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HUMAN CAPITAL DYNAMICS and Industrial Transition in Cambodia

Discussion Paper No. 11

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Human Capital Dynamics and Industrial Transition in Cambodia

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FOREWORD

The Rectangular Strategy Phase III (2013-2018) reaffirms once again the commitment of the Royal Government of Cambodia in reducing poverty and ensuring sustainable, inclusive and equitable growth through diversifying the economic base and improving human capital and good governance.

Cambodia has made impressive achievements in its development with the economy growing (1993 to 2013) at an annual average of 7.7 percent, making it one of the fastest growing economies in ASEAN and Asia. This has contributed significantly to reducing poverty, which now stands below 20 percent compared to 47.8 percent in 2007, and brought the country to the edge of graduating to lower-middle-income country status.

Moreover, employment has grown at 4 percent per year between 1998 and 2008 although much of this growth has been in the rural areas and in the informal segments of the economy. Nevertheless, labour productivity, as measured by output per worker, has been one of the lowest in the region and grew only modestly in the late 2000s. In 2010, output per worker in Cambodia was less than US$4,000 in constant purchasing power parity dollars; this was two-third that of Viet Nam and less than one-fifth of Malaysia's.

As Cambodia grows into a middle income country there is a recognized need by the Royal Government of Cambodia and development partners to diversify the base of the economy and to undertake higher value-added activities through increased productivity. In order to attain such an aspiration Cambodia requires strategic industrial and investment policy approaches, including human capital development policy, to enhance productivity of and returns to work in the existing economic activities – the agriculture, garment, tourism, and construction. This could be achieved by up-skilling and mobilizing the workforce, as a strategy for a broad-based industrial and technology-oriented economy, and by linking the formal education system and technical and vocational education training (TVET) to industrial policy.

To support the Royal Government of Cambodia in developing industrial policy, the United Nations Development Programme (UNDP) has responded by providing policy researches and advices. Working together with key government institutions and ministries, UNDP has published different discussion papers on background policy analyses and researches in areas that are pertinent to industrial competitiveness and human capital roadmap.

This Discussion Paper No. 11 authored by Professor Shandre M. Thangavelu, Associate Professor at the Institute for International Trade and the Regional Director (Southeast Asia) of Centre for International Economic Studies of the University of Adelaide, is the latest in a series aimed at enhancing the body of knowledge and stimulating further discussion in Cambodia using lessons learned from the emerging Asian economies. It examines the on-going policy efforts in industrial development and discusses structural changes, skilled labour force and economic trends of Cambodia. It also offers education and labour force growth scenarios drawing on experiences of South Korea and other ASEAN countries in the past and at present.

It is our hope that this discussion paper can benefit Cambodia in its endeavor to chart policy course towards achieving sustainable, inclusive, and equitable development for the future.

UNDP Cambodia

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The study's design has greatly benefited from the views, concerns, and recommendations that relevant government stakeholders had expressed during the consultation meetings throughout 2013 and early 2014.

A special thanks is owed to H.E. Dr. Hang Chuon Naron, Minister of Education, Youth and Sport and the Supreme National Economic Council's research team led by H.E. Ros Seilava.

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ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
CEF	Cambodia Economic Forum
CET	Continuing Education and Training
CMT	Cut, Make and Trim
CSES	Cambodia Socio-Economic Survey
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GSP	Generalized System of Preferences
HDI	Human Development Index
HDR	Human Development Report
HEQCIP	Higher Education Quality and Capacity Improvement Project
HS	harmonized system
IHDI	Inequality-Adjusted Human Development Index
KDI	Korean Development Institute
MFN	Most Favored Nation
MNC	multinational corporation
MoEYS	Ministry of Education, Youth and Sport
MoLVT	Ministry of Labour and Vocational Training
NEA	National Employment Agency
NGO	non-governmental organization
ODA	Official Development Assistance
PPP	Public Private Partnerships
PSLE	Primary School Leaving Examination
R&D	Research and Development
RGC	Royal Government of Cambodia
SMEs	Small and Medium Enterprises
SNEC	Supreme National Economic Council
STEM	science, technology, engineering, mathematics
TVET	Technical and Vocational Education Training
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
WAP	working age population

Photo: UNDP Cambodia/Nicolas Axelrod

EXECUTIVE SUMMARY

This study highlights some of the key human capital challenges on the way to successful industrial transition of the Cambodian economy. In particular, it emphasizes the close connection between the competitiveness of the labour force, the opportunities afforded the country and its people by an integrated ASEAN, and the country's efforts and capacity to absorb its excess supply of under educated, unskilled labour that might otherwise be excluded from decent employment and the benefits of economic growth altogether.

Human capital building is both a critical constraint on and a key driver of economic diversification and inclusive growth for the next stage of Cambodia's development. Cambodia's young population and its geographic location position it well to benefit from the opportunities presented by other emerging Asian economies. These factors are by no means a guarantee for success in the near future, however. To fully realize the potential locked in Cambodia's "one-time" demographic dividend and to capitalize on the opportunities of regional integration, two bottlenecks—the narrow economic structure and the low human capital base—must be tackled. Important economic, educational and institutional reforms will be necessary if anticipated risks such as the "low-skill, low wage" trap or a widening wage gap between skilled and unskilled labour are to be avoided.

Industrial policy, well-designed and well-executed, can stimulate structural transformation for sustainable growth. To generate decent jobs and reduce poverty and vulnerability, Cambodia's industrialization needs to proceed at a faster pace by improving productivity in existing industries and adding higher value-added activities, and developing a competitive edge in potential future industries. Successful industrial policies complement other market institutions and economic fundamentals such as education and skills policies, research and development (R&D), labour market policies, trade openness and export strategies, institutional strengthening and infrastructure development.

The government is formulating a new Industrial Development Policy to push Cambodia's industrial transformation higher up regional and global value chains. Cambodia can learn from other ASEAN countries' alignments of educational reforms with industrial policies including with expected industrial structures, development of early and broad-based science and mathematics education at primary and secondary schools, expansion and

standardization of primary and secondary schools, and curriculum reform to emphasize basic skills in reading, writing and arithmetic. Also, English language proficiency was important, as was vocational training initiated at an early stage of the education system to complement formal education and provide skills training as an alternative route to further education, in the process forming an employment-oriented framework for ensuring that the skills of job entrants and older workers remained relevant. The development of human capital in agriculture and improvements in diffusion of technology through the establishment of a strong agricultural university were crucial for agricultural sector development and productivity improvements.

Human capital is driven by the age structure, education level and technical skills acquisition of the labour force, technical and vocational education and training (TVET), continuing education and training (CET), and educational policy and institutions. Industrial structure and structural changes are important for economic performance and labour market efficiency. However, lack of human capital and indigenous technology could impede the structural changes industry needs to make in order to shift activities to higher value-added outputs. In an open economy, Cambodia will have to rely more on foreign skilled workers and foreign technology in the form of investments from multinational corporations (MNCs) to strike a balance between human resource development and industrial competitiveness as the basis for sustained innovation-led growth.

Sustainable economic growth relies on balanced growth in human capital development and innovation systems. Global forces can impact on the growth of an open domestic economy. For example, skilled workers are highly mobile within and between countries. As the level of human capital increases, the push factor for outward migration gains momentum and the subsequent emigration of indigenous skilled workers might have a significant impact on the growth of human capital in the domestic economy. In addition to the mobility of skilled labour, recent evidence indicates that in the past decade the mobility of unskilled labour in Asia has also increased.

High possibility of a "low-skill, low-wage" development trap. First, without strong interventions to develop human capital, there is a high possibility of the economy becoming caught in a "low-skill, low-wage" trap in the near future. The abundance of undereducated, unskilled labour could make it difficult for Cambodia to compete with neighbouring countries for foreign direct investment, the much-needed technical know-how and capital, to diversify production into higher value-added activities and improve the country's skill base. Consequently, MNCs could by-pass Cambodia and locate in other emerging ASEAN economies, possibly undermining the country's modern industrial development as

Photo: UNDP Cambodia/Chansok Lay

its low human capital would be insufficient to support competitiveness. In such a scenario, skilled domestic workers might migrate to other ASEAN countries and Cambodia could end up encountering the "migration syndrome" of the Philippines, with heavy reliance on remittances, lower growth and attendant social issues.

Second, even if Cambodia stays on a steady growth path at current trends, the demand for skilled workers from MNCs and key industries will need to be met by foreign workers from the region. The expected scenario here is one of widening wage gaps between skilled and unskilled (mostly domestic) workers. The majority of Cambodians would be excluded from the benefits of economic growth because their low education and training and low productivity make them unemployable, denying them access to decent jobs. Their low salaries would render them highly vulnerable to falling back into poverty and prevent them from breaking the vicious cycle of underinvestment in their children's education.

To avoid these pitfalls and to grasp the opportunities of Cambodia's young population and its strategic location at the hub of emerging Asian economies, the bottlenecks caused by the narrow economic structure and low human capital need to be simultaneously tackled through economic, educational and institutional reforms. To secure competitiveness, the following actions should be considered (for more detail see Section 7):

1. **Address the trade-off between working and schooling.** In creating the basic foundation for human capital development through TVET, it is critical that children complete primary school education. A conditional cash transfer scheme targeting upper primary or lower secondary students could be an effective measure to increase retention and completion rates at these critical stages of education.

2. **Standardize primary and secondary school education.** This could be in the form of national level exams, similar to the primary school leaving examination in Singapore. National exams could improve the quality of education by increasing the incentives for teachers and stimulating the aspirations of students. A clearly defined and unified set of quality standards could also lead to higher returns to education.

3. **Improve the quality of education through transforming education providers.** The quality of education depends on the quality of education providers and the provision of effective incentives. This can be done through transforming existing pedagogies into a Faculty of Education to strengthen the training and certification of teachers and to provide postgraduate teacher education programmes. As exemplified by Singapore, a proper career path, compensation and wage progression commensurate with skills and abilities, and non-monetary benefits such as subsidized housing to incentivize teachers to work in villages, would make the teaching profession more attractive and raise the social status of teachers.

4. **Consolidate the fragmented public universities.** This would create economies of scale and scope and allow the development of linkages and partnerships with leading global universities, attracting investments and helping develop local curricula and research. The government could focus on creating linkages with universities in Japan, the Republic of Korea, Singapore, Australia, Europe and the United States. In addition, access to university education should be broad-based with the creation of province-level universities and the prioritization of agricultural science.

5. **Integrate formal TVET with informal education systems.** An opening up of these systems under an "Education for All" framework could allow every individual to acquire some skills from formal education and, via alternative pathways to higher education, continue upgrading their skills in a way that is compatible with the need to work. Lowering the entry requirement for TVET (currently grade 9) and rearranging and scaling up existing bridging programmes could make TVET more effective and accessible, thus promoting skills acquisition and upgrading to a wider segment of the population.

6. **Introduce within the TVET system life-long learning and skill development opportunities and career progression for skilled workers.** National certification of training programmes is vital for the recognition of vocational qualifications and to signal to the private sector the competencies of the workforce. This underscores the need to put in place quality assurance, accreditation and recognition systems. Endorsement by the private sector and the business community would increase the returns to training and motivate workers to acquire more skills. A public-private partnership (PPP) framework could play an important role in endorsing formal and informal qualification frameworks for both public and private educational institutes. Part-time training courses should be considered to ensure compatibility with work. To build pathways to good jobs, secondary school students need a more tailored education to acquire the technical

skills they need and to help create a more skills-based workforce that meets the needs of industry. For example, the education system could build on the successful National Technical High Schools and Machinery Technical High Schools of the Republic of Korea in the 1960s.

7. **With the support of the private sector set up TVET institutes.** Cambodia could build on the Singapore model where Japanese-German-French Training Institutes created the crucial threshold to develop industrial-based skills and competencies relevant for sustainable growth and competitive industries. Similarly, in Viet Nam's industrialisation, training institutes set up by the Republic of Korea and Japan were instrumental in developing key technical skills. PPPs to develop and fund public universities could replicate the lessons learned from Samsung University and Pohang Institute of Science and Technology in the Republic of Korea.

8. **Scale up existing regional training centres.** A broad-based training framework could build on lessons learned and experiences from Malaysia, Singapore and the Republic of Korea.

9. **Increase the share of education (as a percent of GDP) to about 4 percent.** Public expenditure on education should be increased to at least 4 percent of GDP, comparable with that of neighbouring countries at a similar stage of development.

10. **Increase public funding for TVET and CET.** Public-private partnerships (PPPs) could play an important role in funding TVET and CET and help to internalize the returns to training for the private sector. In particular, PPPs could help set up a jointly-financed Skills Development Fund for workers that could allow them to acquire skills throughout their working career.

11. **Strengthen public higher education and regulate private universities.** To boost science, engineering and technology majors—much-needed local expertise critical to the country's economic and industrial development—it is necessary to strengthen public higher education and regulate private universities. Private universities mainly focus on social sciences and business studies and are reluctant to make the substantial longer-term investments required to set up laboratories and scientific research and development to provide higher education in science, technology and engineering. Public investment in university and technology infrastructures plays an important role in internalizing the social returns to higher education.

12. **Invest in science, engineering and agricultural universities.** Strategic investments in science and technology are vital for significant technological diffusion to support modern industrial and agricultural development for sustainable growth. Higher education's share of public expenditure at around 0.1 percent of GDP, equal to about one tenth of the world average of 1 percent, is not acceptable.

13. **Address skills gaps and mismatches and diversify the economy.** Current liberal economic policy and the push for high-end industries might create skills mismatches and intensify skills shortages. There is a need for industrial policy that will align the industrial transition with skills development and productivity growth in the Cambodian economy. Upgrading of skills and domestic absorptive capacity should be strengthened by requiring MNCs to employ a certain share of local workers in middle and upper management positions. Selective government initiated industrial development to anchor the key industries in the domestic economy could support the coordination of industrial development with sufficient human capital. For example, "export promotion with import substitution strategies" were adopted by several ASEAN countries to develop key competitive industries. A starting point could be the establishment of a central government planning agency, similar to the Economic Development Board of Singapore, tasked with the coordination of ministries and institutions by setting and prioritizing goals under a common vision and integrating formal and informal education/training sectors to meet the changing needs of the private sector. Besides investment in improving labour absorption in key economic sectors including in science parks, investment in seaports, telecommunications, airports and roads that connect urban and rural sectors is vital to diversify the economic base across sectors and geographical areas.

Photo: UNDP Cambodia/Chansok Lay

1 INTRODUCTION

> “Without strong interventions to increase the human capital of the Cambodian workforce, the study envisages a high possibility of a “low skill, low wage development trap” now and in the future.”

The Paris Peace Agreement in 1991 followed by the United Nations-administered election in 1993 marked the opening of Cambodia’s market and its economic integration with ASEAN and the global economy. Reflecting its high degree of openness to trade and investment, the value of the country’s merchandise trade relative to GDP is currently at 136.8 percent, about midway between the ratios for Viet Nam (146.6 percent) and Thailand (130.4 percent), and the inflow of foreign direct investment (FDI) is about 11 percent of GDP. The latter figure is very large considering that FDI flows only started to recover in 1991, and exceeds the ratios for Viet Nam (5.4 percent) and Thailand (2.9 percent) (World Bank, 2012). Besides its openness, notable features of the Cambodian economy are its small state-owned enterprise sector and the high level of dollarization, which limits the scope of monetary and exchange rate policy. Having achieved substantial progress in economic and political stability, the Royal Government of Cambodia (RGC) is now focussing on integrating the economy into the region through the ASEAN Economic Community and is seeking a greater identity in the international community by pursuing membership of the Asia-Pacific Economic Cooperation (APEC).

The Cambodian economy, from 1993 to 2013, grew at an annual rate of 7.7 percent, making it one of the fastest growing economies in ASEAN and Asia. In 1998–2008, before the global financial crisis, Cambodia's GDP reached an annual average growth rate of 9.5 percent. Industry registered the highest growth at an average annual rate of 15.1 percent, followed by services at 10.3 percent and agriculture at a steady rate of 4.3 percent. The doubling of GDP per capita during this period contributed to reducing poverty in the country from 47.8 percent in 2007 to just below 20 percent in 2011, and brought the country to the brink of graduating to lower-middle-income country status.

Despite impressive progress, the economy is still driven by just a few sectors, namely crops, garments, construction and tourism, creating a narrow industrial base for structural transformation. Besides this lack of diversification, the small and open nature of the economy increases Cambodia's vulnerability to external shocks, as evidenced during the 2008 global financial crisis. Although the country recovered rapidly from this shock, registering output growth rates of 6 percent in 2010 and 7.1 percent in 2011[1] , the experience has jolted policymaking, forcing critical reconsideration of the current growth engines, strategies to tackle bottlenecks and efforts to diversify economic structures to boost the catch-up process and enable long-term growth and poverty reduction.

The Fourth Cambodian Economic Forum (CEF) on "Cambodian Economy in Post-crisis Environment: Industrial Policy – Options towards a Sustainable Development", held in 2011, emphasized the government's strategic vision to shift Cambodia's economic development from reliance on agriculture, garments, tourism and construction to a broader industrial and technology-oriented economic strategy. The forum also called for coordination and close cooperation among the agencies and ministries responsible for formulating industrial development policy, and highlighted the important role of the Ministry of Education, Youth and Sport (MOEYS) in producing human resources to serve the new trend of economic development.

The new vision articulated in Rectangular Strategy Phase III reaffirms the important role of economic diversification for the next stage of growth in terms of the country's socio-economic and industrial development, and identifies human resources development as one of four priority areas. In order to generate productive jobs and to continue reducing poverty and vulnerability, Cambodia needs to accelerate its industrialization process through diversification into higher value-added activities by improving productivity and securing the competitiveness of future industries. This next step of the strategic planning process necessitates reassessment of priority policies and objectives for the short, medium and long term. Importantly, the success of these policies and strategies will hinge upon how well the government is able to address key bottlenecks, such as the development and alignment of human capital and skills development with domestic industrial policy.

