technological change requires more highly skilled workers. When people acquire skills, they generally also make themselves more adaptable. New technologies are knowledge and skill intensive and impose a need for training. Countries with skills can adjust more efficiently to the challenges of structural adjustment because

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7 In Sri Lanka, for example, formal vocational training is associated with relatively high returns of 17%, more than double the returns to an additional year of formal education (Riboud et al. 2006).
enterprises are more flexible and better able to absorb new technologies.

Changes in Work Organization. Demand for skills within enterprises depends on the ways in which work is organized. Enterprises traditionally organized work around assembly lines that broke down each task into its most elementary components and minimized the skill and training required. However, increased competition and the introduction of ICT have prompted many firms to make fundamental changes in their internal organization and work practices, including changes in factory layout, the flow of production, quality assurance, and use of inventory. High-performance work organizations typically use self-managed work teams, multi-skilling, job rotation, and cross-training with devolution of decision making. These changes can be productive only if employees acquire new technical skills.

Trade Openness, Competition, and Foreign Direct Investment. Globalization places a premium on skills. Economic openness allows shifts in demand for skills through technological change and induced capital deepening. Capital flows are raised through globalization which, in turn, raises demand for skilled labor. Skills attract foreign direct investment. Conversely, lack of human capital may deter foreign investment. Workforce skill level and quality will thus increasingly provide the cutting edge for successful international competition.

Effect of Skill Shortages on Productivity and Wages. Skill shortages add to the cost of employing skilled workers, since a firm must wait longer to fill vacancies and loses productivity during vacancies. Firms may substitute unskilled for skilled labor, thereby reducing productivity. Skill shortages also improve the skilled workers’ outside options, contributing to job turnover, poaching, and wage increases unrelated to productivity.

A World Bank study (2007a) on TVET in Bangladesh put the case for investment in TVET as follows:

Given the lack of hard evidence on skills shortages, limited supply of VET [vocational education and training] graduates, and concerns about quality—the question arises of justification for investing in the vocational system. There are grounds for investing in the system. There are several reasons for this: (a) there is evidence that there is a skills mismatch. Employers perceive that the graduates coming out of the vocational system are not meeting their needs. They feel that the system is continuing to produce graduates for old and marginal trades, which have no market demand, while newer trades with substantial needs for skilled labor have been left unmet; (b) increasing overseas employment, and the possible market for skilled Bangladeshi workers abroad also offer some justification for investing in the system; and (c) there is an urgent need to increase the levels of enterprise-based training, and a well-designed VET system can also help in addressing this shortcoming.

Experience shows that social objectives have their place in TVET, but pursuit of social objectives in TVET has not been effective when not backed up by sound economic purposes (Middleton, Ziderman, and Adams 1993). In Indonesia, for example, vocational secondary schools cater more to lower-income quintiles of the population than general secondary schools. Technical vocational education in upper secondary schools helps keep students—especially males—in school who lack interest in a purely academic education and otherwise might drop out. At the same time, vocational secondary schools have proved to meet economic criteria, such as higher earnings and employment rates for graduates compared with general secondary schools (ADB 2007g). For similar reasons, Australia is adopting a policy of bringing back workshops and vocational training into every high school, a social objective judged by Australian authorities to be worthy of the investment. This policy makes sense in terms of the high proportion of the age group enrolled and the critical shortage of technical and vocational skills in the economy.

Main Categories of TVET

TVET in the region is diverse and complex, but can be divided into three main categories. For formal TVET, the proportion of enrollment at the upper secondary level and tertiary (nondegree) level is highly correlated with per capita income. In some cases, governments have set unrealistically high targets for the proportion of secondary students to be in vocational programs. Advanced countries are making upper secondary vocational education more general and deferring TVET specialization
to postsecondary levels. For **nonformal training** of various types, enrollments often make up the bulk of participation in skills formation programs. As for **enterprise-based training**, most skills acquisition takes place on the job. Enterprise-based training appears to have a positive and statistically significant effect on the productivity of firms that export or conduct research and development. The rates of formal enterprise-based training vary substantially in the region by country, with firms in South Asia apparently under-investing in worker skills. Traditional apprenticeship systems may be the major source of skills development in South Asia, and are of emerging importance in Central Asia.

Private and nongovernment provision of training is becoming more widespread throughout the region. This is saving the public sector money by reducing the need to finance training from the public budget. In most countries, public financing of TVET accounts for only a small percentage of total spending on TVET. TVET is more expensive than general education because of smaller classes for practical subjects, and the cost of equipment and supplies. Several countries use levies and grants to promote enterprise-based training.

TVET is arguably the most difficult sector to govern and manage because of the complexity in number and type of organizational sponsors, the diversity of clients, the varied types of delivery, and constantly changing labor market demand. To facilitate skills development in many Asian countries, national training authorities have been created under tripartite governance. Reforms often aim at greater employer involvement in establishing standards and in directing and assessing training, and at the use of financial transfer mechanisms to raise performance. The use of national qualification frameworks is spreading in the region, with the objective of focusing skills development on standards and outputs. However, there may be excessive optimism regarding national qualification frameworks, and inadequate appreciation of the magnitude of work involved in their establishment.

**Development Issues in the Region and Their Implications for TVET**

**Growth and Skill Shortages.** Economic growth creates jobs and demand for skills. If the training system is unable to respond, growing pains can result from labor shortages. Employers respond to shortages by upgrading existing workers, restructuring jobs into simpler functions, or hiring expatriate workers. Such shortages can have harmful consequences on productivity. Even in labor-surplus economies, such as India and Bangladesh, skill shortages occur in some occupations, particularly at higher levels of technologically oriented jobs. The economic strategy of most countries is to move up the value chain, which in turn creates demand for more highly skilled workers. Export-oriented economies are likely to experience raised skill requirements for reasons cited earlier. Structural adjustment involves closing or streamlining enterprises, particularly in the state-owned sector. One of the consequences is shedding of labor, which underscores the importance of retraining workers made redundant through structural adjustment. In the PRC, for example, systematic reemployment training of laid-off workers has become important, with more than 1.2 million laid-off workers trained in 2003 (Copenhagen Development Consult A/S 2005).

**Demographics and Labor Market Growth.** Population growth has slowed in most countries in the region, but the number of entrants to the labor market each year still outstrips the capacity of regional economies to create wage jobs. This means that people either will be unemployed, or must find jobs in the informal sector. The informal sector accounts for 80–90% of the labor force in most countries in Central and South Asia and in most of the Pacific.

**Labor Migration.** Migrant labor is an important economic force. Short-term emigration has advantages to countries in terms of relief of unemployment and generation of revenue from remittances. Bangladesh, Pakistan, and Philippines actively seek to market workers for temporary assignments abroad. Bangladesh, for example, places a quarter of a million workers abroad annually at very low skill levels, and the skill level is falling (World Bank 2007a). In some countries, such as Cook Islands, Fiji Islands, and Marshall Islands, the exodus of skilled workers to richer countries has created acute skill shortages. Within countries, the movement of people from rural to urban areas creates the need for new forms of training.

A major factor influencing the PRC labor market is rural-urban migration induced by agricultural labor surplus and drastic wage differentials between urban and rural employment. Agricultural surplus labor is estimated between 150 and 200 million. Government is promoting rural-urban migration as a means of poverty reduction.
Youth. The success of strategies in reaching the Millennium Development Goal of universal primary education in many developing member countries (DMCs) means that increased numbers of youths are graduating with basic literacy and numeracy skills, but without specific occupational skills. This creates pressure for the expansion of postprimary education and training, including TVET. Low-income groups, if they enroll in secondary education at all, tend to drop out disproportionately. A social demand is thus generated to “skill” them before they leave the formal education system. This places pressure on politicians to adopt quick but sometimes superficial solutions, such as “vocationalizing” secondary education. Youth unemployment continues to be an important political and social issue in many countries in the region, including Bhutan and Papua New Guinea.

Major Issues in TVET

TVET systems can be evaluated in terms of relevance (economic and social), effectiveness (quality of instruction, and organizational and management effectiveness) and internal efficiency (resource mobilization and use). Evaluating TVET in these terms provides a useful framework for discussion of the major issues in TVET in the region.9

Economic Relevance

Most analyses of TVET systems in the region point to a mismatch between demand for skills in the labor market and the supply of skills. Skills shortages, especially at higher technical levels, are acute in fast-growing economies as they move up the value-added chain. This was highlighted in the recent article in The Economist (2007) cited previously. As there noted, the growth of some businesses is being constrained by skill shortages, and chief executives cited this as one of their biggest concerns in a recent survey. The migration of skilled labor in search of better-paying jobs may be a contributing factor to skill shortages.

Mismatches may also reflect labor surpluses. Workers made redundant by structural adjustment, as in former command economies, often need retooling in new skills. Internal migration may exacerbate the problem as, for example, millions of people without appropriate skills for available jobs move from rural areas to cities in the People’s Republic of China. A more pervasive issue in many DMCs is that the wage economy is not generating enough jobs to accommodate all entrants to the labor market. The majority of labor market entrants will have to work in rural areas and in the informal sector. However, most training is oriented to wage jobs in urban areas, and little is done to provide skills for income generation in the informal sector.

Three main factors account for mismatches. First, most DMCs lack guidance from labor market information and analysis about skills in demand. Second, employers—who know best the kinds of skills required—are inadequately involved in advising and directing TVET systems. Involvement of employers is essential for linking training supply with demand, but it is often difficult to engage employers in such involvement. Third, TVET programs may be out of date, inflexible, and unresponsive to changing demands. TVET systems tend to be supply-driven and based on allocated budgets, churning out the same skills year after year regardless of labor market demand or consequences. Another manifestation of inflexibility is overspecialization (as in the former command economies) and lengthy training programs.

Social Relevance and Equity of Access

TVET has the potential to raise the productivity and incomes of people, not only in the formal economy but also in the informal sector. Consequently, access to skills training is vitally important, especially for vulnerable groups. Across the region, however, access to organized skills development is relatively low in relation to the number of school leavers. Lower-income groups, and those in rural areas and outer islands, tend to have much less access to skills development. Girls and women in particular tend to be under-enrolled in TVET, or concentrated in traditional female occupations.

Quality of Instruction

The purpose of TVET is to provide relevant knowledge, skills, and competencies for employment and income generation. If the skills are not acquired—i.e., if the quality of TVET is poor—
the money spent is wasted. TVET quality can be viewed in terms of inputs, processes, and outputs. Lack of essential inputs compromises the quality of training in many countries. The first input for quality is definition of training standards, based on occupational requirements. Two innovations are helping to put standards in place: the introduction of competency-based training, and vocational qualification frameworks. Entering trainees and teaching staff are critical inputs. Poor educational attainment of incoming trainees limits skill achievements. The level of skills and knowledge of teachers and work-based instructors is a key determinant of the quality of any country’s system of education and training (Young 2005). Inadequate numbers and qualifications of instructors are principal factors responsible for low-quality instruction. This applies especially to the lack of industrial experience of trainers. Public bureaucracies seldom recognize the need to certify and remunerate instructors based on industrial experience. Infrastructure, equipment, and materials are inputs that also tend to be inadequate and need upgrading to support better instruction.

Quality assurance processes may also be weak, including skills-testing systems. Norms and standards are usually not applied to public training institutions. Accreditation of private training providers has proved difficult. As far as the quality of TVET output, most TVET systems fail to monitor or evaluate the quality outcomes of training in terms of competencies achieved.

Organizational and Management Effectiveness

TVET is arguably education’s most difficult subsector to govern and manage because of its complexity. At the central institutional level, unclear or inappropriate roles hamper the sector. Often several line ministries, such as the ministries of education and labor, have overlapping or uncoordinated legal mandates for TVET. Responsibilities of the various supervisory organizations tend to be ill defined. Fragmented and uncoordinated provision of informal sector training limits effective use of resources. Key TVET organizations, particularly national training councils, often lack the resources to carry out their functions. Lack of data and research on TVET is an almost universal handicap to progress. At the institutional level, managers lack authority and incentives to improve their performance, such as accountability for results. Resources are not linked to outputs.

Internal Efficiency and Sustainability

Low public and private investment in TVET in South Asia stands in contrast to strong investment in the rapidly growing economies of East Asia. South Asian enterprises tend to under-invest in the skills of their workers for fear of poaching. Public TVET depends heavily on government financing, particularly in South Asia, but some Asian countries have had success in diversifying sources of financing. Generally, the way funds are transferred to public TVET institutions provides little incentive for better performance. Scarce public financing for TVET leaves room for greater efficiencies.

Strategic Priorities for TVET

Priorities for TVET are here presented by level or type of country development (ADB 2004a), which corresponds roughly to the level of national development in education and training. In the early stages of a country’s economic development (subsistence and factor-driven growth), the priorities of the national education and training system are basic education and adult education. Also priority is progressive development of a basic skills formation system for skilled blue-collar workers. Higher education is limited. In the investment stage of economic development, universal secondary education, worker upgrading, and technician training become priorities as the importance of skilled workers declines. In the final stage of economic development (innovation-driven growth), higher education becomes the priority, along with research and development. At each stage of the development of a country’s education and training system, the foundation for the next stage needs to be prepared.

The stages are not self-contained. The economies of countries can fall into more than one stage at once, and overlaps occur. In fact, economies are usually mixed, combining various stages of economic development within a country. For example, India has subsistence agriculture and a large urban informal sector, low-cost manufacturing, high-value-added enterprises, and even some enclaves of a knowledge-based economy around Bangalore.
Agrarian, Low-income Countries

In these countries (e.g., Bangladesh, Pakistan, and Papua New Guinea), the economic challenge is to increase agricultural productivity, move into cash crops, and provide better marketing infrastructure such as rural transport and electrification. These countries may also have large urban informal sectors, with up to 90% of the population engaged in nonwage activities (both farm and nonfarm). Educational priorities would be moving toward universal primary education as quickly as possible and providing nonformal skills training to raise incomes and help reduce poverty. Included could be development of livelihood skills through nongovernment organizations (NGOs); development of entrepreneurial training—especially for higher-end manufacturing and services in the informal sector; and support for the development of traditional apprenticeship (Johanson and Adams 2004).

Countries Characterized by Factor-Driven Growth and Low-Cost Manufacturing

In countries of this type (e.g., People’s Republic of China, India, and Sri Lanka), the primary sector, or extraction of natural resources, often dominates the economy. The main economic challenges are to get factor markets working properly so as to use land, labor, and capital efficiently. Full employment would be a principal objective, as agriculture sheds large numbers of workers. Manufacturing would be characterized by labor-intensive activities leading to low-value-added production. Competitiveness would derive from low-cost production, including low wages, and ease of access to external markets. Efforts would be made to keep labor costs in check. Development at this stage does not require massive investments in TVET. “High levels of education and training are not required for the production of low-value-added goods and services” (Ashton and Green 1996).

Priorities for education and training at this stage of development would be universal primary education, development of low-level vocational skills, and inculcation of disciplined work habits. Another priority would be developing a small but strong capacity for basic training. Establishment of a training authority with employer participation would be appropriate to respond effectively to different training markets (Middleton, Ziderman, and Adams 1993).

Transitional Economies

In countries such as the Central Asian republics, Lao People’s Democratic Republic (Lao PDR), Mongolia, and Viet Nam, the primary economic priorities in the transition from a command to a market economy are price liberalization and reduction of subsidies; fiscal and tax reforms, including broadening the tax base; financial sector and banking reform; and establishing a favorable legal and regulatory framework for enterprise growth and development. Restructuring the economy typically requires a major shift away from highly specialized manufacturing and the development of small and medium-sized service-oriented enterprises. New markets need to be developed, particularly for exports. Establishment of a labor market also has to be a priority to cope with the massive shedding of labor that industrial restructuring entails, among other things. This would involve the introduction of active labor market policies to facilitate labor mobility across sectors.

Typically, TVET in command economies was overly specialized, with training institutions linked almost exclusively to one large enterprise and trainees prepared for highly specific jobs within the factory. TVET also enrolled the vast majority of youths at intermediate level. In view of these characteristics, priorities for TVET reform include (i) consolidation of institutions and reduction of enrollment, (ii) de-specialization of previously narrow program offerings, and (iii) reorientation of content to include market-oriented subjects. Enrollment rates in TVET generally have plummeted throughout the transition world, reflecting an extreme mismatch between skills taught and needs of the labor market. Adult retraining would be a priority for those displaced by structural adjustment. Other priorities would be development of private training markets and making public training institutions accountable for costs and output performance (International Labour Organization [ILO] 1998).

Countries Characterized by Investment-Driven Growth

In economies such as Indonesia; Malaysia; Taipei, China; and Thailand, the secondary sector dominates. Chief economic challenges are to (i) attract foreign direct investment and imported technology to exploit land, labor, and capital; (ii) develop flexible labor markets (easy entry,
easy exit); and (iii) link the national economy with the global economy. The economies of these countries are characterized by export manufacturing and outsourced service exports. Production is concentrated in high-value-added goods and services. Competition is founded mainly on high quality, technologically advanced, flexible production based on imported technology. “High-performing” companies burgeon.

The importance of education and training in the present era of international competition applies mainly to high-value-added goods. “To compete in these markets...the evidence for the importance of high levels of education and training is overwhelming” (Ashton and Green 1996). This stage of development witnesses an acceleration in the demand for skills, particularly at the higher levels, and a corresponding decline in demand for unskilled or low-skilled production workers and crafts-level workers. As stated in a recent report prepared for an ADB project in Sri Lanka:

...the present public training output ratio for technicians and crafts-level workers is 1:50. The classical ratio of engineer, technician and skilled workers for a developing economy is about 1:5:25. Presently, this is far from being met and the present skills of the available labor force are not ready to move forward to an industrializing economy without first achieving skill-based competitiveness. Figure 1 (below) illustrates the manpower structure of a developing economy like Sri Lanka, which is aiming to move to an industrializing economy to catch up with neighboring Southeast Asian countries (Association of Canadian Community Colleges 2004).

Figure 1: Changes in Workforce Structure Model

Engineers

Technicians

Skilled Workers

Model 1: Developing Economy  Model 2: Industrializing Economy


Priorities for education and training in these countries include universal secondary education, particularly at postsecondary technician levels, and upgrading the labor force through lifelong learning to retool and update skills. Abilities in language, mathematics, and science become increasingly important prerequisites for the preparation of skilled workers. With advancing technology, workers are increasingly required to read and understand blueprints and operational manuals for complex and expensive machines and instruments. Workers must have the literacy and numeracy skills needed to master the complex and sophisticated expertise required of modern trade and technical occupations. Consequently, universal secondary education becomes important.

Technician training, particularly at post-secondary levels, also becomes a priority to supply the burgeoning middle category of skilled workers (the middle of the hexagon in Figure 1). Skills development would be broadened to include such capabilities as teamwork, communications, and problem solving. Substantial enterprise-based learning would be a requirement (Ashton and Green 1996). As distortions ease, efforts should be made to enhance enterprise-based training (especially for small and medium-sized enterprises) and private training provision. The central training authority should be strengthened and given control of the allocation of funds. A payroll levy may be both feasible and capable of providing stable funding for skills development. Finally, management capacity should be developed at the institutional level with a view to devolution of responsibilities and links to accountability (Middleton, Ziderman, and Adams 1993).

Countries Characterized by Innovation-Driven Growth

In economies such as India; Republic of Korea (pockets); Malaysia; Singapore; and Taipei, China, the tertiary sector dominates the economy. The main economic challenge is to generate a high rate of innovation, adaptation, and commercialization of new technologies, producing pioneering

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10 One of the reasons that Thailand ran into economic difficulties in the mid-to-late 1990s, apart from the Asian financial crisis, was the failure to move quickly enough to universal secondary education. This limited its ability to move up the economic value chain International Labour Organization [ILO] 1998).
products and services at the global technological frontier. At the upper end, this is the knowledge-based economy that generates technological innovation by itself.

Priorities for education and training are well-developed higher education, especially in sciences and engineering specializations, and science-based learning in general education. A dynamic research and development sector linking higher education programs and innovating firms is also a high priority. Most occupation-specific training at this stage can be provided privately, either within enterprises or through trainee-financed private training providers, in view of the strong employment demand for skills.

Small Island Countries

Because Pacific countries are diverse in terms of stages of and prospects for development, they are grouped into three categories to assist analysis and the identification of common TVET priorities (Johanson 2007). Two priorities are shared across all groups and most countries: quality improvement and organizational development. The principal means of quality improvement is establishment of vocational qualification frameworks. These are especially important in countries that export skilled labor. Organizational development requires establishing or strengthening apex training organizations and national qualifications authorities.

Land-rich, Low-income Countries. Papua New Guinea, Solomon Islands, and Vanuatu have low social and economic indices, but positive agricultural potential. In general, the top priority in these countries is training for the informal sector, particularly rural agriculture and related occupations.

Small, Vulnerable Island States. Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, and Tuvalu face severe economic constraints, limited economic prospects, and issues of sustainability. Training for the informal sector is also a priority for these countries, but with special emphasis on delivering services to remote areas and outer islands. Financial sustainability is a major challenge for this group, as is making TVET systems affordable in some countries (Tuvalu), and reducing dependence on external financing in others (Federated States of Micronesia, Kiribati, and Marshall Islands). Where possible, workers should be trained to enable them to migrate to higher-paying jobs.

Advanced Island States. Cook Islands, Fiji, Palau, Samoa, and Tonga have relatively good prospects from tourism, emigration, and remittances. The top priorities for these countries are expansion of training for the wage sector and filling vacancies created by emigration.

The Role of ADB in TVET

ADB Experience in TVET

TVET has been an integral, albeit minor, part of continuing ADB assistance in the education sector. Assistance has been provided through stand-alone projects financed by loans and grants, through components of broader projects (e.g., education sector development projects, as in Cambodia and Mongolia), and through various forms of technical assistance (project preparation, advisory, and regional). In the 1970s and 1980s, TVET made up about 50% of total ADB lending assistance in the sector. Since the 1990s, however, the share of stand-alone TVET projects has declined—averaging about 13% of sector lending over the past 7 years—reflecting the priority assigned to basic education and broader education sector development projects (Appendix 2).

ADB provided loans to 16 countries (some countries receiving more than one loan) for stand-alone TVET projects between 1993 and 2007, for a total of 27 TVET projects and $780 million in lending (Appendix 7). This represents an average of 1.8 projects and $52 million per year. The bulk of the projects and lending have gone to Southeast Asia, particularly Indonesia, Malaysia, Philippines, and Thailand. TVET has also formed

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11 Including the Kyrgyz Republic and Pakistan in Central and West Asia; Bangladesh, Bhutan, Maldives, Nepal, and Sri Lanka in South Asia; and Cambodia, Indonesia, Malaysia, Philippines, Thailand, and Viet Nam in Southeast Asia. Skills development was a component of wider education projects in Mongolia in East Asia, and Marshall Islands, Papua New Guinea, and Tuvalu in the Pacific. Skills development has also been supported in Tuvalu in the Pacific. The People’s Republic of China has received two technical assistance projects for TVET.
a part of seven comprehensive education projects and of three emergency relief projects.12 Earlier projects concentrated on the modern sector of the economy, building infrastructure and financing facilities, equipment, curriculum development, and the training of teachers. More recent projects have supported management and financial reforms, and training for the informal sector.

The objectives of recent TVET projects are appropriate to the recipient economies, and generally are compatible with the stage of economic development and national priorities of the countries in which they are placed. Four of the 10 projects approved since 2000 are directed mainly at training for the informal economy—self-employment, income generation, and livelihood skills. Another includes components aimed at training for livelihood and skills for income generation. These strategies appear well suited to the largely informal economies of the countries involved. An example is a project in Papua New Guinea, where 75–90% of the labor force is self-employed in the informal sector. The project there seems to be particularly well designed and innovative, although implementation has been slowed by weak administrative capacity (Appendix 7). A Pakistan project includes a training component for the informal sector. It incorporates development of livelihood skills in rural areas, with delivery to be handled by nongovernment organizations. Six of the 10 projects are essentially for training for modern sector employment. In the Maldives, the aim is to draw more people into the labor force and reduce dependence on foreign skilled workers.

Lessons from Experience

ADB has a relatively successful record in the design and implementation of recent TVET projects. In 1999 an impact evaluation study of technical and vocational education projects compared the results of 10 completed projects in four countries: Malaysia, Pakistan, Papua New Guinea, and Sri Lanka (ADB 1999b). The projects supported establishment of technical teachers training colleges in Pakistan and Sri Lanka, the upgrading of schools in Malaysia and Papua New Guinea, establishment of new secondary technical and vocational schools in Malaysia and polytechnics in Pakistan, and the upgrading of technical colleges and staff development in Papua New Guinea and Sri Lanka. More than 1 million students benefited from these projects during the preceding 15 years. The main findings of the impact evaluation study are summarized below.

- The projects had significant development impacts up to a few years after their completion, but these were not sustained except in Malaysia. Enrollment capacity increased, providing access and promoting equity for the poorer segments of the population.
- Lacking major reinvestment after project completion, the capacity of project inputs gradually declined. The buildings financed in Pakistan, Papua New Guinea, and Sri Lanka needed repair and refurbishing. Only about half the equipment was still operational, and not all operational equipment was being used because of the lack of consumable materials.
- Course curricula were not updated after project completion and were outdated.
- Teachers had no more in-service training after project completion. The technical teachers training colleges in Pakistan and Sri Lanka were operating below capacity because of insufficient recurrent budgets.
- The institutions were operating in isolation from the industries they were designed to serve, with few or no links to industry—thus lacking essential inputs.
- The findings underscored the difficulty of financial sustainability of TVET investments in poorer countries, and highlighted lessons learned in this regard: “one shot” projects do not work; a long-term focus is essential. “It should have been obvious from the beginning that a single project or even two projects spaced several years apart, no matter how well designed and implemented, could not establish a sustainable system” (ADB 1999b).
- A series of overlapping projects—with consistent core objectives—was recommended, aiming over a longer period (a decade or more) to make an impact on key subsector indicators while strengthening government capacity to manage the subsector.

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12 Including education sector development programs in Kyrgyz Republic (1997), Cambodia (2001 and 2004), and Mongolia (2002 and 2006); a social sector program loan in Thailand (1998); a post-literacy and continuing education program in Bangladesh (2001); and three emergency assistance loans in 2005: earthquake and tsunami assistance to Indonesia, earthquake emergency assistance to Pakistan, and regional assistance for HIV/AIDS in the Pacific.
A holistic approach at the beginning of the first intervention was recommended, with more substantive policy dialogue with governments, and development of a framework for sector development to be implemented over a decade or more, supported by continuing financial inputs.

A TVET system without industry linkage is untenable. A paradigm shift is needed to emphasize the role of TVET in trade globalization. TVET can be a source of competitive advantage for industry, but this requires major adjustments away from a “safety-net” orientation.

Commitment to TVET is the key to sustainability. Ownership and good governance practices are vital ingredients to sustainability. A critical mass of investment and operating resources is needed for TVET systems to deliver desired results. This calls for a higher level of commitment, from policy to action.

After the 1999 study, more TVET projects were completed with much higher performance ratings (Appendix 7). Only one project out of eight was rated less than fully successful, and two of the eight were rated highly successful. What accounts for the difference between earlier and more recent projects? Five of the eight recent projects were in more advanced DMCs, where investments generally tend to be successful. However, recent success also reflects the additional experience gained by DMCs and ADB staff in implementing TVET projects.

Project reviews for recent projects highlighted the following important conclusions:

- Changing labor market demand and new technologies in TVET necessitate periodic curricula updating and regular in-service training of teachers to upgrade their skills (Indonesia and Pakistan projects).
- In the long run, sharing the cost of training with employers and trainees is an important means of sustaining an effective system (Indonesia project). This requires formulating and implementing regulations for revenue raising and accounting by TVET institutions (Cambodia project).
- Involvement of the private sector at all stages of the development of vocational training and education will enhance local ownership and relevance (Indonesia project).
- Sustainable public-private partnerships are essential in a national training body with high-level authority and powers, as is improved quality assurance of private TVET providers (Cambodia project).
- Absence of attention to baseline and beneficiary monitoring can make it difficult or impossible to assess effectiveness and internal efficiency after project completion (Malaysia project).

ADB staff point to additional recent successes. In Sri Lanka, after a series of projects, the last project consolidated gains. While in the past, equipment and materials provision, curriculum development, and staff training were supported, recent support for policy and systems development resulted in the integration of the different elements. This included establishment of a vocational qualification framework, and institutionalization of competency-based training and quality assurance, accreditation, skills standards, and assessments.

The private sector was involved in adopting the new policies. In the Maldives, a recent project has brought government and private employers together to identify occupational areas where training programs are needed. In Indonesia, ADB staff has been impressed by the continued outstanding quality and relevance of upper secondary vocational schools supported in the past by ADB. Encouraged by the positive experience, further ADB support in this field is likely in that country. Learning from lessons in South Asia, a comprehensive project in support of skills development in Bangladesh has been planned.

Strategic Approaches for TVET

There is a strong rationale for continued ADB investment in TVET. Economic demand for technical and vocational skills is increasing as a result of a convergence of factors. These factors include technological change, reorganization of work, economic openness and competition, and capital deepening. Across the region, the need for skills development is intensifying and changing quickly as a result of international competition and globalization. Skills development has a high payoff in the context of enterprise-based training and training of migrants and overseas workers for higher remittances.

Equity and Poverty Reduction. Except for Asia’s newly industrialized countries, no Asian country will be able to generate enough wage employment to absorb the growing number of entrants to the
labor market. Skill formation is important for income generation and self-employment for those in the informal sector and for marginal groups.

Social and Political Demand. Increased demand for skills by the burgeoning number of graduates of basic education is putting pressure on governments to provide more skills training. ADB can help steer these pressures in productive directions.

Reforms are Needed. The pervasive problems outlined above need to be addressed to increase the relevance, effectiveness, and internal efficiency of TVET. Several countries have expressed strong interest in reforming their TVET systems, including Azerbaijan, PRC, Mongolia, and Viet Nam.

External Assistance Can Help. Outside support can help drive the process of reform. ADB can demonstrate international best practice and help steer changes and reforms in the right direction.

ADB Has a Comparative Advantage in TVET. Few donor agencies in Asia can provide both policy advice and substantial capital assistance for TVET. ADB can help close the financing gap for TVET in many DMCs and contribute to effective domestic resource mobilization. ADB also has substantial experience in TVET and a favorable track record in implementing recent TVET projects.

Guiding Principles for a Renewed Strategy for TVET

ADB should aim at moving TVET systems in the directions outlined below.

More Employer Involvement. A critical factor in TVET is a strong link with the labor market. That means links with employers. Employers often know best what skills are required and can articulate the skills implications of newly adopted technologies. Employers have certain limitations, often overlooking long-term requirements, for example, but they are still the best source of expertise on skills requirements. However, time is a precious commodity for employers, and getting them engaged in training can be difficult. Consequently, employers should be judiciously involved upstream in establishing overall system direction, and downstream in evaluating system outputs.

Better Information. Information needs to be generated through periodic labor market surveys, consultations, and tracer studies about skills in demand, absorption of skills, and the benefits of investment in worker skills.

Focus on Trainability, Not Specific Skills. In conditions of uncertainty—which characterize free market economies, many trainees end up working in occupations for which they were not trained. People often change occupations. A lack of coherence commonly prevails. This suggests two things. One is the need for a strong foundation of general education to facilitate adaptation to new circumstances. Often what employers want are trainable graduates who can learn on the job, solve problems, communicate well, function well in teams, and have work discipline. Second is the need for continuous or life-long access to training.

Flexible Supply Response. Flexibility can be built into training provision through a variety of means, including devolution of authority to training institutions—allowing them to find their own markets and mobilize resources, shorten the length of training through the introduction of competency-based training in place of time-based programs, hire staff on fixed-term contracts, and rent instead of purchase training facilities. Other strategies to cope with market uncertainties are to defer specialization in training until just before entry into the labor market, to provide multi-skilling, and to allow for frequent retraining of those in the job market.

Focus on Standards and Outputs. Standards are increasingly important in a global economy characterized by labor mobility. Standards set the basis for evaluating outputs. The outputs of the training system should take priority, not the inputs. The latter have traditionally have been the dominant concern.

Counter Chronic Underfinancing. More efficient use must be made of existing expenditures on training. Institutions must have the freedom to mobilize and allocate resources. Incentives need to be provided for mobilizing funds at the institutional level.

Government Provision of Training Should Be Considered Separately from Government Financing of Training. The two functions have different requirements for economic justification. Government does not need to provide all training. It must rely on enterprise trainers, private training providers, and nongovernment providers. Nongovernment training providers may do a better job, use resources more efficiently, and have better links with the labor market. However, a strong case can be made for public financing of training carried out by other training providers to fill gaps not covered by the private sector and to achieve equity (Middleton, Ziderman, and Adams 1993).
Strategic System-Wide Priorities

It is recommended that system-wide strategic priorities for ADB support of TVET focus on reform in four areas.

