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(in collaboration with the CESR Team and CESR international advisers)

For Ministry of Education (MOE)

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Asian Development Bank



**Myanmar Comprehensive Education Sector Review (CESR)
Phase 1: Rapid Assessment**

**Technical Annex on
Labor Market Analysis: The Demand for Higher
Education and TVET Graduates**

Final version (revised 18 January 2013)

Foreword

This report was prepared as part of the Rapid Assessment (Phase 1) of Myanmar's Comprehensive Education Sector Review (CESR), which is led by the Union of Myanmar Ministry of Education (MOE), coordinating inputs from other government agencies and support from an array of development partners. The report serves as a Technical Annex to the compilation "Volume 1" for CESR Phase 1. Under the umbrella of the CESR, the analysis reported herein was principally funded by Asian Development Bank (ADB) technical assistance TA 8187-MYA: Support for Education Sector Planning, cofinanced by the Government of Australia (represented by AusAID).

The report is based firstly on a literature review and interviews with development partners, government ministries, industry associations, professional associations and enterprises. The interviews were carried out by Paul Brady with the assistance of Aye Aye Myint and Kaing Zah Lynn in the period 3 December 3 to 9 January, 2013. Thanks are expressed to all interviewees for giving their time to participate in the study.

While the report was principally drafted by TA 8187 consultant Paul Brady, it reflects a collaborative effort involving inputs from the CESR Team throughout the process, including in particular Tin Tin Shu, Ohnmar Thein, Zay Yar Aung, Tun Hla, Honey Kyaw, Thet Lwin, and Myat Thida Tun, as well as CESR international advisers Ian Birch and Maurice Robson.

The report also reflects inputs from ADB's staff team for Myanmar education (in alphabetical order, Yasushi Hiroto, Wolfgang Kubitzki, and Chris Spohr), additional ADB-mobilized consultants supporting CESR Phase 1 (Sideth Dy, Martin Hayden, Carsten Huttemeier, Anthony Welch, and Marion Young), GIZ consultant Gerhard Kohn, and UNESCO counterparts. It also benefited from dialogue with counterparts from AusAID and UNICEF (which are supporting overall CESR coordination), as well as JICA and other development partners supporting the CESR.

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ACRONYMS

ADB	Asian Development Bank
CBT	Competency based training
GIZ	German Technical Cooperation
IT	Information technology
IHLCS	Integrated Household Living Conditions Survey
IMF	International Monetary Fund
ITD	Italian-Thai Development Public Company Ltd.
JICA	Japan International Cooperation Agency
LMIS	Labour market information system
NQF	National Qualifications Framework
PRC	People's Republic of China
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
UMFCCI	Union of Myanmar Federation of Chambers of Commerce and Industry
UNESCO	United Nations Educational , Scientific and Cultural Organization

Common Abbreviations

Km.	kilometre
FY	Fiscal year

\$ refers in every instance to \$US

Currency Conversion

1 \$ = 850 Kyats

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SUMMARY

- i. The population of Myanmar is approximately 61 million and is increasing at the rate of 1.3 % per annum. Myanmar is one of the least urbanised nations in South East Asia with almost 70 % of the population residing in rural areas. About 40% of the population is between the ages of 15 and 28. The total labor force is estimated (2011) to be 32.5 million people. Almost half of the labor force is employed in agriculture. Data from FY2008/2009 indicates that women constitute 46% of the labor force. Labor participation rates are high at 67% with respective rates in the rural and urban sectors at 70% and 60%.
- ii. Myanmar has the potential for substantial economic growth given its rich natural resources, young workforce and proximity to other emerging significant economies such as India and the Peoples' Republic of China (PRC). Real GDP growth is estimated respectively at 5.3, 5.5 and 6.3% respectively for FY2010/11, FY2011/12 and FY2012/13. The services sector accounts for 38% of GDP followed by Agriculture (36%) and Industry (26%). In terms of growth, agriculture is in decline relative to the services and industry sectors. The key exports and their percentage share are: petroleum gas (43%), dried and shelled legumes (17%), garments and textiles (8%) and logs (8%). Foreign direct investment (FDI) in Myanmar has substantially increased in Myanmar over time but is mainly in the oil, gas and power sectors.
- iii. There are three key sectors that will be fundamental for future economic growth. One of the sectors is hospitality and tourism. Tourist growth in 2012 was around 15%. However maintaining or expanding this growth will be dependent on better infrastructure. Shortages of hotel accommodation are likely to occur in 2014. The workforce is approximately 422,000 with an estimate of around 49,000 skilled/ trade level workers.
- iv. Construction is another key sector which is fundamental for the growth of all other sectors including agriculture. Myanmar's construction sector is underdeveloped, small and lacks the technical expertise and experience in undertaking large and complex construction projects. The current workforce is approximately 1.4 million with an estimate of trade/ skilled level of 164,000. The potential for construction work is enormous. Road density in Myanmar is 2 km./1000 people compared to an ASEAN overall amount of 11 km./1000 people. Similarly the railway system which potentially can complement road transport is badly in need of upgrading. The Greater Mekong

