

# Technical and Vocational Education and Training: Issues, Concerns and Prospects

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## Volume 27

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Rupert Maclean · Shanti Jagannathan  
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# Education and Skills for Inclusive Growth, Green Jobs and the Greening of Economies in Asia

Case Study Summaries of India, Indonesia,  
Sri Lanka and Viet Nam





# Foreword

The rapidly growing attention to growth models that are environmentally sustainable and reduce carbon footprint drives developed and developing countries to accelerate the transition to a cleaner, greener growth. Some levers can make this transition faster and more enduring—and education, skills, and talent development is one such area.

This book is the outcome of a regional research project that explored the links between research, policy, and practice to enhance quality and relevance of skills development systems, particularly in industries with potential for high employment, growth, and greening. The book reinforces the mutual benefit of greening and moving up the global value chain for more inclusive growth.

Education, skills development, and tertiary education need retooling to build foundational knowledge, workforce training, and expand research and innovation in green economy-related fields. In the past decade, schools have promoted education for sustainable development by integrating environmental concerns in school curricula. There is also progress in research at university level on environmental sustainability and climate change. However, while the importance of skills for greening economies is acknowledged by both public and private sector representatives, Technical and Vocational Education and Training institutions have been slow to incorporate skills that facilitate the greening of various occupations and support the development of new occupations.

The transition to greener economies requires a pool of professional (e.g., architects and engineers) as well as vocational (mechanics and technicians) workers. Environment and sustainability-related courses need to be integrated into the curricula for vocational training. The availability of adequate talent, particularly for innovation, research, and development for a greener economy will foster new and innovative solutions and more cost-efficient and -effective technical approaches, financial models, and implementation capacities to achieve a successful transition.

Countries need to consider building the green growth knowledge base such as setting up national education initiatives for green and climate-resilient development and possibly a national climate education clearing house of knowledge. An example of how this can be done effectively is the Australian Green Skills Agreement, which

seeks to build the capacity of the vocational education and training sector to deliver the skills for sustainability and required in the workplace.

For a greening environment, there is great potential in strengthening the links of environment, energy, education, and employment. At the Asian Development Bank, we will advance our efforts in strengthening these links by optimizing the role of education and skills development, especially as large-scale projects in clean energy, sustainable transport, climate change, and education, continue to be scaled up. These will help reap the benefits from holistic approaches as Developing Member Countries advance toward their sustainable development goals.

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This book is a product of a policy research study *Education and Skills for Inclusive Growth and Green Jobs* commissioned by the ADB on the role of education and training in responding to the transition toward green and sustainable economies and jobs. This regional research and development technical assistance project, which ran from 2011 to 2015, was initiated by the Sustainable Development and Climate Change Department (SDCC) of ADB to reinforce links between research, policy, and practice to enhance quality and relevance of skills development systems in India, Indonesia, Sri Lanka, and Viet Nam. We are grateful for the support provided by Carmela Locsin (formerly director general, SDCC), Woonchong Um (formerly deputy director general, SDCC) and Bart Edes (formerly director, SDCC). We are grateful to the Education University of Hong Kong which was commissioned by ADB to undertake this project.

The project was conceptualized and led by Shanti Jagannathan, senior education specialist at the ADB. In addition to enabling research and analysis on the prospects and challenges of building dynamic skills development systems for a “greening” Asia, the project established the ADB International Skills Development Forum series, which has become a flagship knowledge-sharing event in education and skills in ADB, by financing four of the six annual International Skills Development Forums held so far.

Rupert Maclean (who at the time was at the Education University of Hong Kong) was the overall team leader for the project. In addition to leading the research in collaboration with international and national consultants, he led the development of a series of publications that include the book *Skills Development for Inclusive and Sustainable Growth in Developing Asia-Pacific* and a special edition of the journal *Prospects on Skills for Inclusive and Sustainable Development—Perspectives from the Asia Pacific Region and Beyond*. Special thanks are owed to Rupert Maclean for enabling extensive knowledge partnerships and publications arising from this project.

Brajesh Panth, chief of education sector group at the ADB led the overall coordination of the joint publication process with Springer.