Organization and Management. Many of the issues in TVET derive from fragmented, inappropriate, and ambiguous organizational structures. Legal mandates often overlap and coordination is often unclear between several line ministries, such as ministries of education and labor. Getting the organizational structure right is the first step toward more effective TVET systems. Where possible, TVET systems should be governed by apex organizations, such as national training authorities. Apex organizations should be based on solid partnerships among stakeholders and should be driven by those who represent the demand for skills: employers. Apex organizations should have executive authority to generate labor market information; develop policies; link training supply with demand; coordinate providers; set priorities, policies, and directions; and allocate resources. Such organizations should concentrate on policy and regulation, and eschew direct administration of individual institutions and delivery of education and training. The National Technical Training Authority in Bhutan and the Technical Education and Skills Development Authority in the Philippines are good examples of this approach.

At the institutional level, the priority should be to achieve more autonomy for training institutions—particularly at the postsecondary level—through devolution of authority to the individual institutions. Governance should be handled by stakeholder boards with industry participation. Greater accountability for results should accompany greater freedom to act. Among other things, greater accountability means greater financial accountability, which may require improved systems for audit and control.

Occupational Standards and Outputs. Attainment of quality in skills development requires standards, sufficient inputs, and measurement of outputs against the standards. The development of occupational standards can be pursued through the design of vocational qualification frameworks provided the frameworks (i) focus on outputs (occupational competencies) rather than inputs (courses required, educational credentials), (ii) avoid complexity, and (iii) do not exceed local administrative capacity. Minimum standards should be established for public TVET institutions, which should be subject to accreditation and periodic quality audits. Output indicators should be defined and measured against established standards. Information on the impact of training should be developed through such means as tracer studies of graduates, with findings factored into training policies and resource allocations. The recommendations included in a TVET project in the PRC are pertinent here:

At the current moment, government appears to put substantial emphasis on input control in training and to increasingly aim at unified training standards. As instruments for quality assurance, government may consider that emphasis on good management and effective enforcement of outcome-based quality assurance, mainly through a [competency] standard-based testing system, can be an effective instrument to raise training quality rather than formal input rules and requirements. Training standards and guidelines often tend to reduce flexibility and creative adaptability by training institutions if education authorities enforce them in a rigid manner (Copenhagen Development Consult A/S 2005).

Financial Incentives. The nature of incentives in many TVET systems in the region has contributed to inertia. Budgets are provided regardless of performance. Incentives should be changed for those managing skills development. First, institutions should be allowed to retain and use resources generated. They should be encouraged to introduce or increase user fees, bearing in mind equity implications (World Bank 2006d). Second, managers of training institutions should be given authority through devolution, along with accountability for results. Results should be compared with targets, and budgets should be allocated according to performance. At the same time, managers should be enabled to develop their capacities through in-service management development programs. Third, ADB should support the establishment of competitive training funds that combine external with domestic resources. Such funds have potential to stimulate innovation and better performance. Singapore’s training fund stands out as an instrument for leveraging reforms in skills development.

Private Training Provision. Some control is necessary to regulate private training provision, including establishment and enforcement of reasonable minimum standards. Quality assurance
of private training providers, however, has been problematic throughout the region. Employing commonly accepted and transparent criteria, rather than imposing restrictions, can help encourage and facilitate high quality standards by providers. Sufficient resources must be allocated to monitoring and enforcing quality assurance of private training providers (Johanson 2007). In some places, facilitating private training provision needs a change of mind-set in public administration and society. It may be necessary to remove fee ceilings set by government price committees (Copenhagen Development Consult A/S 2005), or controls by government over fee increase ceilings and their allocations (Philippines). In other cases, bureaucratic red tape and venal practices need to be eliminated.

Priorities by Level and Type of Training

ADB support for TVET has generally included a mix of policy support, capacity development, and investment in physical capacity and infrastructure (including equipment). It will be important to ensure that future investments combine policy advice and capacity development in the four areas discussed in the preceding section, and investment in developing TVET capacity. To guide investment, as stated by ADB (1999b) in its TVET review, “…ideally the whole subsector should be strengthened, but there is a need to prioritize development among TVET delivery systems, lower, middle and higher levels.” Choices about where to invest in skills development should be based on evidence of cost-effectiveness.

Enterprise-based Training. Generally, too much emphasis is placed in Asia on preemployment, institution-based training within the formal school system. Most skills acquisition takes place on the job. The impact of enterprise-based training on productivity has been demonstrated in Asia (Appendix 5). ADB should explore ways to encourage enterprise-based training through such measures tax rebates, training levies, and apprenticeship programs. It is important to determine the reasons why employers do not train workers, and ensure that policy responses tackle the causes.

Informal Sector Training. The informal sector is the dominant segment of the labor market in most DMCs. Training for the informal sector should become a high priority. In this context, training for entrepreneurship plays an important role. Adequate new resources should be allocated for informal sector training. Training strategies should be designed, and capacity developed to support the rural and informal sectors, in part by boosting the technical expertise and delivery capacity of NGOs.

ADB has financed excellent labor market surveys of rural training requirements (e.g., in Vanuatu), superb proposals for income generation through training in the Marshall Islands (King 2005), and has developed an innovative approach to informal sector training in Papua New Guinea. However, it has not studied widespread traditional apprentice systems in South Asia. In general, it is difficult to reorient formal training institutions to the informal sector (Grierson and McKenzie 1996; Johanson and Adams 2004). Developing the capacity of NGOs has greater promise. Substantial literature is available about strategies to develop informal sector training, lessons learned, and pitfalls to avoid (see King and Palmer [2006]; Johanson [2007]; Johanson and Adams [2004]; Appendix 5). ADB is in the process of implementing several projects emphasizing training for the informal sector, which should yield useful lessons (Appendix 7).

Nonformal Training Centers. Where economies are growing, cost-effective training can be provided through a wide range of institutions. In weaker economies, however, training for semiskilled and skilled occupations may best be carried out through nonformal training institutions that are flexible, linked to employers, and provide short, modular, competency-based training. As stated in Middleton, Ziderman, and Adams (1993), a seminal work on TVET:

Overall, any mode of training for industrial and commercial occupations can be cost-effective when the institution is well linked to employers, adequately financed, efficiently organized and sufficiently autonomous to adjust the size and content of courses to meet the quantitative and qualitative dimensions of employment demand. At the same time, enterprise training and skills training centers have been shown to be more cost-effective than vocational schooling.

Postsecondary Technician Training. Postsecondary technical training is likely to gain in importance as DMC economies move up the value chain. Already the Republic of Korea and Malaysia are beginning to defer most technical skills development to the postsecondary level. Consequently, postsecondary technician training institutions can be an appropriate target for investment. Demand for
technicians is expected to grow, especially in countries seeking competitiveness in the global economy. Postsecondary technical institutions occupy special places of leadership in TVET systems as a whole, especially in smaller countries. In stagnant or slowly growing economies, emphasis should be placed on upgrading the quality of technician training, as recommended in the TVET review by ADB (1999b).

**Emigration.** Training for employment abroad, either short- or long-term, may be important in terms of relieving domestic unemployment and gaining remittances. This applies particularly to Bangladesh, Indonesia, Nepal, Pakistan, Philippines, and some countries in the Pacific (Cook Islands, Fiji Islands, and Marshall Islands). Raising the skills and remuneration of those going abroad is a key strategy. Indonesia, in particular, is eager to send more skilled and fewer unskilled workers abroad. Replacement of expatriate workers domestically can also be important, as in Bhutan, Marshall Islands, and Papua New Guinea. In this context, ADB support may be considered for embryonic regional qualification frameworks.

**Need for Strategic Selectivity**

Support for inflexible, government-dominated systems of TVET, such as unreformed systems typical in former command economies, should focus on implementing comprehensive systemic reform to rationalize and streamline these systems, and to ensure they are responsive to labor market needs.

**Diversified Secondary Education.** ADB has not financed this type of institution, but the idea is a hardy perennial with strong political appeal. However, it is costly and difficult to implement, requiring specially trained teachers (who are in short supply), workshops and equipment that are expensive to procure and maintain, consumable supplies, and especially, an ethos that does not occur easily in an academic environment (Johanson and Adams 2004). Nevertheless, the transition from school to work can be eased with classes in secondary schools that provide useful skills for work but do not require purpose-built facilities or expensive equipment, such as accounting, business, and entrepreneurship. Students in such classes can gain practical experience through internships and work-release programs in nearby businesses. Rather than integrating TVET into formal schools, resources would better be allocated to intensive training programs that are well grounded in the labor market, targeting those who are in, or about to enter, that market.

**Secondary Vocational Education.** ADB support of secondary vocational education should be considered with caution, on a case-by-case basis. If graduates of these institutions are not motivated to enter the labor market and instead pursue further education, investment to prepare them for immediate entry into the workplace will not be successful. This was the case in Malaysia, where only a small minority of the graduates of ADB-supported secondary technical and vocational schools went into the labor market. More than 90% of them intended to pursue higher education. When supporting basic education in DMCs where basic education includes secondary education, it will be important to carefully assess whether streams for vocational education should be included, or if other arrangements would better respond to labor market needs. Simultaneous pursuit of expansion of basic education and vocational education streams should be viewed with considerable caution. The aims of each are quite different, depending on requirements for economic development and labor market needs, and may undermine each other.

Efforts at “articulation” between TVET and higher levels of education should also be treated with caution. Such an approach may help raise the status of TVET and could usefully promote upward social mobility for a minority of students. However, financing students through a series of TVET levels, or using TVET as a stepping stone to further education, is not cost-effective preparation for employment (Johanson 2007). Copenhagen Development Consult A/S (2005), in its report on TVET in the PRC, recommended that the Government reconsider its objective of channeling 50% to 60% of secondary students into vocational courses. Rather, investment in general secondary education and expansion of TVET at the tertiary level was recommended. In Indonesia, on the other hand, support for upper secondary vocational schools may be justified because students come from lower-income segments of the population and virtually all enter the labor market upon graduation. About half of their instruction is devoted to core academic fields, facilitating their adaptability and occupational mobility.

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13 Diversified secondary education is attempted in most Pacific island states, and to some extent in India. For a summary of reasons why this is not generally recommended, see Johanson and Adams (2004) and Hauglo and MacLean (2005).
Vocational Qualification Frameworks. These frameworks are difficult to develop and implement, taking more than a decade in New Zealand and Scotland. Administrative requirements for their operation and maintenance tend to be onerous. As stated by Young (2005) in an excellent review of the subject for developing countries, the best approaches are gradual, building on what exists. Competency-based training seems relatively simpler to design and implement successfully.

Regulation of Private Training Providers. DMCs must balance regulation sufficient to ensure that basic standards are met with flexibility to encourage the entry and expansion of private training providers. One lesson is clear, as identified in regional reviews for Africa and the Pacific: countries typically underestimate the resources required to monitor continued compliance with established standards. The initial check is usually the only step taken in quality assurance, and that is often fraught with venal practices.

Implications for ADB

Policy advice must be based on careful and comprehensive analysis. In comparison with other education subsectors, the international knowledge base on TVET is thin. If ADB is to carry out the recommended strategy for TVET, with emphasis on organization and management, occupational standards and outputs, financial incentives, and private training provision, considerable effort will need to be devoted to development of knowledge and skills in TVET.

To do this, ADB must learn more from its own projects. The most recent review of completed TVET projects took place in 1999, and covered only four countries. Since then, a dozen additional TVET projects have been completed, reflecting new priorities. They should be thoroughly assessed, particularly the lessons to be gained from implementation of training projects for the informal sector.

A review should be undertaken within ADB of the incidence and performance of training components (i.e., project-related training) in non-education projects, such as in agriculture, infrastructure, and small and medium-sized enterprise projects. Project-related training supports the training requirements of specific investments in other sectors. Studies of this topic in other development banks (World Bank and Inter-American Development Bank) have been revealing. They tend to have extraordinarily high payoffs if properly designed and executed. The amount of project-related training financed by ADB is likely to exceed substantially that invested directly in TVET projects.

ADB should learn from the rich regional experience on skills development—i.e., cross-country analyses of key themes. ADB should facilitate the consolidation, distillation, and exchange of lessons about successful TVET approaches in the region. The region has a history of rich experiences in skills formation, particularly among (but not limited to) the newly industrialized countries. Lessons from these experiences can provide valuable guidance to less-developed DMCs. Key themes for investigation include (i) incentives that have proved most cost-effective in stimulating enterprise-based training, (ii) the effectiveness of national training authorities versus mere coordination of training organizations, (iii) the feasibility of implementing vocational qualification frameworks in DMCs, and (iv) lessons from implementation of competency-based training.

ADB must seek to fill key knowledge gaps. Particular attention should be given to investigation of the following subjects:

- the dynamics of traditional apprentice systems in South Asia, and intervention strategies that work to strengthen them;
- labor market analysis to identify the skills implications of changing business systems and technological advances; and
- ways to mobilize TVET financing without penalizing trainees from lower segments of the population.

ADB must strengthen its subsector analysis of skills development. This is most important. In the past decade, ADB appears to have sponsored subsector analyses in only a few places, i.e., the Philippines and the Pacific. Project preparation technical assistance as a rule is an instrument for project development and has not been used sufficiently to delve into policy analysis.

ADB staff knowledge and skills should be updated. Given that TVET is challenging and technologies are changing frequently, ADB should invest in updating staff knowledge and skills. This can be done through seminars, workshops, and training programs to familiarize staff with leading TVET systems in the region (Republic of Korea, Malaysia, and Singapore, as well as Australia and New Zealand). This should include wider exposure to
business and employers to better understand labor demand in different contexts.

ADB should establish partnerships where expertise is limited. ADB may need to rely on partnerships with other organizations to acquire sufficient expertise in some areas, such as the International Labour Organization (ILO) in training for the informal sector. Over the medium term, ADB should aim at acquiring a critical mass of staff expertise in TVET.
Introduction

Across Asia, many countries have become victims of their own success. Increased enrollments at primary and secondary education levels are fueling sharply rising demand for access to postsecondary opportunities, a demand that countries are struggling to cope with. The problem needs to be solved. The highly educated are enormously important to social and economic development. Investment in good quality higher education is returned through higher incomes and economic growth. Money spent on higher education benefits all of society, not just those who go to college. National contexts also are changing as developing member countries (DMCs) confront the globalization of markets, high-speed communications, and an expanded role of technology in all aspects of life. Modern economies cannot be managed effectively by primary and secondary school graduates.

The rapid growth in education in recent years has come at a cost. As in all levels of education, the quality of higher education has suffered. Universities in many DMCs suffer from inadequate infrastructure and weak instruction. Low quality is the biggest problem and greatest challenge facing higher education systems in many DMCs.

Over the next decade, expanding and strengthening higher education will be a priority concern in nearly all DMCs. Governments face strong social demand to expand access. Most see a need to increase the supply of highly trained personnel, and all seek to incorporate advances in technology in their economies (Bray 1998). In the face of these challenges, many countries will look to ADB for access to both its financial and knowledge resources.

This chapter examines trends and issues in higher education development across the region, and assesses anticipated demand for ADB assistance in this subsector. Strategies for expanding access, raising quality, and improving the relevance of higher education are appraised, and recommendations provided for ADB’s future role and direction in the subsector.

The Higher Education Landscape in the Region

Shifts in International Support for Higher Education

Since 1970, ADB has provided about $7 billion in loans to the education sector, of which 12% was for higher education (Appendix 2). Over time, however, there was considerable variation in this commitment. Lending to higher education grew between 1970 and 1990, but dropped from 1990 onward as ADB and most other international donors concentrated their support on basic education. Support for higher education fell from about 22% of ADB education lending in the 1970s and 1980s to 15% in the 1990s, to about 2% in the years since 2000 (LaRocque 2006a; Appendix 2).

The decline in financial support for higher education reflected the international consensus reached at the 1990 World Conference on Education for All (EFA): that the central development challenge of that era was to expand access to basic education. A principal argument for this conclusion was that higher education is costly. One year of university education for one student costs as much as providing a year of primary schooling for 20–40 children, and investing in primary schooling has a considerably higher public return. On average, low-income countries spend 34 times more on a student in higher education than they spend on a student in primary education, and 14 times more than they spend on a student in secondary education. The analogous figures for
high-income countries are 1.8 and 1.4 (Glewwe and Kremer 2005). Another powerful assertion was that most of the benefits of higher education accrued to the students themselves rather than to society. In the years following the EFA conference, there was a massive shift in development funding by most major international assistance agencies in favor of basic education (Heynemann 2006).

The renewed interest in higher education across the region has been influenced by the convergence of three factors. First, DMCs have had dramatic success in expanding access to primary and secondary schooling. Increased enrollments at these levels are now fueling sharply rising social demand for access to postsecondary opportunities. Second, the increased economic interdependency among countries (sometimes termed “globalization”), speed of communications, and importance of technology have created new demand for higher-level technical, managerial, and administrative skills. Third, considerable assistance from donors, often in the form of grant aid, is available to support basic education. Hence, while expanding access and improving the quality of basic education remain important, in many DMCs they are being supported by bilateral development partners through grant financing. In such DMCs ADB no longer has a comparative advantage in supporting the expansion of access to basic education through loan financing.

Primary and secondary schools aim to provide students with a strong grounding in basic literacy, numeracy, and other vital skills. Higher education offers the depth and flexibility people need to thrive in the modern workplace (World Bank 2000a). The highly educated are enormously important to social and economic development. Investment in higher education is thus strongly in the public interest. The World Bank (2000a) argues that sustainable poverty reduction will not be achieved without a renaissance in the higher education systems of developing countries. It also maintains that the issue is not primary and secondary education versus higher education, but rather, achieving the right mix among the three levels.

Evidence consistently shows that countries that invest heavily in higher education benefit economically and socially. For example, in countries in the Organisation for Economic Co-operation and Development (OECD), every dollar invested in attaining higher-level qualifications results in a significant return through economic growth. This investment provides tangible benefits to all of society, not only to those who benefit from greater educational opportunities (Schleicher 2006). Countries that provide its citizens with 1 additional year of education can, over time, boost productivity and raise economic output by 3–6% (Schleicher 2006). Country analyses suggest that a 1-year increase in average years of schooling of a country’s labor force raises average output per worker by 5–15% (LaRocque 2007). At the same time, benefits to individuals are significant. An additional year of schooling is estimated to raise income by 10%, and possibly as much as 20% in low-income countries (LaRocque 2007). The earnings differential between workers with secondary and higher education ranges from 25% to 119%. That differential grew by an average of 1% per year between 1997 and 2003 in 18 of the 22 OECD countries (Schleicher 2006). Meanwhile, people without basic qualifications were found to face a significantly higher and growing risk of unemployment and poverty (Schleicher 2006). It is reasonable to assume that in the robust economies of many DMCs, similar patterns hold true.

A realistic concern is that the expansion of higher education opportunities might result in massive degree inflation and a decline in the value of degrees and qualifications. However, evidence points to the opposite conclusion. Across nearly all OECD countries, earnings and other indicators that tell us something about the labor market value of education have risen faster than the supply of degrees and qualifications. This suggests that demand for high-level skills is increasing faster than institutions are able to deliver them (Schleicher...
 Again, it is reasonable to assume a similar pattern will be observed across the region.

Renewed interest in higher education is reflected in the shifting priorities of international development organizations. The World Bank (2002), for example, offers a four-point rationale for its own shift toward greater attention to higher education. One is that social and economic progress is achieved principally through the advancement and application of knowledge. Second, higher education is necessary for the creation, dissemination, and application of knowledge, and for developing technical and professional capacity. Third, developing and transition countries are at risk of being further marginalized in a highly competitive world economy because their higher education systems are not adequately prepared to capitalize on the creation and use of knowledge. Fourth, governments have a responsibility to put in place an enabling framework that encourages higher education institutions to be more innovative and responsive to the needs of a globally competitive knowledge economy, and to the changing labor market requirements for advanced human capital.

The Role of Higher Education in National and Regional Development

Higher education contributes to national development in three principal ways. First, it prepares the primary and secondary teachers who shape the dimensions and quality of the overall education system. Second, those teachers train the high-level technical and administrative personnel needed in government, business, and industry. Finally, higher education institutions operate as incubators of the innovation and creative thinking needed for an economically competitive society.

The preparation of teachers for primary and secondary schooling is essential. Low-quality primary and secondary education lead to enormous inefficiencies in higher education, as incoming students lack preparation for postsecondary study (Hanushek and Woessmann 2007). This creates a vicious cycle as poorly prepared entering students combine in many institutions with low-quality instruction to yield poorly prepared graduates. When some of these graduates return to primary and secondary schools as teachers, the cycle is perpetuated.

One way to break this cycle is to raise the quality of postsecondary preparation received by future teachers. Those teachers need solid content preparation in the subjects they will teach, preparation in modern pedagogical techniques, and training in the use of technology in instruction. To the extent that schools receive better-prepared teachers, and to the extent those teachers have the support they need to implement their new abilities once teaching, future secondary graduates will be better equipped for direct entry into the labor market or for higher education.

Educating higher-level technical and administrative personnel is also vital. International finance, business management, and national governance increasingly depend on automation, high-speed communications, and complex information flows that require high levels of administrative sophistication, technical proficiency, and analytic capacity. Secondary education alone cannot provide the managerial and technical leadership needed in modern business, industry, and government.

The centers of innovation and creative thinking provided by higher education institutions are critical for the innovation upon which economic and social development increasingly depend. Universities have a potentially important role in driving innovation and development in DMCs. They can do so through their role in research and development, and by training workers for the knowledge economy (LaRocque 2007).

Context and Recent Developments

The growing demand for higher education across the region is influenced by, among other things, the rate of population increase, the size of the school-age population, and primary and secondary school participation and completion rates. The proportion of secondary school completers seeking higher education, in turn, is fueled by rising family incomes, changes in the labor market, and social tastes and values. The pattern across the majority of DMCs is that more students are entering general education, a higher percentage is finishing secondary school, and an increasing proportion of those graduates want to continue on to higher education.

Demand for higher education across Asia will continue to grow. Data indicate that, while student enrollments in higher education across DMCs are increasing rapidly, growth in higher education gross enrollment rates is more modest (Appendix 8). This suggests that higher education enrollments have been driven more by the increasing size of
the college-age cohort than by an increase in the percentage of that cohort continuing on to higher education. A second implication of this pattern is that even when (and if) population growth rates in DMCs slow, it is likely that demand for higher education will hold constant or grow due to increasing participation rates. Future demand may differ by subregion, however, as evidenced by the substantial differences among them in size and rate of increase, with the highest enrollments in East Asia (Appendix 8). Additional evidence of the pressure to expand higher education capacity is reflected in the increasing number of new colleges and universities that have been opened across the region (South East Asian Ministers Education Organization 2007). The number of such higher education institutions in selected Southeast Asian countries in 2007 is shown in Table 2. In summary, the demand for higher education in DMCs will continue to increase, resulting in both a need and an opportunity for ADB support of further development in the subsector.

Challenges and Issues in Higher Education

Key issues constraining quality and growth of higher education in the region are examined below.

Internal Efficiency

The low quality of higher education institutions is of considerable concern in many DMCs, a situation created, in part, by rapid expansion without sufficient attention to the conditions of success. The World Bank (2000a) observed that while demand for higher education is rising rapidly, higher education systems are expanding chaotically. Low-quality institutions mushroom in the private sector, while public sector provision suffers from lack of funding and vision, poor management, and low morale. As a result, quality has suffered.

A primary reason for the low quality is that system expansion has been so rapid that demand for qualified college and university instructors has outstripped the supply. This shortage is exacerbated by increasing alternative employment opportunities for highly educated individuals within the fast growing economies of the region. Many institutions lack the resources to pay salaries that are competitive with private sector opportunities available to would-be faculty members. They also face the related challenges of retaining the attention and loyalty of instructional staff they are able to hire. Many of their faculty members have supplemental employment that may compete for the time they would otherwise commit to their teaching and research (Postiglione 2002; Chapman 2000, 2002).

The experience of the National University of Laos (NUOL) illustrates this issue. The university instructional program during the day is tuition-free for admitted students and taught in Lao. NUOL faculty members supplement their university salary by teaching a special evening course in English, for which students must pay a fee. While this arrangement provides a necessary financial supplement for instructors, it has made it difficult for NUOL to capture the time and attention of faculty members for participation in research and governance activities that would strengthen the regular (day) program of the university (Chapman 2002).

Table 2: Number of Higher Institutions in Southeast Asia by Sector and Type, 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Public</th>
<th></th>
<th></th>
<th>Private</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Degree</td>
<td>Nondegree</td>
<td>Subtotal</td>
<td>Degree</td>
<td>Nondegree</td>
<td>Subtotal</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>1</td>
<td>10</td>
<td>11</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Indonesia</td>
<td>—</td>
<td>—</td>
<td>81</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>24</td>
<td>41</td>
<td>65</td>
<td>28</td>
<td>11</td>
<td>39</td>
</tr>
<tr>
<td>Malaysia</td>
<td>18</td>
<td>40</td>
<td>58</td>
<td>22</td>
<td>519</td>
<td>541</td>
</tr>
<tr>
<td>Philippines</td>
<td>424</td>
<td>1,352</td>
<td>1,776</td>
<td>1,363</td>
<td>2,045</td>
<td>3,408</td>
</tr>
<tr>
<td>Thailand</td>
<td>66</td>
<td>—</td>
<td>66</td>
<td>54</td>
<td>401</td>
<td>455</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>201</td>
<td>—</td>
<td>201</td>
<td>29</td>
<td>—</td>
<td>29</td>
</tr>
</tbody>
</table>

— = data not available, Lao PDR = Lao People’s Democratic Republic.
External Efficiency

External efficiency concerns the extent that the knowledge and skills of secondary school graduates are aligned with the entrance requirements of higher education institutions, and the extent that the knowledge and skills of higher education graduates are aligned with the labor market. In many DMCs there are problems at both points.

Higher education institutions in many DMCs grapple with a tension between aligning their entrance standards and curriculum to be responsive to students’ prior level of learning, versus aligning their curriculum with international standards. Higher education institutions are faced with a choice of diverting resources to providing remediation, failing to meet international quality expectations, suffering extremely high dropout rates as poorly prepared students are unable to cope with the university curriculum, or some combination of the three. The articulation between secondary and higher education requirements is further complicated in some countries by the responsibility for these two levels of education being split between a ministry of education and a ministry of higher education. If communication between ministries is weak, alignment of curriculum and the accuracy of expectations tend to suffer.

Even as demand builds for greater access to higher education, graduates in some countries have difficulty finding jobs. This is due in some cases to employers’ concern about the quality of education received by students. In other cases, it is because students have only limited information about existing and projected jobs, entry points for access to desired careers, and career ladders associated with desired professions. Some higher education institutions, such as Canto University in Viet Nam, have undertaken graduate tracer studies and employer surveys as a basis for assessing the relevance of their curriculum and instruction methods. Many other higher education institutions would benefit from this practice.

Access and Equity

Given the importance of higher education in national development and the clear returns to individuals who earn a higher education, it is important that the opportunity be fairly distributed. The benefit stream that flows from earning a higher education needs to be available to all. While considerable progress has been made over the last decade in reducing disparities due to gender (Appendix 8), urban-rural and income disparities continue to block access for some. A strong argument for an ADB role in supporting higher education is to help DMCs ensure inclusive growth. If access to the opportunity for higher education is limited by family resources or background, the distribution of benefits in a society is distorted, and inclusive economic and social development is impeded.

Administration and Governance

Increasing emphasis on privatization and decentralization in higher education across Asia is changing the face of higher education institution management and governance. These trends have at least two implications. The decentralization of university management in countries such as People’s Republic of China (PRC), Indonesia, and Mongolia has resulted in campus-level administrators needing greater managerial and leadership skills than in the past. At the same time, the move toward greater privatization of higher education has put new pressures on campus-level administrators to secure new funding streams, manage funds in more transparent ways than has been historically necessary, and employ levels of accountability that are new to many higher education institutions.

Cost and Financing

Higher education in most DMCs is still mainly concentrated in public universities, and is largely publicly financed. Two significant changes during the 1990s have been the growth of private institutions, and financial diversification in public institutions through introduction of tuition fees and increased reliance on nongovernment sources of funding—mainly research and consultancy income (World Bank 2000a; Woodhall 2001).

One particularly sensitive issue is the growing expectation in many DMCs that students and their families should pay a larger share of the cost of their education. While both society and the individual benefit from higher education, the largest returns accrue to the individual (Woodhall 2001). Graduates will have better job opportunities and higher lifetime earnings than those with only primary or secondary schooling. Consequently, students and their families should pay more of the cost of higher education, but with two stipulations: (i) governments recognize that there needs to be continued protection for students from low-income
backgrounds; and (ii) mechanisms must be available through which students can borrow to cover higher education costs, with some arrangement for future payback. As a result of these concerns, there has been growing interest in student loans.

The World Bank (1994) argues that cost sharing cannot be implemented equitably without a functioning student loan program to assist students who need to borrow for their education. Student loan programs now exist in over 50 countries, including Canada, United States, several European countries, much of Latin America and the Caribbean, and in an increasing number of countries in Africa and Asia. New student loan schemes recently have been established in the PRC and Philippines. The Australian Higher Education Contribution Scheme has attracted particular interest, since it uses the tax system to collect repayments on an income-contingent basis. In many developing countries, however, student loans have been beset by problems, particularly administrative failures and high rates of default.

A second major issue is faculty compensation. As competition for qualified college and university instructors intensifies, many higher education institutions are being forced to evaluate their faculty compensation practices. A pattern of underpaying university faculty while allowing (and even encouraging) them to supplement their income through private consulting has been a common way of subsidizing higher education across the developing world. Instructors reaped the prestige of a university appointment, and universities gained teaching staff at low cost. However, as universities now seek to improve the quality of their instruction and to create new funding streams through research and university-based consulting, many institutions are seeking ways to recapture the time, energy, and loyalty of their instructional staff on behalf of institutional priorities.

In summary, while DMC higher education systems have grown rapidly, quality often has lagged. The challenge of the future will be to raise quality in the face of continuing strong demand for greater access.

The Role of ADB in Higher Education

ADB’s second medium-term strategy (2006–2008) identified education as one of six priority sectors for assistance (ADB 2006b). While priority attention to education is warranted, basic education need not command the same level of emphasis it has in the past. Rather, economic and social development of the region requires that substantial attention be devoted to post-basic education and higher education. ADB is well positioned to play an important role in responding to that requirement. At the same time, there are differences about what strategies will best support higher education.

In certain DMCs, lending may not become the main criterion of ADB success in assisting higher education. As DMCs develop, providing expertise has become more important to many of them than accessing external financing. Loan financing should not be the primary product, particularly in DMCs that have more private capital. For this group of DMCs, it is knowledge that matters, and more emphasis should be placed on meeting their knowledge management needs. A strategic question in this regard is to what extent ADB has or can develop a comparative advantage as a repository and broker of knowledge about higher education.

The economic future of the region lies in DMCs strengthening and mobilizing their capacity in scientific and technological innovation. ADB should concentrate its efforts in higher education on promoting science and technology to foster greater scientific and technological innovation (LaRocque 2007). The most important contributions of ADB would be to help DMCs improve science and math instruction in primary and secondary education, strengthen science and engineering programs in higher education institutions, and help higher education institutions develop as centers of scientific and technological innovation.

ADB Experience in Higher Education

ADB lending for education since the 1990s has concentrated on basic education. As a result, ADB has limited experience with loans for higher education (Appendix 2). Summary information about six higher education loans approved after 1990 is in Table 3. More detailed information about these loans is in Appendix 9. Implementation experience was mixed. While all projects were judged as either satisfactory or successful, only one (in the Lao People’s Democratic Republic [Lao PDR]) was viewed as highly effective. The limited recent history of projects in higher education and the generally middle-range assessments of these projects suggest that ADB will have to exert...
considerable effort to become a major regional broker of knowledge of higher education reform.

**Strategies for Higher Education**

Four separate but potentially intertwined approaches for ADB are (i) lending for infrastructure and policy development to expand access to postsecondary education, both public and private; (ii) developing the capacity of instructional staff and administrators; (iii) operating as a knowledge management and knowledge-sharing organization—funding national and regional hubs devoted to information sharing, brokering international and regional twinning arrangements, and operating as a clearinghouse for technical and managerial expertise; and (iv) targeting support for university-based science and technology as a means of promoting innovation and stimulating economic development in the region. Each approach is discussed below.

**Lending for University Infrastructure and Policy Development**

As a financial institution, ADB’s current focus in higher education—lending for infrastructure development and policy support—could well continue and remain important. Emphasis could be on helping DMCs expand access to higher education and, to a lesser extent, increase quality. The basic aim of this approach would be expanding access to postsecondary education, both public and private.