Sub Region Program (GMS) constitutes an agreement between a number of countries including Myanmar for cooperation in a range of areas especially international roads connections. Three road corridors are proposed and three Special Economic Zones (SEZ) with deep water seaports are under development to substantially transform transportation in the region.

- v. Manufacturing is the third of the key economic sectors. It is anticipated that the overall developments of the ports, road corridors, industrial parks and the comparatively low wage rates will foster substantial industrial development in close proximity to these developments. The easing of sanctions and the attraction of low wages is expected to drive substantial manufacturing effort. Prior to the sanctions, South Korean investment led to approximately 300 export oriented garment and textile factories being set up. The workforce is approximately 1.9 million with an estimate of 222,000 at skilled/trade level.
- vi. Current and potential export earnings, food security and employing more than 50% of the workforce, Agriculture remains an important sector. Productivity remains a key problem. Prevailing conditions in Myanmar have not favored a strong formal sector. Consequently most people are employed in the informal sector. One estimate of the informal sector is to summate all those classified as own account workers, contributing family worker and casual laborers using IHLCS data. This estimate is respectively for urban and rural areas, 54% and 79%.
- vii. Businesses as elsewhere are often gender dominant. For example the garment industry has largely a female workforce. In the plantation sector, the workforce can be up to 70% female. Engineering works however are largely male dominant. Senior positions in nearly all industries are largely male.
- viii. Low income is a push factor for Myanmar citizens to seek work in other countries which provide a pull factor in the comparatively higher wages provided. One estimate is that approximately 10% of the Myanmar population is working in other countries especially Thailand.
- ix. There is a mismatch between the performance sought by industry for their workforce and the outcomes from the education and training sector. The outcomes from various levels of post school programs are people who have a substantial level of knowledge (which may be dated or irrelevant). However they lack the ability to make appropriate decisions in the workplace and they don't have the practical skills that are needed. Consequently graduates are not work ready and require significant work experience

and further training to achieve the performance required in workplaces. The supply from the education and training system is adequate in quantitative but not in qualitative terms. There is moreover a lack of supply of capable experienced personnel in all occupational fields.

- x. There is limited engagement by private industry in the education and training sector. Decisions about what courses are offered and the design of the programs appear to be largely undertaken by government ministries. This means that those who have no direct knowledge about workforce performance requirements decide on the outcomes to be achieved. The TVET sector is not visible and therefore not seen to be fulfilling a relevant role.
- xi. The education and training sector's approach to learning is not compatible with the capability expected of the workforce in the 21 st. century. The current approach emphasizes rote learning and the use of set textbooks (which may be dated). Alternative approaches are needed to achieve the capabilities required.
- xii. Options for phase II. Prepare plans for:
 - a) specific occupation training up to National Skill Standard Authority Certificate 3 level for industry selected occupations in 1-3 of the following industry sectors: construction, tourism, manufacturing. In the case of hospitality this could address qualifications from Certificate II to Advanced Diploma of the ASEAN Common Competency Standards for Tourism Professionals and according to the requirements of the ASEAN Mutual Recognition Arrangement for Tourism Professionals.
 - b) to build the capacity of two higher education institutions outside the ASEAN network to provide training meeting all requirements of the Myanmar Engineering Society for registration on the ASEAN Engineers Register.
 - c) upgrading the training under the Ministry of Agriculture and Irrigation at the University of Yezin and the seven State Agricultural Institutes (SAIs).