To guide Cambodia's transformation process and to move the country up regional and global value chains, the Supreme National Economic Council (SNEC) is formulating a new Cambodian Industrial Development Policy. This UNDP study conducted in collaboration with SNEC, MOEYS and the National Employment Agency of the Ministry of Labour and Vocational Training (NEA/MOLVT) mainly focuses on human capital as a key determinant of both the competitiveness of the labour force and the inclusiveness of economic growth. This in-depth analysis of the linkages between higher education and skills development and industrial transition will be an important contribution to better align industrial policy with educational policy, and aims to support the new Industrial Development Policy. In particular, it intends to achieve the following objectives:

a) To identify the emerging challenges of human capital development to sustainable growth and structural transformation based on important trends in the Cambodian economy.
b) To provide technical and policy insights on the linkages and alignment of education and skills development policies with industrial policy based on the experiences of other successful countries such as Malaysia, Thailand, Viet Nam and the Republic of Korea.
c) To map Cambodia's industrial structure and education policies and to conduct a simple forecast of the education levels of the labour force.
d) To provide policy recommendations as specific technical inputs to the Industrial Development Policy 2014–2018 drafted by SNEC, and to stimulate policy debate on the linkages between human capital availability and structural change in the Cambodian economy in general.

1. ADB Statistical Database System

Photo: UNDP Cambodia/Chansok Lay

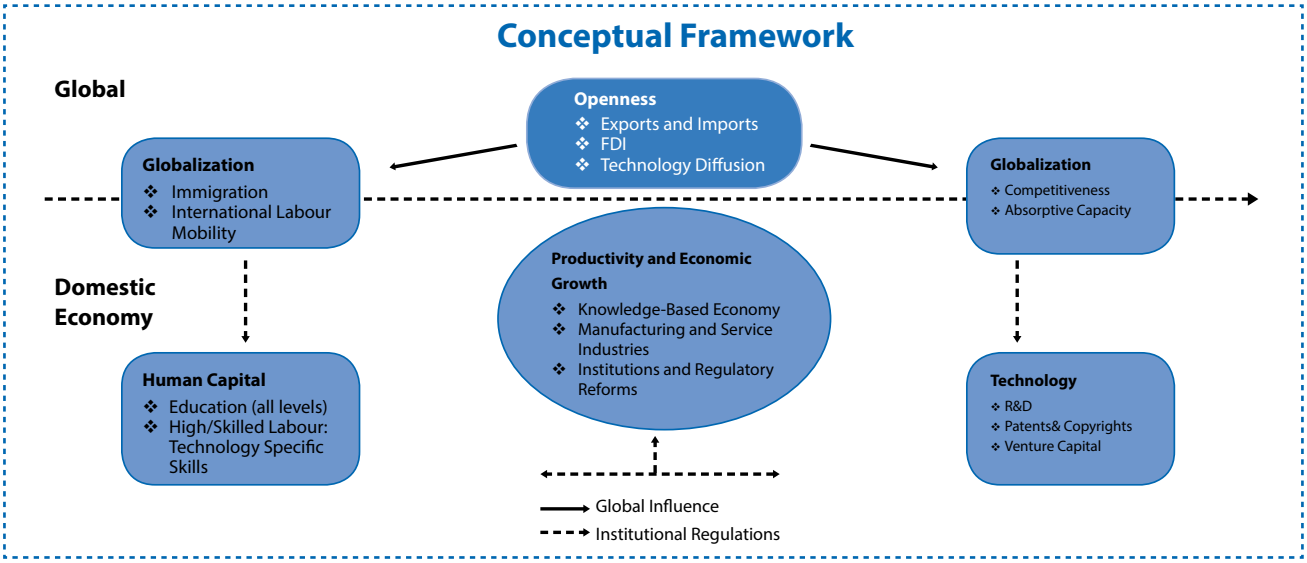
2 STRUCTURAL CHANGES AND IMPORTANCE OF SKILLED WORKFORCE

> "Industrial policy, when well designed and executed, could stimulate the structural transformation necessary for sustained growth."

Industrial policy, when well-designed and executed, could stimulate the structural transformation necessary for sustained growth (Rodrik, 2004). Industrial policy should be forward looking and dynamic visions, and consist of identifying technological and other externalities and then targeting policy interventions to correct those market failures. Overall, industrial policy has to complement other markets and economic fundamentals such as education, research and development (R&D), labour market policy for training and retraining workers, trade openness and export strategies, infrastructure development and capable institutions.

The relationship between industrial structure and human capital development is depicted in Figure 1. Increasing overall human capital in terms of skilled workforce and improved local knowledge capital through R&D investments is critical to secure export competitiveness and attract foreign multinational corporations (MNCs). Indeed, investment in skilled workforce and R&D provides important contributions to total factor productivity growth and thereby accelerates the rate of actual output (economic) growth in the long run.

Figure 1: New economy: An innovation-based economy



Source: Adapted from Thangavelu and Hu (2005)

The main components of a knowledge economy are human capital and technological innovation. A study by Thangavelu and Hu (2005) suggests that a knowledge-driven economy rests on four important pillars or characteristics:

(a) An innovation system

(b) Education and life-long learning

(c) Information and communication technology infrastructure and electronic development

(d) Policy and institutional framework. This paper follows suit and uses similar characteristics to develop a conceptual framework for identifying achievable actions towards realizing a knowledge-based economy.

The human capital component is driven by the educational level of the labour force, the age structure of the labour force, technical skills in the workforce, technical and vocational education and training (TVET), continuing education and training (CET) and educational policy and institutions. A country's innovation system is driven by the outputs of R&D, national innovation policy and core infrastructure investments in new technologies. The effects of human capital and innovation systems are not mutually exclusive. Indeed, there are strong complementary effects which, determined by the absorptive capacity of the domestic economy, largely depend on the level of human capital (in particular the skills and knowledge of workers), the degree of trade openness and the diffusion of technological innovation.

In addition, innovation systems are also determined by institutional regulatory frameworks such as for educational and training institutions, financial support for private sector innovative activities such as venture capital markets, infrastructure investments such as technology hubs, and intellectual property rights in terms of patents and copyrights.

Sustainable economic growth relies on balanced growth in human capital development and innovation systems. Also, global forces can have an impact on the overall growth of an open domestic economy. For example, skilled workers are highly mobile within and between countries. Thus, as the level of human capital increases, the push factor for outward migration gains momentum and the subsequent emigration of indigenous skilled workers out of the country might have a significant impact on the overall growth of human capital in the domestic economy. In addition, recent evidence indicates that in the past decade the mobility of unskilled labour in Asia has also increased.

Structural changes can also affect the growth of domestic economies and create labour market imbalances. Greater mobility of domestic and multinational companies and the ongoing shift of industries to lower production cost countries such as Myanmar will require domestic industrial structures to shift to higher levels of production. This will dramatically increase the demand for skilled workers to implement and complement the diffusion of new technologies. However, a lack of human capital and indigenous technology will impede the structural changes domestic industries need to make to shift activities to higher value-added outputs. Facilitated by more open economic policies and trade strategies, domestic economies will have to rely more on foreign skilled workers and foreign technology in terms of investments from MNCs to strike a balance between human capital development and innovation systems to secure their competitiveness and sustain economic growth.

Photo: UNDP Cambodia/Arantxa Cedillo

3 KEY TRENDS OF THE CAMBODIAN ECONOMY

> "The Cambodian economy remains largely agrarian-based, but it is structurally shifting rapidly towards the manufacturing sector."

Cambodia's economy is one of the smallest in ASEAN. It is almost dwarfed in size by its neighbours economies Thailand and Viet Nam, which are also more developed and efficient. In spite of these challenging economic conditions, Cambodia's economy has more than tripled in size between 2000 and 2012 (see Table 1). During this period, the political situation stabilized, the countryside became more secure, and reforms made the regulatory environment more business-friendly and attractive to investors. Also, capital inflows were large. These benefits were reaped from the country's trade and investment liberalization, even in the initial years after the resolution of the political crisis. Several factors contributed to this openness, in particular Cambodia's proximity to the highly open economy of Thailand and the integration of some Mekong economies into ASEAN. Moreover, in comparison to Viet Nam and Lao PDR, Cambodia has a small state-owned enterprise sector, thus reinforcing its liberal economic policies.

Table 1: GDP at purchasing power parity

(current international dollars, million)

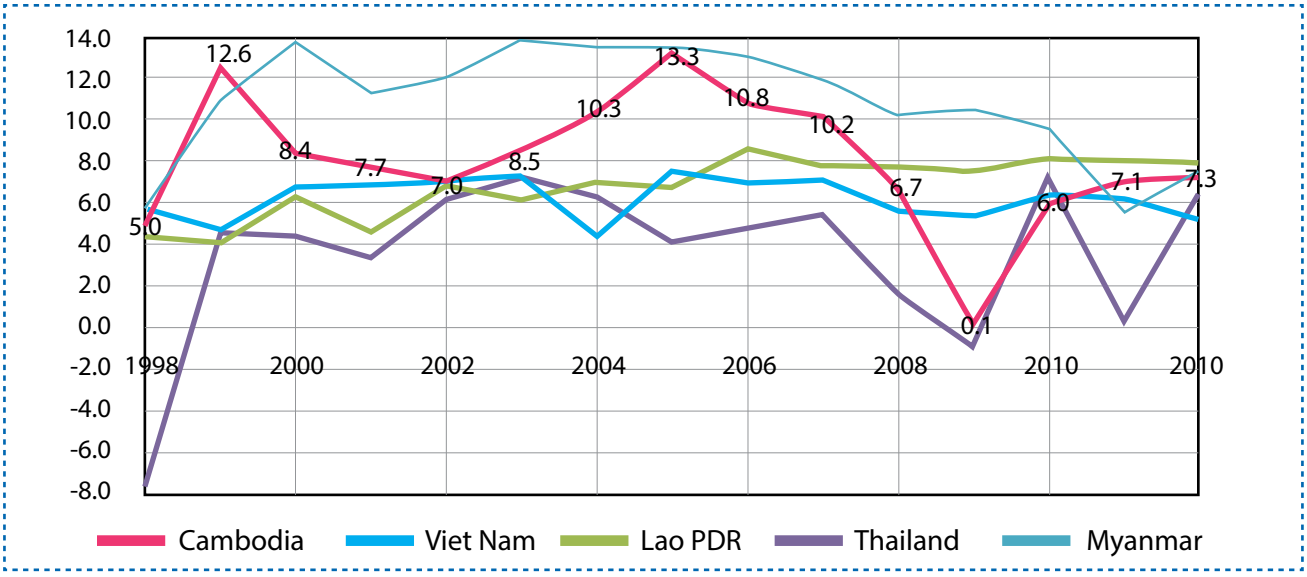
Country	2000	2012
China, PR of	2 987 949	12 470 993
Cambodia	11 440	37 017
Indonesia	496 572	1 223 488
Lao PDR	6 055	19 052
Malaysia	212 058	501 249
Myanmar	...	109 813
Philippines	185 003	426 577
Singapore	136 012	328 324
Thailand	316 563	692 236
Viet Nam	109 999	354 953

Source: ADB Statistical Database System

Photo: UNDP Cambodia/Chansok Lay

The Cambodian economy grew at an average annual rate of 7.7 percent, from 1993 to 2003 one of the fastest growing economies in ASEAN and Asia. Figure 2 illustrates Cambodia's very high GDP growth rates compared to most of its neighbours, in particular before the global economic crisis, the comparably strong effect of the crisis on the small and open Cambodian economy, as well as Cambodia's quick recovery. By 2010 and 2011, Cambodia had caught up with its neighbours and reached higher growth rates than had the five original members of ASEAN—Indonesia, Malaysia, Philippines, Singapore and Thailand.

Figure 2: Real GDP growth rates of selected ASEAN countries (1998-2012)



Source: ADB Statistical Database (2013)

GDP per capita at purchasing power parity prices for selected ASEAN countries is given in Table 2. It is clear that GDP per capita for Cambodia over the past decade has more than doubled, signifying the fast growth of the economy even relative to its population growth. It is also transitioning from low-income to lower middle-income country status and is rapidly catching up with other emerging economies in Asia.

Table 2: GDP per capita at purchasing power parity
(current international dollars)

Country	2000	2011	2012
China, PR of	2 357	8 388	9 210
Cambodia	918	2 326	2 505
Indonesia	2 412	4 657	4 949
Lao PDR	1 190	2 687	2 925
Malaysia	9 028	16 010	17 084
Myanmar	…	1 651	1 801
Philippines	2 410	4 140	4 454
Singapore	33 767	61 070	61 083
Thailand	5 086	9 905	10 757
Viet Nam	1 426	3 745	3 998

Source: ADB Statistical Database System

The Cambodian economy remains largely agrarian-based, but it is structurally shifting rapidly towards the manufacturing sector (see Table 3). Agricultural production is dominated by rice and has fallen to 33 percent of GDP. In contrast, manufacturing has grown rapidly in recent years, but it is dominated to some extent by just one industry— garments and textiles—which accounts for over half of manufacturing outputs and most of Cambodia's exports.

Photo: UNDP Cambodia/Nicolas Axelrod

Table 3: Cambodia economic structure

	1990	1995	2000	2005	2010	2012
GDP at current price in billion Riels	598.6	8,437.7	14,089.3	25,754.3	45,942.2	56,616.8
as % of GDP						
Agriculture	**55.6**	**47.4**	**35.9**	**30.7**	**33.8**	**33.6**
Industry	**11.2**	**14.3**	**21.8**	**25**	**21.6**	**29.7**
Mining	0.5	0.2	0.2	0.4	0.6	7.7
Manufacturing	5.2	9.1	16.0	17.8	14.9	15.1
Electricity, gas, and water	0.4	0.4	0.4	0.5	0.5	0.5
Construction	5.0	4.5	5.2	6.3	5.5	6.4
Services	**31.7**	**34.2**	**37.1**	**39.1**	**38.5**	**37.7**
Trade	9.4	14.6	14.4	13.5	13.8	13.6
Transportation	3.8	5.2	6.6	7.4	7.5	7.5
Finance	6.8	6.6	7.3	7.7	6.9	7.2
Public Administration	4.7	2.8	2.7	1.8	1.8	1.5
Other Industries	**7.0**	**4.9**	**6.1**	**8.6**	**14.0**	**7.9**
Less: Imputed bank service charges		**0.9**	**1.1**	**1.0**	**1.2**	**1.2**
Taxes less subsidies on production and Imports	**1.5**	**4.7**	**6.2**	**6.2**	**7.2**	**7.0**
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: ADB Statistical Database System

As compared to neighboring Thailand, large agricultural processing and home goods manufacturing, which are typically observed in low-income economies, are largely absent due to the proximity to large industrialized and more efficient neighbours. In addition, the Cambodian economy is also characterized by large services sector, particularly tourism, restaurants and transport. In fact, the inflows of official development assistance (ODA) and private capital helped create an enabling environment for service sectors in urban centres (Menon and Hill, 2013). Construction has grown rapidly, fuelled by the country's underdeveloped infrastructure, the boom in urban land values and greater speculative activity.

Manufacturing industry (Table 4) has shown strong growth, far above any of its ASEAN counterparts or even China (Table 4). With the economic liberalization policy of the early 1990s and the opportunities (i.e. tariff concessions) from the granting of most favoured nation (MFN) and generalized system of preference (GSP) trade privileges in the late 1990s and early 2000s, there was significant increase in production with industrial growth peaking at 31 percent in 2000 from a negative figure in 1990. However, this can be attributed to the fact that the base was low and the strong growth might have been purely driven by the base effect. Even so, with a growth rate of 14.5 percent in 2011, industry provides a strong growth impetus for the Cambodian economy as compared to other newly industrializing ASEAN economies such as Viet Nam.

Table 4: Growth rates for industry and services value-added (percent)

Country	Growth rates of industry real value-added (%)				Growth rates of services real value-added (%)			
	1990	2000	2011	2012	1990	2000	2011	2012
China, PR of	3.2	9.4	10.3	8.1	2.3	9.7	9.4	8.1
Cambodia	-2.1	31.2	14.5	9.2	2.7	8.9	5.0	8.1
Indonesia	11.5	5.9	5.3	5.2	9.8	5.2	8.5	7.7
Lao PDR	16.2	9.3	14.6	11.4	-0.4	6.9	8.1	9.2
Malaysia	11.0	13.6	2.7	5.1	11.3	6.0	7.2	6.5
Myanmar	5.5	21.3	10.2	8.0	3.2	13.4	8.6	12.6
Philippines	2.6	6.5	1.8	6.8	4.9	3.3	4.9	7.6
Singapore	9.3	12.4	7.4	1.2	9.8	7.6	4.4	1.2
Thailand	16.1	2.7	-4.8	…	12.7	5.3	3.3	…
Viet Nam	2.3	10.1	6.7	5.7	10.2	5.3	6.8	5.9

Source: ADB Statistical Database System

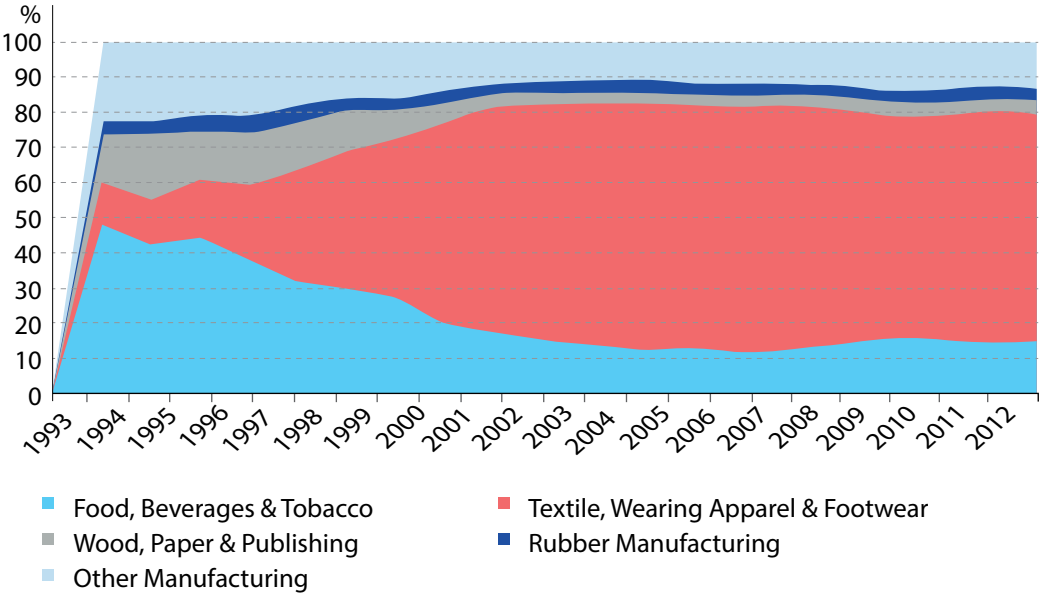
It is not enough to simply observe strong growth in manufacturing; it is necessary to delve deeper by studying individual subsectors. Garment manufacturing alone constitutes more than half of total manufacturing output (see Figure 3), while agricultural processing industries and household goods manufacturing remain low-key. In fact, much of the country's paddy is processed across the border, even for domestic rice consumption (Menon and Hill, 2013).