Evidence of demand for higher education borrowing is ample, though higher education projects are often smaller than infrastructure projects in other sectors. One indicator of DMCs’ potential interest in borrowing is their expressed aspirations for expanding their higher education systems. These are summarized for selected DMCs in Appendix 8. Based on such aspirations, it appears that higher education growth will be substantial over the next two decades. For example, the PRC and India both plan to triple their higher education systems within the next 20 years. Viet Nam wants to increase enrollments by 10% per year through 2010.

A second indicator is the extent to which DMCs have borrowed from other lenders for higher education. The volume of such borrowing confirms demand is strong when terms are favorable. During fiscal year (FY) 1990–2000, World Bank lending for higher education to East Asian, Southeast Asian, and Pacific countries accounted for 38% of that agency’s total lending for higher education. Among those countries, PRC, Indonesia, Republic of Korea, and Thailand ranked with the 10 largest borrowers of World Bank funds for higher education (World Bank 2002). During the same period, World Bank lending for higher education to South Asian countries and Pakistan accounted for 5% of total lending for higher education, and amounted to $574.5 million. Higher education lending to these same countries (and Afghanistan) continued apace during Fiscal Year (FY) 2001–2006, amounting to $334.8 million (World Bank 2007).

ADB must demonstrate that it possesses the relevant knowledge about the substance of higher education borrowing in order to become a major regional broker of knowledge of higher education reform.
education development to increase its rate of lending for higher education. Some DMCs, such as the PRC and Kazakhstan, have enough reserves that they need not borrow, but do so to gain access to the knowledge resources of the World Bank. If ADB lending is to be attractive to such DMCs, it needs to be packaged with a knowledge component.

Lending for ICT. The use of information and communication technology (ICT), particularly to deliver Internet-based distance instruction, provides another mechanism for extending access to higher education. It is widely advocated as an essential tool in poverty reduction as it offers a cost-effective means of providing difficult-to-reach groups with expertise and skills essential to their upward economic mobility (Khan and Williams 2006; Juma and Lee 2005; Salmi 2002; World Bank 2002). A number of DMCs are already using this approach to great advantage (Table 4). Large-scale higher education programs through open universities are under way in PRC, Indonesia, and Thailand (Salmi 2002).

The virtues of ICT-based instruction include lower unit cost. Online instruction may offer as much as a 60% cost savings over conventional campus-based instruction (Kejak and Ortmann 2003; Khan and Williams 2006). The cost of education at the Open University in the United Kingdom is about one third of that at a traditional university (Salami 2000). Online instruction also offers learners the opportunity to study on their own schedule and at the same time sustain other family and job responsibilities.

There is the risk that online instruction has been oversold—i.e., the promise may exceed the delivery (Chapman and Austin 2002b). Problems of quality control, cross-border jurisdiction, language of instruction, equipment maintenance, connectivity, and the recurrent cost of supplies (paper, ink) can limit the benefits of ICT-based instruction. Sustaining student interest and engagement without the level of interpersonal contact provided by traditional courses can also be a problem. The dominant view remains that the move toward technology-based instruction in higher education is inevitable, and DMCs will have to solve these problems within their own contexts. ADB could help them.

ICT-based instructional efforts are country-based. ADB could support and help coordinate the regional delivery of ICT-based distance education. This could involve support for widening access to the Internet, training in use of the World Wide Web, designing instruction for use in an online context, assuring the quality of online instruction, and formulating language policy related to online instruction (of particular relevance in cross-border distance education). A group of universities in the region could be selected to sponsor and support a coordinated program of distance higher education.

Table 4: Sample of Open Universities Across Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allama Iqbal Open University</td>
<td><a href="http://www.aiou.edu.pk">www.aiou.edu.pk</a></td>
</tr>
<tr>
<td>China Beijing Radio and TV</td>
<td><a href="http://www.crtvu.edu.cn/English_crtvu/index_en.html">www.crtvu.edu.cn/English_crtvu/index_en.html</a></td>
</tr>
<tr>
<td>University</td>
<td></td>
</tr>
<tr>
<td>University</td>
<td></td>
</tr>
<tr>
<td>The Open University of Hong</td>
<td><a href="http://www.cuhk.edu.hk">www.cuhk.edu.hk</a></td>
</tr>
<tr>
<td>Kong</td>
<td></td>
</tr>
<tr>
<td>Indira Gandhi National Open</td>
<td><a href="http://www.ignou.ac.in">www.ignou.ac.in</a></td>
</tr>
<tr>
<td>University (India)</td>
<td></td>
</tr>
<tr>
<td>Jiangsu Radio and TV University</td>
<td><a href="http://www.jsstu.edu.cn">www.jsstu.edu.cn</a></td>
</tr>
<tr>
<td>(PRC)</td>
<td></td>
</tr>
<tr>
<td>Karnataka State Open University</td>
<td><a href="http://www.ksoumysore.com">www.ksoumysore.com</a></td>
</tr>
<tr>
<td>(India)</td>
<td></td>
</tr>
<tr>
<td>Kota Open University (India)</td>
<td><a href="http://www.indiastudycenter.com/Univ/States/Rajasthan/KotaOU/default.asp">www.indiastudycenter.com/Univ/States/Rajasthan/KotaOU/default.asp</a></td>
</tr>
<tr>
<td>Shanghai TV University (PRC)</td>
<td><a href="http://www.shstu.edu.cn">www.shstu.edu.cn</a></td>
</tr>
<tr>
<td>Sichuan Radio and TV University</td>
<td><a href="http://www.scrtvu.net">www.scrtvu.net</a></td>
</tr>
<tr>
<td>(PRC)</td>
<td></td>
</tr>
<tr>
<td>Sri Lanka Open University</td>
<td><a href="http://www.lankalinksystems.com/sri-lanka/sri-lanka/">www.lankalinksystems.com/sri-lanka/sri-lanka/</a></td>
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<td></td>
<td>university-sri-lanka.htm</td>
</tr>
<tr>
<td>Sukhothai Thammathirat Open</td>
<td><a href="http://www.stou.ac.th/Eng/">www.stou.ac.th/Eng/</a></td>
</tr>
<tr>
<td>University (Thailand)</td>
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<td>The University of the</td>
<td><a href="http://www.upou.org">www.upou.org</a></td>
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<td>Philippines Open University</td>
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<td>Universities Terbuka (Indonesia)</td>
<td>en.wikipedia.org/wiki/Universitas_Terbuka</td>
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<td>Viet Nam Hanoi Open University</td>
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<td></td>
<td>hanoi_open_university-AR1dcWEEab.html</td>
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<td>Yunnan Radio and TV University</td>
<td><a href="http://www.wikieducator.org/Yunnan_Radio_and_TV_University">www.wikieducator.org/Yunnan_Radio_and_TV_University</a></td>
</tr>
<tr>
<td>(PRC)</td>
<td></td>
</tr>
</tbody>
</table>

PRC = People’s Republic of China.
Source: Internet.
The necessary coordination could be handled by a university in the region, built into the work plan of a knowledge hub (discussed later), or undertaken as a for-profit activity by a private sector organization.

Capacity Development

Strengthening the professional capacity of instructional staff and administrators is a priority across all DMCs, but particularly in countries where enrollment has grown faster than qualified teachers and administrators could be trained and recruited. In countries such as PRC, India, and Malaysia, higher education institutions have sometimes had to hire promising but inexperienced personnel just to meet student demand. In some cases, institutions have lacked the financial means to recruit top-level instructors and have hired less promising (but available) personnel. In both cases, systematic and sustained capacity development is needed. Capacity development is also a pressing need in institutions struggling to adopt and use new communication and research technologies.

The needs for capacity development differ by country, but areas of particularly widespread need on the administrative side include quality assurance, information management, transparency in financial accounting, tracking and use of equipment and facilities, and personnel management systems. Many university instructors express interest in systematically developing teaching skills, expanding their range of pedagogical strategies used in the classroom, developing skills in retrieving and using electronic information sources in their teaching, and improving methods to assess students.

Knowledge Management and Sharing

While capital is continuously needed to develop higher education, providing knowledge is rapidly becoming more important as alternative sources of capital become available, and as the design and operation of higher education institutions become more complex (LaRocque 2007). In general, middle-income countries are more likely to desire technical advice, and are requesting more knowledge components in their education lending.

For ADB to become more prominent as a knowledge provider in support of higher education reform, three questions must be addressed: What kinds of knowledge need to be shared, and does ADB have that knowledge? Does ADB have effective mechanisms for sharing its knowledge? Does ADB have mechanisms for efficiently sharing the knowledge it does have?

ADB has three primary sources of knowledge about higher education. One is knowledge drawn from its experience overseeing higher education projects and reform. That experience is limited and the success of those projects was mixed. ADB has not yet systematically distilled and formulated meaningful lessons from its experience that could guide higher education reform. Studies aimed at such distillation and formulation should be given high priority if ADB moves in the direction of knowledge management as a central product.

The experience of countries in the region in developing their higher education systems is a promising source of knowledge worth sharing. However, systematic analysis of country experience is uneven and generally lacking. Analyses tend to be either anecdotal or written for an academic audience. Information from DMC experience must be practical and considerably more than anecdotal reflections. One role of ADB in any knowledge-sharing mechanism would be to ensure the level of analysis and discourse is practical, insightful, and helpful.

Knowledge drawn from wider international experience can offer substantial benefit to DMCs. It introduces models, management strategies, evaluations, and systematic approaches to curriculum development that have been successful in a broader range of efforts to reform higher education. At the same time, that information must be relevant and sensitive to DMC contexts.

Given its regional mandate, ADB may be in a good position to collect, organize, and disseminate information relevant to higher education reform. These knowledge-sharing functions could be accomplished through a variety of mechanisms, five of which are the most widely discussed: (i) subregional knowledge hubs, (ii) a central knowledge hub, (iii) international twinning arrangements, (iv) regional twinning arrangements, and (v) regional and international consultants. ADB must determine which would be the most compatible with its operations and best serve DMCs’ needs.

Knowledge hubs are centers established to accumulate, organize, and disseminate knowledge about a particular set of issues—in this case, higher education development. Hubs are one way to promote cross-fertilization of new ideas and new
modes of institutional interaction between industry, academe, and governments (D’Costa 2006). They can serve as local outposts of expertise available to help DMC governments and universities set standards, develop capacity, and share information aimed at formulating national policies and institutional strategies. Some of the activities that hubs might sponsor or support are in Table 5.

Hubs could operate with pooled staff from multiple governments, or with an independent staff selected by ADB and DMC representatives. Ideally hubs should be rooted in local institutions and capacities as a way of encouraging strong local ownership, full use of local capacities, and cooperative arrangements that are institutionally, financially, and operationally sustainable. Hubs can collect and disseminate state-of-the-art thinking, relevant examples, and resource materials. They typically have a broad reach to regional and international experts with demonstrated success working in the region. They can handle the logistics of fielding consultants, and provide quality control over consultants’ work, making it easier for DMCs and higher education institutions to access regional and international assistance in higher education reform.

Subregional Hubs. The premise in establishing subregional hubs is that locating expertise closer to the user of hub services increases the relevance and timeliness of assistance. Presumably, knowledge hubs create a focal point for consolidating information and expertise and provide a clear point of contact for governments and higher education institutions seeking assistance. The Eminent Persons Group (footnote 1) envisioned hubs as clusters of technical staff located in major business and academic centers in the region, though other models could be considered (ADB 2007h). A number of hub-like structures already operate in the region (Box 1). Hubs often specialize in particular topical areas, such as use of technology (e.g., the Regional Center for Educational Innovation and Technology [INNOTECH]).

A variation on the subregional hub approach is sometimes referred to as a “center for excellence.” It is typically a university tasked to serve as a demonstration site for a region or subregion. Particular programs or the institution as a whole receives special funding to develop programs intended to serve as models for other institutions in the region. The impact of these centers depends heavily on whether the model is clear to observers, the extent to which observers see in the model a comparative advantage over what they are already doing, and the cost of adopting the model (Rogers 1995).

Central Hubs. The premise that a knowledge hub can be more effective if it is closer to the points of delivery of services is questionable. Unless users of hub services intend to visit the hub location frequently, the location of the hub is largely irrelevant given the good electronic communication and transportation systems in the region. A site central to the region may be a more cost-effective and useful strategy as it allows for easier consolidation of information and cross-fertilization of ideas. The central hub could be located at ADB headquarters, for example.

Central hub staffing would require more than just ADB education personnel with additional responsibilities. A team dedicated to knowledge collection and dissemination would be required, as well as timely provision of consultant services on an as-requested basis. DMC personnel, who better understand the context, personalities, and issues related to their countries’ needs, must participate.

Knowledge hubs have potential liabilities. Although widely advocated, they pose a series of challenges. It is not always clear who is responsible for deciding among competing requests for services, for determining the orientation of advice offered by hub staff and consultants, or for insuring that a wide variety of views are represented. Responsibilities for marketing hub services or monitoring the relevance of services offered are also often unclear. Disagreements

### Table 5: Illustrative List of Hub Activities

<table>
<thead>
<tr>
<th>Capacity development</th>
<th>Program and personnel evaluation</th>
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<tbody>
<tr>
<td>Financial planning and projections</td>
<td>Applications and use of ICT</td>
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<tr>
<td>Marketing and enrollment management</td>
<td>Tracer studies</td>
</tr>
<tr>
<td>Curriculum development</td>
<td>Collaboration in research</td>
</tr>
<tr>
<td>Expanding pedagogical techniques</td>
<td>Commercialization of research</td>
</tr>
</tbody>
</table>

ICT = information and communication technology.
Source: Author.
could arise about the extent to which hubs should be responsive to requests of ADB versus higher education institutions, for example.

It is important that the link between hubs and lending be clear. While hubs typically operate as regional or subregional centers for knowledge sharing, lending happens at the country level. Innovative regional or subregional lending modalities may be needed. A further downside is illustrated by recent experience in Hong Kong, China, where senior staff of six universities expressed reluctance to join together to create a higher education hub, in part from concern that financial support for the hub might compete with funds for their own institutions (Tam 2007).

**International Twinning.** In twinning arrangements, a DMC university and a university in a more industrialized country enter into sustained collaboration over an agreed period. The objective is typically to provide key personnel in the DMC with clear models, hands-on experience, and advice relevant to institutional development through exchange of personnel, study visits, and consultancies. Ideally, the twinning is structured to yield payoffs to both partners as students and faculty from the international partner learn more about higher education development issues in the DMC partner institution.

The advantage of international twinning is that key participants in each institution have sufficient recurrent contact to build a working relationship. Collaboration allows participants to get deeper into the operational mechanisms of university administration than might be possible through workshops or stand-alone consultancies. Operational support for the twinning typically involves funding for

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**Box 1: Examples of Hub-like Organizations in the Region**

The South East Asian Ministers Education Organization (SEAMEO) Regional Centre for Higher Education and Development (RIHED), in Bangkok, helps member states foster efficiency and effectiveness of higher education, with a focus on policy and planning processes, administrative and management systems, and professional training and policy-oriented research. It serves as the regional center and clearinghouse for higher education information and promotes collaboration and institutional links. Available: www.rihed.seameo.org/

The Asian Institute of Technology (AIT), in Bangkok, promotes technological change and sustainable development in the region through higher education, research, and outreach. Established in 1959, AIT has become a leading regional postgraduate institution, and works actively with public and private sector partners throughout the region and with some of the top universities in the world. Available: www.aist.ac.th/

The Asia Pacific Higher Education Research Network (APHERN) sponsors cooperative activities focusing on regional issues. A basic aim is to promote links among researchers and collaboration in research. To that end, APHERN organizes workshops, seminars, and conferences, creating opportunities for participation by all interested research institutions and governments in the region. Issues of institutional research, management, methodology, technology, and accessing international funding sources are examined in these gatherings. As resources permit, APHERN provides a searchable database of member institutions and researchers with areas of research expertise, current projects, and contact details. Available: www.aprim.net/aphern/welcome.htm

The Regional Center for Educational Innovation and Technology (INNOTECH), sponsored by SEAMEO, promotes the use of technology in education across Asia through workshops, training programs, and consultancies with governments and higher education institutions of member countries. Available: www.seameo-innotech.org/

The United Nations University (UNU), based in Tokyo, operates as a think tank and conducts research on pressing social and economic issues facing the developing world. It is worldwide in focus, but its activities include many of central relevance to developing member countries. Available: www.unu.edu/

Source: Author.
Twinning has its limitations. These arrangements can narrow experience sharing to the particular models of the partner institutions. Key personnel in the international partner institution can lose interest or be distracted by other opportunities and commitments. In some cases, the financial underpinnings of twinning may not be workable. The University of New South Wales closed its operations in Singapore just 4 months after they began because of lower-than-anticipated enrollments (Financial Times 2007). There also may be differences in cultural or institutional values. In 2005, the University of Warwick (United Kingdom) dropped plans for a hub after its faculty expressed concern about the cost and potential curbs on academic freedom in Singapore (Financial Times 2007).

Regional Twinning. The success of regional twinning depends on there being good higher education models in reasonable proximity to the DMC partner. When there are, regional twinning presumably offers a more relevant partnering experience as collaborators most likely have undertaken reforms within similar cultural and educational circumstances. A further advantage is that proximity results in lower transportation costs and makes it easier to sustain longer-term professional relationships even after the formal twinning ends.

The downside of regional twinning is the same as for international twinning. The range of expertise is narrowed to that of the collaborating partner, and anticipated benefits may not materialize. Support for the regional twinning also may compete for funds that might have gone directly to the universities involved in twinning.

International and Regional Consultants. The provision of knowledge to DMCs from individuals associated with ADB most often comes from consultants, not ADB staff members. Consultancies are already a widely used and well-understood practice across the region. Direct individual consultancies are the basis of most knowledge-sharing approaches, even within hub and twinning arrangements. Advantages of this approach are that consultants can be hired directly by the higher education institution or DMC government without going through intermediate organizations, and the recipient of services retains complete control of the choice of experts. The disadvantage is that many DMC higher education institutions have difficulty identifying relevant expertise outside their own geographic area, and may not understand the norms and procedures for contracting, supervising, and evaluating consultant services. An advantage of procuring consultants through a hub or twinning arrangement is that those intermediaries can provide some level of screening and selectivity. They can be given specific responsibility for maintaining a roster of experts, and for follow-up to see that consultancy work fulfills its terms of reference, is well received, and is helpful.

General Critique of Knowledge Sharing. There is no overriding advantage of one form of knowledge-sharing mechanism over another, or any reason to limit the range of mechanisms ADB might broker across the region. Each approach has strengths and weaknesses. ADB can, and probably should, employ some combination of approaches in response to DMC and subregional needs and sensitivities. The importance of placing knowledge hubs close to the end-user is diminishing given the high-quality communication and transportation systems in much of the region. More important than physical proximity is that those staffing knowledge hubs and twinning arrangements are knowledgeable and articulate about the issues of higher education development, and sensitive to the regional contexts.

While the need for knowledge management and brokering is persuasive and such a role offers an attractive extension of ADB’s support for higher education, it carries risks. ADB education sector staff is not presently configured to serve as knowledge brokers, and ADB’s history with higher education projects, while competent, is not distinguished. It is often unclear who needs the knowledge or how to deliver it in a useful way. The World Bank has the World Bank Institute for training and knowledge development in various sectors and thematic areas. ADB does not have a comparable organization. ADB efforts in this field may compete with those of other organizations with more experience in knowledge brokering. ADB has strengthened and institutionalized knowledge management with more experience in knowledge brokering.
management in support of its operations in sectors and thematic areas in recent years. Further work in this regard will be needed.

All these constraints can be overcome if ADB chooses to make this strategy a priority. Doing so will require a sustained commitment, an increase and reconfiguration of education staff, and the support of key DMCs. It will also require attention to seven factors critical to the success of any of the knowledge-sharing strategies discussed above:

(i) early DMC access to expertise,
(ii) ability to shift skills mix as problems change,
(iii) emphasis on regional expertise without jeopardizing access to wider world expertise,
(iv) clear identification of where the expertise resides,
(v) competitive procurement procedures able to attract top talent for short-term activities,
(vi) mechanisms to sustain relationships over time, and
(vii) conferences on a technical level that share knowledge and highlight the knowledge products available through ADB.

Fostering Innovation through University-based Science and Technology

A central argument of the Eminent Persons Group was that ADB should concentrate on promoting science and technology as a means of fostering innovation that would, in turn, fuel economic growth (ADB 2007h). The link between innovation, technological change, and economic growth is well established. Evidence indicates that research and development provides an important contribution to output and overall productivity growth. A 1% increase in the stock of research and development typically leads to an increase in output of 0.05% to 0.15% (LaRocque 2007).

Experience in countries belonging to the Organisation for Economic Co-operation and Development (OECD) indicates that innovation and technological change are among the most important factors affecting economic performance. They are thought to contribute significantly to economic growth and the attainment of broader development goals, such as poverty reduction, improved health and communications, and a cleaner environment (LaRocque 2007).

ADB has a track record of supporting university-based science and technology. Between 1970 and 2006, ADB provided loans totaling about $750 million for science and technology projects. Most of these projects were part of ADB assistance to higher education. ADB’s lending pattern for science and technology projects consequently is similar to that for higher education. Lending increased from only $71 million in the 1970s to $280 million in the 1980s, peaking at $360 million in the 1990s. Lending has dropped significantly since 2000 to only $38 million (LaRocque 2007).

While more higher education in science and technology across the region is widely supported, the role of higher education institutions in fostering innovation and technological change is less clear. OECD countries offer considerable evidence that research and development funded or performed by universities and the public sector has a positive effect on overall productivity and on business research and development (OECD 2000). There are questions, however, about the degree investment in university-based science and technology will lead to the innovation and economic stimulation suggested by the Eminent Persons Group.

Higher Education Institutions’ Role in Research and Development.

Capacity in science and technology can be developed in at least two ways. One is by improving secondary and higher education in science and technology, building a labor force with stronger skills that can support development of more technology-based business and industry. Another is using universities to serve as incubators of innovation and fuel the development of new businesses and industry.

The number of graduates in science and engineering across Asia is lower than in Europe and North America. However, the proportion of graduates in science and engineering versus those graduating in other fields is roughly comparable across regions (Appendix 8). On a percentage basis, enrollment growth in math, science, and engineering across Asia appears to be flat. While the absolute number of graduates in these fields is increasing, it is only increasing at about the rate overall enrollment in higher education is increasing (Table 6). These data suggest that one area for attention would be measures to encourage enrollment in fields that most directly contribute to scientific and technological innovation.

Just encouraging enrollment growth in science and engineering will not be enough. Once enrolled, students must have a meaningful program of study and research. In many DMCs that is not consistently the case. Little research is conducted in public universities in many DMCs, and much of that research is of low quality. The low quality is due, among other things, to its theoretical nature, the lack of qualified staff, old
and outdated equipment, and differences in the timeframes and results orientation of academia and industry. These weaknesses are exacerbated by the lack of links between universities and industry, the fragmentation of research efforts, weak commercialization and exploitation of research and development, and the lack of connection between regional economic strengths and research excellence (LaRocque 2007).

The World Economic Forum’s Global Competitiveness Report indicates that the quality of scientific research institutions is low in both East Asia and Southeast Asia (compared with developed countries), and particularly weak in Indonesia, Philippines, and Thailand (LaRocque 2007). This may help explain why an analysis of research and development across East and Southeast Asia (Appendix 10) suggests that, with a few notable exceptions (e.g., Hong Kong, China), university-based research lagged well behind business research and frequently behind government-based research.

Lending to expand access to higher education and lending to promote science and technology would follow quite different directions. Expansion of access often involves creating or enlarging colleges and universities that have a primarily instructional mission. These are often second-tier institutions that may offer good instruction but are not necessarily research oriented. Lending to stimulate scientific and technological innovation would concentrate on top universities that have a research mission. Investing in top universities would not necessarily resolve access constraints, and investing in instruction-oriented universities would do little to promote research.

Investment in university-based science and technology may be questioned on the grounds that the development of science and technology is not an outcome of just one sector, but the convergence of sectoral (e.g., education) inputs with many other factors. A common assumption underpinning research and development and science and technology policy in most developing countries is the linear model (Government of the Philippines 2007). This model assumes that by developing good teaching in the sciences and spending more on research—particularly at university-based basic research centers—advanced technology will be developed, disseminated, and commercialized by business and industry in ways that promote national economic development. However, this model is increasingly challenged. The principal factors that promote technological development are not the activities of universities, science ministries, or specialized institutes.

Development of productive technologies is more often the outcome of industrial and trade policies that promote in-house research and development by business and industry, taxation policies, fiscal policy, and even foreign policy (Government of the Philippines 2007).

A series of preconditions to investing in university-based science and technology must be met if such investment is to lead to innovation and economic growth (Hansen and Lehmann 2006; OECD 2000). Among other things, there must be

- a strong entrepreneurial climate;
- strong links between science and industry;
- independence for faculty members to pursue research they believe is important even in the absence of any immediate applicability or demand from government, business, or civil society;
- a sufficiently stable resource base to ensure continuity of effort;
- incentives sufficient to retain top researchers;
- well-developed financial markets;
- access to capital;
- strong legal protection for intellectual property rights;
- favorable regulatory policies;
- a framework for commercialization of new products and ideas;

### Table 6: Enrollment in Science, Math, and Engineering in Selected Asian Countries (% of all higher education students)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Cambodia</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Malaysia</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Myanmar</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>Philippines</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>India</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Mongolia</td>
<td>26</td>
<td>24</td>
</tr>
</tbody>
</table>

Note: Comparisons across countries should be made with caution.


* 1999–2004 data: UNESCO. For details and caveats, see http://www.uis.unesco.org/
• a stable and supportive macroeconomic environment, including low and stable inflation;
• competitive product markets;
• liberal trade and foreign direct investment policies that reduce barriers to international technology transfer;
• availability of good quality ICT infrastructure to foster innovation by facilitating information exchange and reducing the transaction costs of international trade and foreign investment flows; and
• public support for basic scientific research.

Higher education institutions should focus on developing the knowledge, skills, and attitudes that foster scientific thinking and innovative inquiry, and on helping students understand career opportunities and entry requirements in science and technology fields. They should also concentrate on building links with private sector employers that support placement of graduates in research and development settings. While ADB should support universities becoming hubs of scientific and technological innovation, resources should not be exclusively devoted to this agenda.

Public-Private Partnerships (PPPs). Strong links with the private sector are an essential component in both stimulating university-based research and moving university-generated research and innovation into wider use in ways that have an impact on the larger economy. PPPs are an increasingly popular strategy for forging those links, and move away from the traditional model of government procurement to deliver public services. They also differ from more casual, arms-length, or hierarchical relationships. Instead, they involve institutionalization of arrangements, with government as a partner, shared objectives, co-investment of resources, and clearly defined public interest and involvement (LaRocque 2007).

OECD describes PPPs as one of the best measures for building industry-science relationships (LaRocque 2007). Their principal contribution is supporting collaborative research and development between universities, private firms, and private research organizations, but they also can play an important role in other areas. When managed effectively, they can help develop and integrate a country’s long-term technological competencies and fund early-stage technological development. They can provide a means of funding universities, private research organizations, and private research contractors to help small and medium-sized companies upgrade their technological competencies and receive expert advice.

Through PPPs, a range of business skills can be transferred to the education sector, including managing people and resources, conducting strategic planning, performing needs assessments, allocating resources, analyzing markets, using incentives to accomplish objectives, anticipating demand, and innovating to create new opportunities. Advocates offer a list of anticipated benefits (Ingram and Schneider 2006):

• PPPs can help train better managers within the education sector.
• Effective public-private alliances draw on the comparative advantages of varied alliance partners, each of which brings unique strengths to the solution of a pressing development problem.
• Promoting private sector involvement in university activities can improve sector integration through increased relevance of training.
• Business clearly benefits from a well-trained and educated workforce, while education systems have the opportunity to benefit from training grants.
• Businesses benefit by partnering with universities, as it helps them access university resources and expertise, enhance corporate visibility, and deliver on social responsibility commitments.

Reilly (2005) and LaRocque (2007) identified key elements in successful PPPs, including a clear, well-articulated vision and statement of objectives; identification of partners who are well-motivated and aligned with those objectives; adequate resources; a supportive government; and the right social conditions. Projects undertaken by PPPs must make use of each partner’s skills and promote synergies. Other important elements include good management skills, effective communication and coordination, and regular and systematic project monitoring and evaluation.

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16 A public private partnership (PPP) is any formal relationship or arrangement, over a fixed term or indefinite period, between public and private entities, where both sides interact in the decision-making process and co-invest scarce resources such as money, personnel, facilities, and information to achieve specific objectives in the area of science, technology, and innovation (Dryden 2006).
Despite their anticipated advantages, few PPPs have been used to promote university participation in entrepreneurial research. Four factors may help explain this. One is the apparent reluctance of private firms to collaborate in research and development programs. Another is the poor alignment between public investments in science and technology and the technology development needs of business. The inadequacy of mechanisms promoting such collaboration is also a factor, as is the sporadic and uneven nature of public funding for science and technology.

Some groups question the appropriateness of government promotion or support of PPPs (Government of the Philippines 2007), expressing concerns that may be relevant to possible ADB support. One is that research and development by private corporations are typically done for profit, rarely for altruistic purposes. Governments need not invest in business activities that firms will be doing anyway. Another is that private firms will generally insist on proprietary rights over research and development they fund, even if done at a university-based research center. It is not necessarily appropriate for governments to subsidize such research. Multinational firms that have in-house research and development capabilities almost always conduct such research at their foreign headquarters. Local activities mostly focus on adapting original research findings to a local context and do not require the same level of investment as original research (Government of the Philippines 2007).

PPPs may offer a useful strategy for engaging private firms with universities in ways that stimulate research and innovation, but success depends on how the partnership is designed and implemented. Successful PPPs maximize self-interest as a way of promoting sustainability. The interests of business would include improving the curricular relevance of higher education, recruiting and screening students as potential employees, and accessing university equipment. Higher education interests would include gaining opportunities to improve curricular relevance, accessing private sector equipment and laboratories, working with business to commercialize research and technology undertaken at universities, and placing interns in business as a way of improving the relevance of their education. Even with fulfillment of such interests on both sides, the sustainability of PPPs will be at issue (LaRocque 2007).

A Role for ADB in Promoting Science and Technology. Visions of how best to improve science and technology within a country differ substantially. Advocates of a supply-side approach argue that more innovation depends on the production of more graduates with advanced training in science and technology. They believe that higher education institutions need the capacity and leadership to increase their enrollments in science, math, and related fields to produce the next generation of scientists, technicians, and technology-based entrepreneurs. Advocates of the demand-side approach maintain that innovation can be fostered better by creating a favorable regulatory framework and tax structure, strong protection for intellectual property, and access to capital to support entrepreneurial use of innovative thinking.

Which strategy offers greater promise depends on which problem ADB wants to solve. If public and private sector demand for university-based research in a country is robust but constrained by lack of researchers and laboratory facilities, then a supply-side strategy of financing better research infrastructure and staff might make sense. However, evidence suggests that demand for university-based research is often weak. Where that is the case, a demand-side strategy may be more appropriate. Lending and policy interventions to promote university-based research and innovation in such a setting would not necessarily target universities. Public and private sector demand for university-based research is more likely to be stimulated by creating a favorable regulatory environment and the incentives for business described above.

Both supply- and demand-side strategies are important but not equivalent. Support for research and innovation should follow a two-pronged strategy. The central strategy should concentrate on strengthening teaching of science and technology at secondary and higher education levels to prepare a workforce for high technology and research-oriented employment. Most of those employed in science and technology will not be conducting cutting-edge research. They will be working in settings that require scientific literacy, problem-solving skills, an understanding of scientific methods, and skill in the use of high-tech equipment. The second prong of the strategy would encourage university-based research and development through such measures as (i) creating and managing faculty incentives, (ii) capturing faculty members’ time to work through the institution rather than private consulting, (iii) accreditation and quality control, (iv) procedures for marketing and commercializing innovations, and (v) arrangements for contracting with business and industry.
The problems faced by higher education institutions in innovative research and development differ across subregions (LaRocque 2007), and different weaknesses require different solutions. South Asia is particularly weak in education and ICT. East Asia is relatively strong in indicators of innovation, but weak in education and economic incentives. Central Asia is stronger in education but weaker in economic incentives. Building science and technology proficiency in DMCs will require a range of strategies.

Summary Analysis of Strategies for ADB Support of Higher Education

Arguments in favor of and opposing the four main modalities for ADB support of higher education—lending, capacity development, knowledge management, and targeted support for science and technology—are summarized below and in Appendix 8.