This book draws on a wide range of primary and secondary source materials, as listed in the bibliography at the end of the publication. The authors drew heavily on the outputs from the above-mentioned research project. Four country reports and a regional report were prepared by Rupert Maclean in close collaboration with Saurabh Johri (technical and vocational education and training [TVET] consultant, New Delhi) and Will Douglas (Education University of Hong Kong).

The international research team for the project comprised Rupert Maclean (team leader), Margarita Pavlova (TVET providers specialist), and Belinda Smith (private sector skills specialist). The following national consultants included:

India: Saurabh Johri (TVET specialist and national team leader), Shruti Dasgupta (market research and survey specialist), and Shashikala Sitaram (gender specialist).

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## Series Editor's Introduction

This book reports on a major research project funded by the Asian Development Bank in Manila, and undertaken by the Education University of Hong Kong. It examines a topic that is of great importance not only to countries and communities in the rapidly developing Asia and Pacific region, but also to countries worldwide as they seek to achieve balanced economic growth that benefits all sectors of the community, is sustainable, and minimizes the adverse impact of such development on the environment.

The growing prominence of Asian economies and corporations, together with globalization and technological innovation, are leading to long-term changes in trade, business, and labor markets. Asia's economies have achieved remarkable growth rates, particularly over the past two decades. If Asia continues to grow on its recent trajectory, it could, by 2050, account for 51% of world gross domestic product (compared with 27% in 2010), with a sixfold increase in per capita income [Asian Development Bank, 2011]). With these long-term changes in trade, business, and labor markets, there is a rebalancing of power and influence in the region, and between the region and other parts of the world.

Within Asia and the Pacific, policy frameworks are being prepared to ensure that these growing economic benefits are inclusive by improving the quality and outreach of skills development employability and sustainable livelihoods. Countries are also taking action to ensure that economic growth in Asian and Pacific countries is "green," which minimizes adverse impacts on the environment. The transition to green growth currently focuses on efficient use of energy; greater use of renewable energy and the associated investment in technology development; waste reduction leading to lower pollutant emissions; production processes that conserve; the recycling and reuse of natural resources; and, an understanding that environmental regulations, standards, and economic instruments are not a hindrance to production, but are essential for achieving inclusive, sustainable, and environmentally friendly growth.

The adoption of green growth policies in support of green jobs and the greening of existing occupations are likely to require new skills to respond to the needs of the labor market. In this study, green jobs are defined as

*Jobs that reduce the environmental impact of enterprises and economic sectors, ultimately to levels that are sustainable, are called green jobs. This comprises work in agriculture, industry, services, and administration that contributes to preserving or restoring the quality of the environment while also meeting the requirements of decent work, involving adequate wages, safe conditions, workers' rights, social dialogue, and social protection.*

This definition is consistent with the one used by the International Labour Organization and relevant others (ILO/UNEP/IOE/ITUC, 2008).

The major Springer book series in which this book is published examines issues, concerns, and prospects regarding education for the changing world of work. It seeks to provide research; evidence-based information about a diverse range of key, cutting edge aspects of technical and vocational education and training (TVET); and applied learning. The series showcases promising innovative approaches to TVET and education for the world of work. In doing so it also seeks to create an effective bridge among research, policy, and practice. This is a long-standing publications program that began in 2005 at the instigation of the UNESCO-UNEVOC International Centre for TVET in Bonn, Germany. The numerous volumes published to date in this major Springer book series provide a comprehensive, in-depth picture of current issues, concerns, and prospects in TVET, as they relate to both individual countries and worldwide.

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Rupert Maclean  
Series Editor  
College of the North Atlantic-Qatar

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# Abbreviations

ACB	ASEAN Centre for Biodiversity
ADB	Asian Development Bank
AICTE	All India Council for Technical Education
APEC	Asia-Pacific Economic Cooperation
ASSOCHAM	Associated Chambers of Commerce and Industry of India
ATI	Advanced Training Institute
ATMI (Indonesian acronym)	Academy for Manufacturing Engineering
BAPPENAS (Indonesian acronym)	National Board on Development Planning
BAU	Business-As-Usual
BDI (Indonesian acronym)	Industrial Training Centre
BLPT (Indonesian acronym)	Balai Latihan Pendidikan Teknik (Technical Education and Training Centre)
BPL	Below Poverty Line
BTL	BAC Thang Long
CEDEFOP	European Centre for the Development of Vocational Training
CEO	Chief Executive Officer
CGTTI	Ceylon-German Technical Training Institute
CII	Confederation of Indian Industries
CIPET	Central Institute of Plastics Engineering and Technology
CNG	Compressed Natural Gas
CO <sub>2</sub>	Carbon Dioxide
CSP	Concentrated Solar Power
CSR	Corporate Social Responsibility
DMC	Developing Member Country