The services sector has also constituted a strong growth engine in Cambodia, being primarily driven by tourism and ancillary services such as transport and restaurants (see Table 4). Also, large ODA and private inflows have stimulated the growth of modern services in urban centres especially in Phnom Penh.

Overall, the three key sectors show reasonable growth, but activities within the sectors are not well diversified. This makes Cambodia susceptible to both internal and global shocks. For example, failure of the rice crop due to adverse weather can cause severe food shortages. In fact, the global slowdown sharply reduced demand for tourism and garment exports as these are mostly concentrated in industrialized economies.

Photo: UNDP Cambodia

Figure 3: Cambodian Manufacturing Industries: Garment is the key sector



Source: National Institute of Statistics, Cambodia

The impact of the economic liberalization of the 1990s and the granting of MFN/GSP status is reflected in the high shares of exports and imports shares to GDP. The export and import figures indicate Cambodia's high degree of openness, even in comparison with other ASEAN countries. The export share of 55 percent in 2012 (from a mere 2.4 percent in 1990) reveals that export-led growth is one of the key drivers of the Cambodian economy. Exports are narrowly concentrated on merchandise trade, and garments make up 80 percent of merchandise exports. Other export commodities include timber, rubber, rice, fish and footwear. Notably, tourism dominates the services sector.

Table 5: Exports and imports of goods and services (percent of GDP)

Country	Exports of goods and services (% of GDP)				Imports of goods and services (% of GDP)			
	1990	2000	2011	2012	1990	2000	2011	2012
China, PR of	19.0	23.3	28.5	27.2	15.6	20.9	25.9	24.4
Cambodia	2.4	49.9	54.1	54.6	8.4	61.7	59.5	58.6
Indonesia	25.3	41.0	26.3	24.3	23.7	30.5	24.9	25.8
Lao PDR	…	…	…	…	…	…	…	…
Malaysia	74.5	119.8	91.6	87.5	72.4	100.6	75.7	75.5
Myanmar	1.9	0.5	15.4	14.6	3.6	0.6	15.7	14.9
Philippines	27.5	51.4	32.0	30.8	33.3	53.4	35.6	34.0
Singapore	177.4	192.3	207.2	200.7	167.4	179.5	179.6	178.5
Thailand	33.1	65.0	71.9	…	40.6	56.6	69.7	…
Viet Nam	26.4	55.0	79.4	80.0	35.7	57.5	83.5	76.5

Source: ADB Statistical Database System

Interestingly, the share of imports of goods and services in GDP is larger than that of exports, reflecting the reliance on global markets for intermediate inputs and key resources. Imports include inputs for construction and manufacturing such as petroleum products, machinery and construction materials. This makes Cambodia's economic growth, especially manufacturing sector growth, highly dependent on the regional and global economy.

Transfers constituting ODA, FDI and other capital flows to Cambodia are very large. For over a decade after the United Nations Transitional Authority in Cambodia was implemented, ODA accounted for more than 10 percent of GDP. Most of this ODA was in the form of grants or concessional loans. Although on a declining trend, Cambodia's ODA remains one of the highest as a percentage of GDP among developing countries. These large ODA flows might also hinder the development of government institutions and activities, as some government circles "outsource" key public sector responsibilities to donors and NGOs. It also creates an unhealthy dependence on development assistance which is unsustainable in the long run. Moreover, donor activity is highly concentrated in Phnom Penh, contributing to unevenness between rural and urban development. With respect to FDI activity, the foreign investment climate in Cambodia is an open one, with few restrictions on sectors and foreign equity shares, simple registration procedures and generous fiscal incentives. Inward FDI stock is estimated to be equivalent to about 53 percent of GDP. This is a very large figure considering this FDI is of very recent origins.

Another curious fact related to Cambodia's international trade is the high degree of dollarization in the economy. The national currency (riel) continues to be widely used in rural areas but the urban economy is rife with dollarization. Dollarization means that the exchange rate of the riel in the foreign exchange market affects export competitiveness less than the exchange rate of the dollar against major trading currencies as most contracts are denominated in US dollars. Dollarization also limits the ability of the monetary authority to implement discretionary monetary policy or even direct the banking system by being a lender of last resort. Overall, although economic growth over the past two decades has been strong, it has been bolstered by factors that are unsustainable in the medium to long term. In particular, one of the main factors of concern is the very high level of dollarization.

Cambodia's fast economic growth also contributed to massive improvements in human development. Measured by the Human Development Index (HDI), which captures health (assessed by life expectancy at birth), educational attainment and standard of living (measured by gross national income per capita), Cambodia's gains in human development between 2000 and 2012 are only exceeded by Myanmar and China (see Table 6).

Table 6: Human development index

Country	1990	2000	2012
China, PR of	0.495	0.590	0.699
Cambodia	0.393*	0.444	0.543
Indonesia	0.479	0.540	0.629
Lao PDR	0.379	0.453	0.543
Malaysia	0.635	0.712	0.769
Myanmar	0.305	0.382	0.498
Philippines	0.581	0.610	0.654
Singapore	0.756	0.826	0.895
Thailand	0.569	0.625	0.690
Viet Nam	0.439	0.534	0.617

Note: * The HDI for Cambodia in 1990 was calculated by the UNDP Cambodia Economist, Runsinarith Phim, based on the methodology used in HDR 2013.

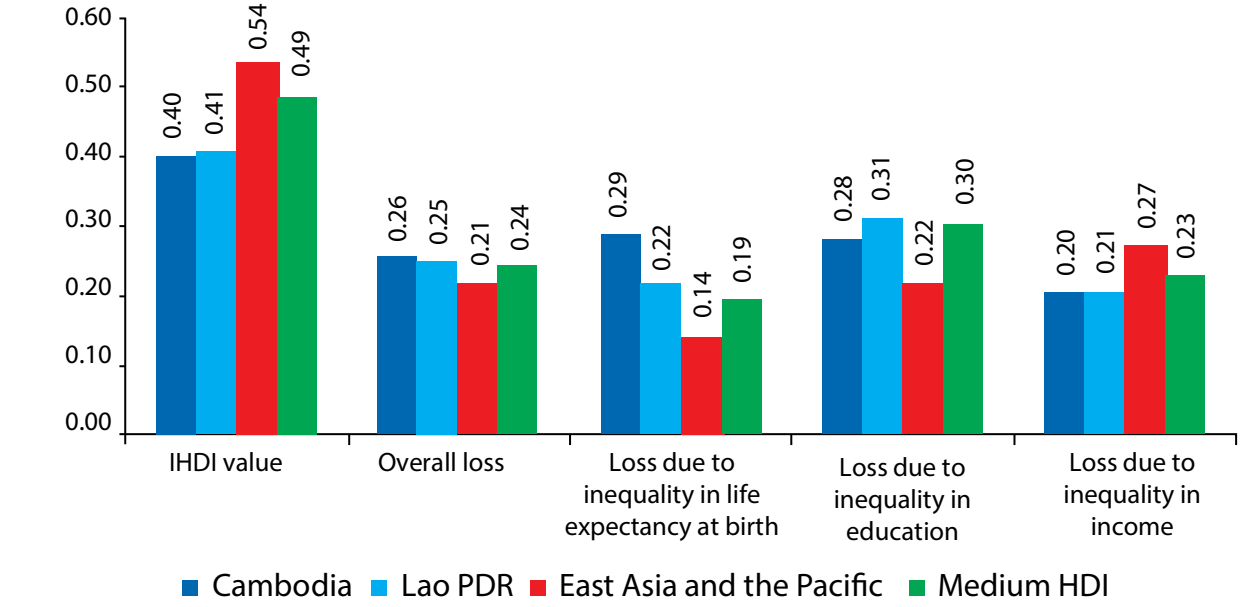
Source: Human Development Report 2013 (UNDP, 2013)

Looking at the inequality-adjusted Human Development Index (IHDI), however, reveals a different picture and raises some concerns regarding the distribution of the gains from human development (see Figure 4). Cambodia's high overall loss of 26 percent in IHDI value due to inequality is unmatched in the region. Broken down into the different components, it is evident that most of the losses, which are far above the average losses in the East Asian and Pacific region, stem from inequalities in health and education. On the other hand, losses due to inequality in income distribution in Cambodia appear to be rather moderate.

Indirectly, these IHDI values give some clear indication about the large untapped potential benefits or missed improvements in human development for large shares of the population due to unequal distribution of the benefits

from economic growth. Figure 4 demonstrates that efforts to improve the inclusiveness of growth in Cambodia need to focus on inequalities in health and education. The aim of this paper is to explore the dimension of education in the light of industrial transition.

Figure 4: Inequality-adjusted human development index



Source: Human Development Report 2013 (UNDP, 2013)

Photo: UNDP Cambodia/Chansok Lay

Photo: UNDP Cambodia/Muthit Ker

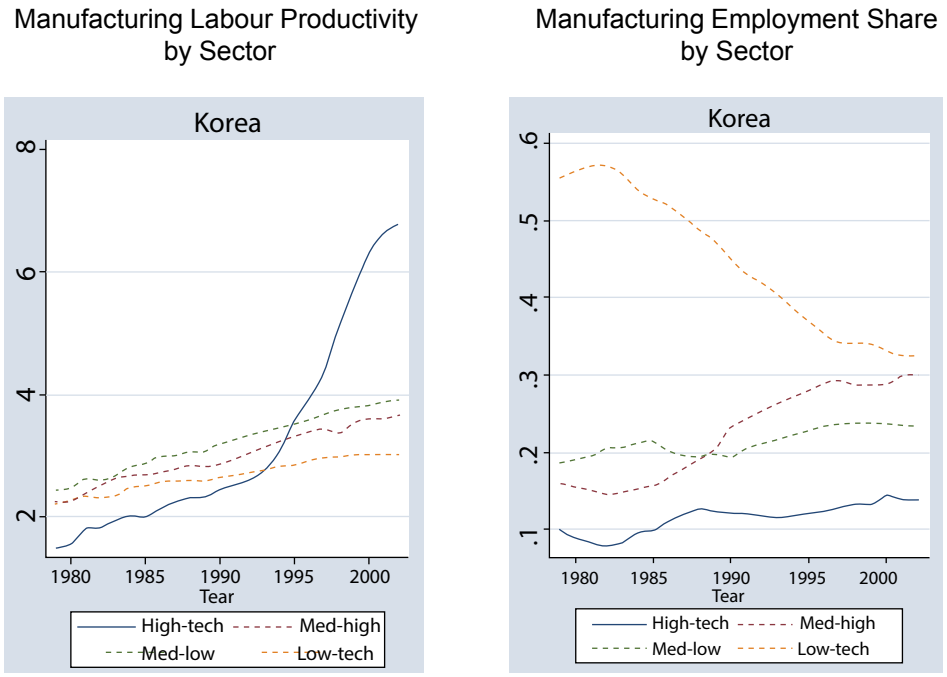
4 INDUSTRIAL POLICY AND HUMAN CAPITAL DEVELOPMENT: CASE STUDIES

In this section, the case of the Republic of Korea on industrial and education policies as a response to the economic structural changes at different stages beginning in the 1960s up until now is discussed. (For the more case studies on other ASEAN countries, see Appendix 1).

1. Industrial and Education Policy of the Republic of Korea: Responding to Structural Changes

The Republic of Korea has been particularly successful in aligning its educational policies and practices with the demand for skills at each stage of its industrialization process. Figure 5 illustrates the country's industrial policies. Overall productivity and employment growth in key industries were maintained or increased when the economy transitioned to higher value-added activities. Workers at risk of being displaced from less competitive industries were trained and retooling as different industries and occupations emerged without loss of overall productivity growth. The success of this bold industrial policy hinged on the effective alignment of educational policies with industrial strategies.

Figure 5: Economic restructuring in the Republic of Korea (percent)



Note:
Variable plotted is the log of value added per worker.

Source:
authors' calculation using GGDC 60-industry database

Source: Thangavelu and Hu (2006)

As the Republic of Korea graduated from imitation to innovation, its education policy also aligned to meet the changing demands for skills and talents that the new economic structure demanded. Kim and Lim (2004) noted three distinct stages of the Republic of Korea's economic development. The description of the key features of the country's economic structure and education policy at each stage is summarized in Table 7.

Table 7: Industrial and educational policy in the Republic of Korea

Republic of Korea: From imitation to innovation			
Stage	**Economy**	**Major industry exports**	**Education policy mix**
1960s to mid-1970s	Take-off and export-driven import substitution in the 1960s; export acceleration in the early 1970s	Light manufacturing (clothing, textiles), electronic goods (televisions)	Expansion of primary and lower secondary education, school equalization policy, emphasis on TVET (late-1960s), separate TVET track, limited access to university education
Mid-1970s to late-1980s	Structural adjustments from imitation to innovation in the 1980s	Heavy, chemicals, iron, shipbuilding, precision manufacture	Expansion of upper secondary education, strengthening junior college and open university, expansion of higher education
1990s to present	Knowledge-based economy by the mid-1990s	Semiconductors, ICT, mobile phones, memory chips	Establishment of life-long learning infrastructure, promotion of deregulation and diversity, curriculum integration and school diversification, employment insurance system, cyber university and credit bank system

Sources: Kim and Lim (2004); Thangavelu and Hu (2006)

One critical success factor of the Republic of Korea's industrial policy was to develop forward-looking industrial strategies that allowed sufficient time lags for the development of human capital and education, as these lagged variables were derived from output growth. The key features of the country's industrial and education policies can be summarized as follows:

- **Forward-looking industrial strategies** and economic blue-prints, endorsed by government, workers and employers, focussing on industrial strengths and economic fundamentals.
- **Educational reforms at secondary and post-secondary level,** notably curriculum reforms, strengthened the relevance of science and technology to contemporary life and society. Vocational high schools established in the early 1960s to provide technical skills training allowed the Republic of Korea to upgrade the education and skills of its workforce to meet industry needs in the early stages of growth.
- **Government investment in primary and secondary education** equipped schools with laboratory infrastructure for hands-on science experiments.
- **Improved quality of education** through in-service teacher training and new physical sciences grants improved science education in all primary schools.
- **Reformed and reinforced Employment Act** protected workers' rights and labour market institution reforms strengthened the bargaining power of workers; employment intermediaries helped to reduce skill mismatches and create one-stop centres for job seekers.
- **Public-private partnerships** created coordination bodies, reducing costs and increasing positive externalities within the domestic economy.

Photo: UNDP Cambodia

2. Experiences from other ASEAN countries

We mapped the industrial policies and educational reforms of Malaysia, Thailand and Viet Nam (see Appendix 1) to create a comprehensive picture of the key lessons and features from their alignments of educational reform with industrial strategy, as summarized below:

- Educational reforms in line with expected industrial structures.
- Development of early and broad-based science and mathematics education at primary and secondary schools.
- Expansion and standardization of primary and secondary schools.
- Curriculum reform to emphasize basic reading, writing and arithmetic skills; English language proficiency was also important.
- Vocational training initiated at an early stage of the education system to complement formal education and the provision of skills training as an alternative pathway to further education formed the framework for human resources development, ensuring the relevance of skills and technical training to labour market requirements.
- Human capital development in agriculture and advances in technology diffusion through the establishment of a strong agricultural university enabled agricultural development and productivity improvements.
- Improvements in the quality of education: increased funding for teacher training and establishment of higher education institutions.
- Development of forward-looking policies and economic blueprints endorsed by the public and private sectors.
- Export promotion with import substitution strategy anchored key industries in the domestic economy, especially those related to large capital-intensive investments (ship building, transport equipment), resources and commodities.
- Employment Act clearly defines and protects workers' rights and improves their bargaining power.

Photo: UNDP Cambodia/Chansok Lay

5 KEY CHALLENGES FOR THE CAMBODIAN ECONOMY

> "The average educational attainment of the labour force is currently at primary education level or even lower ... which remains a big obstacle to industrial diversification efforts and improvements in the inclusiveness of growth."