Continued ADB lending for investment in infrastructure and policy development would help support the substantial future growth of higher education institutions expected in the region. The procedures for this modality are already well understood within ADB and its DMCs, contributing to its effective use. Alternative sources of capital for such investment, however, are more widely available now, and an increasing number of DMCs have sufficient resources for such investment without borrowing. ADB lending in support of ICT could be a cost-effective means of expanding access to higher education, and marries lending with interest in science and technology. ADB has increasingly supported ICT for basic education, and has organized regional conferences and implemented analytical studies in this rapidly evolving field. Drawing on this useful experience, ADB should consider expanding such activities in the higher education subsector, too.

ADB support to develop capacity of higher education institutions clearly can be justified by the erosion of institutional, administrator, and instructor capacities in recent years resulting from the expansion of higher education systems outpacing growth in the number of qualified administrators and instructors. Administrators with better managerial skills will increase the efficiency and cost-effectiveness of higher education, and better instructors will improve its quality. However, administrators and instructors with improved capacities must be supported by sufficient resources to effectively apply their expanded capacities, or they may well move out of education into competing career opportunities.

An active ADB role in knowledge management and sharing offers an attractive extension of its support for higher education, but carries some risk. ADB education staff is not presently configured for this role, and would have to be expanded and reconfigured. ADB’s experience with higher education is neither extensive nor adequately consolidated. Consolidation of experience and systematic expansion of higher education knowledge are required. The World Bank has the World Bank Institute for training and knowledge development, while ADB lacks a comparable organization. ADB may find itself competing with organizations with more experience in knowledge brokering. ADB would also have to decide what mechanisms for knowledge sharing would best suit the region’s needs and sensitivities. Different mechanisms have different strengths and weaknesses (Appendix 8).

While the connection between innovation, technological change, and economic growth is well established, the role of higher education institutions in that context is less than clear. The link between higher education institutions and innovation and technological change is tenuous. The activities of universities are not the principal factors that promote technology development. ADB support could help higher education institutions retain top researchers and deal with salary inequities of science and technology faculty, but current education lending allows DMCs to allocate funds to science and technology. Success of such support is largely contingent on factors outside the higher education subsector, and the payoff is uncertain.

Needs will differ by country. To some extent, country context follows geographic lines. More often, however, it is determined by economic, social, and political differences, as suggested in Table 7.

Crosscutting Issues

Attention to six crosscutting issues will be essential to development of higher education in the region, regardless of whether ADB takes a leadership role in support of that development, and regardless of the focus of ADB support among the strategies discussed above (Chapman and Austin 2002a). Higher education institutions will need to

(i) seek a new balance in their relationship with government;
(ii) cope with autonomy;
(iii) manage expansion while preserving equity, raising quality, and controlling costs;
(iv) tackle new pressures for accountability; (v) support academic staff in new roles; and (vi) diversify financial resources.

Changing Nature of Government-University Relationships. Shifts toward privatization and decentralization, as seen in the PRC, are changing the relationship between governments and higher education institutions, often in ways that cannot be fully anticipated. As new relationships are forged, goals sometimes collide. This often happens when system components change at different rates. Conflicts may emerge, for example, when the pace of change in tax laws, land ownership rights, financial accounting systems, and institutional operating procedures differs. New rules create contradictions and misalignments. Uncertainty arises about what some new policies mean. Innovative practices that some see as necessary and appropriate are viewed by others as violations of existing laws and regulations (Box 2). The conflicts that emerge between rules, operating procedures, and incentive systems can threaten to undermine the very system changes being sought are to strengthen (Chapman and Austin 2002a).

Misalignments often are the result of well-intentioned people and groups working at different speeds with different perspectives. One of the most effective ways of blocking reform, however, is to argue that actions being proposed are illegal, and that those advocating reform are breaking the law.

<table>
<thead>
<tr>
<th>Table 7: Higher Education Priorities by Country Typology</th>
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<tbody>
<tr>
<td><strong>Context of Higher Education</strong></td>
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<td>-------------------------------</td>
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</tbody>
</table>
| Post-conflict countries | Afghanistan, Cambodia, Timor-Leste | • Rehabilitation of damaged or incomplete physical facilities  
• Basic faculty development |
| Countries with rapidly growing higher education systems and international higher education providers | People’s Republic of China, Malaysia | • Systems for quality assurance  
• Information management systems  
• ICT for higher education, including distance education in higher education  
• Systematic instructional development, expanding the range of pedagogical strategies used in the classroom |
| Countries with well-established higher education systems | Republic of Korea, Philippines, Thailand | • Advanced level of faculty development  
• Development of research skills  
• Retrieving and using electronic information sources in teaching  
• Student assessment |
| Countries with emerging or new higher education systems | Pacific island nations | • Strategic planning  
• Infrastructure development  
• Networking and twinning |

ICT = information and communication technology.  
Source: Author.

Box 2: Snapshot Case Study: Higher Education Reform in Mongolia

During the 1990s, the Government granted universities more autonomy, shifted more management responsibility to each university, and expected each university to generate more of its own income. Universities were allowed (and expected) to charge fees to cover their expenses. But fee levels were still regulated by the Government. Universities were not allowed to raise their fees at a rate that would cover the costs of instruction. Government continued to treat all university income and assets as state property. Public universities could not dispose of outdated equipment (e.g., computers, furniture, and laboratory equipment) to upgrade to newer equipment without permission of the State Property Committee. Universities were given responsibility for generating income but not the authority needed to do so. These misalignments have been reduced but they slowed reform.


Implications of Greater Institutional Autonomy. In many countries, institutional leaders have long pushed for greater institutional autonomy. But greater autonomy from government often changes
the distribution of campus power and resources. Institutions often want more independence in campus governance without giving up their dependence on public funds. Governments, however, often want colleges and universities to be more financially self-sufficient, but may not want to relinquish authority over their operations. The search for balance is one of the central challenges of higher education reform in virtually every country. The benefits of autonomy are often clearer than the costs, to both universities and governments.

The Simultaneous Challenges of Managing Expansion while Preserving Equity, Raising Quality, and Controlling Costs. There is generally a tension (and sometimes a direct trade-off) among the political necessity to expand access, the educational desire to raise quality, and the overwhelming need to control costs. Governments are being forced to choose among the politically prudent, the academically desirable, and the financially feasible (Box 3). Institutional leaders must understand the interrelationship of these factors. They need guidance on the appropriate balance among these competing goals. This is the central focus of much higher education research in many countries. Research of this type examines the cost of different programs relative to the quality of instruction and the success of graduates.

New Pressures for Accountability. Rapid increases in enrollment, financial challenges, and the growing prevalence of online courses can undermine the quality of university education. This happens when instructional staff must be hired faster than they can be adequately trained, when new institutions lack clear procedures and systems for quality control, and when new modalities of delivering instruction (such as the Internet) lead to questions about how educators can be sure quality is being maintained. The convergence of these events, such as is happening in PRC, India, Indonesia, and Thailand, impart new importance to the design and control of quality assurance procedures.

Higher education research can help institutional leaders monitor instructional quality across different types of institutions. Such research can be a valuable tool for assessing the extent new technologies and pedagogical practices are being accepted by teachers and students.

Supporting Academic Staff in New Roles. The growth of higher education across the region has created enormous demand for new instructional staff, sometimes at a rate greater than qualified personnel can be trained and recruited. In the PRC, it is predicted that 80% of the full professors in universities will retire by the middle of this decade. To recruit enough staff to replace them, many institutions will need to improve faculty incentives (e.g., salary and conditions of employment, such as housing and workload). Universities will have to help faculty balance the competing pressures on them to teach, develop curriculum, conduct research, and take on institutional leadership roles.

To do this well, university leaders will require considerable information about the needs of their academic staff. How much time do instructors spend in preparing lessons? In meeting with and advising students? Does academic staff feel prepared for teaching and advising responsibilities? How much money does academic staff earn from work outside university employment? Once programs and policies to recruit and retain faculty are developed, universities will need a mechanism to assess their efficacy.

Opening New Markets. Virtually all analyses of higher education in the region cite the shortage of funds as a critical constraint, and the search for new funding streams as a major challenge. One way for higher education institutions to create new funding streams is to offer new products and widen their clientele. Some institutions that have served only the traditional college-age population are seeking to attract more international students to their own universities. They do this by improving the quality of their university systems, by offering more programs in English, and by underpricing the competition (Welch 2007), as shown in Table 8.

Conclusions

The low quality of higher education is the biggest problem and greatest challenge facing many DMC higher education systems. Among the areas needing greatest attention are (i) aligning the knowledge and skills of secondary school graduates with higher education entrance requirements, (ii) linking higher education preparation with labor market demand, (iii) diversifying the financial resources of public higher education institutions, (iv) financing private higher education, (v) increasing emphasis on cost-sharing by students and families, and (vi) dealing with staff compensation issues.

Pressure to extend access and improve the quality of higher education will continue to increase
across many parts of the region. Demand for a stronger role by ADB in support of higher education can be expected to grow. The most promising approaches for ADB support of higher education development include investment in infrastructure and policy development, capacity development, and knowledge management and knowledge sharing. Concentrating higher education funding in science and technology should be viewed with caution. The development of science and technology is based on the convergence of inputs from multiple sectors. The activities of universities are not among the principal factors that promote such development. Demand-side market mechanisms may be more effective in stimulating growth in science and technology.

ADB’s operations in higher education will increasingly need to be complemented by the provision of expertise in the substance and management of higher education. ADB must demonstrate that it has the relevant knowledge and efficient ways of sharing that knowledge. However, ADB does not yet have a comparative advantage as a knowledge broker in higher education, and is not yet configured to serve in that role.

Promising mechanisms for regional sharing of higher education knowledge include central and subregional knowledge hubs, international and regional twinning arrangements, and the use of regional and international consultants. No one approach offers overwhelming advantage. Using some combination of these mechanisms is probably the most appropriate strategy.

### Implications for ADB

Future ADB operations in higher education will need to be accompanied by a more significant knowledge component, requiring stronger emphasis by ADB on this component. ADB capacity to collect, consolidate, synthesize, and share key findings and knowledge about the development and reform of higher education systems will have to be greatly augmented. ADB also should consider serving as a repository and provider of such knowledge.

Assuming a greater knowledge-sharing role will require a bigger budget and staff. Education staff is likely to require reconfiguration and possibly expansion. Increased support for targeted research studies, conferences, and seminars is likely. If resources are inadequate to fully develop higher education staff, ADB could position itself as a broker of partnership arrangements (e.g., knowledge hubs, twinning, and consultant pools) as an alternative strategy. Internal staff expertise in higher education will remain crucial, but could be supplemented through outsourcing and partnerships.

The overall conclusion is that ADB could significantly increase its support for higher education, but a greater role for ADB in knowledge management and knowledge sharing related to higher education will be necessary. This will require a sustained commitment, an increase and reconfiguration of staff devoted to the education sector, and support from key DMCs.

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#### Table 8: Competitive Advantages of Countries in Attracting International Students

<table>
<thead>
<tr>
<th>Country</th>
<th>Student Visa Not Required for Study for Less than 3 Months</th>
<th>Low Tuition (up to $5,000 per year)</th>
<th>Moderate Tuition ($5,000–$15,000 per year)</th>
<th>Low Living Costs</th>
<th>Moderate Living Costs</th>
<th>Programs to Prepare Foreign Students Before They Start Classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>UK</td>
<td></td>
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<td>X</td>
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<td></td>
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<tr>
<td>Canada</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>PRC</td>
<td>X</td>
<td>X</td>
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<tr>
<td>France</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>Germany</td>
<td>X</td>
<td>X</td>
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<td>Japan</td>
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<td>Malaysia</td>
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<td>New Zealand</td>
<td>X</td>
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<tr>
<td>Singapore</td>
<td>X</td>
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<tr>
<td>US</td>
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</table>

The study provides a strategic framework for assessment of ADB assistance in the education sector. It concludes that education, at all levels, is essential for sustained and inclusive economic growth and social development. The importance of broad-based education sector development encompassing the three key subsectors is increasing as developing member countries (DMCs) move up the development and technological ladder. The reviews of the three subsectors make it clear that rapid change and development in DMCs have given rise to new issues and challenges.

The chapter on basic education recognizes that, while much progress toward universal primary education has been achieved as a result of international emphasis on Education for All (EFA) and the Millennium Development Goals (MDGs), the contribution to development has been hampered by inadequate quality. Increasingly complex requirements for development mean that basic education must expand beyond primary into secondary schooling. In countries where universal primary education is not yet an immediate goal, the accumulated experience of EFA should be brought to bear to accelerate progress. ADB has accumulated significant experience supporting DMC development of basic education. Lessons learned from earlier projects have been incorporated into project designs of recent years. ADB has successful experience in many DMCs as the lead development partner in this subsector. While grant financing from bilateral development partners will continue to be available for basic education, financing gaps are likely to remain in many DMCs. With its experience and financing resources, ADB continues to have a comparative advantage in the subsector.

The chapter on technical and vocational education and training (TVET) recognizes its vital role in dealing with the rapidly increasing shortages and mismatches in skills that are hampering development in the region. ADB has a relatively long and successful record in designing and implementing TVET projects. Project performance ratings in this subsector have improved considerably, reflecting successful incorporation of lessons learned and experience gained by DMCs and ADB. Regional demand for skills development will continue to evolve rapidly. An ADB approach to TVET anchored in strong analytical work and systemic reform is recommended, with emphasis on formal and informal TVET assured by national qualification frameworks. ADB is well positioned to support public-private partnerships in the subsector. ADB continues to have significant comparative advantage in TVET, given the subsector’s substantial future financing requirements. Only a few bilateral development partners support TVET in the region, and they have relatively low financing capabilities.

The chapter on higher education recognizes the rapid expansion of higher education throughout the region, as well as its essential role in lifting DMCs to the next level of growth and development. Demand for higher education will continue to grow. Higher education enrollments are driven more by the increasing size of the college-age cohort than by growth in the percentage of that cohort continuing on to higher education. Even where population growth rates are slow, demand for higher education will likely remain steady or grow due to increasing participation rates. This is expected to fuel a need and an opportunity for ADB to support development of higher education. While recent expansion of higher education systems in DMCs has been accompanied by a variety of innovative arrangements and new delivery systems, equity, and especially quality, have sometimes suffered. Both resource support and knowledge sharing and networking are essential to deal with this situation. ADB has limited experience in supporting higher education. The continuing expansion of higher education systems may well increase demand for additional financing in many DMCs. This is likely to be accompanied by rising demand for ADB technical assistance and advisory services.
The three subsectors cannot be treated independently; the symbiotic relationship among them is clear. The quality of TVET and higher education is dependent on the quality of entrants prepared by basic education. Conversely, the quality of basic education and TVET depends on the quality of teachers and sector managers produced by higher education. As countries move up the ladder of development, they need to balance priorities among the three subsectors to meet growing and increasingly complex education and skill requirements. The need for quality and relevance is becoming progressively more important in the sector.

Strategic Recommendations

Strategic areas of intervention are identified where ADB can make the greatest impact and contribution. Because countries differ greatly, the strategic perspective for development of education in each will also differ. The main sections of this report elaborate on the different perspectives, but a set of policy strategies commonly applicable to most countries emerges from the analysis of each subsector.

Basic Education. The following areas are recommended for attention.

Quality should receive emphasis to ensure that basic education systems deliver citizens who can contribute to and benefit from equitable, inclusive, and sustainable growth. DMCs will need help to manage the risk of quantitative expansion undermining quality improvement, and to enhance quality through curriculum reform where enrollments are already high.

Retooling and upgrading of teachers is required, using ICT and other innovative means and incentives in preservice, in-service, and continuous professional teacher development programs. Combined with interactive and learner-centered methodologies, this is the best means of transmitting quality education.

Development of a professional and accountable bureaucracy is essential to carry out reforms. Capacity development in sector policy, planning, and administration is needed, including deployment, transfer, and supervision of teachers and school administrators. Assistance is required to consolidate the expansion of basic education to include secondary education—even upper secondary—in DMCs where economic and social development requires a strengthened foundation of basic education.

Equity of access to education should continue to be emphasized, with special attention to disadvantaged and underserved groups, to promote equitable access to the fruits of growth. It will be important to help governments realize that the excluded will not easily adapt to mainstream education systems, and to help governments adjust these systems to better accommodate disadvantaged groups.

The potential benefits of the other important dimensions of basic education, such as early childhood education, literacy, and adult education programs, should be realized in DMCs where this has not yet occurred.

Innovative modalities and partnerships, such as use of ICT and links with private, corporate, and community sectors will be increasingly important in support of all of the above priority areas.

For TVET, the focus of attention should be on system reform to better align skills formation with requirements in the labor market, as outlined below.

Organization and management of TVET systems should be improved. Getting the organizational structure right is one of the first steps toward establishing a successful TVET system. This means forging close links with the labor market based on employer involvement in the system. Where possible, apex training organizations and national training authorities should be created or strengthened to analyze trends, set policy direction, and allocate resources.
Quality standards need to be created, based on development of occupational standards through the design of efficient vocational qualification frameworks and the setting of minimum training standards. Support of overly ambitious frameworks should be avoided because some DMCs have limited administrative capacity. Development of competency-based training is proving to be an efficient way to deliver instruction emphasizing achievements rather than time spent training.

Financial incentives should be improved. Financial mechanisms currently provide little incentive for better performance and result in inertia. Positive incentives should be established for institution managers to mobilize and use financial resources. Financial transfer mechanisms from apex organizations to institutions should incorporate performance conditions. ADB could help establish competitive training funds with equal access by public and private providers.

Private training provision should be expanded. It can be a vital instrument for increasing access to skills formation at little or no cost to government. Standards must be established and enforced, but the regulatory framework should ease rather than impede expansion of private provision. In some places, encouraging private training provision requires a change in the perspective of public administrators and society.

Greater attention should be devoted to continuous in-service training of adults and enterprise-based training. This emphasis contrasts with the past almost-exclusive focus on institution-based preemployment training. Training for the informal sector should be given prominence, particularly in less-industrialized DMCs, as a means of raising the productivity and incomes of low-income populations and supporting inclusive development. In DMCs where economies are moving up the value chain, postsecondary technical training should be accorded high priority in view of its seminal role in leveraging improvements throughout training systems.

Support for “vocationalizing” secondary education should be approached with caution in view of its undistinguished record in developing countries worldwide. Attempts at “diversified secondary education” have failed widely because of high costs, shortage of instructors, and the low status of the programs in an academic context.

Careful monitoring of the destination of graduates of secondary technical and vocational schools through tracer studies should be supported by ADB to ensure that training is directed at those motivated to enter the labor market and apply newly acquired skills.

Higher Education. Recommended areas for attention are outlined below.

Quality improvement is vital. Low quality is the biggest problem and greatest challenge facing many DMC higher education systems. Among the areas needing greatest attention are (i) aligning knowledge and skills of secondary school graduates with higher education entrance requirements, (ii) linking higher education preparation with labor market demand, (iii) diversifying financial resources in public higher education institutions, (iv) financing private higher education, (v) increasing emphasis on cost-sharing by students and families, and (vi) dealing with faculty compensation issues.

Infrastructure development, knowledge management and sharing, and capacity development are recommended as the most promising investment strategies for ADB support of higher education development. While investing in infrastructure development will contribute to the expansion of and access to higher education systems, it will be important to accompany such investment with measures to ensure equitable access. Knowledge management and sharing, and capacity development, will be important for strengthening quality in the above-listed areas needing greatest attention. Virtually all DMCs seek to incorporate advances in ICT to improve delivery of higher education.

ADB needs to become more of a knowledge organization to strengthen its relevance in the higher education subsector. ADB could serve as a repository and provider of knowledge about strategies for continued expansion and quality improvement in higher education. To fill this role will require that ADB increase its capacity to collect, consolidate, synthesize, and share key findings and knowledge related to the development of higher education systems.

A promising strategy would be for ADB to position itself as a broker of partnership arrangements (e.g., knowledge hubs, twinning, and consultant pools), if resources are not available to expand staff resources in higher education. Staff expertise in higher education will remain crucial, however, but could be supplemented through outsourcing and partnerships.

Science and technology as a focus of investment in higher education should be approached with caution. The development of
science and technology is based on the convergence of inputs from multiple sectors. The principal factors that promote development of science and technology are not the activities of universities. Higher education can support development of science and technology when comprehensive policies and cross-sectoral national development frameworks exist in this field in DMCs.

Implications for ADB

The knowledge component of ADB work in general can be expected to increase in line with the knowledge management role foreseen in ADB’s long-term strategic framework (ADB 2008b). This will be true in all three education subsectors, if the above recommendations are to have an impact.

There must be a knowledge base, a repository of experience and latest thinking about education issues and subsectors. For example, the international knowledge base for TVET is relatively weak, and ADB has a unique opportunity to fill this gap. ADB must consolidate its experience and institutional memory in TVET, organize it, and house it as a repository of knowledge about effective strategies. ADB must do the same with its considerable experience in basic education.

This will mean developing additional capacity to carry out these tasks. It may mean setting up a mechanism or an organizational unit to systematically package, organize, and share the experience of education staff with other staff and with DMCs.

For priority as well as innovative areas where ADB experience is limited, some staff may have to be upgraded or retooled. This can be done in a variety of ways, including regular training sessions, country visits, and short study leaves. If warranted by demand, more professional staff for specific priority areas may be recruited.

In fields where it is not feasible to develop staff expertise, ADB can cultivate a network of expert organizations, associations, and individuals with the required expertise, to be called upon when needed. The potential for a variety of partnership arrangements will contribute to ADB’s role as knowledge broker.

Using an expanded and consolidated knowledge base, ADB can continue to lead in the anchoring work of rigorous sector analyses, depending less on project preparation technical assistance and more on its own country education databases to identify areas of intervention were it can make a distinctive contribution.

For some new priority areas, flexibility, innovative modalities for implementation, and new collaborative arrangements with partners and the private sector will be needed. Future projects should explore and pioneer new financing and partnership arrangements.

As a knowledge organization, ADB should provide more venues for the exchange of information and expertise, first among education staff who deal with similar problems across the region, but also among DMCs.
Appendix 1: 
Education Economics: Emerging Issues in the Asia and Pacific Region

Introduction

This appendix was prepared as a background paper for Education and Skills: Strategies for Accelerated Development in Asia and the Pacific, commissioned by the Asian Development Bank (ADB). It reviews new empirical research on education economics since the 1990s, and considers the case for continued public investment at various levels of the education ladder in light of recent research.

Review of Literature

This section concisely summarizes research in education economics since the late 1990s. It is assumed that readers are familiar with the state of knowledge up to that time. Only a brief synopsis is thus presented of the “knowledge context” within which recent research has been conducted.

Organization and presentation of this summary is complicated by interactions between many of the key themes—supply and demand; quality and efficiency; cost, finance, and sustainability; and the role of donors all interact with one another. If a single theme emerges in recent research, it is that relationships are nonlinear and are context bound. It is difficult to speak of education policies and likely impacts independent of the broader social, economic, and policy context. Different investments in education can have quite different impacts depending on the national (and increasingly, global) context.

A final introductory point is that the discipline of economics focuses on the efficient allocation of limited resources. The emphasis in this paper is primarily on research that has policy implications for development assistance in general and for ADB in particular. With this in mind and recognizing the need for a concise yet comprehensive review, discussion centers on the main trends of research and does not discuss methodological details.

Economic Rationale for Public Involvement in Education

Synopsis of Context

The economic rationale for public investment in education and training was well established based on work dating back to the 1960s and 1970s. Arguments in favor of public finance (and, in some cases, public provision) include market failure, positive externalities, equity objectives, economies of scale, and the view of education as a public good.

Update

No significant research challenges the fundamental arguments in favor of public investment in education, per se. However, evidence is increasing that questions the rationale of public rather than private provision of education, particularly at levels beyond basic education. Evidence also questions the rationale of economies of scale; some evidence shows diseconomies of scale, reflected in movement toward decentralization, charter schools, and deliberate reduction in the size of large secondary schools.

It is important to emphasize that arguments in favor of public investment do not imply a need for public production. As an analogy, decisions to invest in physical infrastructure are not put forward as a rationale for public institutions to build civil works.

The general consensus remains that “there is an unambiguous role for governmental subsidy of education, because it both raises GDP [gross domestic product] and creates a more equal income distribution” (Hanushek, Leung, and Yilmaz 2003).

Costs

Synopsis of Context

International organizations have developed extensive databases on education indicators that include information on average government expenditure on education, by level, for most
countries.¹ Reliable information on private cost and finance generally is not available (Psacharopolous and Patrinos 2004). However, World Bank data for the most recent year available suggest that private costs—on average across all levels—are about 18.5% of total costs. Data tend to be incomplete and are sometimes of questionable accuracy. Of greater importance is that these data sources do not include information on unit costs by institution—information that is essential to address equity and efficiency issues. One clear pattern is that enrollment and costs have been rising, with public expenditure often consuming as much as 20% of national budgets and 6% of GDP. As a consequence of expansion, the share of education budgets required for salaries has increased, often squeezing out resources for other educational inputs. In low-income countries with rapidly increasing enrollments, it is not uncommon for salaries to consume over 90% of the total education budget.

Update
A substantial amount of work has been accomplished in recent years aimed at estimating the likely cost implications of meeting the education targets of Education for All (EFA) and the Millennium Development Goals (MDGs). Development agencies, including the World Bank, the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the United Nations Children’s Fund (UNICEF) have undertaken a number of large-scale studies with this aim. Findings of nine major studies are reviewed and compared in a recent report of the Finance Working Group of the EFA Fast Track Initiative (Gurria and Gershberg 2005). Estimates of the annual financing gap ranged widely from $3 billion to $11 billion per year—a difference of almost four to one! These marked differences are attributed to differences in study assumptions and methodologies. It is estimated that the cost of providing secondary education to the 400 million children currently not enrolled would be about $22 billion to $45 billion a year (Binder and Woodruff 2006). These cost estimates are generally based on currently observed average unit costs, and in all likelihood understate actual requirements. The actual costs of reaching marginalized children (from poor households, or those living in remote areas) will undoubtedly be substantially higher. One estimate, based on data from 94 countries, suggests that reaching MDG education targets would require increasing educational expenditure by one third (Baldacci, Guin-Siu, and de Mello 2002). There are also concerns about the adequacy of defining basic education as 5 years of schooling. Many experts believe that a minimum of 8 or 9 years is required to provide critical skills (Sperling and Balu 2005).

Research regarding private costs is ongoing. While high, however, private costs are difficult to estimate. In many countries, it is not uncommon for children to receive after-school instruction in “cram” schools, or in private classes provided by their own teachers. Publicly funded education, which is ostensibly free, can involve significant private costs for such things as uniforms, books, supplies, travel, and “contributions” to the parent-teacher association. There is some concern that these private costs will increase with the expansion of public provision in the context of budget constraints, and may constitute a barrier to access. There are extreme cases, such as the Chinese “study mothers,” who accompany their children studying in Singapore (Huang and Yeoh 2005).

Overall, evidence suggests that international data substantially understate the full cost of education.

Returns

Synopsis of Context
Since the mid-1960s and the emergence of the concept of human capital and “new labor economics” (associated with Gary Becker and Jacob Mincer), hundreds of studies and probably thousands of individual analyses have established and confirmed that there are strong and consistent private returns to investment in education. During this period, research findings were comprehensively summarized by George Psacharopoulos in 1973, and updated in 1985 and again in 1994. The private rate of return to an additional year of schooling is typically about 10%. Estimated social rates of return are generally lower than private, higher for women, higher in developing countries, and decrease by level of education.

Update
In a major update, Psacharopolous and Patrinos (2004) summarized information on rates of return,
based on data from 98 countries. Private and social rates of return continue to be high, with some evidence that the private rate of return to higher education has been increasing, as shown in Figure A1.1, below.

A number of studies have questioned the conventional wisdom that returns to primary education are consistently higher than those at secondary and tertiary levels. In an analysis of data from a survey of employment and unemployment in India, using dichotomous variables for education level, Kingdom and Unni (2001) found that returns are actually higher at higher levels. Similar findings have been reported in other studies (Fryer and Vencatachellum 2005; Gibson and Fatai 2006).

A study of returns in Australia (Junankar and Liu 2003) found a curvilinear relationship between returns and level—concave for most of the population but convex for Aborigines.

Some evidence shows that returns to investment may differ by stage of development of a country, and that in low-income countries primary education is the best investment. For middle-income countries, expansion of secondary education would yield the highest social returns, while in high-income countries the returns may be greatest in tertiary education.

Functioning Labor Markets. Returns to education are clearly depressed in controlled labor markets. The transition to an open market economy and global integration increase the return to education. A study of nine transitional economies found that returns increased substantially with transition. In countries where the transition was slow, the average rate of return was about 3% lower (Yemtsov, Cnobloch, and Mete 2006). This pattern also emerged in studies of individual countries (Patrinos, Mooock, and Venkataraman 1999). In cases of extremely constrained labor markets, returns are severely depressed and may actually disappear. For example, one study found no return to primary education for black females in one province of pre-independence South Africa (Fryer and Vencatachellum 2005).

Externalities

Synopsis of Context

The value of positive externalities has generally been ignored in most rate-of-return analyses because they are difficult to measure, and particularly hard to quantify in monetary terms. Despite this, substantial research on externalities has been conducted. By the mid-1980s, 19 separate benefits, in addition to income differentials, had been identified (Haveman and Wolfe 1984). Research on the social benefits of education as of the late 1990’s is summarized in Behrman and Stacey (1997).

Update

Psacharopolous and Patrinos (2004) differentiate between the “narrow” and “wide” social rates of return. The narrow rate of return, typically reported in empirical studies, captures only market outcomes associated with investments in education and training. The wide return includes positive externalities. Psacharopolous and Patrinos suggest that wide social rates of return might actually exceed private rates of return to education.

Analysis of data from 57 demographic and health surveys in developing countries shows a strong negative relationship between education and unwanted fertility (Brown 2006). Impact appears to be conditional, in part, on the cost of fertility control (Kim, J. 2005). However, some research suggests that the causal impact of education on fertility reduction in these studies may be overstated, especially in the case of higher education (Angeles, Guilkey, and Mroz 2005).

Maternal education is strongly related to child health in the forms of decreased under-5 mortality (Sastry 2004), lower child morbidity, improved self-reported health status, and—in the
case of higher education levels—increased use of prenatal, delivery, and postnatal health services (World Bank 2005b). It is estimated that a 10% increase in female primary enrollment is associated with a decrease in infant mortality of 4.1 per 1,000 live births; the corresponding estimate for secondary education is 5.6 (World Bank 2005b). A strong correlation exists between schooling and good health, whether measured by mortality rates, morbidity rates, or self-reported health status (World Bank 2005b). Analyses of demographic and health surveys in 49 developing countries show that the mortality rate of children under 5 is highest in households where mothers have no schooling and lowest where mothers have some secondary schooling or higher (World Bank 2005b). Education is also related to an individual’s health status, with a continuing positive relationship of education to health throughout the lifetime (Adams 2002).

Education has substantial spillover benefits in improving citizenship and social capital. Increased education is associated with higher voter participation, support for free speech, and greater civic knowledge (Dee 2004). Completion of secondary school is associated with reduced criminal activity and incarceration in the United States (US) (Lochner and Moretti 2001).

Two extremely important externalities associated with increased educational opportunity are reduced income inequality and social instability. It is well documented, however, that economic growth is associated with increased income inequality. In Asia, income inequality increased in almost all countries between 1995 and 2005. The greatest increases in inequality were experienced in Bangladesh, Cambodia, People’s Republic of China, Nepal, and Sri Lanka. In many Asian countries, school participation of children from the lowest income quintile is about one third that of the highest quintile (Ali 2007). The pattern suggests that targeting disadvantaged groups to assure inclusive growth may be essential to promote sustainable economic development.

Increased education is also associated with reduced public corruption, which, in turn, increases investment in education and other social services. A comparative study of 64 countries (1996–2001) found that public corruption distorts the structure of public spending and reduces the portion allocated to the social sectors, including education (Delavallade 2006).

For married couples, wives’ education has a strong and significant effect on husbands’ earnings (Amin and Jepsen 2005; Kimenyi, Mwabu, and Manda 2006). The relationship of maternal education to girls’ school participation is well established in earlier literature. Maternal education also has been found to increase the probability that children will learn to speak English (Bluedorn and Cascio 2005). Evidence shows positive “neighborhood effects,” through which the average education in a community can affect youths’ economic outcomes by impact on school quality, information flows, job networks, and examples (Jensen and Seltzer 2000). A recent review of research on the social benefits of education can be seen in Lange and Topel (2006).

**Employment, Productivity, and Economic Growth**

**Education and Employment**

**Synopsis of Context**

The link between education and employment is well established. In most countries, strong and consistent evidence shows that educated individuals are more likely to be in the labor force—particularly in the formal sector, and that they have lower levels of unemployment. Many developing countries, however, have a perennial problem of unemployed youths among school leavers and graduates.