DTET	Department of Technical Education and Training
EC	European Commission
ECOTECH	Economic and Technical Cooperation
EdUHK	The Education University of Hong Kong
EGILAT	Experts Groups on Illegal Logging and Associated Trade
EMCO	Energy Management Company
ENG	Energy Working Group
EU	European Union
EWEC	East-West Economic Corridor
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
FICCI	Federation of Indian Chambers of Commerce and Industry
GCF	Green Climate Fund
GDP	Gross Domestic Product
GDVT	General Department of Vocational Training
GHG	Greenhouse Gas
GINSI	Importers Association of Indonesia
GPEI	Indonesia Exporters Association
GTZ	Gesellschaft für Internationale Zusammenarbeit, (German Federal Enterprise for International Cooperation)
HDI	Human Development Index
HE-VTPs	Higher Education Vocational Training Providers
HM Government	Her Majesty's Government (UK)
HR	Human Resources
HRD	Human Resource Development
HRDWG	Human Resource Development Working Group
IDR	Indonesian Rupiah
IL&FS	Infrastructure Leasing and Financial Services Ltd.
ILO	International Labour Organization
IMF	International Monetary Fund
Indecon	Indonesia Ecotourism Network
IOE	International Organisation of Employers
ISO	International Organization for Standardization
IT	Information technology
ITI (Indian term)	Industrial Training Institute
ITUC	International Trade Union Confederation
KADIN (Indonesian acronym)	Indonesia Chamber of Commerce
KKNI (Indonesian acronym)	Kerangka Kualifikasi Nasional Indonesia (National Qualifications Framework)
LCREE	Low Carbon and Resource-Efficient Economy



LMIS	Labour Market Information System
MHRD	Ministry of Human Resource Development
MNC	Multinational Corporation
MOE	Ministry of Environment
MoEC	Ministry of National Education and Culture
MOET	Ministry of Education and Training
MOF	Ministry of Finance
MOHE	Ministry of Higher Education
MOIC	Ministry of Industry and Commerce
MOIT	Ministry of Industry and Trade
MOLISA	Ministry of Labour, Invalids, and Social Affairs
MoMT	Ministry of Manpower and Transmigration
MOSDE	Ministry of Skill Development and Entrepreneurship
MOSPI	Ministry of Statistics and Programme Implementation
MOT	Ministry of Transport
MOU	Memorandum of Understanding
MPI	Ministry of Planning and Investment
MSMEs	Micro, Small, and Medium Enterprises
NAITA	National Apprenticeship and Industrial Training Authority
NAMA	Nationally Appropriate Mitigation Actions
NCCC	National Council on Climate Change
NCPC	National Cleaner Production Centre
NEPC	National Environmental Protection Council
NGO	Nongovernment Organization
NO <sub>2</sub>	Nitrogen Dioxide
NOS	National Occupational Standards
NOSSDC	NOSS Development Committee
NQF	National Qualification Framework
NSDA	National Skill Development Agency
NSDC	National Skill Development Corporation
NSQF	National Skills Qualification Framework
NSSD	National Strategy for Sustainable Development
NVQ	National Vocational Qualification
OECD	Organization for Economic Co-operation and Development
OHS	Occupational and Health Safety
OSD	Occupational Skills Department
PG	Postgraduate
PLC	Public Limited Company or Programmable Logic Control
PPP	Purchasing Power Parity or Public–Private Partnership
PROPER	Program for Pollution Control, Evaluation, and Rating
PSU	Public Sector Undertaking
PV	Photovoltaics