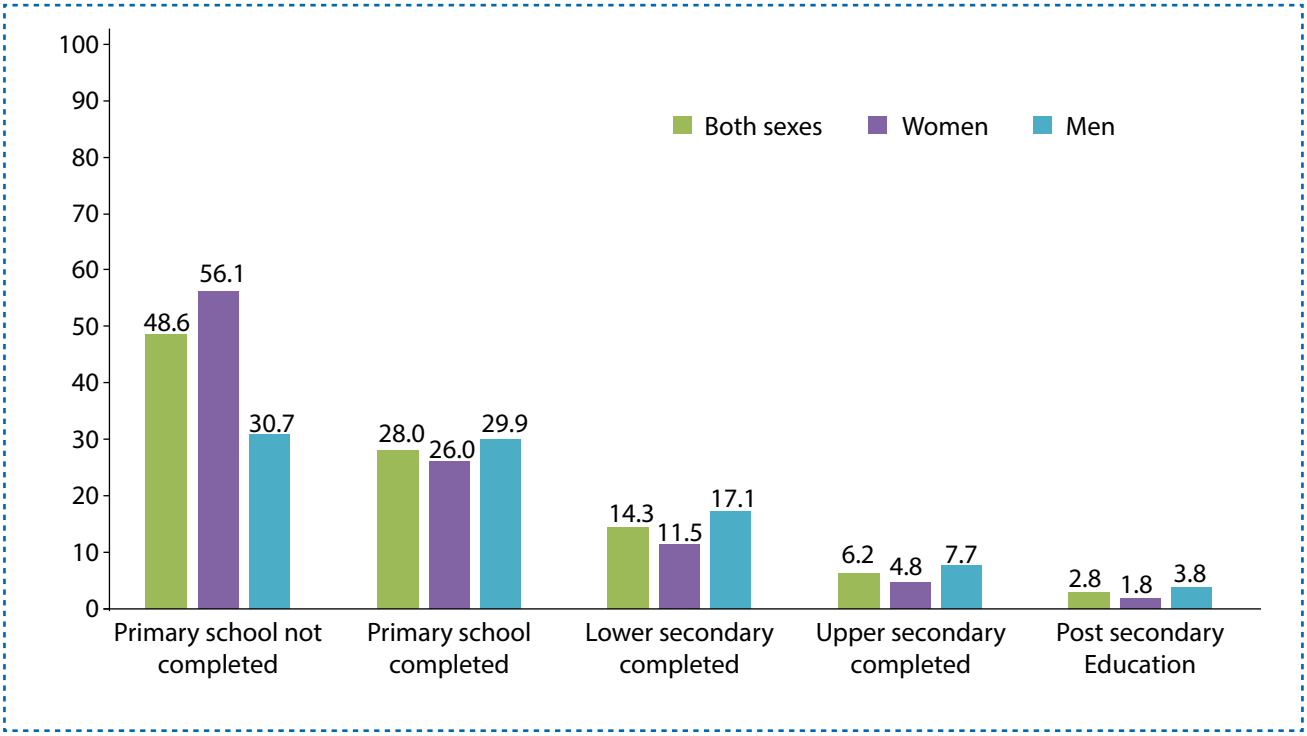
The aim of this chapter is to identify the major challenges of human capital in the structural transformation process. Although Cambodia has experienced strong economic growth, there are several serious problems that require important economic and institutional reforms if the "low-skill, low-pay" development trap is to be avoided.

1. Low educational attainment of the Cambodian labour force

In spite of an endowed labour surplus, Cambodia's labour force is still characterized by low-education and low-skills. The average educational attainment of the labour force is currently at primary education level or even lower (see Figure 6), which remains a big obstacle to industrial diversification efforts and improvements in the inclusiveness of growth. According to the Cambodian Socio-Economic Survey (CSES) 2012, 48.6 percent of the

labour force (aged 15-64) has no or has not completed primary schooling, and only 23.3 percent has completed lower secondary education (see Figure 6). In rural areas the situation looks even worse. This pattern is confirmed by data from the Ministry of Education, Youth and Sport for academic year 2009/10 which shows 73.7 percent of students exiting or dropping out from the general education system with at most primary education, and only 16.5 percent leaving with an upper secondary diploma. Even among youth (aged 15–24) labour force participants in 2012, 70.4 percent had completed primary education only (CSES, 2012). Also notable are significant gender differences, in particular the fact that more than half of the women in the labour force (56 percent) have not completed primary school.

Figure 6: Educational attainment of the labour force aged 15–64 (percent), 2012



Source: Cambodia Socio-Economic Survey 2012 (NIS, 2012)

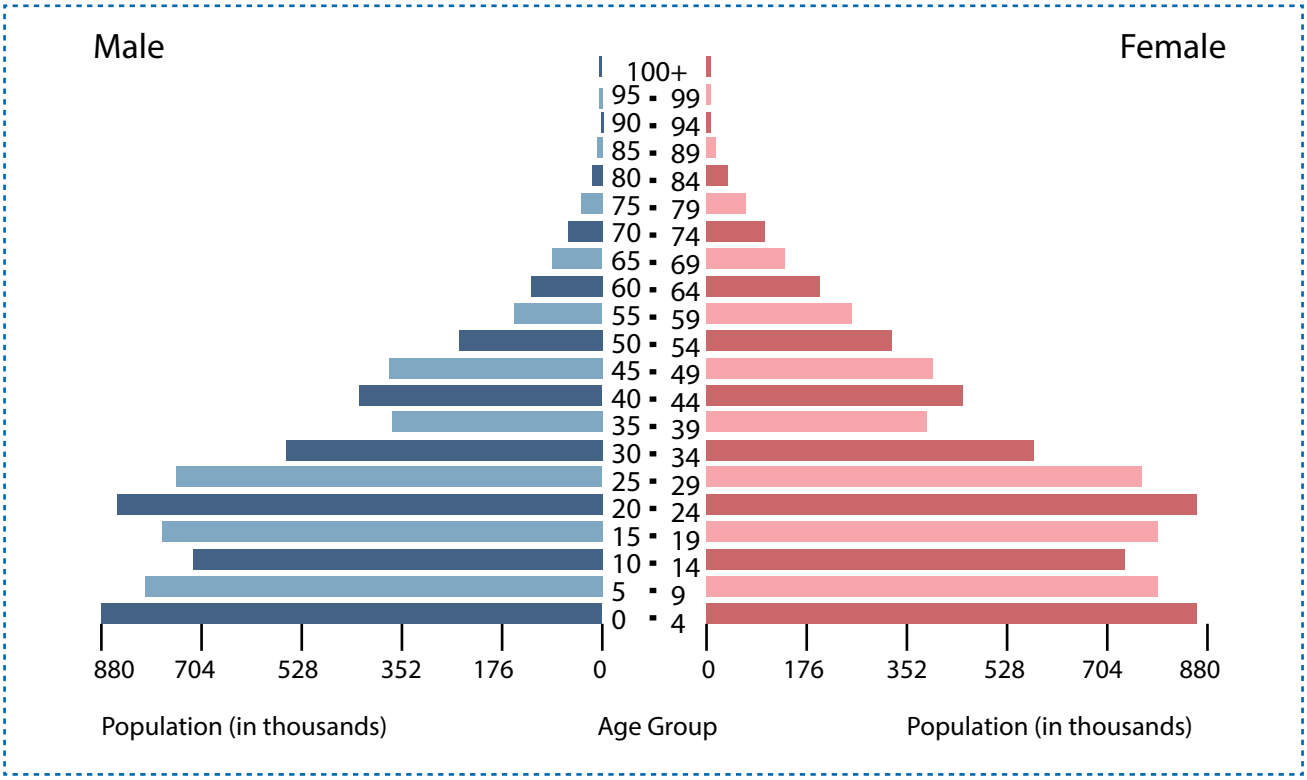
Despite recent progress in the education system, the key challenge is to shift the average educational attainment in the economy towards secondary and higher education levels within the next decade to meet the increasing demand from industry for skilled labour and to support the transformation into higher-value added activities.

2. Demographic transition with shrinking growth of the working age population

Cambodia is now in the "demographic transition" phase from a high fertility-mortality rate to a low fertility-mortality one. As Figure 7 shows, after the war, the country experienced a baby boom in the 1980s and 1990s, which registered an annual increase in the number of births from about 401,000 in 1980–1985 to 417,000 in 1990–1995. As a result, the total population increased from about 6.5 million in 1980 to more than 14.1 million in 2010. Since the birth rate peaked in the mid-1990s, the annual increase in total population has progressively declined from around 283,000 in 1980–1985 to 208,000 in 2005–2010, with annual growth rate declining from 4.3 percent to about 1.5 percent, respectively.

Consequently, the country's working age population (WAP), aged 15–64, increased from about 4 million in 1980 to about 9.6 million in 2010. However, the annual increase in WAP passed its peak of about 270,000 in 1995–2000, and its annual growth rate has declined steadily from 4.8 percent in 1995–2000 to 2.7 percent now. In the next 30 years, with the continuing decline in both population generational entries and balances, Cambodia's WAP is projected to start decreasing.

Figure 7: Demographic structure of Cambodia, 2012



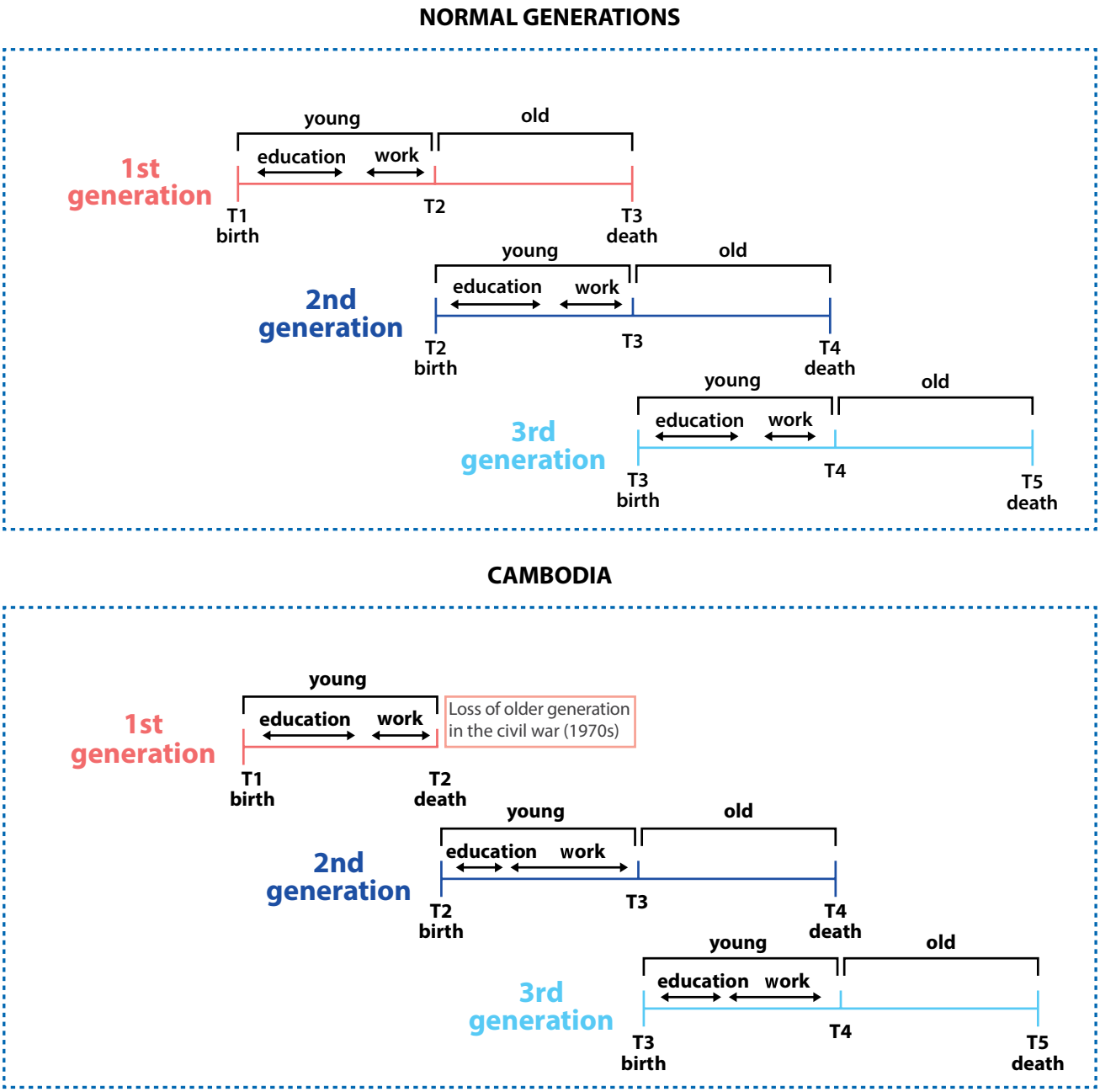
Source: UN Population Division (2012)

Compared to other Asian countries, the demographic structure should give Cambodia a better competitive advantage in terms of abundant supply of labour, though first signs of a slow disappearance of this advantage are already visible in the forms of shortages and recruitment problems even for low-skilled workers (Cheng and Heng, 2013). Cambodia's demographic structure, however, poses two major challenges. First, in order to increase the potential gains and reap the benefits from the one-time demographic dividend, the low human capital base needs to be urgently addressed. The demand for education and training from young people needs to be both stimulated and matched with labour demand, and better quality jobs and job prospects for the future provided. Second, the lack of a large middle-aged population, as result of the 1970s civil war, has negative intergenerational implications for the accumulation of human capital and could be an obstacle to further reductions in school drop-out rates. Intergenerational household dynamics are discussed in the next section.

3. The young population has greater incentive to work than to invest in education as a reflection of Cambodian household dynamics

The persistently high dropout rates, particularly at primary school level, and early labour market entrances provide strong evidence that the opportunity cost of investing in education must be very high for the young population. The overlapping generations framework presented in Figure 8 attempts to model the intergenerational effects of the tragic loss of a huge number of people during the civil war and explains this high opportunity cost and resultant lack of investment in education as a direct consequence of the insufficient number of middle-aged working adults to support the cost of investment in better education for the young population.

Figure 8: Overlapping generations framework : Opportunity cost of education

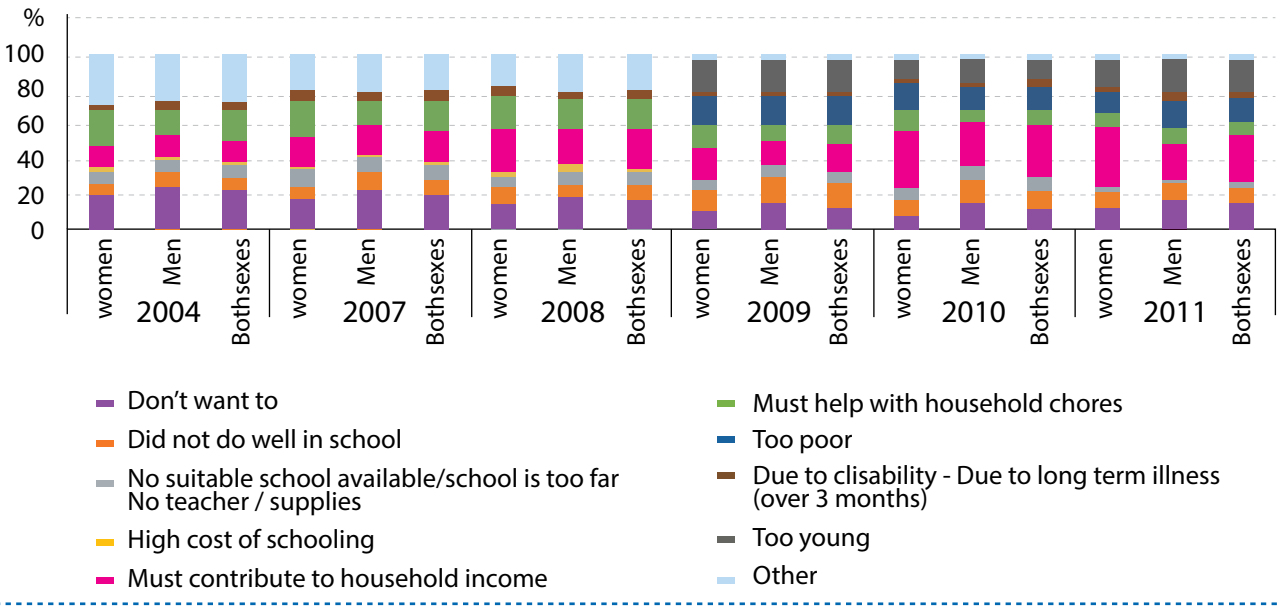


Source: Author's illustration

Cambodia had a tumultuous period of war that plunged into a destructive three-decade civil war starting in 1970. The war devastated all sectors. During the four-year (1975–1979) Khmer Rouge period, about two million people were killed, destroying substantial parts of human capital stock including nearly 80 percent of the country's teachers. This tremendous loss and destruction is reflected in the demographic structure (see Figure 7), with a pauce middle-aged population and an abundant youth population.

In the absence of an older generation, which would normally contribute significantly to household income thereby reducing the opportunity cost of investment in education, the younger generation faces an early trade-off between completing education and participating in the labour market to support household income. This observation is supported by several surveys such as that by UNICEF (2012) which, after examining the reasons for the high dropout rates at primary and secondary schools in Cambodia, concludes that factors related to poverty and low household income are by far the most crucial.

Figure 9: Reasons for not attending school among students aged 6–17



Source: UNICEF (2012) based on CSES 2010

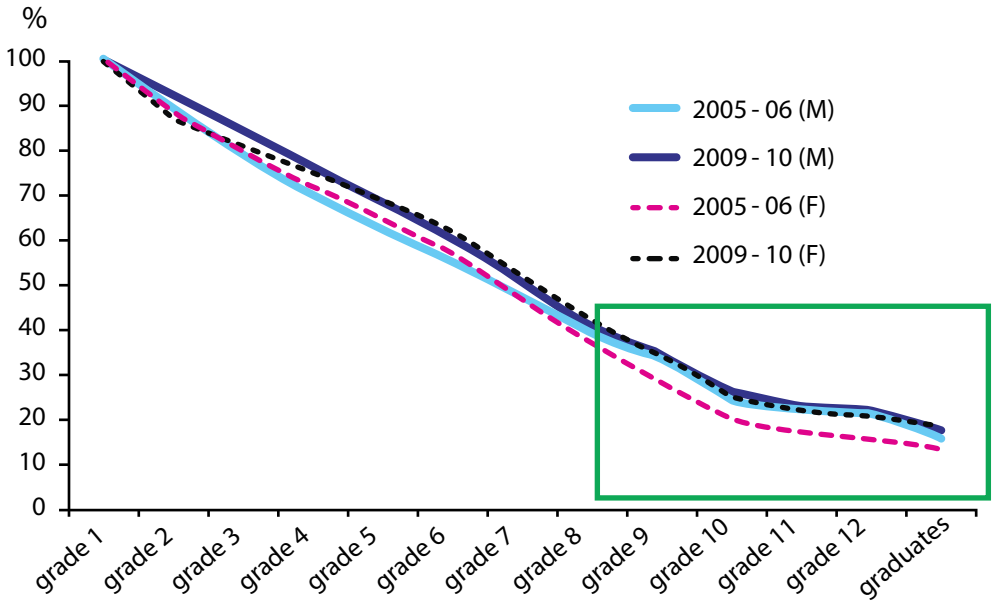
It is not surprising then that young people tend to invest less of their time in education in the early stages of their human capital life cycle. Low education at the early stages typically negatively affects the ability to accumulate further education and training and has a negative impact on workers' productivity and employability at later stages of the life cycle, especially in a country like Cambodia with a transforming economy and rapid technological progress. This vicious cycle persisting, insufficient earnings will again have a similar negative effect on subsequent generations, leading to low human capital accumulation, low growth equilibrium, and eventually the pernicious effects of the low-skill development trap. To break this cycle, government policies are needed to reduce the opportunity cost of investment in human capital at household level as well as in the overall economy. Given the risk of the economy getting stuck in low-skills equilibrium, the need to ensure that older workers have and maintain the skills the labour market demands becomes even more crucial. In particular, the role of progressive technical and vocational education and training (TVET) will be important for the next stage of growth to maintain the productivity of older workers and a vibrant economy.