**Figure A1.2 States Unemployment Rates for Ages 25 and Above, by Educational Attainment, 2006**

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However, the consensus is that education and training, in and of themselves, do not create jobs.

**Update**

The pattern of decreased unemployment at higher levels of education has remained consistent with earlier research. See, for example, unemployment patterns in the United States in 2006 (Figure A1.2).

### Education and Productivity

**Synopsis of Context**

A basic tenet of economic theory is that wages reflect marginal productivity in a competitive market economy where firms seek to maximize profit. However, in economies with large public sector employment, the relationship of education to labor productivity is likely to be less robust.

**Update**

In a widely cited review of empirical research, Pritchett (1996) found that the stock of human capital had no positive effect on the growth rate of output per worker; in some cases, he found a negative relationship. In addition to average stocks of human capital, the distribution of education levels may also influence productivity. A study of 94 countries during 1960–1995 found that both the average index of human capital as well as the dispersion of human capital positively influences productivity growth (Park 2006).

### Education and Economic Growth

**Synopsis of Context**

Education and human capital and their impact on technological change, in particular, have featured prominently in economic growth models since the 1950s. Khan and Williams (2006) provide a review of the evolution of these approaches. While most analyses have found a positive relationship between education and economic growth, findings have had low statistical strength. In cross-country analyses, findings have been inconsistent, while there are strong and consistent relationships in microanalyses (measuring the relationship between individuals’ income and education). However, macro analyses (measuring differences between countries in aggregate education and growth) often fail to find similar relationships. One of the most influential and widely cited studies before 2000, titled *Where Has all the Education Gone?* (Pritchett 1996), reviewed cross-sectional growth models and found no relationship (or possibly a minor negative relationship) between growth in educational expenditure and growth in output per worker.

**Update**

With globalization, increased international trade, and migration of capital and skilled labor between countries, there is increased recognition of the importance of technology and innovation to improve competitiveness and sustain economic growth. In countries at low levels of development, economic growth primarily depends on increases in primary factors of production, including land, labor, and primary commodities. As countries make the transition to middle-income status, growth is driven by “technological diffusion”—the introduction and adoption of global technology in local production. Growth in high-income countries requires “technological innovation”—the capacity to develop new technologies. Within this framework, investments in education and technology are essential in facilitating the transition to higher status. In the transition from basic production to technological diffusion, “...a sophisticated educational base is needed to absorb and upgrade primary innovations and foreign technologies effectively” (Porter et al. 2002). Technological innovation requires a population with high levels of tertiary education and substantial institutional capacity in research and development.

Numerous country studies in the Asia and Pacific region have found that education is an important factor in economic growth. In the People’s Republic of China, for example, analysis of interprovincial differences in economic growth in 1978–1988 (Kawakami 2004) and 1900–2000 (Qian and Smyth 2006) found growth strongly related to education levels. The same finding emerged in an analysis of growth in Taipei, China during 1965–2000 (Lin 2003), with higher education and engineering and natural sciences identified as being of particular importance (Lin 2004). In India, it was estimated that an increase of 2 years in average schooling for all would lead to permanent increases in GDP growth of 0.15–0.20% (Jain 2004). Other analyses of Indian growth in 1966–1996 attribute gains to primary but not secondary education. However, female education at all levels was found to be important (Self and Grabowski 2003). In Thailand, inadequate investment in education is posited to explain loss of growth and decreased technology divergence (Stokke 2004).

Similar patterns emerge in many studies of intercountry or regional differences in Asia. The
experience of East Asian growth is frequently cited. For example, World Bank analyses found that improvement in primary education was a powerful explanatory variable for East Asian economic growth, accounting for a half point of the higher growth there as compared with Latin America (Khan and Williams 2006). The relationship of education investment and economic growth in East Asia is examined in a series of 12 papers (Boldrin, Chen, and Wang 2004). In South Asia, where growth rates were lower, public expenditure on education was still found to be an important and statistically significant predictor of growth (Parida and Pravakar 2007). It is estimated that had human capital stocks (as measured by average years of schooling) in India been comparable to those observed in Southeast Asia, the average economic growth rate in India would have increased from the observed 2.8% to 5.1% (Siddiqui 2007).

Patterns observed in the Asia and Pacific region are replicated in studies in other regions. An analysis of government expenditure in 30 developing countries during the 1970s and 1980s by Niloy, Haque, and Osborn (2007) found that expenditure on education was the only outlay significantly associated with economic growth, controlling for other factors. Analysis of pooled time-series data for 94 developed and developing countries (1960–1995) found a positive relationship between human capital and productivity growth (Park 2006). Similar findings emerged in a study of 93 countries, where education was found to have a significant and positive long-run impact on growth (Agiomirgianakis, Asteriou, and Monastiriotis 2002).

In addition to direct positive impacts on growth, education is seen as acting indirectly through increased social equality and cohesion (Gylfason and Zoega 2003). There is also evidence of the positive impact of secondary education on growth in countries where the education sector functions productively (Rogers 2003). The availability of a skilled labor force also is critical in attracting direct foreign investment (Faini 2004).

Evidence is clear that growth is related to national capacity in scientific research and development. In economies where scientific capacity is expanding particularly rapidly, such as the People’s Republic of China; Hong Kong, China; Taipei, China; Republic of Korea; and Singapore, the publication rate has more than doubled in the previous decade (World Bank 2000a). Higher education, research and development, and university-private sector linkages are found to be important drivers of innovation and growth in advanced economies. The quality of doctoral research in science and technology fields was found to be positively associated with growth of employment and per capita income (during business cycle expansion) in a study of United States metropolitan areas (Hill and Iryna 2007). Growth in pharmaceutical research was closely related to local university research (Furman and MacGarvie 2007).

Despite the many individual studies in which an education-growth nexus appears, there is a lack of consistent supporting empirical evidence, and no consensus that this relationship exists in aggregate data. The relationship between individuals’ education and earnings within countries (based on “Mincerian” earnings function analysis)\(^3\) is consistent and persuasive, implying a positive impact of education on individual productivity. The same pattern is not consistently found in aggregate cross-country analyses.

There is considerable interest in trying to understand the lack of a consistent relationship in aggregate data. One explanation is that average years of schooling (which are used in most studies) is a poor proxy for human capital stocks (Woessmann 2003). The quality and learning impact of an additional year of schooling differs substantially across countries. When education quality measures (such as average performance on international standardized tests) are included in growth models, the overall explanatory power of estimates increases substantially, and the importance of years of schooling decreases (Hanushek and Woessmann 2007). It is estimated that an increase of one standard deviation is associated with a 1\% increase in annual growth of per capita GDP (Hanushek 2005). Another factor is that the impact of education can be conditional on stage of economic development (Sianesi and Van Reenen 2003), with tertiary education being most important in advanced economies. Analysis of patterns in Asia since 1960 (Keller 2006) suggest that expenditure on primary and secondary education was of the greatest importance. The impact of education on  

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\(^3\) The so-called “Mincerian” earnings function refers to the economic model developed by Jacob Mincer (Mincer, J. 1974. *Schooling, Experience and Earnings*. New York: National Bureau of Economic Research and Columbia University Press), in which the log of observed earnings is postulated to be a function of years of schooling, years of experience, and years of experience, squared. The estimated regression coefficient on the years of schooling variable is widely accepted as being an estimate of the rate of return to investments in education. The model has been estimated on literally thousands of data sets over the past 30 years and provides remarkably stable results in a range of countries and population groups.
growth has also been found to be more robust in open than in closed economies (Jamison, Jamison, and Hanushek 2006; Jain 2004).

Interest in education’s role in income inequality is also keen. Substantial empirical evidence supports the hypothesized “Kuznets curve,” an inverted U-shaped relationship between economic growth and income inequality, where inequality increases with economic development and then declines (Iradian 2005). Investments in basic education clearly help reduce income inequality during the development process. Evidence shows that education inequality actually slows economic growth (Bowman 2007).

In summary, substantial empirical evidence shows the impact of investment in education on economic growth. The failure of many aggregate growth studies to confirm this relationship is attributed to measurement error and misspecification of models. Many anticipate that as better data become available, the apparent divergence between microanalyses and macro analyses will be resolved. It is increasingly clear that a principal factor in stimulating economic growth is improvement in cognitive competencies and skills, rather than years of schooling or educational expenditure, per se. As noted in the review of efficiency issues below, there is little evidence of a relationship between educational spending and learning outcomes. This pattern is also observed in an analysis of East Asian economies (Nabeshima 2003). The relationship between education and growth is perhaps best summed up by Hanushek (2005): “Education can boost economic growth—but simply spending more money is seldom the answer.”

Globalization and Migration

Synopsis of Context
In general, earlier studies of migration emphasized “brain drain” issues and the concern that, with migration, public expenditures in developing countries constituted a subsidy to developed nations. Concern was also expressed about lost tax revenue from emigrants with higher education, and loss of positive externalities in the local economy.

Update
There has been increasing awareness of the positive impact of migration on development. Multinational agencies, including the World Bank and ADB, have initiated research to better understand the scope of migration and the impact of worker remittances on home economies. Human capital theory views migration as another investment in human capital, increasing the return on investments that have already been made. Recent studies support this hypothesis. Most migrants to countries belonging to the Organisation for Economic Co-operation and Development have a secondary (high school) education or higher (Adams 2003).

The value of remittances by foreign workers to their home countries now outpaces official development assistance. The World Bank estimates that transfers through formal channels reached $70 billion in 2004, $125 billion in 2005, and $167 billion in 2006 (Brinkerhoff 2006). This represents an average annual growth rate of over 50%, in current dollars. In 2001, South Asia was the second-largest recipient of remittances in the world (over $15.4 billion) and had the highest remittances as a share of GDP (over 2.5%). In the Philippines during 2001–2003, remittances constituted over 10% of GDP (Brinkerhoff 2006). It is generally agreed that official estimates significantly understate the true level of remittances due to the use of informal remittance systems (Brinkerhoff 2006).

Research indicates that remittances have a strong positive impact on investment at home, including household investments in education. In analyses of household surveys, it is found that in recipient households, school enrollment rates are higher (Acosta 2006), retention in school is significantly better (Edwards and Ureta 2003), and educational expenditure in general is higher (World Bank 2004). This is particularly clear in cases where the value of remittance income increased suddenly due to exchange rate shocks, such as occurred in Mexico (Docquier and Rapoport 2004) and the Philippines (Yang 2006).

It is unclear whether increased educational expenditure is primarily a wealth effect (recipient families can better afford education), or whether, to varying degrees, remittances are specifically “earmarked” for the education of family members. One study found that remittance income had 2.6 times the impact of other income on increasing school attendance, suggesting an element of earmarking (Edwards and Ureta 2003). This is an area that warrants further study. Research also shows that receiving remittances reduces the level and depth of poverty, thereby enabling households to invest more in education and entrepreneurial activities (Adams 2007). Analysis of data from 127 developing countries also suggests that the prospect of emigration itself fosters investment in education at home (Beine, Docquier, and Rapoport 2006).

The benefits of migration are not limited to remittances alone. There is strong evidence that
links to the overseas diaspora foster innovation. In the case of the People’s Republic of China, it is noted that earlier migration has produced overseas communities of engineers, scholars, and managers who are familiar with cutting-edge technology and best-practice management approaches, and who understand the dynamics of international product and financial markets (Dieter 2006). Developing countries benefit from network effects (such as business contacts, investments, and technological help) from skilled and successful emigrants abroad (World Bank 2004). Evidence shows that the positive impacts of migration on growth are positively related to the technological development of sending countries (Corrado di and Stryszowski 2006), particularly where inequality in income or schooling is low (Fabio 2004).

It is also clear that many migrants return home after gaining skills and experience abroad. Immigration records in the US over 1971–1981 indicate an average 30% return rate across all countries, with some countries as high as 50% (Wescott and Brinkerhoff 2006). Overseas workers reinvest income to purchase homes, and return migrants often start businesses (World Bank 2004). Cyclical migration is also common, particularly in Pacific island countries, where migrants accumulate resources to reinvest in the local economy (Baladacchino 2006). By example, migration provides a signaling effect that increases incentives for others to obtain education at home (Ranis 2007), and migrants are a source of information about modern concepts (Fargues 2006).

Recent research indicates that the negative effects of migration are typically not a major concern. For those countries where the educational attainment of migrants can be estimated, less than 10% of the best-educated (tertiary level) population of labor-exporting countries has migrated. Studies of the impact of migration on the teaching force in home countries have found that the impact is generally limited (Docquier and Rapoport 2004). For a handful of labor-exporting countries, however, international migration does appear to cause brain drain (Adams 2003).

**Stimulating Demand and Improving Access**

**Synopsis of Context**

By 1999, research had firmly established that, in economic terminology, education is a “normal” good: i.e., individuals and societies “consume” more education as income increases. The low levels of educational participation and attainment of poor households, and the reluctance of some families to educate girls, however, remain problematic.

**Update**

The main focus of EFA and MDG education initiatives has been to expand the supply of places in basic education—when schools are not available enrollment clearly is not possible. There is, however, an important demand-side aspect to reaching out to schoolchildren. Research continues to show that decisions regarding schooling are responsive to private economic incentives, and that participation increases with household income and anticipated returns, and decreases with cost. There is a significant positive relationship between changes in wealth and changes in the demand for education (Glewwe and Jacoby 2004). Household wealth is an even a stronger predictor of attendance than orphan status (Ainsworth and Filmer 2006). There is also a link between students’ self-reported assessment of school quality and the probability of remaining in school (Hanushek, Lavy, and Hitomi 2006). Decreases in child mortality (associated with a higher probability of realizing a return) are also associated with increased willingness to invest in education (Baladacchino and Estevan 2006).

Research indicates that in some situations, targeted, demand-side subsidies are more cost-effective than supply-side expansion (Coady and Parker 2004). However, in a review of 122 World Bank–targeted antipoverty interventions in 48 countries, a quarter of the interventions were found to have been regressive (Coady, Grosh, and Hoddinott 2004). One study also found that adult literacy campaigns are 1.5 to 2.5 times more cost-effective than building more schools (Handa 2002). It has been demonstrated that enrollment and attendance can be effectively raised through complementary programs such as school feeding, and nutritional and health interventions. For example, in a randomized experiment, deworming of school children in Kenya reduced absenteeism by one quarter (Miguel and Kremer 2004).

**Finance and Sustainability**

**Synopsis of Context**

The financial sustainability of the expansion of the education sector in developing countries has been a long-standing concern of governments and donor organizations. As enrollments and the size of the teaching force increase, resources for other learning-related inputs are squeezed out. In the past, donor
organizations have typically been unwilling or unable to support recurrent costs. This has resulted in relative over-investment in capital projects which typically have not been well maintained. An example of the concern about such problems is the 1990 World Bank study, *The Sustainability of Investment Projects in Education*. Data collection at the time of project design and completion of a sustainability analysis were strongly recommended as part of the appraisal process in this study (World Bank 1990).

**Update**

Development agencies have been shifting support toward coordinated financing of multiagency programs. Increasingly, such programs use a sector-wide approach, which includes budget support that can include recurrent cost items. This change does not, however, fully come to terms with issues of financial sustainability. National budget projections typically do not extend beyond 3 years, while education projects have long-term, ongoing recurrent cost implications. External support programs generally involve commitments for a limited period (often 3–5 years). In accepting support for recurrent costs, the implicit expectation is that donor programs will be renewed or extended. Sustainability analyses are now often included as part of the appraisal process. However, since they are undertaken with reference to a specific investment project that has already been designed, there may be perverse incentives for analysts to develop optimistic projections that will facilitate project approval.

**Efficiency and Quality**

**Synopsis of Context**

Economists differentiate between technical efficiency (making the best use of a defined set of resources) and efficiency of allocation (selecting the best combination of inputs, based on cost and marginal impact). A substantial body of economic education “production function” research emerged following publication in 1966 of the Coleman Report in the United States. It found that differences in learning outcomes were predicted primarily by differences in household characteristics rather than schools (Coleman 1966). The Coleman findings and methodology have been challenged on a variety of fronts, mostly related to the correlation of home and school characteristics and the generally small differences between US schools (relative to differences between families). It was anticipated that school effects might be found to be stronger in developing countries, where differences between schools are greater. A voluminous body of international research followed publication of the Coleman study, which attempted to identify the specific school inputs that made a significant difference in student outcomes. In general, there have been no consistent findings relating specific inputs to outcomes.

**Update**

On the whole, research has not found a consistent or significant relationship between purchased inputs and school learning outcomes in either developed or developing countries (Hanushek and Luque 2003). Some studies do find a link between levels of spending and education outcomes (Gupta, Verhoeven, and Tiongson 2002), but overall, findings are mixed at best. Teachers’ salaries are the largest component of education expenditure in virtually all school systems. A synthesis of 277 studies of the relationship of class size to student achievement found no consistent relationship (Hanushek and Luque 2003). Most of the studies (72%) found no statistically significant relationship; the remaining 28% were evenly divided between positive and negative effects. Similar results were found in Asia (Chapman and Adams 2002). Some researchers have questioned this conclusion, challenging the findings on methodological grounds (Borland, Howsen, and Trawick 2005). A comparative study of efficiency of education systems in Group of Seven countries found that systems with lower pupil/teacher ratios tended to be less efficient, and that efficiency was inversely related to the share of social spending going toward salaries (Verhoeven, Gunnarsson, and Carcillo 2007). While there is clear evidence that some teachers are more effective than others in facilitating learning gains, most empirical evidence suggests that degrees and teacher qualifications are not related to student achievement. Similarly, in-service training of teachers in many cases does not have a consistently positive impact (Hanushek 2005).

The failure of so many studies to find consistent relationships is hypothesized to be due to low levels of technical efficiency in most education systems—i.e., inputs are not used optimally, resulting in poor student results. However, an underlying assumption of production function research is that resources are used efficiently. While there are incentives for efficient production in profit-maximizing firms competing in a market economy, there are no comparable incentives in public sector provision of...
education. In the absence of efficient production, the conceptual basis of the production function model collapses (Worthington 2001).

It has been observed that the efficiency of education systems is lower in countries with high levels of corruption (Swaroop and Rajkumar 2002), where aid dependency is high (Hanushek and Luque 2003), and in countries with higher ratios of public-to-private financing (Pang and Herrera 2005).

Perhaps the most significant change in the economics of education literature since the late 1990s has been the increased recognition of the importance of cognitive skills and school quality—as opposed to years of school attendance—in explaining individual returns and economic growth. This is not an entirely new issue. What has changed, however, is the growing body of empirical evidence demonstrating its importance.

Concerns about quality are increasingly voiced by international and development agencies. The Asian Development Outlook 2007 notes, for example, that measures of average years of education or educational attainment do not capture critical factors linked to quality (ADB 2007a). Data underlying these concerns emerged, in part, from a major ADB study of school quality in member countries (Chapman and Adams 2002). The importance of school quality in economic development is reflected in the fact that measures of school quality are now included in the World Economic Forum's annual index of international competitiveness. “...[E]ducation policy makers and development agencies are therefore strongly urged to measure the effects of education policies on quality and relevance, rather than focusing exclusively on raising attainment” (Porter et al. 2002, par 1.1.6).

Key Emerging Issue—Information and Communication Technology

Synopsis of Context

Three major approaches have been employed in the use of information and communication technology (ICT) in education: direct delivery of services to learners, use of computers in traditional classrooms for quality enhancement, and training individuals to use computers and become computer literate (addressing the so called “digital divide”). Costs have decreased and special initiatives have been undertaken to provide laptops in developing countries, and major development agencies, such as ADB and the World Bank, have financed various ICT education projects.

Update

It is widely accepted that capacity in ICT is an essential precondition for a country's transition to a modern economy. Substantial international attention has been directed at the “digital divide” issue. In January 2000, The World Economic Forum launched a Global Digital Divide Initiative. This was followed by similar efforts by other international organizations, such as the G-8 Dot Force, the United Nations ICT Task Force, and InfoDev, a multidonor program administered by the World Bank.

The growth of distance education to provide university degrees and teacher upgrading has, in general, been successful. Analysis of the 10 largest distance education services shows an average cost reduction of almost two thirds compared to traditional classroom instruction. Together, these institutions serve 2.7 million students. Five of the 10 largest systems operate in ADB developing member countries, serving over 1.5 million students. In these countries (People’s Republic of China, India, Indonesia, Republic of Korea, and Thailand), average unit costs are about one quarter of those of traditional universities (World Bank 2000a).

Results of using computers and ICT in traditional classroom settings at the primary and secondary level have been disappointing. In an analysis of Programme for International Student Assessment (PISA) results for 32 developed and developing countries, the availability and use of computers at home and at school did not have a positive impact on learning outcomes. When statistical controls for household socioeconomic status were included in the analysis, no impact was found for computers in school, and access at home was found to be statistically significant and negative. The authors suggest that the “mere availability of computers at home seems to distract students from effective learning” (Fuchs and Woessmann 2004).

In the US, a Congressionally mandated study of the impact of computers on learning involved an experimental design with random assignment of 132 schools to treatment and control categories. Sixteen instructional reading and mathematics software packages were used. The $15 million study concluded that there were not statistically significant differences between treatment and control groups (Dynarski et al. 2007). Findings from the US, however, where home access to computers is common, may not be applicable to developing countries.

Hardware costs have dropped significantly and there has been a great deal of publicity about
plans to provide laptops to schools in developing countries at a subsidized cost of about $100 each. However, this cost target appears to have been unrealistic, with the estimated cost rising by almost 90% as of September 2007, and likely to increase further. However, even at a unit cost of $100 (and assuming the availability of free operating system software), the cost of these laptops would not be financially sustainable in many DMCs, where teacher salary costs consume over 90% of the recurrent budget. The costs of computer maintenance, replacement, consumables, electricity, and connectivity are substantial.

A chronic sustainability problem in education is that donor organizations have tended to “over-invest” in capital goods, without due consideration of the ongoing recurrent cost implications of the investments. Substantial literature on the so-called “R-coefficient” dates back at least two decades. Experience in ICT projects has demonstrated the danger of underestimating the full recurrent cost implications of investments. As a consequence, the concept of “total costs of ownership” (TCO) evolved. The TCO approach was initially developed in the late 1980s to estimate the full cost of owning and operating personal computers. TCO is defined as the sum of all the costs of any item from “cradle to grave”—i.e., from purchase of the item, through its use and maintenance, to its disposal or end of its useful life. The TCO approach aims to arrive at the “real cost,”—including the often “hidden costs”—of deploying ICT in schools. In addition to TCO concerns, it is often difficult to recruit staff with relevant skills, or to retain teachers who acquire these skills.

The Case for Public Sector Investment in Education in Asia and the Pacific

Basic Education (Grades 1–5 and Through Grade 9)

By worldwide consensus, access to basic education is a fundamental human right. The consistently observed high rate of return to investment in basic education, and the clear importance of literacy, numeracy, and other basic skills as requisites for national development underpin an international commitment to meeting EFA and MDG education goals. Universal basic education also contributes significantly to addressing concerns about income inequality.

The rationale for public investment is clear: significant positive social externalities associated with reduced fertility, improved public health, and social stability which are essential for national development and economic growth. It has consistently been demonstrated that the education of girls and women is of particular importance.

A number of countries, some in the Asia and Pacific region, are clearly at risk of not meeting MDG education targets by 2015. Of equal concern—even where numeric enrollment and retention targets are met—is that the quality of education may be so poor as to have limited, or perhaps, no significant impact on learning outcomes. In some countries, the rate of return to basic education has declined, suggesting a need for policy makers to attend to quality concerns (ADB 2007a).

Climbing primary enrollments will inevitably lead to growing social demand for places at the postprimary level. In fact, the opportunity to attend secondary school is often a factor in the decision to enroll children in primary. The World Economic Forum has identified universal secondary education as a critical precondition for countries attempting to move their economies beyond a traditional primary commodity base (Porter et al. 2002).

Development literature strongly indicates that in a knowledge-based global economy, a minimum of 9 years of education constitutes a reasonable minimum target for universal education. It is therefore reasonable to consider the first 9 years of schooling as constituting basic education.

Technical and Vocational Education and Training (TVET)

With globalization and the transition to a knowledge economy, the ability of nations to deal with technological change is increasingly recognized as a key factor in economic development. The implications of this phenomenon for investment in education differ by level of development, but the rationale for public investment in stimulating supply, demand, and opportunities for cost-effective TVET is clear. This does not, however, imply that state provision of TVET is required.

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4 See news article at http://osnews.com/story.php/18620
5 See, for example: World Bank (1990).
The history of state-run TVET institutions has been disappointing. There have been examples of successful institutions, however, which typically target specific market needs. In many countries, there has been a proliferation of publicly funded TVET institutions offering programs at all levels, often under the control of different ministries. The impetus for their establishment was often linked to manpower forecasts and concerns about youth unemployment and the employability of academic graduates. Creation of these institutions was encouraged and sometimes funded by donor agencies. In general, these institutions have proven to be inefficient, to have high unit costs and, in many cases, to saturate labor markets with redundant skills.

A key issue at the secondary level is whether academic or vocation curricula contribute most to economic growth. The emerging consensus is that academic education has a greater long-term impact on growth. For example, differences in growth rates between Europe and the US in the 1980s and 1990s are attributed to differences in education policies during the two previous decades. It is argued that as the rate of technological change increased, those with more general academic backgrounds were better able to adapt (Krueger and Kuman 2004). In a study of growth in Japan, Self and Grabowski (2003) found that primary education had a positive impact on growth in general, and that secondary and higher education had a particular impact in the post-World War II period. Vocational education was not found to have contributed significantly to growth. Despite higher costs, most empirical studies generally found that there was no concomitant wage differential observed for vocational education graduates, except for instances where there were specific skill shortages, growing employment, and a good match of vocational skill training to vacancies (Neumand and Ziderman 2003).

Students and parents appear to be aware of the benefits of academic training, and it is widely observed that vocational options are often a second choice for students who fail to gain admission to academic institutions. This is not universally the case, however. In Thailand, where private returns to vocational training are higher, students from affluent families were more likely to choose TVET options at upper secondary (Moenjak and Worswick 2003).

Education economics literature suggests that TVET should be demand- rather than supply-driven. Substantial evidence shows that individuals are willing to pay for high quality TVET and that, in a supportive regulatory environment, private sector providers will be responsive to demand. The most effective training is enterprise-based, or a system of combining institutional training with enterprise-based internships.

Bearing in mind the diversity of the TVET sector and the danger of overgeneralization, it is clear that investments in vocational and technical skills can be an important factor in economic development and growth. This is particularly the case when technological and ICT skills are involved. The key challenge is to identify mechanisms where public resources can be used to stimulate a supply response to market demand for specific competencies. It has been clearly demonstrated that supply-driven initiatives can be extremely costly and inefficient.

Higher Education

Expansion of higher education and the existence of national or regional university research centers are increasingly recognized as crucial elements for economic development in the global economy. The greatest expansion of higher education enrollment will occur in developing countries in the coming decades (Altbach 2003). Studies of the Asia and Pacific region have demonstrated the critical role of education in economic growth. The presence of a highly educated workforce also contributes directly to attracting foreign direct investment.

In addition to producing graduates, higher education institutions can serve as catalysts for research and development. A recent ADB study asserts that to make the transition from low-cost assembly to high-value innovation, the Asia and Pacific region must develop world-class research and development capacities (ADB 2007b).

However, in a number of countries, particularly in South Asia, the production of higher education graduates has outstripped the demands of the labor market, suggesting that there can be instances of “over-education” (ADB 2007a).
## Appendix 2: ADB Loans, Grants, and Technical Assistance in the Education Sector

### Table A2.1: Loans and Grants—Breakdown by Subsector and Subregion, 1970–2007

<table>
<thead>
<tr>
<th>Period</th>
<th>Central &amp; West Asia</th>
<th>East Asia</th>
<th>Pacific</th>
<th>South Asia</th>
<th>Southeast Asia</th>
<th>TOTAL</th>
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<td>Value ($M)</td>
<td>%</td>
<td>Value ($M)</td>
<td>%</td>
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<tr>
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Table A2.1: Loans and Grants—Breakdown by Subsector and Subregion, 1970–2007

<table>
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<tr>
<th>Period</th>
<th>Central &amp; West Asia</th>
<th>East Asia</th>
<th>Pacific</th>
<th>South Asia</th>
<th>Southeast Asia</th>
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<td>%</td>
<td>Value ($M)</td>
<td>%</td>
<td>Value ($M)</td>
</tr>
<tr>
<td>C. 2000–2007</td>
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ADB = Asian Development Bank, M = million, % = percent, $ = US dollar.
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</tr>
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<td><strong>Tertiary Education</strong></td>
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<td>1,100,000</td>
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<td>1,550,000</td>
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<td><strong>TOTAL</strong></td>
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<td>1,275,000</td>
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<tr>
<td><strong>Regional Education Sector Development</strong></td>
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<td>2,380,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
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<td>15,460,000</td>
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<tr>
<td><strong>East Asia</strong></td>
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Table A2.2: Technical Assistance—Breakdown by Subsector and Subregion, 1974–2007
### Table A2.2: Technical Assistance—Breakdown by Subsector and Subregion, 1974–2007

<table>
<thead>
<tr>
<th>Subsector</th>
<th>Central &amp; West Asia</th>
<th>East Asia</th>
<th>Pacific</th>
<th>South Asia</th>
<th>Southeast Asia</th>
<th>Regional</th>
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<td>%</td>
<td>Value ($'000)</td>
<td>%</td>
<td>Value ($'000)</td>
<td>%</td>
<td>Value ($'000)</td>
</tr>
<tr>
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<td>100.00</td>
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</table>

- **Basic Education**: 8,925,000, 35.28%; 2,650,000, 19.43%; 2,575,000, 25.45%; 7,656,800, 17.06%; 18,457,000, 19.99%; 2,900,000, 21.88%; 43,163,800, 21.63%
- **Secondary Education**: 2,050,000, 8.10%; 0.00, 0.00%; 314,000, 3.10%; 1,500,000, 3.34%; 25,020,000, 27.10%; 355,000, 2.68%; 29,239,000, 14.65%
- **Tertiary Education**: 410,000, 1.62%; 2,535,000, 18.59%; 95,000, 0.94%; 2,057,000, 4.58%; 6,884,000, 7.46%; 1,295,000, 9.77%; 13,276,000, 6.65%
- **Nonformal Education**: 1,000,000, 3.95%; 1,000,000, 7.33%; 1,100,000, 10.87%; 12,864,500, 28.67%; 4,815,000, 5.21%; 1,790,000, 13.51%; 22,569,500, 11.31%
- **Technical Education, Vocational Training and Skills Development**: 2,749,200, 10.87%; 1,600,000, 11.73%; 2,491,000, 24.62%; 11,036,000, 24.59%; 11,804,720, 12.78%; 2,872,000, 21.67%; 32,552,920, 16.32%
- **Education Sector Development**: 10,165,000, 40.18%; 5,855,000, 42.93%; 3,543,000, 35.02%; 9,762,000, 21.75%; 25,357,500, 27.46%; 4,039,400, 30.48%; 58,721,900, 29.43%

ADB = Asian Development Bank, Devt = Development, % = percent, $ = US dollar.
## Appendix 3: The EFA Development Index and its Components in Selected ADB Developing Member Countries

<table>
<thead>
<tr>
<th>Ranking According to Level of EDI</th>
<th>Developing Member Country</th>
<th>EDI</th>
<th>Total Primary NER&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Adult Literacy Rate</th>
<th>Gender-Specific EFA Index (GEI)</th>
<th>Survival Rate to Grade 5</th>
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<td>Kazakhstan&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>0.990</td>
<td>0.996</td>
<td>0.986</td>
<td>0.995</td>
</tr>
<tr>
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<td>Georgia&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>0.998</td>
<td>0.993</td>
<td>0.982</td>
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<tr>
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<td>Kyrgyz Republic&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>0.992</td>
<td>0.991</td>
<td>0.969</td>
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<td>Tajikistan&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>0.996</td>
<td>0.930</td>
<td>0.980</td>
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<tr>
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<td>Fiji Islands&lt;sup&gt;c&lt;/sup&gt;</td>
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<td>0.929</td>
<td>0.960</td>
<td>0.987</td>
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<td>Azerbaijan&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>0.895</td>
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<tr>
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<td>0.909</td>
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<tr>
<td>67</td>
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<td>0.958</td>
<td>0.772</td>
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<td>0.969</td>
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<td>0.868</td>
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<td>Bangladesh&lt;sup&gt;b&lt;/sup&gt;</td>
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ADB = Asian Development Bank, EFA = Education for All, EDI = EFA Development Index, GEI = Gender-specific EFA Index, Lao PDR = Lao People’s Democratic Republic, NER = net enrollment ratio.