SAARC	South Asian Association for Regional Cooperation
SCE	Steering Committee on Economic and Technical Cooperation
SD	Sustainable Development
SEZ	Special Economic Zone
SHG	Self-Help Group
SHRDC	SAARC Human Resources Development Centre
SLSEA	Sri Lanka Sustainable Energy Authority
SMEs	Small and Medium-sized Enterprises
SMK (Indonesian acronym)	Sekolah Menengah Kejuruan (vocational secondary school)
SOM	Senior Officials Meeting
SSC	Sector Skill Council
STAR	Standard Training and Assessment Reward
TPTWG	Transportation Working Group
TVEC	Tertiary and Vocational Education Commission
TVET	Technical and Vocational Education and Training
UGC	University Grants Commission
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
US	United States
USA	United States of America
USAID	United States Agency for International Development
VBCSD	Viet Nam Business Council for Sustainable Development
VEIA	Viet Nam Environmental Industry Association
VET	Vocational Education and Training
VSS	Vocational Secondary School
VT	Vocational Training
VTA	Vocational Training Authority
VTC	Vocational Training Centre
WWF	Worldwide Fund for Nature

# Abstract

International interest in sustainable and inclusive growth has gained impetus because of the recognition that the “brown” economy model does not address global issues such as growing inequality and social marginalization, environmental degradation, and resource depletion.

Evidence has shown that the “green” economy is a potential source of employment, can halt further productivity loss, and can address climate change and environmental degradation.

Broadly, three kinds of skills sets for green jobs can be identified. The first is general sustainability literacy, predominantly in the form of soft skills, awareness, and action competence. The second set includes occupation-specific science, technology, engineering, and mathematics (STEM) skills, while the third set encompasses leadership and management skills aimed at green transition. Many of these skills exist and are transferable, but need to be further strengthened and mainstreamed, or complemented with additional green concepts and practices. Others, such as broader STEM skills and leadership skills are missing. All present particular opportunities for the training sector.

Each of the four countries studied—India, Indonesia, Sri Lanka, and Viet Nam—as part of this Asian Development Bank (ADB)–Education University of Hong Kong (EdUHK) research study, presents an overview of main research findings concerning education and skills for inclusive growth, green jobs, and the greening of the economy for each country. This includes examples of government and business sector responses to the issues and challenges being addressed, and examples of how technical and vocational education and training (TVET) systems and institutions are addressing both the revision of curricula in the context of green growth dynamics and patterns of training and skills development for meeting demands.

The research study reported on in this book is unique. The findings, conclusions, and recommendations are based on primary data that were specifically collected for the study. Similar studies conducted in Asia have relied largely on the secondary sources of data, and report on existing research and related literature. By comparison, this study—in addition to reporting on existing research and related

literature—surveyed TVET providers and business enterprises and examined survey responses of policy makers and practitioners on key aspects of education and skills for inclusive growth and the greening of economies. In addition, in-country workshops were held in each of the four countries to ascertain the views of key stakeholders in government, nongovernment organizations, members of the international development community, TVET providers, and members of the business sector. These workshops were organized to discuss key aspects of green growth, green jobs, inclusive growth, and the greening of economies, and to discuss the main findings emerging from the research.

In addition to reporting on research findings from India, Indonesia, Sri Lanka, and Viet Nam, this book examines cross-cutting issues, concerns, and prospects regarding education and skills for inclusive growth and green jobs for the four countries. These are critical themes and issues in the selected industry sectors triggering a demand for green jobs in the region; how industry is responding to those demands; areas impeding the transition from traditional to green practices; the importance of skills development, especially green skills, with regard to successful examples and the reasons for their success; the role of TVET in addressing industry needs; reasons for the slow response of TVET toward green skills, and key impediments; and, what works concerning initiatives from countries to fast-track reforms in TVET to facilitate inclusive growth and the greening of economies.

The research study provides recommendations to help manage the transition toward green and inclusive growth presents a suggested framework for implementation of potential strategies and policy initiatives, and examines areas for further research.

Summaries are provided in this book of the case studies undertaken for India, Indonesia, Sri Lanka, and Viet Nam.

The full, detailed case studies are available for viewing and downloading from [www.cna-qatar.com/research/unesco-unevoc](http://www.cna-qatar.com/research/unesco-unevoc).