4. Low completion of education due to low returns to education and the lack of higher quality job prospects

Besides the opportunity cost of education, the decision to stay in school is also determined by the expected returns to additional education in terms of income and job quality. The rapid decline in the cohort survival rate of students[2] as they move to higher grades (see Figure 10) clearly demonstrates the insufficient incentives for keeping young people in school to complete their education. It might also indicate that the marginal returns from additional years of schooling are very small given the low wage rates and the unlikely prospect of finding a good quality job. The low average returns to education reinforce the argument that the economy may become trapped in low-skills equilibrium. This suggests that promoting quality jobs and decent wages for all workers should be one of the key priorities of labour market reforms, while the upgrading of Cambodia's skills certification system and reform of wage-bargaining institutions will certainly play critical roles.

2. The enrolment rate for primary school (grade 6) in Cambodia in 2012 was around 97 percent and the completion rate was 87 percent. The completion rate is the total number of new entrants in the last grade expressed as a percentage of the total population of education age to the last grade. However, both the enrolment and completion rates are based on cross-sectional data and the data on new entrants does not fully account for the cohort and attrition effects. The cohort study given in Figure 10 is based on longitudinal data that clearly accounts for the schooling survival rate of each cohort for each grade traced over the years in terms of attrition effects (for example youth leaving formal education and joining the workforce, and any household effects on schooling).

Figure 10: Cohort survival rates of students by grade and gender, 2005/06–2008/09



Source : EMIS, Ministry of Education, Youth and Sport

5. High level of liberalization and privatization in higher education reduces internalization of the social and economic returns and contributes to skill mismatches

Higher education in Cambodia has made significant progress over the years. In particular, the liberalization of the higher education sector in 1997 allowing the establishment of private higher education institutions (HEIs) built the basis for a rapid increase in the number of HEIs. The privatization of higher education appeared to be the only feasible response to the need for higher education expansion given the lack of public HEIs and government budget constraints. However, this liberalization along with the rather weak regulation of private HEIs comes at a cost. Social and economic returns to higher education are not internalized in the economy, evidenced by the absence of leading public universities and the dominance of profit-oriented private universities offering degrees mainly in the fields of social sciences and business administration.

University enrolment rates and the number of university graduates have increased rapidly in the last seven years. Between the academic years 2005/06 and 2011/12, total enrolments have risen from around 95,000 to more than 245,000, while the share of female enrolments has reached 38.3 percent from 31.7 percent in 2005/06. Consistent with the rise in university enrolments, in the last five years, the number of students graduating from university with an associate's or bachelor's degree has tripled. In the academic year 2010/11, of the total of 45,650 graduates, 70.5 percent earned a bachelor's degree and 26.9 percent an associate's degree, while only 2.6 percent graduated with a master's or doctoral degree.[3]

By area of specialization, available data for bachelor's programmes in the 2010/11 academic year shows that more than 50 percent of total enrolments were concentrated in economics and business administration majors. In addition, 75.8 percent of total enrolments were in only four majors, i.e. economics and business administration, languages and literature, information technology, and law. Yet important science, engineering and technology majors, which play critical roles in the country's economic and industrial development, have attracted little interest from students. Disaggregated by subject, agriculture accounted for 4 percent of total enrolments, tourism 1.7 percent, engineering 3.8 percent, medicine 3.1 percent and science 2.5 percent.

3. EMIS data

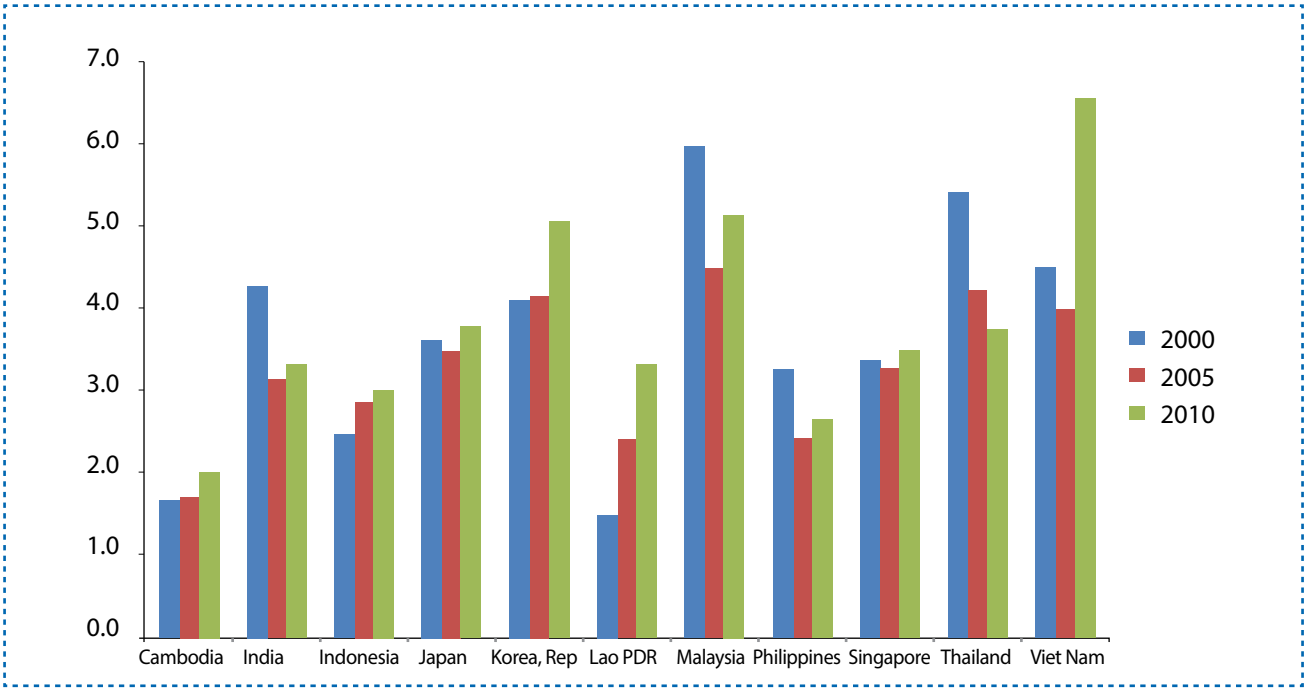
The liberalization of the higher education sector is also reflected in the large number of private universities providing degrees in social sciences and business administration. In 2013, 63 private universities compared to only 39 public universities were providing undergraduate and postgraduate programmes.

With such a large number of private universities, whether quality-assured mass higher education has been achieved is questionable. A serious cause for concern is the dearth of HEIs offering STEM (science, technology, engineering, mathematics) subjects. In comparison with the provision of higher education in social sciences which requires low capital investment and offers quick returns, STEM university education requires heavy capital investments in laboratories, technology, and scientific research and development. Without sufficient economies of scale in enrolments to secure positive returns to their capital investments, private universities will remain reluctant to invest in STEM education. Thus, the private sector alone cannot be expected to develop the much-needed infrastructure to educate scientists, technicians and engineers. This implies that costs of and social returns from STEM education will have to be internalized through longer-term investments by government in educational infrastructure for science and technology. In particular, there is an urgent need to focus on developing leading public universities to create centres of excellence in science and technology education and scientific research.

6. Lack of public investment in education in general, and in improving the quality of educators

Cambodia's public expenditure on education as a percentage of GDP in recent years has risen consistently (Figure 11). Yet it still compares unfavourably with that of other Asian countries, in particular emerging ASEAN economies such as Lao PDR and Viet Nam. In order to develop a robust human capital base, complement economic structural change and productivity growth, and compete successfully for high quality FDI with neighbouring countries, there will need to be large increases in public spending on education.

Figure 11: Share of public education expenditure to GDP



Source : WDI

Limited financial resources and low teacher salaries are among the main challenges to improving the quality of education for better learning outcomes and to better linking higher education policy and industrial development. Although teacher salaries, subsidized by public funding, have increased by about 14 percent from US$75 per month in 2007 to US$161 in 2013, the increase has not kept pace with the cost of living (MOEYS, 2013).

Until 1996, higher education in Cambodia was entirely dependent on extremely low funding from the government of around 0.1 percent of GDP, equal to about one tenth of the world average of 1 percent. Movement towards the privatization of higher education began in 1996, allowing tremendous increase in enrolment. Ever since its onset, and with public expenditure on higher education in the past several years (2008–12) remaining at an average of 0.09 percent of GDP, private funding has continued to play a significant role in higher education provision. In 2012, the share of public spending on higher education as a proportion of MOEYS total budget was only 4.1 percent. Of the total higher education expenditure, a meagre 0.7 percent went on funding scholarships—an extremely low percentage to realize the goal of equitable access to education (MOEYS, 2013).

Table 8: Public higher education expenditure, 2010–2012 (US$)

Year	Total MOEYS budget	Higher education public expenditure	GDP	MOEYS budget as % of GDP	Higher education public expenditure as % of GDP	Higher education public expenditure as % of MOEYS budget
2008	155 500 000	7 550 525	10 400 000 000	1.5	0.1	4.9
2009	185 636 500	11 294 975	10 400 000 000	1.8	0.1	6.1
2010	206 219 750	10 547 650	11 300 000 000	1.8	0.1	5.1
2011	228 974 575	10 500 675	12 900 000 000	1.8	0.1	4.6
2012	251 906 600	10 241 150	14 200 000 000	1.8	0.1	4.1

Source: HEQCIP Finance Policy (MOEYS, 2013)

Despite being earmarked by government as one of the priority areas for development, funding for science and technology education in Cambodia remains very limited. As a result, quality scientific research appears to be largely absent and a lack of organizations and structures to support technology commercialization and transfer is evident. Government capital expenditure is meagre at best. In most cases, the capital budget is funded by international financial institutions and development partners such as the World Bank and Asian Development Bank (ADB). Given the uncertainty of capital budgets, it is difficult for higher educational institutions to plan for quality improvement, especially in science and technology where huge investment capital is required (MOEYS, 2013).

Recently, the government has articulated its strong commitment to building capacity for the provision of quality education, for example, in the Five Year Plan on Policy and Research Development in the Education Sector and in the Innovation Research Grant under the Higher Education Quality and Capacity Improvement Project (HEQCIP), a joint project between the government and the World Bank. Nevertheless, ever steeper public investment in higher education will continue to be one of the key priorities for the next phase of Cambodia's development.

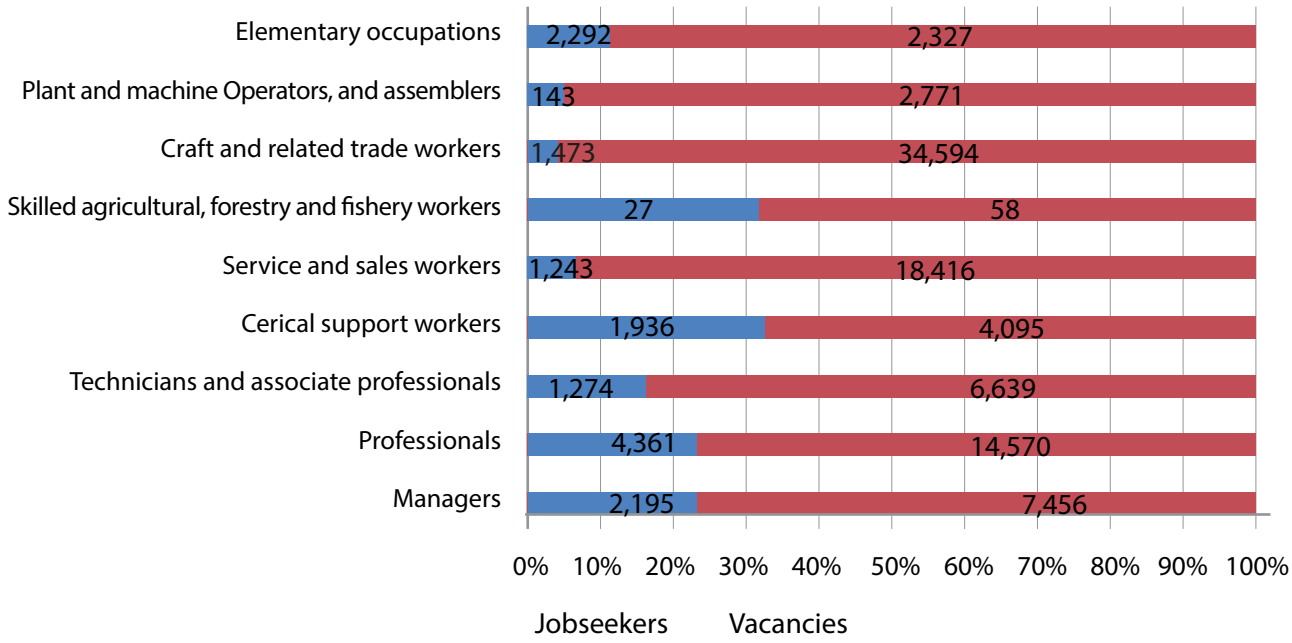
7. Ongoing structural changes in the economy increase the demand for semi-skilled and skilled workers

In view of the rapidly changing structure of the Cambodian economy, there is growing concern about skills mismatches and shortages in the labour market, especially in lower-to-middle skills. This has become one of the major constraints to Cambodia's diversification, industrialization and equitable economic growth, as well as to its ability to exploit its comparative advantage and strategic location in the evolving ASEAN Economic Community.

This growing mismatch can be partially observed from the data on workforce demand by investment projects approved by the Council for Development of Cambodia between 2008 and 2012. These projects, a major source of

formal employment in the private sector, if fully implemented, would require medium-skilled workers to fill more than 55 percent of the 800,000 expected new jobs. In addition, as shown in Figure 12, skills mismatches are confirmed by data on actual vacancy and jobseeker flows collected by the job centres of the National Employment Agency (NEA). By industry, the data shows a large imbalance between supply and demand of labour in manufacturing, education, accommodation and food service, wholesale and retail trade, and other services. By occupation, the gaps are most severe across the semi-skilled, skilled, technical and professional profiles.

Figure 12: Vacancies and registered jobseekers by occupation, 2010–Oct 2012



Source: National Employment Agency (2013)

Data collected from an employer survey conducted by NEA in 2012 in six major sectors (food and beverage manufacturing; garments; footwear and textiles; construction; accommodation; and finance) indicates that more than 70 percent of those industries are facing recruitment difficulties. Among those difficult-to-fill vacancies, 20 percent are caused by shortages of hard and soft skills, especially lack of technical, practical and job specific skills, foreign language proficiency, basic computer competencies, communication and customer handling skills, team work and problem solving. The survey also showed that more than 50 percent of employers are having problems with their current employees who do not perform their work to the level expected of them.

The growing demand for semi-skilled and skilled workers seems to be generally met by skilled foreign workers from the region such as from Singapore, Malaysia, Indonesia, Thailand and Viet Nam. If Cambodia is not able to upgrade the skills and education of its workforce, there will be wage gaps between unskilled (largely domestic) and skilled (mainly foreign) workers and low wages will further exclude unskilled domestic workers from the benefits of economic growth.

8. Immediate need to diversify industry structure and export markets to create linkages for global production value-chains

Manufacturing industry growth in Cambodia has been strongly linked to the economic liberalization of the 1990s and the opportunities stemming from the most favoured nation (MFN) status, which built the base for the rise of a strong garment industry that still dominates manufacturing (see Figure 2 in Chapter 3). There are more than 300 factories providing jobs for more than 300,000 workers in Cambodia as of 2011. In addition, roughly 40 footwear factories provide direct employment for more than 60,000 workers.

However, the garment sector is criticized for relying on cut, make and trim (CMT)-oriented operations, catching only the lowest value-added in the production process. For Cambodia to move to the next stage of growth, skilled labour development is an important issue that has to be tackled. In the garment sector, these skills could include skills in design, pattern and sample making, and materials finding.

The garment sector is required to move from CMT to higher value-added activities such as apparel and clothing accessories, pattern making and fabric sourcing. The diversification of the garment industry has great potential to support the development of small- and medium-sized enterprises (SMEs) in Cambodia through backward linkages for multinational activities. The garment industry should promote vertical and horizontal linkages to global supply chains. Cambodia can perhaps draw lessons from Sri Lanka, which has successfully diversified its garment industry; its transformation is detailed in Appendix 2.

In Sri Lanka, sector diversification was driven by multinational activities with exports to Europe, the United States, Australia and Asia. Both textile and clothing production together create domestic value-added of about 40 percent of the industry's total export a 10 percentage point increase compared to the value in 2002 (Jayawickrama et al. 2011). The local value-added component has risen in recent years due to the use of more locally produced fabrics and materials as downstream factories have increased the supply of fabrics and other textile materials to garment manufacturers. Furthermore, the increased supply of embroidery, lace and other materials by domestic SMEs also led to increases in domestic value-added of the Sri Lankan garment industry.