<sup>a</sup> Total primary NER includes children of primary school age who are enrolled in either primary or secondary schools.

<sup>b</sup> Adult literacy rates are United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS) annual literacy estimates. The estimates were generated using the UIS Global Age-specific Literacy Projections model.

<sup>c</sup> Adult literacy rates are unofficial UIS estimates.

Appendix 4: Definition and Scope of Technical and Vocational Education and Training

Technical and vocational education and training (TVET) refers to a broad range of preparation at different levels of the education and training system. “Vocational” refers to middle level, or traditional trade occupations for semi-skilled and skilled workers. “Technical” refers to occupations in the technician category that are usually prepared at the postsecondary level. Vocational and technical “education” refers to exposure to the world of work and to preparation for entry into further studies in vocational and technical education. Technical-vocational “training” means preparation for direct entry into, or upgrading in, specific (or clusters of) occupations in the labor market.

The terms “formal,” “nonformal,” and “informal” training also have specific meanings in this study. Formal education and training is structured learning that takes place in the education system, and usually ends with accredited or certified outcomes. Nonformal education and training is structured learning that takes place outside the recognized education system, in or outside the workplace, and does not result in an accredited qualification. Informal education and training is less organized and structured, and usually takes place in the workplace—such as learning by doing alongside an experienced worker. This should not be confused with training for the informal sector of the economy, which means training people for work outside the wage or modern sector of the economy. Formal, nonformal, and informal means of training can be delivered by either public or private (i.e., nongovernment) providers.

Within the formal education system, TVET occurs at different levels. The International Standard Classification of Education, developed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1997, specifies four levels of education and training pertinent to TVET: level 2 (lower secondary), 3 (upper secondary), 4 (non-tertiary postsecondary) and 5 (first stage tertiary, nondegree.) Within these levels there are three types of program orientation—type A (general), type B (pre-vocational), and type C (vocational or technical)—for direct entry into specific occupations (see figure below).

TVET considered in this study includes that delivered at secondary, postsecondary, and first stage (nondegree) tertiary levels within the formal education system, and nonformal (i.e., organized) TVET outside the education system.

Figure A4: International Standard Classification of Education Mapping Diagram

A = general, B = pre-vocational, C = vocational or technical, 1 = primary, 2 = lower secondary, 3 = upper secondary, 4 = non-tertiary postsecondary, 5 = first stage tertiary, nondegree, 6 = higher education, degree level.

TVET in Asia and the Pacific: Diverse and Complex

TVET is provided at different levels within the education system—secondary, postsecondary, and tertiary. It is provided in schools and technical institutes within the formal education system, in dedicated training centers outside the formal education system, and on the job in both the formal and informal sector (e.g., traditional apprenticeships). It is provided in separate training institutions, in parallel with general education, and integrated with general education in schools. TVET is provided within monotechnic or polytechnic institutions, and in institutions supported by nongovernment organizations, church agencies, and for-profit organizations. TVET training programs may last for a few days or for 3-to-4 years. The clientele may be youths for preemployment training or continuing training, or adults for upgrading or retraining. It may be given full-time, part-time, or on block release. In short, TVET provision is heterogeneous and complex.

In Asia, TVET can be divided into three main categories: (i) TVET as part of the formal school system of education and training, (ii) nonformal TVET (organized training outside the formal education system), and (iii) enterprise-based training.

Figure A5.1: Percentage of Upper Secondary Students Enrolled in TVET Programs in Selected Countries, 2002


Source: Calculated from enrollment data in International Centre for Technical and Vocational Education and Training (UNEVOC) (2006).
Formal TVET

The proportion of enrollment in formal TVET at the upper secondary level is highly correlated with per capita income. In contrast with general education, however, few systematic data are available on enrollments and outputs from TVET.\(^1\) Available data best describe the proportion of students enrolled in TVET subjects in upper secondary (International Standard Classification of Education [ISCED] level 3), and in tertiary, nondegree, prevocational (ISCED 5B). Figures A5.1 and A5.2 show these data for selected Asian, Pacific, and higher income countries, and the strong correlation between the proportion of students enrolled in TVET subjects and per capita income. The higher per capita income, the higher the proportion of students enrolled in TVET subjects. As may be seen in the two figures, the vocational education stream is quite small in South Asian countries. Less than 3% of students at the upper secondary level in India were enrolled in TVET programs in 2002, for example (World Bank 2006d, ii).

Governments commonly establish high targets for the proportion of secondary students to enroll in vocational programs. In Indonesia, the target was 70% of upper secondary students in vocational schools, while the State Council in the People’s Republic of China (PRC) targeted 60% enrollment in secondary vocational programs (Copenhagen Development Consult A/S 2005, 7). Policy makers are keen to expand vocational education despite poor labor market outcomes. Pakistan planned to add technical vocational streams in secondary education, and aimed for half of all secondary students entering those streams (World Bank 2006c). India targeted 25% (World Bank 2006d, ii), while in Bangladesh the goal was 20% of all secondary students enrolled in vocational/technical secondary (World Bank 2007a, 12). Starting from such a very low base—only 1% to 3% of total enrollments in 2002, as may be seen in Figures A5.1 and A5.2—the targets of these three latter countries were extremely ambitious.

Advanced countries are making upper secondary vocational education more general, and deferring TVET specialization until postsecondary education.\(^5\)

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\(^{1}\) See International Centre for Technical and Vocational Education and Training (UNEVOC) (2006) for an extensive examination of this topic.
levels. The Republic of Korea is moving away from vocational secondary education. The proportion of students in secondary vocational programs is being reduced in favor of more general secondary education, with TVET specialization deferred until the postsecondary level. Vocational students made up 46% of secondary students in the Republic of Korea in 1995, but this share had dropped to 31% by 2003. The proportion of vocational secondary graduates entering higher education increased from 19% to 57% over the same period (Pillay 2005, quoted in World Bank 2006d, 17). Similarly, Malaysia is emphasizing postsecondary TVET at the expense of secondary vocational and technical. A 1999 Asian Development Bank (ADB) impact study of TVET in selected Asian and Pacific countries found that only 1% of final year students in secondary technical and secondary vocational schools intended to enter the labor market. More than 90% intended to pursue further studies (ADB 1999b). These findings were confirmed in a more recent ADB project completion report (ADB 2007e).

Student enrollment in tertiary (nondegree) TVET also correlates with per capita income. Figure A5.2 shows the proportion of students enrolled in TVET programs at the tertiary, nondegree level (including certificate and diploma programs.)

Formal TVET provision has been widely seen as irrelevant to industry in South Asia. Employers have long preferred to recruit trainees through systems that select candidates from unskilled and casual labor (King 2007, 6). One of the consequences of the relatively low enrollment in TVET in South Asia is a scarcity of TVET skills in the labor force.

In Bangladesh it is barely conceivable that there should be so few people in the labor market with technical/vocational qualifications. The 2002/03 Labor Force Survey estimated only 53,000 such men and 5,000 such women….For every single person in the labor force with technical/vocational qualifications there are some 690 others who have not gone beyond grade X, more than 104 others who have completed SSC [secondary school certificate] or HSC [high school certificate] and even 34 who have a university degree (World Bank 2007a, 3).

Nonformal Training

Enrollments in various types of nonformal training often make up the bulk of participation in skills formation programs. However, little or no cross-country data exist for TVET outside the formal education system—e.g., in vocational training centers, industrial training institutes, and rural training centers. In the People’s Republic of China, nonformal vocational training is more important in quantitative terms than vocational education in schools. Counting all types of nonformal training—preemployment, upgrading, and reemployment training—a total of 76 million people participated in 2003, compared with 12.6 million students in vocational secondary education (Copenhagen Development Consult A/S 2005).

In India, some 350,000 to 400,000 secondary students are enrolled in vocational education (less than 3% of the 14 million students in Grades 11–12), whereas craftsman training schemes in industrial training institutes and centers enroll over 740,000 trainees (World Bank 2006d, 12, 20). Similarly, in Papua New Guinea, vocational centers enroll about 18,000 trainees, compared with relatively few in secondary vocational programs. Nonformal training tends to make up the bulk of training provision.

Enterprise-Based Training

Most skills acquisition takes place on the job in one of two forms: enterprise-based training in the formal sector of the economy (e.g., in regulated apprenticeship systems), or in the informal sector (traditional apprenticeships).

In the formal economy, the rates of enterprise-based training vary substantially by country. Firms in South Asia, however, appear to be underinvesting in worker skills. Only about 22% of all firms in Bangladesh and 17% of manufacturing establishments in India provide formal training for...
employees.\footnote{See World Bank 2006d, 62; and World Bank 2007a, 37. The ability of a firm to provide on-the-job training depends partly on its size. Opportunities for enterprise-based training are generally lower for smaller firms. For example, in Indonesia about 90\% of enterprises are very small, employing on average only 1.6 workers. It is not realistic to expect much training in this context.} These figures are low compared with those in the fast growing economies in East and Southeast Asia, such as the Republic of Korea and Malaysia. When firms in South Asia do train, they tend to extend training to a much smaller share of their workforce than firms in East Asia (Figures A5.3 and A5.4).

In-service training also varies among countries in Central and South Asia. Figure A5.5 compares Bangladesh, India, Pakistan, and Sri Lanka using data gathered from World Bank Investment Climate Surveys. The unweighted estimates show that, on average, Indian firms are less likely to train than firms in Bangladesh (27\%) and Sri Lanka (38\%). Even when the data for other countries are weighted to have the same size distribution as India, the low relative ranking of India remains unchanged, although the training gaps with Bangladesh and Sri Lanka are reduced somewhat.

In Bangladesh and India, external training appears to have a positive and statistically significant effect on productivity among firms that export or conduct research and development. This could explain the greater propensity to train among firms facing international competition or using new technologies (World Bank 2006d, 67; World Bank 2007a, 20).

The incidence of training of individuals also varies, but is lowest in certain Central and South Asian countries. Table A5.1 shows the percentage of workers in these countries receiving enterprise-based training in each of four occupational groups—managers, professional staff, production workers, and non-production workers. In Bangladesh and Pakistan, employers extend in-service training to only a small fraction of their workforce. The percentages of workers trained in India and Sri Lanka are considerably higher, but are still much lower than in East and Southeast Asia. A World Bank study found that Malaysian manufacturers provided in-service formal training to 22\% of their workers in 1994 (Tan and Batra 1995).

In the PRC, enterprise-based training is the norm rather than the exception. The Ministry of Labor estimated that there were 22,000 firm-based training centers in 2003 that provided courses for some 30 million people. Enterprises are considered key elements in the provision and delivery of TVET, for both preemployment and upgrading. Several laws stipulate the obligation of enterprises to provide systematic vocational education and training for employees, and enterprises must spend 1.5\% of their wage bill for worker training. However, the incidence of such training may be declining with the restructuring of the economy and the reduction in the number of state-owned enterprises (Copenhagen Development Consult A/S 2005, 9).

The main reasons for non-training by firms are examined in Figure A5.6, based on data gathered in the World Bank’s World Business Environment Survey (World Bank 2000b). It is important to investigate why employers do not train their workers, as interventions to stimulate greater enterprise-based training must address the root causes of failure to train.

Some reasons cited for non-training that may be related to market failures include (Batra and Stone 2004, 9):

- Training is unaffordable owing to the firm’s limited resources. Economic analysis shows
that training employees has a high payoff to firms. If so, inability to finance this investment could reflect a capital market failure.

- Cost of high labor turnover. Firms cannot capture the full benefits of training owing to externalities, such as poaching among firms. This causes them to under-invest in worker training.
- Lack of knowledge about training techniques, or skepticism about the benefits of training. Firms may suffer from inadequate information about the benefits of training.

The above factors may argue for incentives that counter market failures, such as training levies refundable against private training expenditures by firms (Batra and Stone 2004, 21).

**Relative Importance of the Three Types of TVET**

The relative weights of the three principal types of training (formal, nonformal, and enterprise-based training) vary from country to country. However, it is common to find that formal, school-based training enroll fewer trainees than either nonformal training or enterprise-based training. The estimates in the PRC shown in Figure A5.7 illustrate this point, showing the relative importance of formal training, nonformal training, and enterprise-based training.

**Traditional Apprenticeship Systems**

These still function widely and may be the primary source of skills development in South Asia. They are increasingly important in Central Asia (Box A5.1). The informal or unregistered sector is responsible for between 80% and 90% of employment in much of South Asia (King 2007, 7). This type of training has not been adequately analyzed, but clearly has several advantages. The main strengths of traditional apprenticeship are its practical orientation, its self-regulation, and the fact that it is self-financing. Apprenticeship also caters to individuals who lack the educational requirements for formal training, serves important target groups (rural populations and the urban poor), and is generally cost-effective. However,
its disadvantages must be weighed against these strengths. Traditional apprenticeship is gender biased, screens out applicants from very poor households, perpetuates traditional technologies, and lacks standards and quality assurance. In many countries traditional apprenticeship is proving too narrowly focused to cope with the increasing challenges of technological change, skills enhancement, and wider markets (Johanson and Adams 2004, 32).

Private Training Provision

This is becoming more widespread throughout Asia, and takes several forms. It includes not-for-profit training provided by nongovernment organizations, community organizations, and church agencies. It also includes training provided by commercial enterprises for profit. Typically, for-profit training concentrates on types of training and fields that have low unit costs, such as commercial studies, accounting, information and communication technology, tailoring/sewing, and tourism/catering. This is the case, for example, in Bangladesh, where private providers tend to focus on less expensive courses (World Bank 2007a, 11). Church agencies often provide training in higher-cost fields. Private training by church agencies can be of high quality, such as that provided by the various Don Bosco schools and institutes operated by the Roman Catholic Church. In some countries in Asia and the Pacific, most formal and nonformal TVET is provided in nongovernment institutions. In the Philippines, 60% of all training institutions in institution-based, middle-level skills development are private, and they accommodate 80% of total enrollments. Private technical-vocational skills development is financed almost exclusively from nonpublic sources, mainly tuition fees. There is little or no subsidy for private training (Johanson 1999, 4). In Indonesia, 77% of the vocational secondary schools in 2006 were private, enrolling 73% of all students (ADB 2007f, 27).

In Bangladesh, nongovernment institutions accommodate more than half of the trainees at the basic skill level, 73% at the secondary school certificate vocational level, all the high school certificate trainees in business studies, and about half the students at diploma level (Box A5.2). Until 1990, private sector participation was negligible. By the late-1990s, the private sector was supplying about 40% of total enrollments in TVET. By 2005 this proportion had risen to over 60%, in part with the support of public subsidies for teachers’ salaries in nongovernment institutions (World Bank 2007a, 11, 12).

Box A5.1: Traditional Apprenticeship in Pakistan

Pakistan is the world’s largest exporter of surgical instruments.

The success of this sector is explained by simple technology and skills, an elaborate system of subcontracting among the large and small units and a thriving market for their products. The small enterprises possess a pool of skills and metal-working knowledge which, though limited, allows them to shift from one product to another…. The main system of skill diffusion is through informal apprenticeship with the ‘ustaad’—or master craftsman—transferring skills to young apprentices….

This system is complemented by interaction with the large firms.

In contrast, India has a relatively weak nonpublic training market, apart from industrial training centres. Apart from the industrial training centres, the size of the sector is increasing (World Bank 2006d, vi–vii, 54–55). Under its 11th Plan, India is encouraging more public-private partnerships, including those for TVET. In the PRC, non-state training providers are now explicitly encouraged, but operate under firm state control. The nongovernment training sector is expanding rapidly, with almost 1,400 non-state vocational schools (9.3% of the total) enrolling 800,000 students. An estimated 17,000 nongovernment vocational training institutions enrolled five million trainees in 2002 (Copenhagen Development Consult A/S 2005, 34).

Nongovernment training saves the public sector money by reducing the need to provide and finance training from the public budget. The growth of nongovernment training institutions, where trainees pay for all or most of the costs, opens ways for expanding the national training system without heavy commitments of public funds. Expanding nongovernment training can enable more public spending on basic education. Additionally, private training providers often are more responsive to market needs, as their sustainability depends on the placement of graduates (Box A5.3). Nongovernment training providers also can be more innovative because they are subject to fewer bureaucratic restrictions than public institutions. In competition with the public sector, nongovernment training providers can help raise quality system-wide (Johanson and Adams 2004, 92). On the other hand, private training providers can exploit students and their parents by not delivering on promises. Consequently, in most countries such training providers are regulated. However, regulations can be excessive and include barriers to the entry or expansion of legitimate private training providers.

**Box A5.2: Bangladesh Underprivileged Children’s Education Programme (UCEP)**

The Underprivileged Children’s Education Programme (UCEP), established in the early 1970s, seeks to raise the living standards of poor urban children and their families. It targets working street children, and aims to provide them with skills to enhance their employability, often in the informal sector.

UCEP is conducted in 30 general schools for nonformal basic education in four major cities of Bangladesh, working three shifts per day. Total enrollment is about 20,000. Skill training is provided in three training institutions working two shifts each, training a total of 1,400 trainees. UCEP has extraordinarily high completion and employment rates for its graduates, both averaging about 95%.

UCEP’s program can be divided into three stages:

(i) The first stage is accelerated nonformal basic education starting at age 10 or 11. About half the graduates from this program are admitted into vocational training.

(ii) The second stage consists of fundamental skills training which may vary in length from 6 months to 2 years.

(iii) The third stage is placement in employment and follow-up on the job.

Factors that have contributed to making UCEP successful include

- providing students with a solid base of general education;
- focusing on the appropriate target group—i.e., those with “blue collar working aspirations”—who intend to enter the labor force after training as semiskilled workers;
- ongoing links with industry, which ensure that trainees are trained in the knowledge, skills, and attitudes sought by employers, and also that employers are aware of the competencies of UCEP graduates;
- focusing on acquisition of skills and competencies through highly structured, supervised, individual “hands-on” instruction (rather than being driven by credentials and certificates); and
- following-up rigorously each graduate in terms of employment, earnings, and performance on the job.

Cost and Financing of TVET

TVET is more expensive than general education because of smaller classes for practical subjects, and the cost of equipment and supplies. In the PRC, where economies of scale can be realized, specialized secondary schools and vocational schools cost $660 and $350 per student, respectively, compared with $240 per student in regular secondary schools (Copenhagen Development Consult A/S 2005, 41). Vocational secondary schools in Indonesia cost 25% more per student than general secondary schools. In India, unit costs of vocational education are about 60% more per student than general secondary schools. In most countries, public financing of TVET accounts for only a small percentage of total spending on TVET. Data are incomplete and usually do not account for expenditures on nonformal training. In the PRC, central and local government spending on specialized secondary schools, technical schools, and vocational schools accounted for only 8% of total expenditures. Sources of funding for TVET, as for general education, have been diversified successfully since the early 1990s. Tuition fees account for 22% to 33% of total spending, and account for substantially higher proportions of the total in vocational than in secondary or even higher education. This may contribute to the low reputation of VET compared to general secondary and higher education (Copenhagen Development Consult A/S 2005, 43). Funding for vocational

Box A5.3: Efficiency of Private Training Providers in the Philippines

Private costs per graduate were only 70% and 45% of those in public institutions at skilled worker and technician levels, respectively. They tend to use facilities and equipment more intensively (74% for laboratories and 80% for workshops compared with 44% for laboratories and 55% for workshops in government technical-vocational schools). Also, they make more intensive use of staff: 90% of private training providers had staff-student ratios above 1:12, while two thirds of government schools had teacher-student ratios below 1:12.

Source: Johanson (1999).

Box A5.4: Training Levy in Fiji Islands

The Training and Productivity Authority of Fiji (TPAF) levies a 1% fee on the gross salaries of all employees in registered firms, regardless of their size. The public service is included, but certain workers are excluded—e.g., teachers, nurses, and military. The purpose of the levy is to stimulate training within enterprises. TPAF collects the levy itself by requiring employers to submit documentation and payment semiannually, and by contacting delinquent employers through four Levy Enforcement Officers. About 5,200 employers currently pay the levy and an estimated 600 do not. The proceeds amounted to Fiji dollars (F$) 8.8 million in 2003 and F$9.5 million in 2004. In theory, employers can recoup up to 90% of the amount they pay into the levy each year. However, while 5,200 enterprises contributed to the levy in 2005, only 270 received any kind of reimbursement for training (through 1,800–2,000 individual claims). These 270 organizations accounted for two thirds of all levies paid. The training levy makes a sizeable net contribution to TPAF’s operating funds. In 2003 TPAF paid out only about 30% of levy revenue, and 38% in 2004. The balances of levy revenue, plus income from course fees, finance TPAF training operations. TPAF does not have to depend on public funds for its training operations, making it unique in Pacific Island countries.

Source: Johanson (2007).
Singapore’s Skills Development Fund (SDF) has been operating since 1979. All employers, including public sector enterprises, are required to pay a levy of 1% of the wages of all employees earning 2,000 Singapore dollars (S$) per month or less. The basic principle is to motivate employers to train workers by reimbursing part or all of training expenses from the Fund. Reimbursement of training expenses from the Fund is not restricted to only contributing companies. Any enterprise that undertakes training may apply. Applicants for grants must demonstrate the need to train their employees. Grants can be used for direct training costs—e.g., fees for external training—or for establishing training infrastructure, including the cost of trainers. Costs must be shared, with grants only covering between 30% and 70% of training costs. Trainees must be employees of the firms receiving the grants. The present policy is to increase training for service sectors, for small and medium-sized enterprises, for less-educated and less-skilled workers, and for older workers. Training for certifiable skills is emphasized.

The Fund has been responsible for massive growth in company training. In financial year 2003, SDF reached 100% of all companies with 10 and more workers, and 41% of those with less than 10 workers. The 578,000 training places created represented a ratio of one out of every four workers. Total company investment in training reached the target of 4% of payroll some years ago.

The Malaysian Human Resource Development Fund (HRDF), also a levy reimbursement scheme, was established in 1992. The Human Resource Development Act created the Human Resource Development Council—comprising representatives from the private sector and from responsible government agencies—and a secretariat to administer the scheme. Under HRDF, employers pay a payroll contribution of 1%, and are eligible to claim a portion of allowable training expenditures up to the limit of their total levy for any given year. Reimbursement rates vary by sector and type of training. HRDF is considered one of the best-run schemes administratively, and is extremely efficient in reimbursing claims and facilitating application procedures. About 4,000 companies have registered with HRDF.

An evaluation of HRDF was undertaken with a survey of 1,450 firms eligible to participate in HRDF. The survey found that 402 firms (28%) were not registered with the HRDF. Of those registered, 35% reported that they did not claim reimbursements from HRDF. Small firms (with 50 to 100 workers) were more likely to be noncompliant (49%) than large firms (8%). The data also revealed wide variations across subsectors in the utilization of the HRDF scheme. The highest utilization rates were in professional and scientific instruments, general machinery, electric machinery, and ceramics and glass. Subsectors with low utilization rates were food, beverages, tobacco, textiles and apparel, and wood products and furniture. Comparing the training experiences of two groups of firms—those registered with the HRDF and those eligible but unregistered—provided some answers as to whether HRDF has resulted in an increase in training among firms. Regression analysis showed that while HRDF did not have any impact on increasing training in small firms, it did have a role in increasing training in medium and large firms. Empirical analysis showed that firms least likely to claim from HRDF were small firms and firms providing no training or only informal training. Factors cited by employers as inhibiting their training were: limited resources available for training, use of technology with low skill requirements, adequacy of skills provided by schools, and the availability of skilled workers who can be hired from other firms.


Box A5.5: Skills Development Funds in Singapore and Malaysia

Education in India reflects the low enrollments, accounting for only 1.6% of the spending on general secondary education—most provided by the individual states. In Viet Nam, expenditure on VET declined from 8% of the state education budget in 1991 to 5.5% in 1994. On average, TVET schools derived only 58% of their budgets from the state. The balance was raised through tuition fees,
contract training for enterprises, and the sale of goods and services.

To stimulate enterprise-based training, Fiji Islands, Republic of Korea, Malaysia, and Singapore use levies to provide firms with grants in proportion to the level of training their employees undergo (Boxes A5.4 and A5.5).

**Institutional Framework—Organization and Management**

TVET is arguably the most difficult sector to govern and manage because of the complexity in the number and type of organizational sponsors and ownerships, the heterogeneity of clients, the types of delivery, and the constantly changing economic demands. Much, if not most, of skills development activities—i.e., that in nongovernment training institutions, on the job, and in the informal sector—are not monitored and recorded by central agencies. Patterns vary from country to country as TVET is highly context-specific. Economic demands change and TVET must keep up to date with technological developments. This is difficult and expensive.

At the risk of oversimplification, TVET is most commonly organized and managed by three main types of organizations: (i) ministries of education for TVET within the formal school system; (ii) postsecondary technical institutes that may be semiautonomous and handle their own affairs under their boards of directors; and (iii) an array of ministries—including labor, employment, industry, and agriculture—which commonly administer nonformal training. Box A5.6 describes the array of involved ministries in Bangladesh and Nepal.

**System-wide Reforms**

Many countries in Asia have established national training organizations to coordinate and facilitate training. Such organizations exist in Bhutan (National Technical Training Authority), Malaysia (National Vocational Training Council), Marshall Islands (National Training Council), Nepal (Council for TVET), Papua New Guinea (National Training Council), Philippines (Technical Education and Skills Development Authority), and Vanuatu (Vanuatu National Training Council), among others. Their functions vary, but generally national training organizations are responsible for coordination of skills development, for establishment of standards and accreditation/certification, and often for the financing of training. Box A5.7 summarizes reforms being implemented in Australia.

**Qualification Frameworks**

The use of national qualification frameworks (NQFs) and vocational qualification frameworks is spreading rapidly in the Asia and Pacific region. An NQF does two things. First, it provides a clear hierarchical progression of qualifications from lower to higher skill levels. Second, it allows the development of occupational standards within the framework of qualifications.

NQFs promise several advantages (see Johanson and Adams 2004, 81; Young 2005; Cotes 2006). They can motivate individuals to continue their education and training by establishing specific, clear steps on the ladder to increased qualifications (and incomes). They can lead to cost-effective training by focusing on outcomes regardless of how skills are obtained—in classrooms or out of school. They can also support efforts to level the conditions under which private and public institutions compete for public funds. NQFs stress...
Australia faces challenges as a result of its changing economy, with major implications for the labor market and technical and vocational education and training (TVET). Strong economic growth—a product of globalization, technological advance, and enhanced trade with the People’s Republic of China—is producing fundamental changes in the labor market, including chronic and acute shortages of skilled and technically qualified labor. Casual and contract employment is growing at 20% per annum and is projected to equal or surpass permanent employment in a few decades. Labor is more mobile, and about 2 million workers change jobs each year. Manufacturing enterprises are giving way to service and knowledge enterprises, increasing the number of high-wage jobs (compared to blue collar jobs in construction, engineering, and automotive industries) and the demand for highly skilled workers. The workforce is ageing, and older workers are increasingly in need of retraining and upgrading their skills.

These labor market changes have produced new challenges for the TVET system, including obtaining information on changes in labor market demand, changing the content of training toward generic and employability skills, and promoting flexible job entry-exit. Other new challenges are achieving national and international recognition of qualifications in order to make them portable, and recognition of prior learning—i.e., taking into account skills acquired on the job by experienced people undergoing retraining.

The scope of the Australian system of TVET encompasses eight state or provincial systems of education, 4,500 public and private training providers, and about 1.5 million trainees. Government provides about 60% of the funding for TVET, while 40% comes from private sources.

Five essential reforms have been undertaken in response to challenges facing the system. The reforms started with greater engagement of industry/employers. A joint industry-government National Qualifications Council, chaired by industry, now approves all new VET programs and provides quality assurance on outcomes.

TVET policy is thus now industry led. Industry Skills Councils, representing 10 sectors and composed entirely of industry members, develop standards and qualifications for various occupations. They provide continuous input for skills definitions.

Second, a structure of standards-based qualifications has been developed. “Training Packages” have been adopted based on (i) competency or unit standards, (ii) guidelines for assessment of achievement of those competencies, and (iii) the qualifications framework. In effect, industry determines the outcomes and providers are free to develop their own training programs to achieve the outcomes. This has two benefits: it frees industry from the minutia of curricula development, and allows creativity and innovation by training providers in the design of training.

Third, a framework has been established for quality assurance among training providers to ensure that the 4,500 training providers throughout the country meet minimum standards in training delivery and assessment. Under the Australian Training Qualifications Framework, training providers are registered and audited according to core standards.

Fourth, funding is used to sharpen training provider performance. A “purchaser-provider model” is used, whereby the public sector signs a performance agreement stipulating parameters and standards for the required training. A financial reconciliation is made after the training, and sanctions (e.g., immediate return of the funds) are applied in cases of under-delivery in quantity or quality. This reform implants greater accountability in the training process.

Fifth, in recognition of the multiple pathways to qualifications, a system to recognize prior skills acquisition has been introduced—i.e., certification on the basis of skills gained on the job rather than in training. Such certification is done by registered training providers and assessors.

Source: Based on World Bank video presentation by Robert Stowell on 13 August 2007.
the competencies acquired, not the avenues or ownership of the institutions that teach the skills. They can also promote equity through recognition of prior learning and skills acquisition. They can be used as an important element in increasing labor competitiveness and mobility in the Pacific region. NQFs can also promote job mobility, and therefore increase labor market efficiency.

However, NQFs also have drawbacks. The NQF system has been criticized in the United Kingdom as possibly contributing to de-skilling because of a narrowly defined concept of competencies, based on the performance of elementary tasks, rather than on a wider range of comprehensive skills and knowledge. It takes time and effort to develop NQFs—the highly successful system in New Zealand took 10 years to develop. It can impose an administrative burden that is difficult to bear, particularly in smaller, lesser-developed countries. There also may be a tendency to define qualifications in terms of educational requirements, instead of required occupational competencies, as was done in Vanuatu.

There may be unrealistic expectations for NQFs and inadequate appreciation of the work involved in their establishment and operation. The application of NQF models from Australia and New Zealand in other development contexts may be problematic because of different, much weaker educational, economic, and institutional environments. Success of any reform depends to a degree on the interrelationship of complexity of design and implementing capacity. The relative slowness of implementing some interventions in developing countries may be due to weak institutional implementing capacity in the face of a high level of complexity. In short, NQFs may end up imposing more regulations on training providers, reducing their responsiveness to demand.

**Internationally and Regionally Recognized Qualifications**

Is there a role for regional or international recognition of skill certification, or alignment of skills standards in occupational areas where there is much labor migration? This would allow portability of national certificates across national boundaries. International certification of training institutions (e.g., their processes for quality assurance) is already available through the International Organization for Standardization (ISO) 9000. Several training institutions have obtained ISO 9000, such as private commercial institutions in Thailand. However, this certification is costly and few institutions can afford it, although it contributes to more efficient operation—hence lower costs—of the institution. International certification of individual qualifications seems a more distant goal. Three systems of recognition are possible. First, mutual recognition can be established, involving mapping qualifications from one country to another. This can be relatively simple, targeting a few occupations. Second, mechanisms can be created to enable individuals to acquire the qualifications of the host country. The proposed Australia-Pacific Technical College (APTC), in which four specializations will be offered in four locations in the Pacific, exemplifies this approach. Through APTC, residents in Pacific Island countries will be able to achieve Australian qualifications with the view to emigration and helping reduce acute skill shortages in Australia. Third, the development of regional qualifications would enable the skills of workers to be recognized in other countries. Regional qualifications frameworks have been discussed in several regions, including the Caribbean, southern Africa, and the Pacific. However, uneven development of NQFs has proved to be an obstacle thus far. Fully implemented NQFs appear to be a prerequisite to development of regional frameworks.

**Use of Distance and E-Learning**

An example of use of the Internet for distance learning is the package of services offered—via the Internet—by the Technical Education and Skills Development Authority (TESDA) of the Philippines. Its “e-TESDA” program provides (i) information on systems and standards for technical-vocational institutions; (ii) services in terms of program registration, computerized career profiling, and e-search and referral; (iii) a register of certified

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3 ISO is a network of the national standardization institutes of 157 countries, with its Central Secretariat in Geneva, Switzerland. It is the world’s largest developer and publisher of international standards. ISO 9000 deals with quality management systems.

4 Paul Brady, New South Wales Training and Further Education, Australia, email communication 6 August 2007.

5 Available: www.aptc.edu.au
Filipino workers and TVET-qualified trainers and assessors; and (iv) links to Internet-based training courses. The courses are of two types: online training fully accessible via the Internet; and blended training in which the theoretical, conceptual, or knowledge-based part of the training is given online, and the remainder in TVET workshops. Full online courses include accountancy technician, software development, computer networking, medical transcription, and contact center services. Blended training is provided for a wide range of fields, including automotive servicing, trainer/assessor methodology, servicing consumer electronics, machining, plumbing, and slaughtering livestock. However, according to some accounts, relatively few people have taken up e-training. Further investigation is needed into how many participants enroll and complete the programs, and the program’s cost-effectiveness.