Photo: UNDP Cambodia/Nicolas Axelrod

6 CAMBODIA'S INDUSTRIAL STRUCTURE AND EDUCATIONAL POLICIES

> "... in order to increase the potential gains and reap the benefits from the one-time demographic dividend the low human capital base needs to be urgently addressed."

As discussed in Chapter 3, Cambodia's industrial sector has shown very strong growth since the economic liberalization policy in the early 1990s, supported by the granting of most favoured nation (MFN) and generalized system of preferences (GSP) status in the late 1990s and early 2000s. Its growth rate increased significantly to nearly 31 percent in 2000 from negative growth in 1990, and in 2011 the industry sector posted a growth rate of 14 percent. The impetus for the marked increase in industrial growth is significant for the Cambodian economy compared to other emerging ASEAN countries such as Viet Nam.

The Fourth Cambodia Economic Forum (CEF) in 2011, the highest national forum to discuss economic challenges and seek policy resolution, took as its theme "Cambodian Economy in a Post-Crisis Environment: Industrial Policy – Options Towards a Sustainable Development". Presented at the Forum by the Supreme National Economic Council (SNEC), a study on *Industrial Development Policy for Cambodia* stimulated discussion on economic

diversification and industrial development in response to lessons learned from the global financial crisis.

The CEF concluded that Cambodia's industrial development policy requires several fundamental changes and suggested directions for further research along those lines (SNEC 2011). As Cambodia is already endowed with endogenous and exogenous opportunities, critical for the next stage of growth will be:

(1) Capturing more value-added in existing industries

(2) Upgrading existing competencies and capacities to release the dormant potential of existing industries

(3) Identifying latent comparative advantage-industries and nurturing their growth.

The state should lead and intervene in policy and regulatory frameworks, and continue to work closely with the private sector in transforming and diversifying Cambodia's economic structure. Special economic zones were highlighted as important tools for structural development. Among important roles of the government in meeting the objectives and goals of economic expansion are:

(1) Capital mobilization for industrial development

(2) Knowledge accumulation including building skills in science and technology,

(3) Infrastructure development.

1. Mapping of Cambodia's industrial structure and education policy mix

Using the framework outlined in the previous section, Table 9 maps Cambodia's industrial structures and education policies since the 1970s.

Table 9: Industrial structure and education policy mix for Cambodia

Industrial and Education Policy: Cambodia			
Stage	**Economy**	**Major Industry/ Exports**	**Education policy mix**
1970s	Tragic Period	Agriculture, Mining	Destruction of educational infrastructure and human capital by war and genocide
1980s	Reconstruction, Central, Planning, SOEs, Collective Farming, Trade with Communist Blocks	Agriculture – subsistence Commodity exports-rice, rubber, timber, etc	Rebuilding education system, TVET (Assistance from Soviet Union), Foreign language school (Vietnamese & Russian)
1990s	Rehabilitation & Reconstruction De-collectivization of agriculture, Liberalization and Openness-Attract FDI and encourages trade, Privatization of State-owned enterprises, Triangular Strategies (1998)-Integration to ASEAN, MFN-GSP status granted by US, Europe and other garment importers	Agriculture, fisheries, rubber Garment- Export	Expansion of primary and lower secondary education, Private foreign language schools (French & English) allowed, Private university allowed
2000-2013	Rectangular Strategies, Poverty elimination, Export-Driven TVET Programs Special Processing Zones (Infrastructure development) FTAs-AFTA, ASEAN+1s, WTO EU's Everything but Arms Treatment	Rice, garment, construction, tourism	Education Law(2007) Education for All Primary and lower secondary education Liberalization of higher education Public universities Private universities Vocational education (Revisit of TVET)

2013-2020 (Future Industries)	Export-Drive: Manufacturing and Agriculture, Sustainable Energy, Agriculture Productivity and Competitiveness SME Development (Further policy development) Industrial Parks and infrastructure (network) Railways, Ports and Airports-ASEAN Connectivity Financial Sector Development and Reform	Commodities (rice, rubber, cash crops), Minerals and Oil-Gas, Agro-processing, bio-fuel Construction and Buildings Electronic and Electrical components assembly, Machinery parts, Transport and Transport Equipments, Paper and Paper products, Plastic Industry, Leather and Furniture, Building materials, Handicraft Garment: diversity into the global production value-chain Business Services, Tourism and Hospitality, Banking and Finance, Telecommunication Services, Logistics, Aviation, Maritime Services, Healthcare, Education services	TVET—Dual Track (Training of less educated [Primary and lower], training of females), Polytechnics, Regional TVETs, training of older workers, CET- Lifelong Learning, Public & Private Partnership-need funding, infrastructure and institutional and legal framework Expansion of Secondary Schools: Basic Literacy, Strong communications skills, Science and arithmetic skills-STEM Expansion of S&T education at universities: Strong science and engineering degrees-need funding, Leading universities (Public) Agriculture universities to develop agricultural technology and improve productivity of agriculture sector Expansion of Entrepreneurship skills Public and Private Partnerships in developing Research Institutes: ASEAN, Japan, Korea, and Chinese research and economic cooperation Skills needed: Technical and Science, Managers, Technicians, Semi-skilled (Clerical) Required Skills: Soft skills-communication-English and other languages, computer skills, teamwork

It is imperative that Cambodia expands its economic and industrial base, thus diversifying its economy by supporting existing sectors to move to higher value-added activities as well as creating new industries. Table 9 also identifies the future industries that Cambodia might attract with the right domestic fundamentals and absorptive capacity such as physical infrastructure and technology-specific human capital. Based on extensive discussions with the SNEC research team, and allowing for limitations related to existing linkages between sectors in terms of data and the lack of a comprehensive input-output table, the research team identified the following promising priority sectors and subsectors for the next stage of industrial growth:

- Agriculture: mineral industry, agro-processing, food processing, rice milling, rubber plantation
- Light manufacturing component assembly: electronic and electrical goods, machine parts, transport equipment
- Wood pulp and paper products, timber processing, leather products, furniture making
- Information and communication enabled industries and services, travel and tourism, banking, finance and insurance services, telecommunications
- Garments: next stage of growth in production and diversification into global production value chains to create higher value-added and quality jobs.

From the case studies of the Republic of Korea and other successful ASEAN countries outlined in Chapter 4, it is clear that finding the right education policy mix at each step of economic development is one of the key elements of effective industrial strategies to unlock the potential and support growth in particular sectors. Improving the curricula for each education level and coordinating skills development with economic policy will increase labour productivity

in Cambodia in general, but also equip people with the necessary education and skills to move to more productive sectors.

In a recent study, based on Cambodia's current economic structure, the Korean Development Institute (KDI, 2013) carried out linear projections of the skills demand by sector for 2013–2015 and drew the following interesting conclusions. First, in the short-term, skills development and employability improvements are expected to occur in medium-level occupations (such as clerical workers and hospitality staff in services and craft workers in industry) rather than in high-level posts (such as technicians in industry). Therefore, planning needs to focus on educating unskilled workers in the crops sector to enable them to move to employment in non-crop agriculture and services and further up to medium-level jobs in industry. This emphasizes the importance of ensuring that children complete primary and lower secondary education and of promoting TVET programmes. Second, in the long run, growth potential is higher in high value-added industries. This implies that policy plans will be needed to shift medium-skilled workers to higher-level occupations; thus, vocational training and university-wide curricula redesign to train better levels of technological expertise will take precedence.

In order to complement forward-looking industrial strategies in the medium and long term and to build human capital management fundamentals for potential new industrial sectors, the conclusions of the KDI (2013) study seem to be valid and the need to improve the average education level and the urgency to implement the right education reforms quickly are even more intensified. The training, education and skill requirements of the labour market to meet these new sectors include better quality secondary and post-secondary education, wider access to TVET–CET institutes, retraining opportunities for older workers, access to training opportunities for women, and a focus on producing skilled production workers such as technicians and science managers and semi-skilled workers including clerical and general workers.

As seen in Chapter 2, the education level of the workforce is one of the most critical drivers of structural transition. However, most studies focus on skills demand from the private sector and tend to neglect education supply analysis. In the next section, this study attempts to fill some of these research gaps and missing links through simple education level estimations. It is important to note that these estimations are not exact but mostly indicative to demonstrate the often underestimated time lag of education reforms based on two different scenarios for the average education level of the labour force.

2. Labour Force Education Level Growth Scenarios

Towards a better understanding of skill demand and supply and to anticipate the needs of industry by 2025, we carried out several labour force growth projections using population projections to 2050 as given by the Ministry of Planning. The supply-side projections are based on demographic shifts, educational attainments and labour force participation rates. The potential labour force is calculated using data from the Cambodia Socio-Economic Survey (CSES, various years) on participation rates by gender, age and education. Comparative statics on the improved educational attainment of the labour force are calculated by manipulating the share of the labour force that has lower secondary education.

The purpose of the projections is to understand the urgency of educational and institutional policy changes and investments under two different scenarios.[4] The results have several limitations and are intended to be indicative rather than exact. For example, the projections account for the pace of labour force aging but not household dynamics in investment in education. Thus, the share of workers with primary and lower education could be higher in the future if household dynamics (using overlapping generations' models) were taken into account.

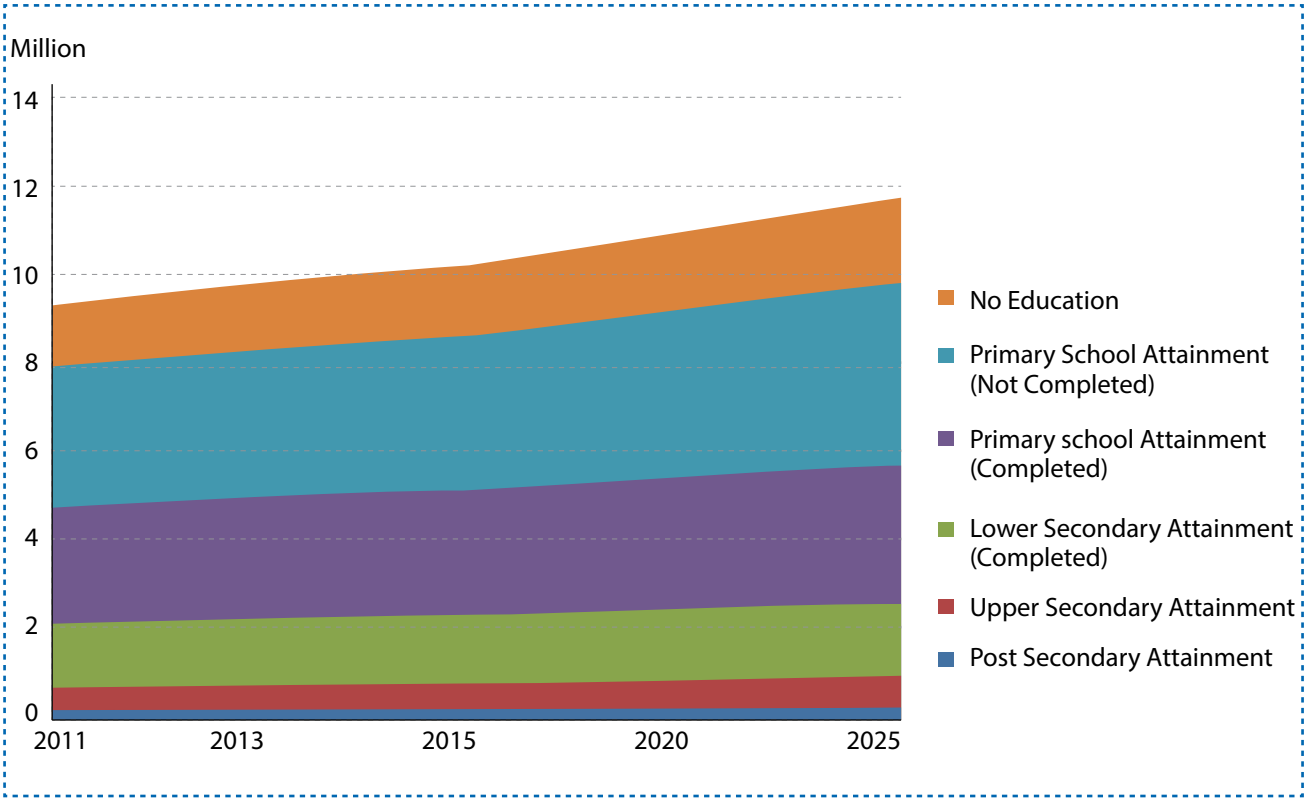
Scenario 1:

We assumed that similar and current industrial and institutional structures will exist until 2025 without any fundamental structural and institutional reforms. This implies that in the future the population will make similar labour market participation decisions by gender, age and education.

4. More exact education level forecasts will be conducted in the Cambodian Human Development Report 2014.

The results for Scenario 1 are given in the following figure :

Figure 13: Scenario 1 – Labour Force Projections: 2011 – 2025 (Based on Population Projections from Ministry of Planning)



Source: Author Illustration

The projection indicates that the average educational attainment of workers in 2025 will remain centred on primary and lower secondary education. This demonstrates that the average human capital attained is insufficient to support the demand for semi- and skilled human capital in 2020 or 2025 (see Table 9).

We also projected industrial skill and labour demand based on SNEC's forecasts of GDP growth by sector to 2025. Based on current productivity projections by key industries, the results show that there would likely be sufficient jobs for all workers in 2025 if they were to meet the skill requirements of industries in 2025.

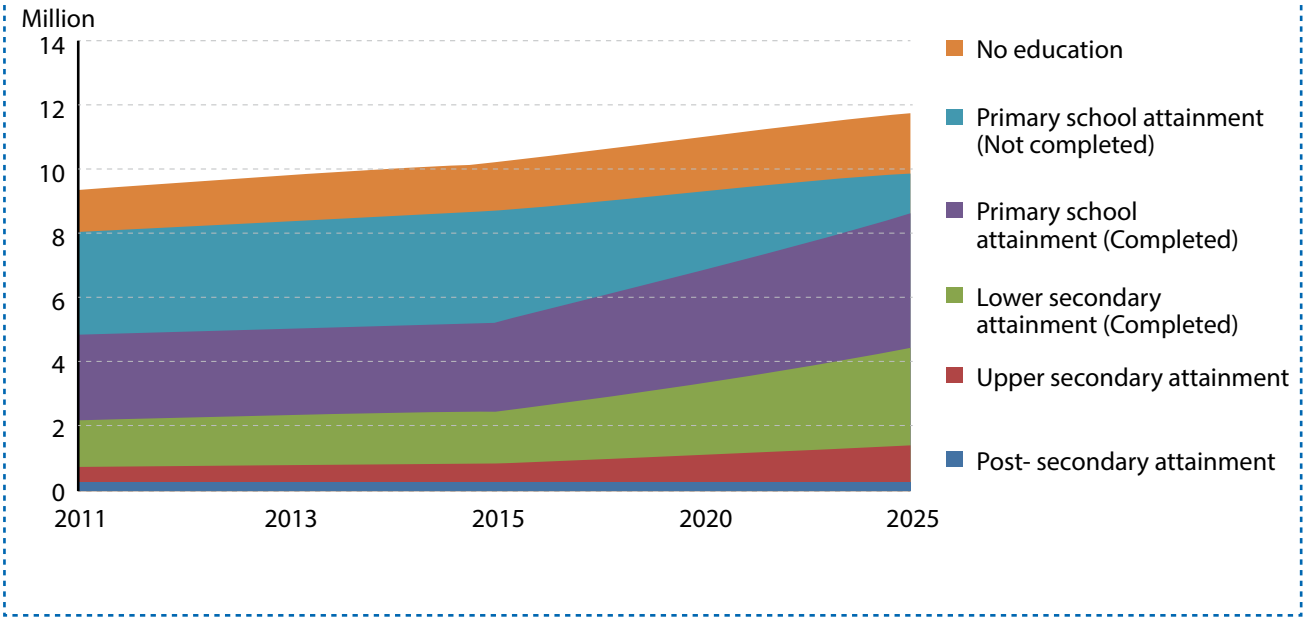
Scenario 2:

We assumed changes in the educational attainment of workers as follows (1) gradually shifting non-completed primary school to completed primary school in 2015 to nearly 50 percent by 2020, (2) of those completing primary schooling in 2015, 15 percent complete lower secondary and 5 percent complete upper secondary education by 2020, and (3) no changes in the educational attainment of older workers (45–64 years)

The results indicate that significant share of the workforce would have attained primary and lower secondary education by 2025. Firstly, we observe that we managed to increase those not completing primary schooling to completion of primary education by 2025. Second, the share of secondary attainment (lower and higher) increased to nearly 30 percent compared to only 22 percent in Scenario 1.

However, despite the big push for education policy and higher education reform, the results of our projections indicate that the average educational attainment of workers in 2020 and 2025 will not have surpassed primary school completion.

Figure 14: Scenario 2 Labour Force Projections for 2011-2025



Source: National Employment Agency (2013)

This shows the significant task ahead and the vital role of government in reforming the education system to shift the average human capital in the labour market towards secondary and higher education. However, the projections do not consider the impacts of TVET and on-the-job training which are expected to play important roles in improving the skills of primary and lower educated workers over the next decade.

The labour force scenarios suggest several possible paths for Cambodia's next stage of growth. Following current trends, Scenario 1 indicates that without strong government intervention to increase the human capital development of the Cambodian workforce there is a strong possibility of the economy becoming caught in a low-skill development trap. In this equilibrium we would expect a certain level of de-industrialization, with MNCs shifting to other emerging ASEAN countries and a significant hollowing-out of the industrial base as the stock of human capital would be unable to secure firms' competitiveness. Further, there is a risk that large numbers of skilled domestic workers might migrate to other ASEAN countries in which case Cambodia could encounter the "migrant syndrome" of the Philippines where the economy would ultimately rely on remittances. This scenario could also lead to significant social issues and lower growth. A second possibility is to have a steady growth at current trends with multinational firms and key industries' demands for skills met by foreign workers from the region. In this case, we could expect widening wage gaps between skilled (mostly foreign) and unskilled (mostly domestic) workers.

Scenario 2 shows that with strong alignment between education policy and industrial policy, institutional reforms, vocational and on-the-job training, and forward-looking industrial policy, there is a possibility of creating a competitive labour force with sufficient skills to keep the economy on a sustainable growth path.

The results from the two scenarios provide further evidence for the urgency of reforms given the time lag of the impact of education reforms and the demographic situation. Furthermore, the considerable time lags before educational reforms take effect and the consequent large share of undereducated workers in the labour force, even in light of successful education reforms in the next years, highlight the need for coordinated human capital intervention at different points over the life cycle. (1)There is an urgency to improve the education level of new labour market entrants, toward universal quality primary school completion, higher levels of secondary education completion and better inclusion of vocational training pathways at an early stage of education.(2)The under-educated and largely unskilled labour force stock needs to be directly addressed to ensure employability, improve productivity and facilitate shifts of workers into more productive sectors. (3) Investments in education and skills building need to be increase, disincentives removed, and new funding mechanisms explored. (4)Coordinated actions and alignment of industrial policy, education and skills building are required to reduce skill gaps and mismatches.

Photo: UNDP Cambodia/Chansok Lay

7 CONCLUSION AND RECOMMENDATIONS

This last chapter attempts to provide specific policy recommendations for reforms and interventions, grouped in response to the four sets of challenges that ought to be simultaneously tackled. In brief, they are:

(1) Improve the educational attainment of new labour market entrants, ensure quality primary education for all, and significantly increase the share of people with quality secondary and higher education

(2) Increase the productivity of the existing undereducated and unskilled labour force through new continuous learning pathways

(3) Break the vicious cycle of systematic underinvestment in education and skills building

(4) Reduce the large skill gaps and mismatches hindering economic diversification by building institutions to manage structural transformation and ensure linkages between the education system and industrial policy, and by pursuing industrial policy that focuses on upgrading the skills of domestic workers.

In order to support core planks of industrial development, a number of supplementary policies and actions are necessary, among which policies and actions in the education and skills building sector are paramount. In this regard, the study proposes taking the following actions on education, TVET, investment in education and training, and coordination needs.

Challenge 1: Low educational attainment of new labour market entrants

Conclusion:

High dropout rates and the low quality of education are still major issues throughout the education system. The cohort survival rate of schooling declines significantly during primary education and even more sharply at lower secondary level. This demonstrates that there is a greater incentive for young people to go out to work rather than invest in completing their education. On one hand, this implies that the marginal return from the additional years of schooling is very small in terms of higher wages. On the other, this reflects the burden on young people to start contributing from an early age to their families' income. This is largely a consequence of the civil war destroying a large share of the country's human capital, thereby constraining the ability of the middle-aged population to decrease the opportunity cost of their children's investment in education. Thus, it is crucial for Cambodia to ensure quality primary education for all and to significantly increase the shares of the population with secondary and higher education.

Proposed Actions 1:

a. There is an urgent need for government *to address the negative trade-off between working and schooling*. It is critical to encourage young people to complete their primary school education. Primary education is crucial for creating the basic foundation for human capital development for further investment in education or TVET. In fact, the returns to TVET are higher for workers with a strong foundation in basic education (at least grade 7). A conditional cash transfer scheme strictly targeting upper primary or lower secondary students could be an effective measure to increase retention and completion of education at these critical levels.

b. There is a need for *standardization of primary and secondary school education* in Cambodia. This will provide a basic and unifying foundation for developing strong human capital and will also allow the government to consolidate resources to develop a strong curriculum. The standardization of the lower educational system could be in the form of *national level exams* such as the primary school leaving examination (PSLE) administered by the Ministry of Education in Singapore. Such an exam could improve the quality of education by increasing the incentives for teachers and the aspirations of students. Clear and unified quality standards could also lead to higher returns to education.

c. The quality of education critically depends on *the quality of education providers and their incentives*. Existing pedagogy institutes could be transformed into a strong Faculty of Education to strengthen the training and certification of teachers, and to provide a postgraduate degree in education. Also, a proper career path, appropriate compensation with wage progression, and non-monetary benefits like subsidized housing to serve as an incentive for people to work in villages, would make teaching more attractive as a profession and strengthen the social status of teachers.

d. There is an urgent need to have a *flagship public university* in Cambodia (e.g. "National University of Cambodia" or "King Sihanouk University"). Consolidating the fragmented current public universities into a larger one would create economies of scale and scope and allow the government to develop linkages and partnerships with other leading global universities to attract investments and to develop local curricula and research. The government could focus on creating linkages with universities in Japan, the Republic of Korea, Singapore, Australia, Europe and the United States. In addition, access to university education should be broad-based in terms of creating provincial universities, with first priority given to the study of agricultural sciences.

Challenge 2: Low productivity of the under-educated, unskilled labour force and lack of continuous learning paths

Conclusion:

The average educational attainment of the current labour force is primary education. This is not sufficient to absorb, diffuse and implement new innovations and technologies and will have long-run implications for the economy's competitiveness. In addition, the economy needs to become more productive to ensure employability, and competitiveness of the work force in the context of a continuously disappearing comparative advantage from a labour surplus and thus a generally rising wage pressure. Therefore, it is of utmost importance that workers systematically update their skill-sets at later stages of the life cycle. Yet the education and skills system does not adequately respond to these needs. The absence of systematic, large-scale training and continuous learning institutions creates a disconnection between TVET and formal/informal education, and leads to low returns to training.

Proposed Actions 2:

a. The objectives of TVET take a two-track approach: to reduce household poverty, and to develop employability skills for industry. This approach centres on skills training for greater human capital accumulation and addresses the opportunity cost of training at the household level. Given the high dropout rates at early stages of the education system and the low educational foundation of the labour force, there is an urgent need to better integrate formal education, TVET and informal education and to improve the link between these systems. An opening up of these systems under an "Education for All" framework could allow every individual to acquire some skills from formal education, as well as to continue upgrading their skills and move to a higher level of education in different ways, at different speeds and in a way that is compatible with the need to work. In particular, lowering the education level entry requirement for TVET (currently grade 9) and rearranging and scaling up existing bridging programmes could be considered to make TVET a more accessible and effective tool for skills upgrading across wider segments of the population.

b. TVET should be progressive and accumulative throug-hout the career path. Certification of the various training programmes at the national level is vital for the recognition of training certificates and to signal to the private sector the competencies of the workforce. Thus, proper quality assurance, accreditation and recognition systems need to be introduced. An endorsement by the private sector and businesses would increase the returns to training and further motivate workers to acquire more skills and training. A public-private partnership (PPP) framework could also play an important role in endorsing the formal and informal training framework that includes public and private educational institutes. Part-time studies should also be considered to ensure compatibility with work.

c. In terms of institutions, the government, with private sector support, could set up TVET institutes, such as the Japanese-German-French Training Institutes in Singapore, at the initial stages of development. Such TVET institutes could create the crucial threshold to develop industry-based skills and a competent workforce with relevant skills to create competitive advantages in industry. Also, for Viet Nam's industries, the training institutes of Japan and the Republic of Korea were important to develop key technical skills in the workforce.

d. Government could consider scaling up the existing regional training centres, similar to experiences in the Republic of Korea, Malaysia and Singapore, to create a broad-based training framework.

e. The government should emphasize the importance of science and engineering universities and the University of Agriculture, which will be crucial to increasing the technology diffusion and productivity of the agriculture sector.

Challenge 3: Vicious cycle of systematic under-investment in education and skills building

Conclusion:

A lack of financial resources is prevalent in all corners of the education system and most visible in the low salaries of teachers and inadequate infrastructure. Poverty and insufficient family income are the main reasons for early school dropouts and limited human capital accumulation of the young. Even though public expenditure on education has been increasing over the years in absolute terms, as a percentage of GDP it is stagnating at around 2 percent. This is significantly lower compared to that of other emerging ASEAN economies such as Lao PDR (3–4 percent) and Viet Nam (6–7 percent). The share of public education expenditure on higher education to GDP is only one tenth of the world average. Similarly, private sector investment in TVET and skills training is lacking. To complement structural changes in the economy and increase human capital development, this vicious cycle of underinvestment in education and skills building needs to be broken, either through higher prioritization of education or innovative financing models, public-private partnerships and readjustment of incentives.

Proposed Actions 3:

a. To maintain competitiveness with other emerging ASEAN economies, public expenditure on education should be increased to around 4 percent of GDP, which would be comparable to that of neighbouring countries at a similar stage of development.

b. The government needs to increase the funding for overall education and in particular for post-secondary and higher education (universities, polytechnics and TVET institutes). For instance, public spending on higher education is only around 0.1 percent of GDP, equal to about one tenth of the world average (MOEYS 2013).

c. The government could create public-private partnerships (PPP) to develop and fund public universities in Cambodia. Samsung University and the Pohang Institute of Science and Technology in the Republic of Korea funded by POSTECT could serve as role models.

d. Government should increase public funding for TVET and CET. PPPs could play an important role in the provision of funding for TVET and CET, and could help to internalize the returns to training for the private sector. In particular, PPPs could help set up a jointly-financed Skills-Development Fund for workers that would enable them to acquire skills throughout their working career. [5]

e. Since the capabilities and competencies gained from TVET will translate into crucial economic and social returns, the government should provide more public funding for integrated and better facilities for TVET. In addition, the quality of TVET lecturers and training providers could be improved through strengthening and standardizing the national accreditation system. The quality and relevance of TVET training could be integrated with the private sector and business associations under the PPP scheme for TVET training. In fact the government has already set up several important initiatives to provide a National Standard and Accreditation System for TVET training.

f. The government could integrate TVET training schemes into a progressive and employable skills framework that emphasizes the quality of workers, which would be in line with the demand for skills (higher paying jobs) by the private sector. In fact, an integrated TVET system could focus on building skills and technical expertise that will be relevant for professionals, managers and technicians in middle and upper management positions at MNCs.

5. A tax in the form of a Corporate Social Responsibility (CSR) tax could be levied on the private sector to mobilize financial resources for investing in human capital to upgrade productivity especially through vocational education/skills training.

Challenge 4: Large skills gaps and mismatches hindering economic diversification

Conclusion:

Given the structural changes in the economy, there are growing skills gaps and mismatches in the labour market. The liberalization of the Cambodian economy led to growing demands for semi-skilled and skilled workers from MNCs, which due to the lack of local talent are mostly met by foreign workers from the region. Further, the economy lacks key local industries that would allow policymakers to manage and leverage technology creation, systematic skills upgrading of local workers and local employment creation. Thus, there is an urgent need for the government to build effective institutions to manage structural transformation and to ensure the linkage between the education system and industrial policy, as well as to initiate an industrial policy that focuses on upgrading the skills of domestic workers.

Proposed Actions 4:

a. There is a need for a central government planning agency, such as the Economic Development Board in Singapore, to enhance interministerial/institutional coordination by setting common prioritized goals and visions to coordinate and integrate formal and informal educational systems to meet the changing skills needs of the private sector.

b. There is a strong need for industrial policy that aligns industrial transition, skills development and productivity growth. Skills upgrading and absorptive capacity could be strengthened by requiring MNCs to employ a certain share of local workers in middle and upper management positions. The current industrial strategy of promoting liberal economic policies and pushing production towards high-end industries might intensify and create skill mismatches and shortages.

c. Selective government-initiated industrial development to anchor key industries in the domestic economy could support the coordination of industrial development with sufficient human capital. For example, "export promotion with import substitution strategies" were adopted by several ASEAN countries in industries that require heavy capital investments.

d. To support the transition towards industry and manufacturing, a strong preparation in basic science, technology, engineering and mathematics (STEM) should begin in the early stages of education. A different technical pathway in secondary school could help build these skills to create a more skills-based workforce that would help meet the initial needs of industry development. For example, Cambodia could build on the successful example of the National Technical High Schools and Machinery Technical High Schools of the Republic of Korea in the 1960s.

e. Greater support for public higher education and stronger regulation of the large number of private universities are needed to boost science, engineering and technology majors. These subjects play a critical role in the country's economic and industrial development, but have attracted little interest from students who are mainly focused on social sciences and business administration.[6] Since running science and technology programmes requires large investment in laboratories, technology, and scientific research and development, private universities will be reluctant to invest in these fields of higher education. The role of government is important to internalize the social returns to higher education by investing in university and technology infrastructures.

f. The government needs to hike the absorptive capacity of the economy by investing in infrastructure, science parks, seaports, telecommunications, airports, and roads that connect urban and rural sectors. The provision of infrastructure is an important component of an innovation system that supports the amalgamation of key local and foreign industries.

6. EMIS (2010/2011). Available data for the bachelor 's programme in the 2010/11 academic year shows that 75.8% of total enrolments are concentrated in only four majors, i.e., economics and business administration, languages and literature, information technology, and law.

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Appendix 1

Industrial and Educational Policy : Malaysia			
Stage	**Economy**	**Major industries/exports**	**Education policy mix**
1960s–1970s	Agriculture and mining	Agriculture, mining, construction	Expansion of primary and lower secondary education Malay as national language Standardization of education system 3-year vocational and secondary education route
Mid-1970s–late 1980s	Take-off and export-driven export-promotion with import-substitution strategies	Agriculture and commodities: rubber, tin, iron ore, oil palm, timber Light manufacturing (12% share) Tourism and travel Government linked corporations – Sime Derby (Bhd), Petronas	Curriculum to emphasize basic reading, writing and arithmetic skills Tertiary institutes: National University of Malaysia Malaysian Technological University University of Agriculture Ungku Omar Polytechnic
1990s	Export-driven FTAs – AFTA, ASEAN +1s	Gradual shift to manufacturing in electronics and electrical appliances Science parks at Penang; multi-media super corridor (infrastructure Putra Jaya, Cyber Jaya)	Expansion of upper secondary education Postgraduate Diploma in Teaching (PGDT) to meet demands for graduate teachers
2000–present	Modern technology	Agriculture development: synthetic rubber, iron ore, oil palm—bio-fuel Electrical appliances and electronics	Private institutions and foreign universities (only after 20 years of growth) Free education for 11 years Government responsible for secondary education Expansion of vocational training

Industrial and Educational Policy : Thailand			
Stage	**Economy**	**Major industries/exports**	**Education policy mix**
1960s–1970s	Import substitution strategies Agriculture and mining	Agriculture, mining, construction	Expansion of primary and lower secondary education Expansion of Chulaongkorn University (1917) Expansion of Thammasat University (1933) Expansion of Kasetsart University (1943) – Agriculture Science Vocational education: King Mongkut's Institute of Technology (1940) – Agricultural Technology
Mid-1970s–late-1980s	Take-off and export-driven with import-substitution Investment Protection Act (1960) Tax exemption on capital imports 4th NESDP (1977–81) Export promotion policy revised to reduce anti-export bias resulting from earlier ISI Export processing zones	Agriculture: rice and commodities Tourism Industries: machinery, basic metals, rubber, processed minerals Automotive industries (Export promotion with import substitution strategy) Japanese –Thai Eastern Seaboard Development: Port, petrochemical, fertilizers, integrated steel complex	Khon Kaen University (1964) ❖ Leading educational and learning centre of northeastern Thailand Chiang Mai University (1964) ❖ First provincial university ❖ Provide occupational and educational knowledge Prince of Songkhla University (1967) ❖ Needs of Southern Thailand ❖ Strong in medicine, management sciences and services Private tertiary education Establishment of Bangkok University (1962) Assumption University (1969) Business administration, architecture, arts, engineering, law, biotechnology.
1990s–2000s	Export-driven FTAs – AFTA, ASEAN +1s	Construction, motor vehicles, transport industries tourism, telecommunications	Private institutions and foreign universities (only after 20 years of growth) Enrolment at higher secondary and vocational institutions increased to 72%

Industrial and Educational Policy : Viet Nam			
Stage	**Economy**	**Major industries/exports**	**Education policy mix**
1970s	Viet Nam war Export promotion with import substitution strategies Agriculture Mining	Agriculture, mining, construction	Expansion of primary and lower secondary education Establishment of Hanoi Polytechnic Institute (1961-5), assisted by USSR graduates Reforms: 12-and 9-year general education system combined into 10-year system ❖ Primary: 4 ❖ Lower secondary: 3 ❖ Upper secondary: 3 Illiteracy elimination – compulsory education
1980s – 1990s	Take-off and export-driven Doi Moi reforms Centrally planned → socialist-oriented expansion of autonomy of state enterprises + removal of state subsidies Development of private sector Opening to FDI Export processing zones and industrial parks	Second Five Year Plan Main sectors: agriculture, heavy industries (meant to complement agriculture) Secondary sectors: commerce, construction transport and services, Infrastructure: ports, roads, airports, telecom.	Implementation of "patriotic" education system ❖ Issued new 12-year curriculum ❖ Printed new textbooks to replace old European/North American-oriented ones in the South ❖ Nationalisation of private schools ❖ Removal of schools from religious influence Eliminating illiteracy seen as a patriotic act.
1990s–2000s	Export-driven FTAs – AFTA, ASEAN +1	Construction, motor vehicles, transport industries, electrical appliances and electronics tourism, telecommunications	Vocational education Education network strengthened and developed. ❖ Goal to have vocational training centres in all districts by 2010 ❖ VND23 trillion allocated to train 1 million rural workers by 2015 (2009) German Technical Cooperation (GTZ) (2006–10) ❖ Hanoi Vocational Training Centre + Republic of Korea-Viet Nam Industrial Technology Institute ● Supported by Republic of Korea International Development (KDI) Cooperation Agency ❖ Hanoi Industrial College ● Supported by Japan International Cooperation Agency (JICA)