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6 Available: www.tesda.gov.ph
Appendix 6: Main Issues in Technical and Vocational Education and Training in the Asia and Pacific Region

Analytical Framework

Technical and vocational education and training (TVET) systems can be evaluated in terms of relevance (economic and social), effectiveness (quality of instruction, and organizational and management effectiveness), and internal efficiency. An analytical framework for evaluating TVET systems is shown in Figure A6.1.

This framework translates into five criteria which are used to evaluate TVET in the Asia and Pacific region (the region), highlighting primary issues.

Criterion 1: External Efficiency or Economic Relevance

Most analyses of TVET systems in Asia, as elsewhere, point to a mismatch between the demand for skills in the labor market and the supply of skills (e.g., in the People’s Republic of China [PRC] and Pakistan). The fast growing economies of East and Southeast Asia are experiencing acute shortages of workers, particularly at higher technical and professional levels. As stated in a recent article in The Economist (2007):

Despite its booming economies and huge numbers of people, Asia is suffering a big shortage of skills. And [the Asian talent shortage] is about to get worse. It seems odd. In the world’s most populous region the biggest problem facing employers is a shortage of people….But some businesses are being forced to reconsider just how quickly they will be able to grow, because they cannot find enough people with the skills they need. In a recent survey, 600 chief executives of multinational companies with businesses across Asia said a shortage of qualified staff ranked as their biggest concern in China and South-East Asia. It was their second-biggest headache in Japan (after cultural differences) and the fourth biggest in India (after problems with infrastructure, bureaucracy and wage inflation). Across almost every industry and
Another manifestation of low economic relevance is the commonly held view that the TVET system is “supply-driven”—i.e., based on allocated budgets rather than on external labor demand (e.g., in the Kyrgyz Republic and Nepal).

Low economic relevance results in poor labor market outcomes for graduates of training systems, particularly in Central and South Asia. In Pakistan, employment rates are low for polytechnic graduates. In that country’s North West Frontier Province (NWFP), diploma graduates typically spend 1–2 years looking for work, then require additional training of 3–6 months after recruitment. In the Marshall Islands, employment rates for TVET graduates are reported to be only about 30%.

The results of a World Bank tracer study in Bangladesh indicated that only 10% of TVET graduates were employed, and only 5% of female graduates. About 45% of graduates were unemployed and 45% were pursuing further education (World Bank 2007a, 29). Those with vocational qualifications that were employed received lower wages than graduates of the general education system (World Bank 2007a, 33), suggesting low returns on investment in TVET.

In India, there is little evidence of demand for workers with technical and vocational skills. However, this may be due to the fact that workers with TVET qualifications do not have skills that meet the demands of the labor market. Even 3 years after graduation, over 60% of all graduates remained unemployed. Although a significant proportion of apprentices find employment, close to two thirds are not employed in the trade for which they were trained (a third of these were trained in obsolete skills). There appear to be three reasons for this: (i) limited growth and labor demand in the manufacturing sector, (ii) a mismatch between skills attained and those actually in demand, and (iii) a mismatch between the skills taught and the graduates’ own labor market objectives (World Bank 2006d, i, iii).

In contrast, demand for TVET and employment rates have been strong in economies like Republic of Korea; Malaysia; and Taipei, China, where investment has stimulated formal job growth and policies are committed to quality work skills (Adams 2006).

Apart from domestic job growth, three factors within TVET systems account for mismatches: (i) lack of information about skill requirements, (ii) inadequate employer involvement in directing TVET systems, and (iii) inflexible supply response by TVET providers. Each factor is discussed in sequence.

**Lack of Labor Market Information.** Most countries lack guidance from labor market analyses and information about skills in demand (e.g., Maldives, Nepal, Pakistan, Philippines, and Viet Nam). The Maldives needs more effective labor market analysis. Nepal cites weak needs assessment and the inability of labor market systems to provide up-to-date information or to guide skill supply. As a consequence, TVET courses and content are irrelevant to labor market demand. In Bangladesh, there is virtually no way for students, entrepreneurs, training providers, or other organizations to get consolidated and reliable information regarding TVET.

Students should have access to information to decide which course will be most appropriate for them. Education providers need to be aware of recent developments and trends in the local and international labor market so that they can update their courses accordingly. Above all, adequate and systematic data are the prime elements by which policymakers design successful models of service provision (World Bank 2007a, 34).

A World Bank survey of employers in Bangladesh concluded that:
so many employers are unaware of the numbers of graduates and types of skills being produced by the VET [vocational education and training] system, the government should play a more proactive role in providing information on the types and quality of training. This would enable better matching of supply and demand (World Bank 2007a, 27).

Malaysia appears to be an exception to the general lack of information. A tracer study of secondary technical and vocational graduates indicated 90% of technical graduates moved on to polytechnics, while the remaining 10% (mostly secondary vocational school graduates) proceeded to specialized vocational institutes. A telephone survey in 2006 by the Malaysian Employers Federation indicated satisfaction with graduates’ technical knowledge, but employers wished to see more emphasis placed on soft skills, such as problem solving, communication, and work ethics (ADB 2007e, 16–17).

Inadequate Employer Involvement. Involvement by employers is essential to link training supply with demand, but it is difficult to engage employers. While employers know best what skills are currently in demand in their enterprises and, by extension, the economy, they typically cannot predict skill requirements far in advance. However, employers are not often engaged in advising or directing TVET systems. Nepal cites a lack of industry involvement in the TVET system. Primary vocational education in the Kyrgyz Republic suffers from weak interaction with the private sector and lack of systematic labor market research. Industry involvement in curriculum development is limited, and current curriculum modules are not revised regularly to reflect changing technology and market demands. NWFP, Pakistan cites weak links with the labor market. Training institute management committees have not proved effective in inducing cooperation from industry. Not enough graduates are being produced with skills in new technologies.

Inadequate employer involvement in the vocational training system is only beginning. Until recently, employers participated to only a limited degree in defining training policies and developing courses. This is now changing, and industry associations and individual employers are showing considerable interest in developing and managing industrial training institutes (World Bank 2006d, iv)

An ADB employer survey in the Pacific found that relatively few employers participated in advising TVET systems. As shown in Figure A6.2, less than 7% of employers advised TVET through national training councils, advisory boards, or employment associations. Only 3% advised ministries of education on school curricula, only 6.5% were on advisory committees of training institutions, and only 4% participated in the testing and evaluation of TVET students.

A World Bank analysis of TVET in the PRC recommended a greater role for employers:

China may consider...[putting] more emphasis on the development and strengthening of employer involvement in the delivery of training to improve relevance of TVET offers, technological adaptation as well as ownership of the TVET system by employers. Possible measures to stimulate employer-based training services include financial incentives, pro-active training institution management, curricular flexibility and official recognition of apprenticeship training or other cooperative modes of training organization (World Bank 2006a, 12).

In India, industry involvement in the vocational training system is only beginning. Until recently, employers participated to only a limited degree in defining training policies and developing courses.

In Sri Lanka, employers are not involved in identifying training program offerings, validating curricula, or setting program standards.

In Bangladesh:

...there are insufficient links between VET institutions and employers, which results in slow and inadequate responses to labor market developments. Employers have no scope for participating in policy development, developing curriculum or providing trainers.

The Ministry of Education does not consult employers in setting policy, curriculum design or vetting accreditation procedures. Courses are not offered on the basis of labor demand or in consultation with employers (World Bank 2007a, 37).

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Employers are inadequately involved in vocational secondary education in Indonesia as well. However, greater participation now occurs at local levels through chambers of commerce and the use of industry assessors to examine students. Most employer participation is being driven at the school level.

Inappropriate or Inflexible Supply Response. TVET programs must be flexible, up to date, and responsive to changing labor market demands. Often, however, they are too lengthy and rigid. In Pakistan, diploma-level training takes 4 years. An analysis of TVET in the Maldives cited the need for short courses (ADB 2003c). In Nepal, most skill programs are institution-based, lengthy, and resource intensive. Short-term programs are lacking. In Bangladesh, there is an imbalance between extensive long-term training available to Grade 10 graduates and short-term training for those with less education. Most training is for preemployment, and lasts 2 to 4 years. In Papua New Guinea, vocational centers run the same, standard 2-year program year in and year out with little attention to outcomes and impact. Arrangements for staffing at vocational centers are not consistent with a responsive training approach. No possibility exists for the hiring of local craftspeople for short assignments. Courses are offered—such as welding—because staff is on the roster, regardless of labor market demand. In Samoa, most TVET providers use traditional time-based courses. Closing a program to open a new one, in response to market changes, is very difficult. Providers favor offering a new program while maintaining the old ones, because of sunk investment costs. In Vanuatu, rural training lasts 2 years without achievement of skill levels needed to be productive in the labor market.

The range of training may be limited, not reflecting developments in the economy (e.g., in Bhutan, Maldives, and Pakistan). In Bhutan, the Village Skills Development Program, supported by an ADB project approved in 2001, was subsequently evaluated as “appropriate and effective” in opening up income opportunities in villages during the off-farm season. However, impact on income was limited because of program focus on traditional crafts, while the need to include modern construction skills, for example, was not recognized. In the Kyrgyz Republic, entrepreneurial, multiskilled labor will have comparative advantages, but these skills currently are not taught in the TVET system. In Bangladesh and Sri Lanka, postsecondary technical education (diploma programs for technicians) is relatively underdeveloped. Employers in Bangladesh assert that more diploma holders in vocational training should be produced. The current provision of diploma-level education is inadequate given market demand. Sri Lanka has only one technician graduate for 50 craft/operator graduates, compared with the needed ratio of 1:5 or 1:10 (World Bank 2007a, 27).

Properly oriented and up-to-date curricula are other critical aspects of responsiveness. In the Fiji Islands, employers complain that the curriculum of the Fiji Institute of Technology (FIT) and vocational secondary centers in secondary schools tend to be theoretical and based on time spent, rather than practical and based on competencies achieved. Curriculum updating is needed. An example is the inclusion of shorthand in the FIT franchise program on office technology, a skill now in little demand. In Papua New Guinea, vocational center courses have not changed much in 25 years. In Bangladesh, excessive centralization of curriculum development and staff management in Dhaka severely limits local level responsibilities and initiatives.

Curriculum development—including the introduction of new courses, the expansion of high demand courses, the closing of obsolete courses, etc.—is rigid and time consuming. Curricula are revised only every five years or so. Part of this weakness stems from inadequate resources. To cite one example, polytechnic institutes were extremely slow to integrate computers as a part of training. For instance, suggestions and plans have been made since 1995 to add the SSC (Voc) [secondary school certificate—vocational] courses in areas of high demand for labor, such as agriculture (horticulture, poultry, diary, agro-based food, forestry, aquaculture) and leather making, but have yet to materialize (World Bank 2007a, 35, 36).

Even though the vast majority of people will work in rural areas and in the informal sector, most training is oriented toward wage jobs in urban areas. Little attention is given to the relevance of short courses to local labor markets—e.g., in agribusiness and food processing. Entrepreneurship training is underemphasized and under-provided (e.g., in Papua New Guinea and Vanuatu). In Nepal, the lack of post-training support is an issue. Most training providers focus solely on training rather than on career placement and continuing advisory support.
In Bangladesh, too little attention is paid to the important roles of the informal sector and the rural sector.

A significant majority of people work in the informal sector, but little thought has been given to enhancing their skills. Most employment will also continue to be in the rural sector. The formal training system is not designed to offer skills to low-educated people and particularly not to those in the rural non-farm sector. Nor do other providers fill the gap. Most workers in this sector continue to learn trades through informal apprenticeships at their place of work from other low-skilled craft people (World Bank 2007a, 37).

TVET in countries with vibrant private training markets tends to be more responsive to changes in labor market demand. The longevity of private (for-profit) training providers often depends on their knowledge of labor market demand, and on adapting their programs to meet that demand. High employment rates for graduates help promote providers to new clients. Thus, if private providers are interested in survival over the medium term, their incentives are to provide relevant, quality training. Students must avoid “fly-by-night” operators interested only in short-term profits, not in providing value for services.

Criterion 2: Social Relevance, or Equity

Virtually all ADB TVET projects aim at improved access for vulnerable groups. Such groups in the Kyrgyz Republic include adults and out-of-school youth, for whom there is a lack of training provision. In the Maldives, school leavers and dropouts have inadequate access to training opportunities for employment skills. There is concern about youth unemployment and “enforced youth idleness.” The range of skills training also needs to be expanded for women and island residents. Nepal provides inadequate access to training. Most people, particularly the poor and disadvantaged, lack access to skills training that enhances earning capacity. Similarly, in NWFP, Pakistan, a reasonable network of training facilities is available, but access remains limited for the rural population and for girls.

Access to skills development is a function of availability, affordability, and personal choice. Negative attitudes affect TVET, and personal choice is influenced by the general view of TVET in many countries as a “second class” option. The low status of TVET derives from many sources, including the low priority it receives in public budgets, the lower academic ability of those channeled into it, and perceptions about the financial payoff to TVET. In Fiji Islands and the Philippines, for example, TVET suffers from a poor image and is perceived as a “dead end” and last-choice option.

Lack of vertical articulation is another manifestation of inequities. Structural impediments—lack of opportunities for further advancement in the education system—impede upward mobility of TVET students. This contributes to views of TVET as a dead end and its low prestige. Sri Lanka, for example, lacks alternative paths to higher education, restricting upward mobility within the TVET system. The PRC also reports a lack of articulation between vocational education at secondary and higher levels (Copenhagen Development Consult A/S, 8).

Total access to organized skills development is low relative to the number of school leavers,

Table A6.1: Index of Opportunity for TVET in Selected Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated Number of Annual School Leavers</th>
<th>Estimated Number of Annual Entrants to TVET</th>
<th>Percent Accommodated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji Islands</td>
<td>14,000</td>
<td>1,300</td>
<td>10</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>60,000</td>
<td>9,000</td>
<td>15</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>9,000</td>
<td>1,000</td>
<td>11</td>
</tr>
<tr>
<td>Vanuatu</td>
<td>4,500</td>
<td>1,000</td>
<td>22</td>
</tr>
<tr>
<td>Nepal</td>
<td>200,000</td>
<td>50,000</td>
<td>25</td>
</tr>
</tbody>
</table>

TVET = technical and vocational education and training.

Note: School leavers means all students who terminated their education, including dropouts and graduates who did not proceed to further education, from primary, lower, and upper secondary education. Fiji Islands excludes the Training and Productivity Authority of Fiji (TPAF).

Source: Johanson (2007).
resulting in widespread poverty of opportunity—a lack of opportunity to achieve an acceptable quality of life. The most common interpretation of “poverty of opportunity” is insufficient access to education, health, and other basic services, or to economic opportunities. Yet, poverty of opportunity applies particularly to TVET. Few opportunities exist for school leavers and “pushouts,” females, adults, and those who live in remote areas to acquire technical and vocational skills.

The point of Table A6.1 is not comparison among countries, but the small minority of school leavers able to gain access to skills acquisition through training. No more than one in four school leavers is able to obtain a place in vocational training centers in the five countries examined, and the more likely proportion is only about one in ten. This proportion is declining. Since the number of school leavers is increasing faster than access to vocational training, an increasing proportion of those who need skills for employment and income are not given the opportunity to access such skills.

Lower income groups, and those in rural areas and outer islands have much less access to skills development. Place of residence tends to be highly correlated with level of income. In the Philippines, for example, 86% of TVET institutions are in urban areas. A similar picture may be seen in Indonesia. The Marshall Islands lacks skills training opportunities in its outer islands, especially for women and youth.

About 70% of students in TVET institutions come from low-income families (ADB 1999b, 2002b). Level of income, in turn, is highly correlated with affordability, another determinant of access to vocational training. Affordability is a function of not only the direct costs of attendance, but also indirect costs such as transportation and income foregone. In Indonesia, upper secondary vocational schools cater more to the poor than general secondary schools, drawing 21% of their students from the lowest income quintile, compared to only 13% for general secondary schools (ABD 2007f, 30).

An apparent contradiction exists. Vocational institutions cater to students with lower academic abilities from low-income groups. Yet many low-income people cannot afford the direct and indirect costs of vocational training. In Papua New Guinea, training in vocational centers is limited to those who can afford to pay tuition fees, excluding potential students unable to pay the fees. Many students drop out and do not receive certificates because their parents cannot afford continued tuition charges.

Girls and women tend to be under-enrolled in TVET and concentrated in traditional female occupations. By and large, the TVET systems favor males over females. In NWFP, Pakistan, for example, there are 12 postsecondary technical institutes for men but only 1 for women. In the Philippines, 40% of trainees are women, but they tend to concentrate in traditional programs such as sewing, arts and crafts, and food services, which lead to low paying jobs. In Indonesia also, 40% of vocational secondary students are female, mostly concentrated in commerce and hospitality programs.

Men tend to monopolize technical and trades training, while women are found almost exclusively in home economics and domestic science–related programs. This constrains women’s ability to start their own businesses and to compete for jobs. There are multiple causes of female under-enrollment, reflecting both cultural values and employer preferences. Cultural stereotypes of women inhibit young women from participating in some programs. In some places, parents deem travel to vocational institutions by daughters unsafe. As a consequence of inequitable access for females, many females lack the basic skills to become employable, directly limiting their ability to improve their welfare and that of their families. For unmarried females with children and no husband, the inequity of access to training makes it difficult for them to lift themselves out of poverty.

**Criterion 3: Quality of Instruction**

The purpose of TVET is to provide relevant knowledge, skills, and competencies for employment and income generation. If skills are not acquired due to the low quality of instruction, money spent on instruction is wasted. Skills acquisition, or the quality of instruction, can be viewed as a function of inputs, processes, and outputs.

**Quality in Inputs.** Lack of essential inputs compromises the quality of training in many countries. An array of inputs is important in determining the quality of training provided. These include

- existence of employer ratified standards;
- clear and attainable objectives;
- adequately prepared students on entry;
- adequate numbers of trained instructors with relevant work experience;
- appropriate training content with definition of associated learning outcomes;
sufficient financing for tools, equipment, and supplies; assessment of performance against training objectives and standards; and strong management of the training process.

The Training and Productivity Authority of the Fiji exemplifies excellence in many of these requirements.

In contrast, quality is a serious issue for vocational education in the PRC, as indicated by a lack of practical orientation, inappropriately skilled teachers, and a shortage of resources (Copenhagen Development Consultant A/S 2005, 7).

The first, and perhaps the most important, input for quality is definition of training standards, based on occupational standards. In Nepal, for example, skills standards are lacking as benchmarks for training delivery and assessment. In contrast, trade testing provides standards for training in Fiji Islands, Kiribati, and Papua New Guinea. Two innovations are helping put appropriate standards in place: the introduction of national qualification frameworks (discussed in Appendix 5), and the definition of core competencies required as part of competency-based training. Indonesia, Papua New Guinea, and Philippines adhere to the principles of competency-based training. Samoa introduced competency-based training at its Institute of Technology, greatly reducing the number of students that fail. The Vanuatu Institute of Technology also adopted competency-based training, helping reduce repetition and raise throughput. The competency-based training method ensures that trainees are able to perform stipulated tasks. These standards provide clear targets toward which trainers can aim.

Standards, however, can be overly rigid, as in the PRC.

The development and expansion of TVET from the 1980s onwards was accompanied by the introduction of a streamlined vocational qualification system in 1994. The system comprises five qualification levels. It is a standards-based system with external testing and certification. In 2003, more than 4,000 occupational standards had been developed….However, standards appear not to be appropriately aligned with the requirements of the labor market. Accordingly, government is considering the modernization of standards a policy priority (Copenhagen Development Consult A/S 2005, 9).

Vocational standards and qualifications are a powerful tool for quality enhancement. In China, however, concern has been raised with respect to the labor market relevance of the standards. There appears to be a point for increased involvement of employers in standard setting. Bureaucracy and procedural rules in standard setting and revision need to be minimized and streamlined in order to allow flexible and fast adjustment of standards with changing requirements in the labor market. The number of vocational standards in China and their level of differentiation may be reduced. In a modern knowledge society, the composition and design of occupational standards need to reflect the importance of core skills (Copenhagen Development Consult A/S 2005, 12).

Another critical input for quality is the entering student. Incoming trainees with poor
educational attainment limit skill achievements, lengthen training completion times, and often necessitate bridging programs. One of the main issues that affect TVET quality in the Pacific is the poor educational background of entering students. In Kiribati, Federated States of Micronesia, and Tuvalu, incoming students have a poor educational foundation. Low quality general education is characterized by deficiencies in basic academic foundation studies, such as math, science, and English. Similarly, in the Marshall Islands, the College of the Marshall Islands is handicapped by the low quality of incoming students. Time is consequently wasted in remedial instruction, and dropout levels are high.

Curriculum is another important element of quality. TVET curricula tend to be rigid and static, as discussed previously. In the Philippines, curricula have lagged behind rapid changes in business and industry. The same applies in Nepal, where curricula are not revised regularly.

Inadequate numbers and qualifications of instructors is one of the main factors responsible for low-quality TVET instruction. In the Kyrgyz Republic, the skills of most instructors are outdated and need to be upgraded. In the Philippines, only 30% of trainers have trade certification and only 10% have industrial experience. Teaching personnel in Sri Lanka are inadequate in number and in qualifications. At the postsecondary level, 6 out of 10 positions are unfilled owing to a hiring freeze. Some 80% of teaching staff have diploma or lower qualifications. Only 13% have industrial experience. In Bangladesh, qualified teachers and instructors are in short supply, and the scope for technical teacher training is limited. A primary problem has been the sudden expansion in the number of institutions, with the supply of teachers failing to match this growth (World Bank 2007a, 36). In Nepal, technical teachers have virtually no industrial experience, and pay levels are so inadequate that teaching is not an attractive career option for qualified individuals. Substantial numbers of vocational teachers in the Fiji Islands are unqualified: 42% in office technology, 44% in automotive engineering, and 59% in carpentry and joinery.

Most government bureaucracies lack understanding of the need for TVET instructors to have industrial experience rather than (or in addition to) academic qualifications. Ministries tend to treat all teachers the same, not offering salaries commensurate with market demand for skills. Different treatment may be needed for technical-vocational instructors. Indonesia plans to allow professional certification of vocational instructors based on assessment of skills competencies.

Facilities, equipment, and materials are also important factors in TVET quality, and tend to be under-provided in the region. In the Kyrgyz Republic, poor infrastructure and lack of adequate training equipment characterize most primary vocational education. This means that students learn about skills in theory, not through hands-on practice. Most training equipment was supplied during the Soviet era and is outdated or not functioning. Public training providers in Nepal also lack tools, equipment, materials, and supplies, as well as budgets for in-service staff development. Vocational centers in Papua New Guinea are characterized by poor standards of maintenance and lack of suitable facilities. Trainees have to observe work practice, rather than engage in hands-on practice, because of the lack of sufficient equipment and inadequate resources for repair and maintenance of training equipment.

Quality Assurance Processes. A common technique of quality assurance is skills testing, but skills testing systems in the region are often weak. In the Kyrgyz Republic, no comprehensive assessment system based on agreed skills standards is in place. Schools arrange their own examinations without formal external quality control. Industry participates in examinations only occasionally. In NWFP, Pakistan, the problem centers on the poor quality of the examinations. Examinations are rigid in scope, content, and coverage, and in the treatment of theory and practice. Sri Lanka lacks quality assurance mechanisms, including audit of programs and accreditation. In the Federated States of Micronesia, the lack of a quality assurance, accreditation, and certification authority has been identified as a major deficiency. In contrast, vocational secondary schools in Indonesia use competency-based instruction in modules along with assessment by industry personnel.

Norms and standards are usually not applied to public training institutions. In the Fiji Islands, the Ministry of Education has no working system for quality assurance—in terms of monitoring systems and indicators—for its vocational centers. The quality of training provision consequently varies by institution.

Another important aspect of quality assurance is accreditation of private training providers (PTPs). However, accreditation of PTPs in the region has proved problematic. Standards have been established for PTPs in many countries, but these standards have been difficult to enforce. “Effective
regulation of private sector providers is far from straightforward and like any other regulatory activity, requires considerable capacity of its own” (Young 2005, 31). Assessment and accreditation of PTPs is an essential first step toward achieving minimum standards. While desirable, it is difficult to implement quality assurance systems for PTPs. Effective monitoring and control requires reasonable criteria and procedures, sufficient staff with expertise and training in assessment of institutions, and funds to support periodic inspections.

In Papua New Guinea, the National Training Council has been trying to do too much with too little resources. It reports inadequate staff capacity to carry out assessment of PTPs, courses, and trainers. It also lacks prosecutorial powers for institutions failing to register. As a result, there are substantial weaknesses in the registration process for PTPs. Some registered private institutions operate below acceptable quality and provide little value for money.

Bangladesh has also experienced problems with its accreditation of PTPs.

Notwithstanding the considerable expansion of private places in recent years, serious concerns remain about the accreditation process. Procedures are said to be time consuming, complicated and rigid, yet are often not followed properly. There have also been allegations of political interference in the process. Under normal procedures, after receiving an application, the Bangladesh Technical Education Board sends a team to inspect the facilities available for VET courses. However, the resources to carry out such inspections are severely limited, which introduces delays into the accreditation process, and often leads poor quality institutions receiving accreditation (World Bank 2007a, 34, 46).

Even Republic of Korea and Taipei, China have had trouble in assuring the quality of PTPs. “Taiwan and Korea also found that it is difficult to ensure reasonable standards and quality in private institutions” (Tilak 2002, 12).

Quality as Outputs. Most TVET systems fail to monitor or evaluate the quality outcomes of training in terms of competencies achieved. It is virtually impossible to evaluate the outputs of vocational training directly except where trade tests are used systematically. In some countries, low pass rates indicate underlying problems with the quality of instruction. In the Philippines, student performance on trade tests has been low—the 49% pass rate in 1995 declined to 38% in 1998. In Pakistan, less than half of graduates pass the external examination. The pass rate in NWFP, Pakistan was only 18% for the diploma in business administration. In Bangladesh, the pass rate was only 50% for secondary school certificate (vocational), even though the students tested were prescreened (World Bank 2007a, 24). The PRC had a better record of success in 2003, when nearly 7 million candidates went for skills testing and 85% passed, including some 1.4 million vocational secondary school graduates (Copenhagen Development Consult A/S 2005, 9). In the Pacific, only one indicator could be found of training effectiveness: Training and Productivity Authority of Fiji (TPAF) test results. Pass rates in TPAF tests vary from year to year, ranging from 66–75% for Level III, 50%–66% for Level II, and 40–65% for Level I. More use could be made of trade training statistics—e.g., pass rates—to establish benchmarks for quality and effectiveness of training.

Criterion 4: Organizational and Management Effectiveness

The organization of TVET at the national level in many DMCs is commonly fragmented (see Appendix 5, section C.). Typically, there are two main organizations responsible for TVET: the ministry of education for formal technical and vocational education, and the ministry or department of labor for nonformal skills development. In Viet Nam, for example, both the Ministry of Education and Training and the Ministry of Labor, Invalids, and Social Affairs offer vocational or technical training at the upper secondary level. Viet Nam’s Law on Vocational Training is not clear about which of these agencies is responsible for vocational training. Similarly, in Thailand, both the Ministry of Education and the Ministry of Labor offer vocational training. The Ministry of Education claims that its upper secondary programs differ, in that they are formal upper secondary and confer certification, while the Ministry of Labor’s programs are short-term courses for qualifications only.

Unclear or inappropriate responsibilities affect TVET, with confusion in the roles of key institutions, particularly concerning regulation and provision of training. In NWFP, Pakistan, the role of the provincial government should be limited to policy, planning, and monitoring and evaluation,
with training delivery gradually devolved to TVET institutions supported by district management committees.

In the Philippines, the Technical Education and Skills Development Authority (TESDA) inherited 58 technical and vocational schools and about 60 nonformal training centers upon its formation. It is not appropriate that the agency that accredits and supervises training institutions also operate them. In Nepal, the roles of the various stakeholders have not been clearly defined or coordinated. The Council for TVET focuses on training provision, but needs to move out of provision to focus on its strategic role for the sector as a whole. In the PRC:

TVET is characterized by state-control and largely state provision….Regulatory functions are divided between different ministries. There appears to be a need for better coordination and a clear definition of the future role of Government in TVET. The key function of the public sector should be regulation and facilitation, i.e., setting of a conducive policy and legal environment for training provision, quality assurance through accreditation of training providers, standard setting, testing and certification, facilitating research and teachers training and setting the rules for financing mechanisms. National Training Authorities established in other countries often as semi-autonomous bodies and with the participation of industries and stakeholders may serve as an example. Government may also consider concentrating its own involvement in training provision to strategic fields, and on the other hand systematically strengthen non-government training provision (Copenhagen Development Consult A/S 2005, 1).

The mandates for TVET supervisory organizations tend to be unclear in several countries. In Papua New Guinea, the division of labor is unclear between the Ministry of Labor and Industrial Relations and the National Department of Education, as evidenced by different and sometimes contradictory plans for the same policy areas. Roles are also unclear between the Department of Education and the Department of Community Development on responsibilities for informal sector training. The latter agency has responsibility for training for the informal sector, but lacks the training expertise that resides in the former. In the Marshall Islands, unclear mandates lead to duplication in several areas. The roles and responsibilities of the Ministry of Education, the National Training Council, the College of the Marshall Islands, and other entities often overlap and cause confusion.

Fragmented and uncoordinated provision of informal training limits effective use of resources. In Bhutan, inter-ministerial coordination is weak. In Nepal, training is highly fragmented due to the lack of coordination, leading to duplication of effort in curricula development and skills standards, among other areas. In Papua New Guinea, the three main parts of the TVET system do not work harmoniously. The National Training Council, the National Apprenticeship and Trade Training Board, and the TVET Division of the National Department of Education can be seen as dysfunctional. Each has its own board and management structures; each develops its own policies; each forges its own links with enterprises; and each is responsible for some registration and certification of training providers, each using different criteria in the process.

In Bangladesh:

The current institutional framework for VET leads to poor coordination between the main actors. Currently, the Bangladesh Technical Education Board [BTEB] is responsible for curriculum development, examinations, and accreditations of non-public courses. The Department of Technical Education [DTE] is responsible for implementing new courses, staff recruitment and the establishment of new institutions.1 However, inadequate coordination between these two agencies leads to overlap of activities, and burdens both agencies with a workload for which they do not have sufficient resources. Furthermore, the National Council for Skills Development and Training (NCSDT), formed in 1979 to coordinate training policies and programs is defunct—not having met in over 20 years. There is a complicated delegation of authority between the Ministry of Education, Department of Technical Education, the Bangladesh Technical Education Board, and heads of the institutions. This can be seen clearly in the multiplicity of institutions overseeing SSC (Voc) [secondary school certificate—vocational] schools, which generally fall

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1 Also, the Department of Secondary and Higher Education handles salary subsidies to private secondary schools, including those that offer secondary school certificates (vocational).
under the Directorate of Secondary and Higher Secondary Education, but are bound to policies and instructions from DTE and BTEB for their accreditations, examinations, curriculum, staff issues, financing, and facilities (World Bank 2007a, 34).

In India, management of the TVET system also is fragmented. System management is shared among central and state authorities for vocational training (National Council of Vocational Training and state councils of vocational training). While the different authorities have clearly specified functions on paper, there is little coordination between them, leading to diverse accountability and duplication of effort, with different agencies often performing the same functions (World Bank 2006d, iv).

Several key national TVET organizations, particularly national training councils, lack the resources to carry out their functions. In Papua New Guinea, the National Training Council lacks resources and expertise to carry out registration and accreditation of private training providers. Similarly, the Vanuatu National Training Council has insufficient budget and staff to handle its work, resulting in a backlog of applications for accreditation, among other problems.

Lack of data and research on TVET is an almost universal handicap to progress. Information about TVET performance is scarce in almost all countries. In Papua New Guinea, for example, there is inadequate record keeping on graduates, and an absence of basic management information on inputs and outputs (e.g., costs per student). In India, the preoccupation with providing and financing training has resulted in the neglect of a key role: providing information about the availability and effectiveness of training programs (World Bank 2006d, iv).

At the institutional level, managers lack authority and incentives to improve their performance, such as accountability for results. Resources are not linked to outputs. In Bangladesh:

…one issue of particular importance to internal efficiency is the over-centralization of curriculum development and staff and resource management in Dhaka. This severely limits the scope for taking advantage of local level responsibilities and initiatives…. Institutions throughout South Asia have few incentives to improve their performance. The main problem is the way institutions are governed. Principals of public sector institutions and those provided subsidies by the government have little autonomy to replace training courses with new ones, ensure that students receive quality training, change curricula, and involve the private sector in decision-making at the institutional level. At the same time institutions are not held accountable for performance (World Bank 2007a, 35–36).