Appendix 2

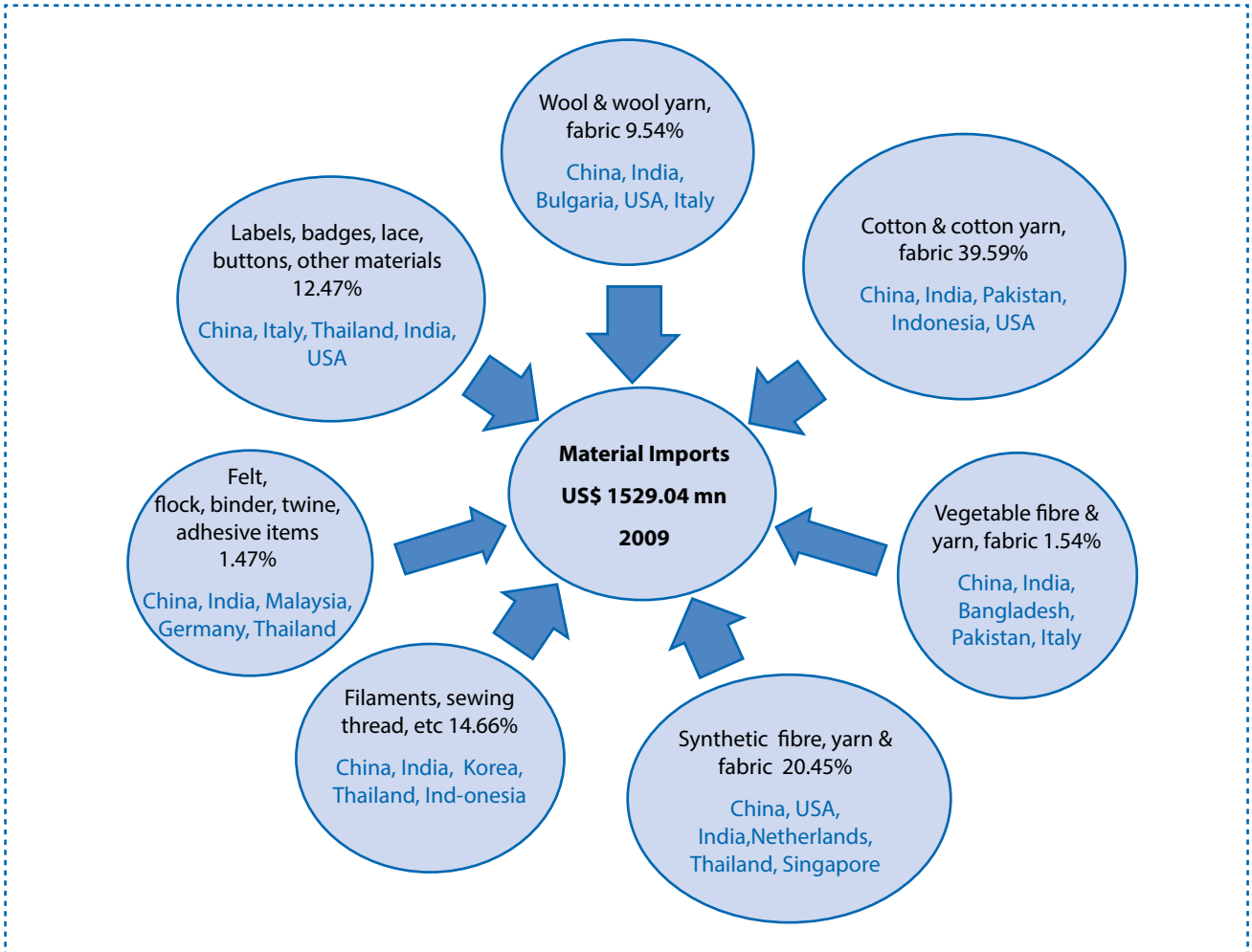
Sri Lanka's garment industry: the supply chain network (see Jayawickrama et al., 2011)

Sri Lanka is one of the leading countries in garment manufacturing, attracting much multinational activity. The world's largest multinational textile and clothing companies are operating in Sri Lanka as suppliers of materials, producers of materials, producers of clothing and accessories and trading agencies. These firms are involved at several stages of the textile and clothing supply chains. Basically, harmonized system (HS) codes 50–60 are inputs or materials used in the textile and garment industry, and 61–63 are final garment products. Table A1 shows that out of Sri Lanka's total textile and garment exports, HS 50–60 products accounted for about 5.4 percent only. In contrast, HS 50–60 products constitute more than 95 percent of the country's textile and garment imports, including imports of fabric, cotton, fibres and man-made filaments. Therefore, the textile and garment industry in Sri Lanka is heavily dependent on the import of textile materials.

On the other hand, Sri Lanka's exports are dominated by garments: HS 61–62 products accounted for nearly 90 percent of the total textile and clothing exports of the country in 2009. These two product categories mainly cover apparel and clothing accessories. Therefore, Sri Lanka mainly exports finished garments and imports textile materials.

Sri Lanka's garment industry is characterized by its high dependency on foreign inputs. Out of total textile material imports in 2009, fibre and yarn accounted for about 73 percent, fabric for 16 percent, and lace, nets, embroidery for 4 percent. Textile covering and packing items, sewing thread, labels and badges each accounted for 2 percent of total material imports.

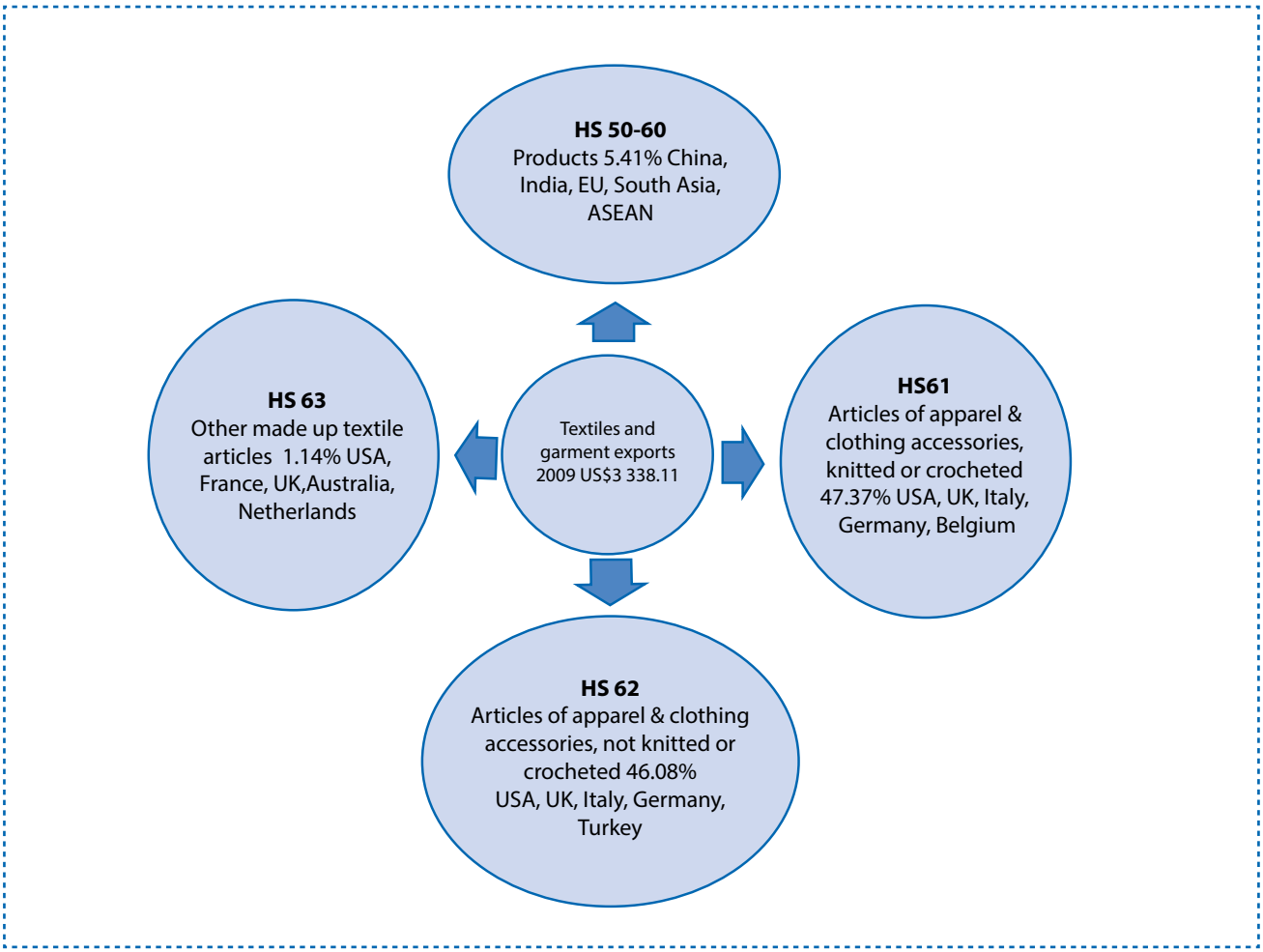
Figure A1: Composition of textiles and clothing material imports to Sri Lanka, 2009



Source: Author's Illustration

Sri Lanka's textile and clothing industry is mainly restricted to the export of finished products or final goods. In 2009, ready-made garments accounted for about 95 percent of the country's total textile and clothing exports: articles of knitted and crocheted apparel and clothing accessories (HS61) accounted for 47 percent, articles of non-knitted and non-crocheted apparel and clothing accessories (HS62) accounted for 46 percent, and other textile articles and materials (HS63) for only 1 percent. As given in Chart 1, the major destinations of Sri Lanka's garment exports are the United States (41 percent) and the European Union (52 percent). Major importers within the European Union are the United Kingdom, Italy, Germany, Belgium and France. Sri Lanka exports a very small amount of its garment products to ASEAN and South Asian countries, with ASEAN+1 countries accounting for only about 1.8 percent of the total. Therefore, Sri Lanka's garment industry is not dependent on the markets of ASEAN and East Asia.

Figure A2: Composition of Sri Lanka's textile and garment exports, 2009

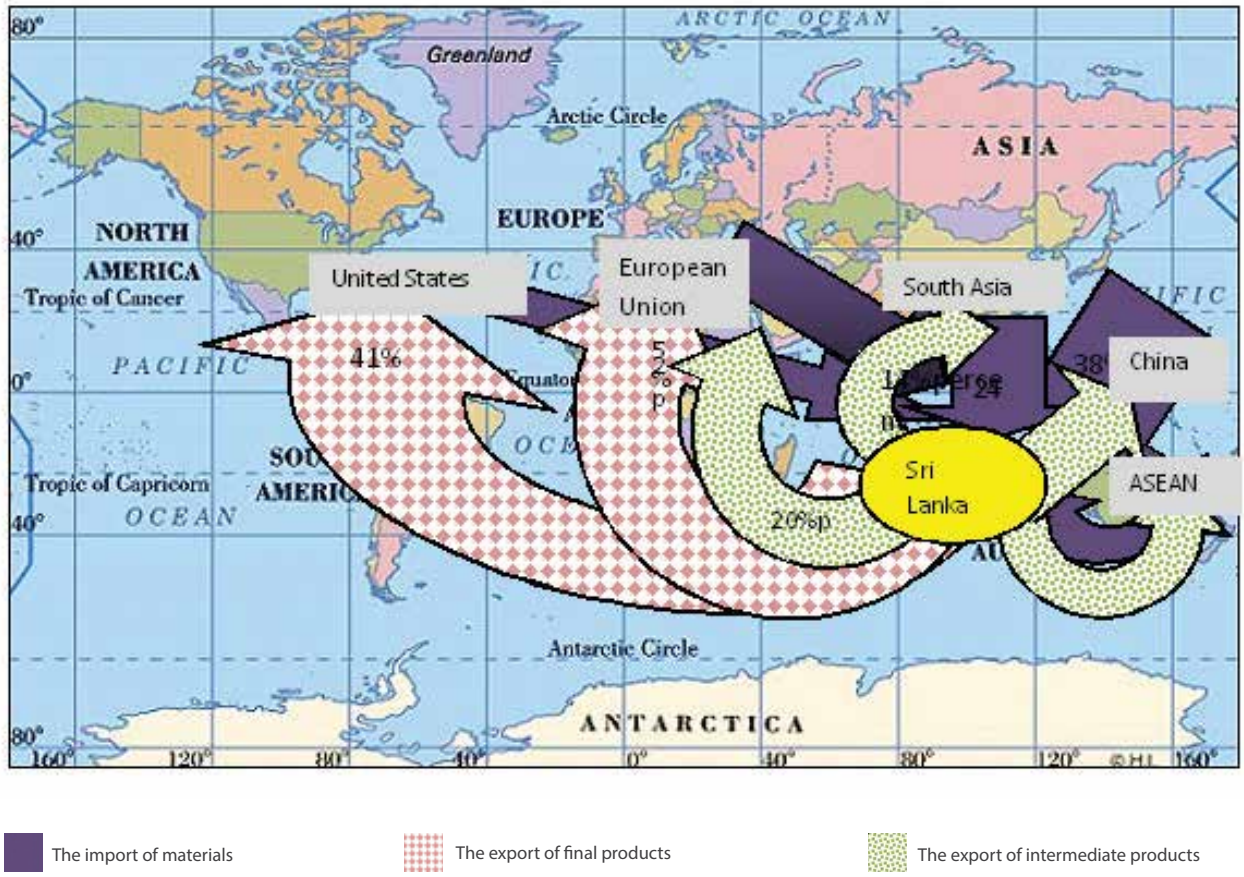


Source: Author's Illustration

Supply chain map of garment industries in Sri Lanka

Figure A3 illustrates the supply chain of Sri Lanka's textile and garment industry. Dark arrows represent the imports of textile materials. China, South Asia, the European Union and ASEAN countries are the major outsourcing destinations of the industry. Exports mainly go to the European Union and the United States. However, a certain amount of textile materials are exported to Asian countries where China and India have become the dominant buyers. Some European countries that produce garments outsource materials from Sri Lanka. The link between Sri Lanka's garment industry and ASEAN countries is important: Sri Lanka outsources significant materials from ASEAN countries while it imports textile materials for ASEAN countries that are currently expanding their garment industries. The final market for Sri Lanka's garment products at the moment is dominated by European Union countries and the United States. The bulk of the finished garments are produced for the markets in these Western countries. The garment industry in Sri Lanka has not strongly linked with Asia and East Asia and therefore there are greater opportunities to explore that market.

Figure A3: Map showing the supply chains of Sri Lanka's textile and clothing industry, 2009



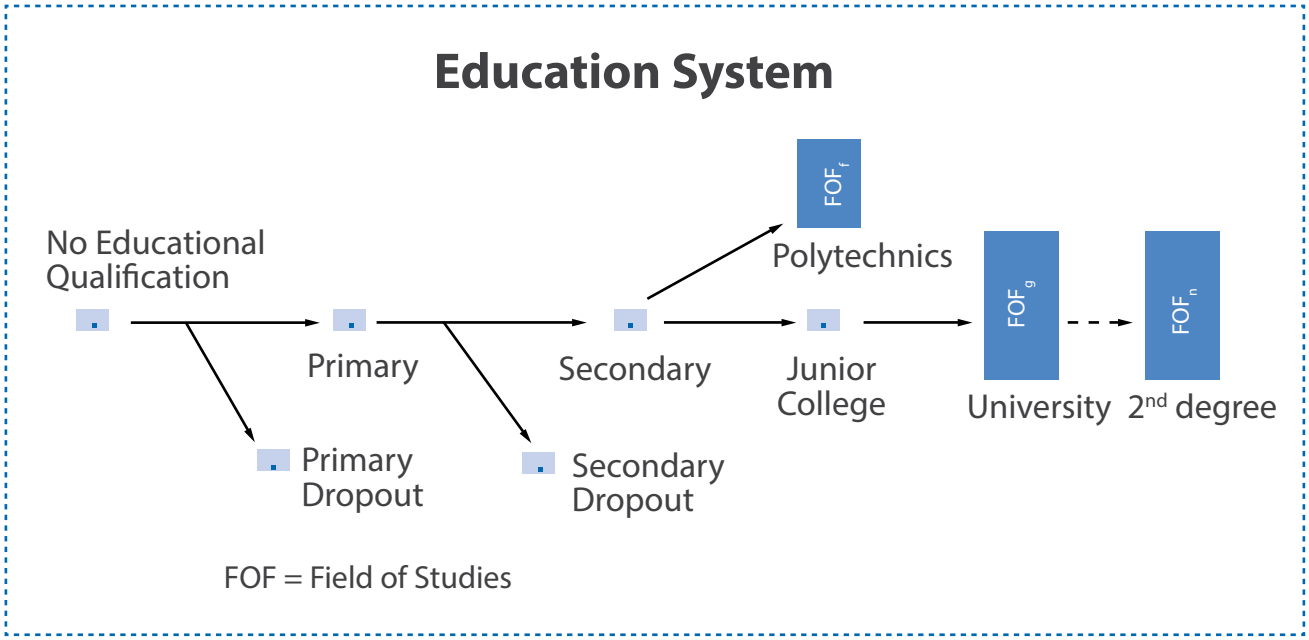
Source: Author's Illustration

Appendix 3

Singapore's educational structure: 'Education and Different Pathways for All'

A typical Singapore citizen will begin formal primary education at the age of 6. The duration of primary education is six years. Following the national primary school leaving examination (PSLE), a typical child will have four years of secondary education, after which he or she may proceed to do a diploma course (usually about 3 years) at Polytechnic or two years of pre-university study at Junior College. Until very recently, only graduates from Junior College were eligible to do degree courses at university. At polytechnic, students can enrol in one of seven fields of study. Similarly at the universities, an undergraduate can specialize in one of nine fields of study. The attrition rate for primary education is practically nil. For secondary education, the drop-out rate is slightly higher, but drop-outs generally will have attained at least two years of secondary education. The bulk of them will be dispatched to the Institute of Technical Education where they are trained in specific skills and crafts (hairdressing, household equipment maintenance and vehicle repair). Some of them may return to complete tertiary education at polytechnic.

Figure A4 : Education system in Singapore



Source: Toh and Thangavelu (2013)

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