Similarly, training institutions in India lack incentives to improve performance. Institution managers have little freedom to fill places to capacity, replace training courses with new ones, and ensure that students receive quality training (World Bank 2006d, iv). In the same way, resources are not linked to outputs in Sri Lanka.

Criterion 5: Finance and Internal Efficiency

Low public investment in TVET in South and Central Asia stands in contrast to strong investment by the rapidly growing economies in East and Southeast Asia. Bangladesh spends just 1% of its education budget on TVET programs, while Pakistan spends 2%, and India spends 4% (King 2007, 28). Papua New Guinea spends just 0.7% of central government expenditure on education on TVET, making it the poor relation of the education sector. In contrast, Malaysia allocated 18% of its education budget to TVET (King 2007, 28). Similarly, Republic of Korea and Taipei, China have invested heavily in TVET. TVET tends to be expensive and requires a minimum level of investment to be effective.

Low private investment in skills development in South Asia mirrors low public investment. Enterprises underinvest in the skills of their workers. They have insufficient incentives to train.

Market failures diminish employer incentives to train. International experience suggests that there are three market failures that constrain training, particularly among small firms: (a) the high cost of training; (b) lack of adequate information; and (c) high turnover of skilled workers (i.e., poaching) (World Bank 2007a, 54).

In India, with state training authorities focused on providing training through the public sector, almost no attention is paid to the use of financing as an innovative means to encourage good quality public training and private training, or to provide
incentives to enterprises to train their workers. States are losing a valuable opportunity to leverage their limited training financing resources (World Bank 2006d, viii).

Public TVET depends heavily on government financing, particularly in South Asia. In Bangladesh, in addition to financing virtually all costs, government provides scholarships to about 60% of vocational students without regard to financial need or means testing. Heavy public financing, plus pervasive constraints on increased public spending, make it difficult to raise funds to expand coverage or improve the system. The result is chronic underfinancing of the inputs necessary for quality instruction. Bhutan faces a lack of capital necessary to develop new training programs and facilities to accommodate out-of-school youths, females, and the unemployed. In Sri Lanka, training financed by government free of cost to participants constrains program expansion and contributes to uncertain financial sustainability.

However, some countries have been able to diversify sources of financing. In the PRC, sources of funding for TVET have been diversified successfully since the early 1990s. Tuition fees account for 22% to 33% of total spending, with the proportions substantially higher in vocational than in secondary schools—or even higher education. In the Fiji Islands, the Fiji Institute of Technology raised about half its operating costs from tuition fees from rising student numbers out of necessity when the Government imposed a ceiling on its contributions (Johanson 2007). In Indonesia and the Philippines, the extraordinarily high proportion of private training providers operating on tuition fees means that private sources finance almost all TVET there. This is not necessarily a good thing from an equity standpoint, since vocational institutions tend to cater to lower-income groups. Cost sharing should be combined with scholarships for low-income students.

Distortions occur in spending on TVET. Salaries and allowances drive out spending on essential inputs, such as equipment, operations, and materials. In India, almost 95% of expenditure goes to salaries and allowances, leaving little for operation of vocational training institutions. In the Kyrgyz Republic, only 13% of the budget is used for operation and maintenance of TVET institutions. In Bangladesh, “…a consequence of prioritizing salaries to such an extent that there have been inadequate funds for sufficient instructors, equipment, in-service training and consumable supplies, maintenance/repair of machinery and other critical infrastructure” (World Bank 2007a, 41).

Many countries do not provide TVET with incentives to mobilize additional resources. In Bangladesh, profits of individual institutes are returned to the Ministry of Finance. Institutes have little incentive to generate income from services or production, as revenues and student fees are remitted to general government revenues (World Bank 2007a, 60). In India:

Training providers have insufficient interest in their financial state of affairs. Student fees in industrial training institutes are retained by the respective state governments and the institutional functionaries have no financial incentive to meet labor market needs—a common failing of supply-driven models of VET (World Bank 2006d, ix).

TVET is expensive, but the way funds are transferred to TVET institutions gives little incentive for better performance. In India, …once an institution begins to receive funding, subsequent funds are guaranteed regardless of institutional performance. The same levels of finance are allocated to poorly performing institutions with high dropout rates as to those that maintain a high quality of teaching and performance (World Bank 2006d, viii).

Instead of transferring resources to institutions on an ad hoc basis or on the basis of teacher subventions, public resources could be transferred on the basis of input or output criteria. This process is already underway in Bangladesh, where some input-based measures are being used to allocate resources. Institutions could be financed according to the estimated cost of inputs—using norms such as the number of trainees enrolled, or number of classes. This is better than ad hoc funding, but it does not overcome the inherent weaknesses of direct allocation, including the lack of incentives (i) for quality assurance or efficiency (funding formulas based on average costs can actually promote expansion of institutions), and (ii) to close the gap between training and employment needs (World Bank 2007a, 60).

Indonesia’s positive experience with direct transfers is noteworthy. Both TVET and general schools in Indonesia receive much of their funding directly from central agencies with flexibility in its usage. Schools are responsible for spending the funds according to plans approved in conjunction with school committees. This approach has proved
successful. It empowers the school, usually leads to lower costs, and speeds the procurement of goods and services.

Public TVET financing is in short supply, but even available resources often are not used efficiently. Spending is frequently wasteful, such as that on the large proportion of students that failed external examinations or failed to graduate in Pakistan’s NWFP and India’s Andhra Pradesh (World Bank 2006d, 27). Resources are sometimes underused. TVET facilities in the Kyrgyz Republic are heavily underused, with only 24,000 students enrolled in facilities that can accommodate 90,000 (ADB 2007g, 2). Bangladesh uses only 40% to 50% of its TVET capacity (World Bank 2007a, 24). In India, the average number of trainees per staff member in its industrial training institutes and industrial training centres ranges from 5.5 to 9.6—indicating an underutilization of teaching staff. Allocations are distorted. In the Kyrgyz Republic, only a third of staff are instructors and teachers, while two thirds are administrators and support staff.

The World Bank review of TVET in Bangladesh indicates what needs to be done. First:

Control over public sector providers would need to be decentralized and institutions given far greater financial autonomy if any form of income generation was to have an impact of the operations of institutions. Only then could the full potential of cost sharing and income generation be realized.

Second:

…introduce performance-based funding [that] rewards performance and pay[s] on results. Institutions that meet targets should be rewarded; those that do not are penalized. Output targets can be defined in absolute terms (e.g., number of course completions, pass rates on examinations) or in relative terms (e.g., years to completion). Outcome targets measure the success of training providers in meeting labor market needs (e.g., job placement within a reasonable time). The key for both types of targets is to define transparent and measurable criteria that are easily collected but not easily manipulated (World Bank 2007a, 60–61).
The regional patterns of Asian Development Bank (ADB) lending for stand-alone technical and vocational education and training (TVET) projects are summarized in Figure A7.1.

The bulk of the projects and lending have gone to Southeast Asia, particularly Indonesia, Malaysia, Philippines, and Thailand.

Figures A7.2 and A7.3 show technical assistance projects for TVET by region and amount over the past 10 years. In total, the ADB implemented 12 project preparation technical assistance projects, 13 advisory technical assistance projects, and one regional technical assistance (Pacific). South Asia captured both the bulk of the technical assistance projects and the highest amounts. Project preparation technical assistance projects were particularly numerous in South Asia, outnumbering advisory technical assistance projects.
by seven to four. This may indicate the lack of capacity to prepare projects in the subregion. The distribution of TVET projects approved by ADB since 2000 by principal orientation may be seen in Table A7.1.

A recent project in Papua New Guinea seems to be particularly well designed and innovative, although implementation has been slow because of weak implementation capacity (Box A7.1).

The comparatively strong performance of TVET projects completed since 2000 is shown in Table A7.2.
Box A7.1: Training Fund for Sustainable Skills Development in Papua New Guinea

The ADB-funded Employment Oriented Skills Development Project in Papua New Guinea established a donor-government training fund to provide a permanent source of financial support to informal sector training. The Fund is managed by an experienced professional and the accrued interest from the invested capital (approximately kina [K] 50 million) has been used to cofinance short-term employment-oriented skills training conducted by vocational centers, churches, nongovernment organizations, and private training providers. As long as the annual interest generated by the Fund is equal to, or greater than, the annual expenditure on skills training, sustainability is assured.

The Fund was slow in starting up because of requirements for special legislative and bureaucratic measures, and the need for individual provinces to first contribute to the Fund’s capital before qualifying for its resources. Consequently, disbursements only got underway in late 2003, almost 3 years after the project began. By mid-August 2006, the Fund had cofinanced 151 short training activities for some 2,500 beneficiaries in four provinces.

In financial terms this represented only about 6% of the accrued interest that had been generated to date. Sustainability, therefore, was not a problem, mainly because the volume of activity was still low.

Despite a slow start and the need to streamline administrative procedures to increase the level of disbursements, the Fund appears to have had some added benefits. Through the required provincial contributions, it increased financial commitment to skills training at the provincial level while, at the same time, stimulating the development of local training markets where it operated. By mid-2006, provincial contributions to the Fund totaled some K2.2 million, and a total of 88 different training providers had accessed Fund resources. As the Fund covered only part of total training costs, both providers and participants contributed to the cost of programs. This resulted in a degree of broad-based ownership not normally associated with project-financed skills training activities.

Source: Johanson (2007).
Appendix 8: Supplementary Data on Higher Education

Table A8.1: Student Enrollment in Higher Education Institutions in Selected Countries in Asia and the Pacific

<table>
<thead>
<tr>
<th>Country</th>
<th>1980&lt;sup&gt;a&lt;/sup&gt;</th>
<th>1998&lt;sup&gt;b&lt;/sup&gt;</th>
<th>2004&lt;sup&gt;c&lt;/sup&gt;</th>
<th>2007&lt;sup&gt;d&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei Darussalam</td>
<td>143</td>
<td>3000</td>
<td>4,917</td>
<td>7,502</td>
</tr>
<tr>
<td>Cambodia</td>
<td>601</td>
<td>—</td>
<td>45,370</td>
<td>47,835</td>
</tr>
<tr>
<td>Indonesia</td>
<td>543,175</td>
<td>—</td>
<td>3,441,429</td>
<td>2,790,391</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>1,408</td>
<td>12,000</td>
<td>33,760</td>
<td>71,359</td>
</tr>
<tr>
<td>Indonesia</td>
<td>57,650</td>
<td>443,000</td>
<td>632,309</td>
<td>692,976</td>
</tr>
<tr>
<td>Malaysia</td>
<td>163,197</td>
<td>—</td>
<td>555,060</td>
<td>555,000</td>
</tr>
<tr>
<td>Philippines</td>
<td>1,276,016</td>
<td>2,209,000</td>
<td>2,427,211</td>
<td>3,685,624</td>
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<tr>
<td>Thailand</td>
<td>361,400</td>
<td>1,814,000</td>
<td>2,251,453</td>
<td>2,469,808</td>
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<tr>
<td>Viet Nam</td>
<td>114,701</td>
<td>810,000</td>
<td>845,313</td>
<td>785,000</td>
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<td>—</td>
<td>—</td>
<td>6,349</td>
<td>17,370</td>
</tr>
<tr>
<td>People’s Republic of China</td>
<td>1,662,796</td>
<td>7,364,000</td>
<td>19,417,044</td>
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<tr>
<td>India</td>
<td>3,545,318</td>
<td>—</td>
<td>11,295,041</td>
<td>—</td>
</tr>
<tr>
<td>Kazakhstan&lt;sup&gt;e&lt;/sup&gt;</td>
<td>—</td>
<td>402,900</td>
<td>1,134,700</td>
<td>—</td>
</tr>
</tbody>
</table>

— = data unavailable.

<sup>a</sup> World Bank (2000a).


<sup>c</sup> UNESCO (2004).

<sup>d</sup> Southeast Asian Ministers of Education Organization (2007).

<sup>e</sup> The Agency of Statistics of the Republic of Kazakhstan.
Table A8.2: Gross Enrollment Rates in Higher Education in Selected Countries in Asia and the Pacific

(Percent)

<table>
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<td>Azerbaijan</td>
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<td>Kazakhstan</td>
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<td>Tajikistan</td>
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<td>14</td>
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<td>—</td>
<td>—</td>
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<td>Uzbekistan</td>
<td>30</td>
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<td>15</td>
<td>15</td>
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<tr>
<td><strong>East Asia</strong></td>
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<td></td>
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<tr>
<td>People’s Republic of China</td>
<td>3</td>
<td>6</td>
<td>13</td>
<td>19</td>
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<tr>
<td>Hong Kong, China</td>
<td>—</td>
<td>—</td>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>39</td>
<td>66</td>
<td>83</td>
<td>89</td>
</tr>
<tr>
<td>Mongolia</td>
<td>14</td>
<td>26</td>
<td>34</td>
<td>39</td>
</tr>
<tr>
<td><strong>Pacific</strong></td>
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</tr>
<tr>
<td>Timor-Leste</td>
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<td>—</td>
<td>10</td>
<td>—</td>
</tr>
<tr>
<td><strong>South Asia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>—</td>
<td>6</td>
<td>6</td>
<td>—</td>
</tr>
<tr>
<td>India</td>
<td>6</td>
<td>—</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Nepal</td>
<td>6</td>
<td>—</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Southeast Asia</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>77</td>
<td>85</td>
<td>90</td>
<td>94</td>
</tr>
<tr>
<td>Cambodia</td>
<td>1</td>
<td>—</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9</td>
<td>—</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>—</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Malaysia</td>
<td>8</td>
<td>23</td>
<td>29</td>
<td>—</td>
</tr>
<tr>
<td>Myanmar</td>
<td>4</td>
<td>7</td>
<td>11</td>
<td>—</td>
</tr>
<tr>
<td>Philippines</td>
<td>27</td>
<td>29</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Singapore</td>
<td>20</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Thailand</td>
<td>—</td>
<td>32</td>
<td>39</td>
<td>41</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>2</td>
<td>11</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>Others (for purposes of comparison)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>30</td>
<td>45</td>
<td>51</td>
<td>54</td>
</tr>
<tr>
<td>Macao, China</td>
<td>25</td>
<td>27</td>
<td>65</td>
<td>69</td>
</tr>
</tbody>
</table>

— = data unavailable.

Note: Gross enrollment rate (GER) is the number of pupils enrolled in a given level of education, regardless of age, expressed as a percentage of the population in the theoretical age group for that level of education.

### Table A8.3: Number of Higher Education Students by Subregion in 1991 and 2006

(Million)

<table>
<thead>
<tr>
<th>Subregion</th>
<th>1991</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Asia</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>South and West Asia</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>East and Southeast Asia and the Pacific</td>
<td>14</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22</strong></td>
<td><strong>56</strong></td>
</tr>
</tbody>
</table>


### Table A8.4: Enrollment in Higher Education by Course Type and Gender in Selected Asian Countries, 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Degree</th>
<th>Nondegree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Subtotal</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>1,137</td>
<td>2,537</td>
<td>3,674</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>27,901</td>
<td>19,523</td>
<td>47,424</td>
</tr>
<tr>
<td>Philippines</td>
<td>1,085,178</td>
<td>1,335,678</td>
<td>2,420,856</td>
</tr>
<tr>
<td>Thailand</td>
<td>—</td>
<td>—</td>
<td>2,089,041</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>689,109</td>
<td>630,645</td>
<td>1,319,754</td>
</tr>
</tbody>
</table>

— = data unavailable. Lao PDR = Lao People’s Democratic Republic.

<table>
<thead>
<tr>
<th>Country</th>
<th>Aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central and West Asia</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Afghanistan                  | By the end of 2010, student enrollment in universities will be 100,000 with at least 35% female students; curriculum in Afghanistan’s public universities will be revised to meet the development needs of the country and private sector growth.   
| Kazakhstan                   | Not less than 30% of secondary school graduates will continue education in the higher education system as a result of increased access and prestige of higher education and the need to satisfy social and market demand. 
   
   The Kazakhstan Strategy Development Plan up to 2010 focuses on strengthening universities, and support to and integration of Kazakhstan higher education institutions into the world education system, among other goals.  
| Pakistan                     | Assuming past trend will be sustained, enrollments in universities, DAIs, CoEs, and distance learning institutions are projected to double by 2010 and triple by 2015, reaching 1.0 million and 1.9 million by these dates, respectively. Accordingly, the enrollment rate in these institutions would rise from 2.5% to 6.2% of the 17–23 age group.  
| Tajikistan                   | A main priority in reforming higher education is financing.  
| Uzbekistan                   | The National Program Third stage (2005 and after) emphasizes formation and development of national...high schools and capacity development, staffing, and the informational basis of higher education institutions.  
| **East Asia**                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| People’s Republic of China   | The national goal is to achieve a 15% GER in higher education by 2010. Among the objectives for 2001–2050 is to increase the GER to 23% in 2010, 40% in 2020 and 55% in 2050; and to have 1,500 engineers and scientists per million population in 2020 and 3,000 per million population in 2050.  
| Republic of Korea            | New University for Regional Development (NURI) is one of the ministry’s key projects supporting development in regional universities of areas of specialty and strength. An estimated W1.4 trillion is to be invested over 5 years to develop capacity for innovation and human resources development in regional universities during 2004–2008.  
   
   Preparation is under way for the 2nd Brain Korea 21 project investment cycle.  
| **South Asia**               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| India                        | The 11th Five Year Plan aims to expand capacity in all institutions of higher education by 50% over the next 3 years. The education scheme involves a package consisting of fellowships for a 5-year period in basic sciences, social sciences, humanities, and applied sciences; creation of 100 additional posts in colleges and universities; and the setting up of computer laboratories in all government colleges and university departments, and scientific labs in schools and colleges.  
| Indonesia                    | Under the Higher Education Long-Term Strategy 2003–2010, the structural adjustment to be carried out aims to have, by the year of 2010, a healthy higher education system, with provision of the corresponding framework and structures.  
| Lao People’s Democratic Republic | At the university level, the goals are selective expansion…to continue the training and upgrading of teachers by year 2020. Every effort will be made to increase the share of government budget for education, increase enrollment of girls and ethnic minorities in higher education, and increase the student population ratio from 520/100,000 by year 2010 to 650/100,000 by 2015 and 840/100,000 by 2020.  
| Malaysia                     | Fundamental research will be activated by application to get grants of RM300 million in the 9th Malaysia Plan (2006–2010). MoHE has targeted an increase in the proportion of postgraduate students from 18% to 25% in the year 2010. Also planned is an increase in higher education enrollment numbers of the 17–23 age cohort to 40% by the year 2010.  
   
   The Malaysian nation’s Vision 2020 (Wawasan 2020) promotes a paradigm shift from an economy based on labor-intensive and lower-end manufactured products to an economy based on knowledge as part of the process of becoming a fully developed nation.  

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Continued on next page
Aspirations

Table A8.5—continued

<table>
<thead>
<tr>
<th>Country</th>
<th>Aspirations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viet Nam</td>
<td>In its Five-Year Socio-Economic Development Plan 2006–2010, the Government has established an overall quantitative goal of increasing enrollment in universities and colleges by 10% annually, to reach a level of 200 students per 10,000 population by 2010.⑨</td>
</tr>
</tbody>
</table>


Table A8.6: Science and Engineering Doctoral Degrees⑤ in Selected Regions and Countries, by Field (2000 or Most Recent Year)

<table>
<thead>
<tr>
<th>Region and Location</th>
<th>All Doctoral Degrees</th>
<th>All S&amp;E ④</th>
<th>Natural Sciences ③</th>
<th>Math/Computer Science</th>
<th>Agri. Science</th>
<th>Social/Behavior Sciences</th>
<th>Engin.</th>
<th>Non-S&amp;E</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Regions</td>
<td>207,383</td>
<td>114,337</td>
<td>46,715</td>
<td>7,389</td>
<td>7,761</td>
<td>20,054</td>
<td>32,418</td>
<td>93,046</td>
</tr>
<tr>
<td>Asia ⑥</td>
<td>47,489</td>
<td>24,409</td>
<td>8,658</td>
<td>373</td>
<td>3,085</td>
<td>1,467</td>
<td>10,832</td>
<td>23,080</td>
</tr>
<tr>
<td>PRC (2001)</td>
<td>13,001</td>
<td>8,153</td>
<td>2,655</td>
<td>–</td>
<td>536</td>
<td>621</td>
<td>4,341</td>
<td>4,848</td>
</tr>
<tr>
<td>Taipei, China (2001)</td>
<td>1,463</td>
<td>970</td>
<td>144</td>
<td>107</td>
<td>90</td>
<td>108</td>
<td>521</td>
<td>493</td>
</tr>
<tr>
<td>India (1997)</td>
<td>10,408</td>
<td>4,764</td>
<td>3,498</td>
<td>–</td>
<td>968</td>
<td>–</td>
<td>298</td>
<td>5,644</td>
</tr>
<tr>
<td>Japan ⑥ (2001)</td>
<td>16,078</td>
<td>7,401</td>
<td>1,586</td>
<td>–</td>
<td>1,241</td>
<td>610</td>
<td>3,964</td>
<td>8,677</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>396</td>
<td>256</td>
<td>161</td>
<td>19</td>
<td>8</td>
<td>20</td>
<td>48</td>
<td>140</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>6,143</td>
<td>2,865</td>
<td>614</td>
<td>247</td>
<td>242</td>
<td>108</td>
<td>1,654</td>
<td>3,278</td>
</tr>
<tr>
<td>Middle East</td>
<td>5,759</td>
<td>2,902</td>
<td>1,307</td>
<td>241</td>
<td>265</td>
<td>495</td>
<td>594</td>
<td>2,857</td>
</tr>
<tr>
<td>Sub-Saharan Africa ⑧</td>
<td>2,064</td>
<td>679</td>
<td>253</td>
<td>0</td>
<td>142</td>
<td>143</td>
<td>141</td>
<td>1,385</td>
</tr>
<tr>
<td>Europe ⑥</td>
<td>97,840</td>
<td>53,119</td>
<td>23,567</td>
<td>4,412</td>
<td>2,577</td>
<td>8,927</td>
<td>13,636</td>
<td>44,721</td>
</tr>
<tr>
<td>European Free Trade Association</td>
<td>3,391</td>
<td>1,418</td>
<td>729</td>
<td>129</td>
<td>76</td>
<td>149</td>
<td>335</td>
<td>1,973</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>21,686</td>
<td>12,481</td>
<td>4,204</td>
<td>226</td>
<td>847</td>
<td>2,775</td>
<td>4,429</td>
<td>9,205</td>
</tr>
<tr>
<td>Georgia</td>
<td>467</td>
<td>287</td>
<td>91</td>
<td>NA</td>
<td>15</td>
<td>120</td>
<td>61</td>
<td>180</td>
</tr>
<tr>
<td>Americas ⑧</td>
<td>50,544</td>
<td>31,198</td>
<td>12,015</td>
<td>2,188</td>
<td>1,512</td>
<td>8,738</td>
<td>6,745</td>
<td>19,346</td>
</tr>
<tr>
<td>North and Central America</td>
<td>46,475</td>
<td>28,590</td>
<td>10,824</td>
<td>2,095</td>
<td>1,039</td>
<td>8,421</td>
<td>6,211</td>
<td>17,885</td>
</tr>
</tbody>
</table>

⑤ = data unavailable, Agri. = agriculture, Engin. = engineering, PRC = People’s Republic of China, S&E = science and engineering. ⑥ Data for doctoral degrees use the International Standard Classification of Education (ISCED 97), level 6. ④ S&E data do not include health fields. ③ Includes physical, biological, earth, atmospheric, and ocean sciences. ⑧ Includes only those countries for which relatively recent data are available. ⑨ Includes thesis doctorsates, called ronbun hakase, earned by employees in industry.

Table A8.6—continued

Table A8.7: Arguments Supporting and Opposing Alternative Strategies of ADB Support for Higher Education

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Arguments in Favor</th>
<th>Arguments Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lending</td>
<td>• Substantial projected growth in number of higher education institutions</td>
<td>• Capital is widely available through private markets</td>
</tr>
<tr>
<td>Lending for infrastructure and</td>
<td>• Well understood procedures within ADB and DMCs</td>
<td>• Increasing number of DMCs have sufficient resources to expand their higher</td>
</tr>
<tr>
<td>policy development</td>
<td>• Maximizes DMC control over funds to invest in the manner they determine is most</td>
<td>education system without borrowing</td>
</tr>
<tr>
<td></td>
<td>appropriate</td>
<td></td>
</tr>
<tr>
<td>Lending for ICT</td>
<td>• Cost effective means of expanding access to higher education</td>
<td>• Already widely used in countries of Asia</td>
</tr>
<tr>
<td></td>
<td>• Marries interest in S&amp;T with lending</td>
<td>• Mixed history of success</td>
</tr>
<tr>
<td>Capacity Development</td>
<td>• Growth of higher education system has been faster than qualified administrators</td>
<td>• Increased capacity of personnel is only useful if, once trained, they have the</td>
</tr>
<tr>
<td>Developing capacity of institutions</td>
<td>could be trained and recruited</td>
<td>financial resources with which to operate at a higher level</td>
</tr>
<tr>
<td></td>
<td>• Improved managerial skills can increase efficiency and cost-effectiveness of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>higher education</td>
<td></td>
</tr>
<tr>
<td>Developing capacity of individuals</td>
<td>• Growth of higher education system has been faster than qualified</td>
<td>• Improved capacity provides greater career mobility; could result in loss of</td>
</tr>
<tr>
<td></td>
<td>instructional staff could be trained and recruited</td>
<td>personnel to private sector business and industry</td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td>• Focal point for expertise and information</td>
<td>• Current communication and transportation systems make subregional placement</td>
</tr>
<tr>
<td>Subregional hubs</td>
<td>• Clear point of contact</td>
<td>unnecessary</td>
</tr>
<tr>
<td></td>
<td>• Sensitive to subregional issues and needs</td>
<td>• Possibly redundant with other existing hub-like structures now operating in the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>region</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Mixed reviews regarding impact and effectiveness of hub-like structures now</td>
</tr>
<tr>
<td></td>
<td></td>
<td>operating in the region</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Easily dominated by specific points of view or orientations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Decisions regarding multiple requests for services can cause tension with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>clients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Possible lack of clarity about responsibility for quality control</td>
</tr>
</tbody>
</table>
### Table A8.7—continued

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Arguments in Favor</th>
<th>Arguments Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central hub</td>
<td>• Clear point of contact</td>
<td>• Decisions regarding multiple requests for services can cause tension with clients</td>
</tr>
<tr>
<td></td>
<td>• Less expensive</td>
<td>• Staffing commitments may narrow ability to address new problems</td>
</tr>
<tr>
<td></td>
<td>• Large enough to have critical mass and cross-fertilization of expertise across sub-areas of work</td>
<td></td>
</tr>
<tr>
<td>International twinning</td>
<td>• Can develop and sustain relationships over time</td>
<td>• May narrow the range of knowledge and advice provided</td>
</tr>
<tr>
<td></td>
<td>• Can develop deeper knowledge of DMC university issues</td>
<td></td>
</tr>
<tr>
<td>Subregional twinning</td>
<td>• Partners face similar cultural and educational circumstances</td>
<td>• May narrow the range of knowledge and advice provided</td>
</tr>
<tr>
<td></td>
<td>• Sensitive to local issues</td>
<td>• Possible lack of suitable partner institution</td>
</tr>
<tr>
<td>Brokering of individual consultant services</td>
<td>• Can respond to a wide range of specialized requests with top expertise</td>
<td>• Appropriate expertise may be hard to identify</td>
</tr>
<tr>
<td></td>
<td>• Can secure specialized expertise on an as-needed basis</td>
<td>• Often lacks follow-up and quality control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Multiple consultants’ efforts can be scattered and disconnected</td>
</tr>
</tbody>
</table>

#### Targeted Support for Science and Technology

| Direct or indirect lending for science and technology | • Can help retain top researchers                                                  | • Success requires long-term continuity and sustained commitment                     |
|                                                     | • Salary inequities between science and technology faculty and those in other fields | • Success largely contingent on factors outside of higher education                  |
|                                                     | • Country lending already allows governments to allocate money to science and technology if they choose. | • Payoff is long term and uncertain                                                    |
|                                                     |                                                                                     | • Often weak private sector demand                                                   |
|                                                     |                                                                                     | • Commercialization of research can be difficult and uncertain                       |
|                                                     |                                                                                     | • Weak protection for intellectual property rights                                   |

**ADB** = Asian Development Bank, **DMC** = developing member country, **ICT** = information and communication technology, **S&T** = science and technology.

*Source: Author.*
Appendix 9: Summary of Recent ADB Loans for Higher Education

<table>
<thead>
<tr>
<th>Bangladesh Open University Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
</tr>
<tr>
<td><strong>Comments</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cambodia Special Rehabilitation Assistance Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
</tr>
<tr>
<td><strong>Comments</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indonesia Higher Education Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose</strong></td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
</tr>
<tr>
<td><strong>Assessment</strong></td>
</tr>
</tbody>
</table>

Continued on next page
### Indonesia Higher Education Project

**Comments**
- Consultant services were 56% of appraisal estimate, largely because a large number of local Indonesian consultants were used. Management and academic staff thought this component was one of the most successful of the project.
- The fellowship component was successful, but returning fellows were discouraged by lack of university support for new course development and lack of funding for research.
- There were problems with ongoing maintenance of facilities after construction, and with updating of curricula. There was a need for university to increase cost recovery.

### Lao People’s Democratic Republic Postsecondary Education Rationalization Project

**Purpose**
Establish a multi-campus national university, and develop an operational framework (including a management system, academic structure, and supporting mechanisms).

**Rationale**
Shortage of higher education graduates poses obstacle to sustain national development gains.

**Assessment**
- Project was rated highly relevant.
- The project was rated very efficient. The cost of education at National University of Laos (NUOL) was $88/student, while cost of education at the 10 postsecondary institutions before consolidation was $264/student. After cost recovery, NUOL student costs estimated at $57/student.
- Overall, the project was rated as highly effective.

**Comments**
Project amalgamated 10 postsecondary education institutions to create the NUOL.

### Papua New Guinea Higher Education Project

**Purpose**
Enable the higher education system to respond to manpower and human resource development needs, improve primary and secondary education through teacher education, and rationalize and consolidate administration and management of higher education to achieve coordinated and cost-effective development of the higher education sector.

**Rationale**
The higher education system was unable to produce the required number of trained personnel to exploit the country’s natural resources, and to assist with its social and economic development. It was not producing enough graduates to provide the needed number of primary and secondary school teachers.

**Assessment**
Overall performance was judged satisfactory, given the problems encountered.

**Comments**
- Difficulties encountered in inadequate attention to implementation issues lead to excessive project duration. Delays in contracting resulted in the loss of good fellowship candidates. A government freeze on staff recruitment in the public sector restricted government capacity to fill vacancies.
- The number of short-term consultants was too large for government to effectively manage, and the lack of counterpart staff constrained project work.
- Project was rated as relevant. Country and higher education institutions benefited. Capacities of the universities were enlarged and strengthened. Enrollment gains anticipated at appraisal were not achieved.

*ADB = Asian Development Bank.*

Appendix 10:
Research and Development Performance by Sector in Selected Countries

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Sector of Research and Development Performance (% of GERD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business</td>
</tr>
<tr>
<td>East Asia</td>
<td></td>
</tr>
<tr>
<td>NIEs</td>
<td>63.0</td>
</tr>
<tr>
<td>People’s Republic of China</td>
<td>62.4</td>
</tr>
<tr>
<td>Hong Kong, China</td>
<td>33.2</td>
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<tr>
<td>Taipei, China</td>
<td>62.2</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>76.1</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>51.3</td>
</tr>
<tr>
<td>Indonesia</td>
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</tr>
<tr>
<td>Malaysia</td>
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<tr>
<td>Philippines</td>
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<td>Singapore</td>
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<tr>
<td>Thailand</td>
<td>43.9</td>
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<tr>
<td>Developed Countries&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Japan</td>
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<tr>
<td>United States</td>
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<td>Latin America&lt;sup&gt;b&lt;/sup&gt;</td>
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<tr>
<td>Emerging Europe&lt;sup&gt;c&lt;/sup&gt;</td>
<td>42.7</td>
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</table>

GERD = gross expenditure on research and development, NIE = newly industrialized economy.
Note: Data are for 2002–2005, latest available year. Medians used for regions and subregions.
<sup>a</sup> Twenty-one countries. <sup>b</sup>Eleven countries. <sup>c</sup>Nine countries.

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