A. THE MYANMAR ECONOMY

1. Socio Economic Context

1. The population of Myanmar is approximately 61 million and is increasing approximately at the rate of 1.3 % per annum.¹ Myanmar is one of the least urbanized nations in South East Asia with almost 70 % of the population residing in rural areas.² Approximately 40 % of the working population is between 15 and 28 years thus providing an important pool of young human resources to sustain economic development.³ Wage rates are low at around \$65 per month for unskilled labor in factories . Over one million young people enter training or the labor market each year. Limited training places mean that most school leavers have to simply find employment without further education and training.

2. Myanmar ranks 149 in human development terms in comparison to 186 other countries.⁴ Classified as a low human development country, its *human development index* places it ahead of Cameroon, Madagascar, Tanzania and Papua and New Guinea but behind Bangladesh, Timor Leste and Angola. Myanmar and Timor Leste are the only countries in South East Asia classified as having low human development. Annual per capita income is \$900 compared to Viet Nam (\$1400), Thailand (\$5000) and the PRC (\$5300).⁵

2. Overview of the Myanmar Economy

3. Myanmar has been in isolation from the international economy for a large part of its existence since independence in 1948. Poor linkages to international trade and other factors have resulted in Myanmar missing out in the level of economic growth witnessed in other South East Asian economies. Myanmar has the potential for substantial economic growth given its rich natural resources, young workforce and proximity to other emerging significant economies such as India and the PRC. One estimate is that Myanmar could grow at between 7% and 8% per year for a decade or more and raise its per capita income to between \$2,000 and \$3,000 by 2030 (footnote 3). Much of this will depend on the degree to

¹ ADB. 2011. *Asian Development Bank and Myanmar Fact Sheet*. <http://www.adb.org/publications/myanmar-fact-sheet>

² Independent Evaluation Group. 2012. World Bank Indicators-Myanmar-Density & Urbanisation <http://www.tradingeconomics.com/myanmar/rural-population-wb-data.html> (accessed 15 December 2012).

³ ADB. 2012a. Myanmar in Transition. Opportunities and Challenges. Manila.

⁴ United Nations Development Program (UNDP). 2011. Human Development Index Trends. <http://hdr.undp.org/en/data/trends/>

⁵ Economist Intelligence Unit. 2012. Myanmar: White Elephant or new tiger economy? http://www.asia.udp.cl/Informes/2012/informe_birmania_EIU.pdf?ts=952012 (accessed 20 December 2012).

which the economy can be effectively modernized especially through substantial change to the financial sector.⁶

4. Real GDP growth is estimated respectively at 5.3, 5.5 and 6.3% respectively for FY2010/11, FY2011/12 and FY2012/13 (footnote 3). The share of GDP by each economic sector is provided in Table 1. Table 2 provides data on the relative growth of the sectors. Both tables show that the industry and services sectors are becoming significantly more important in the economy.

Table 1: Structure of the Myanmar Economy

(% share of GDP)

Sector	1990	2000	2009	2010
Agriculture	57.3	57.2	38.1	36.4
Industry	10.5	9.7	24.5	26.0
- (Manufacturing)	(7.8)	(7.2)	(18.1)	(19.5)
Services	32.2	33.1	37.4	37.6
Household final				
consumption	-	-	-	-
expenditure				
Gross Capital				
formation	-	-	-	-
General gov't final				
consumption	3.6	0.6	0.1	0.1
expenditure ..				

Source: World Bank. 2012. *Myanmar at a glance*. <http://devdata.worldbank.org> (accessed 9 December 2012).

Table 2: Sector GDP Growth

(% in constant prices)

Sector	2007	2009	2011
Agriculture	8.0	4.7	4.4
Industry	21.8	5.0	6.5
Services	12.9	5.8	6.3

Source: ADB. 2012. *Myanmar in Transition. Opportunities and Challenges*. p.2. Manila.

5. Exports in FY 2011/12 went primarily to the PRC (\$2214 million) and India (\$1046 million).⁷ Other major destinations for exports were: Japan (\$320 million), Korea (\$215

⁶ International Monetary Fund (IMF). 2012. *Myanmar 2011 Article IV Consultation*. <http://www.imf.org/external/np/sec/pn/2012/pn1244.htm>.

million) and Germany (\$42 million). Changes have occurred overtime in the products exported. In 2000, exports were dominated by garments and clothing but in 2009, the chief export was petroleum gas. Over this period, petroleum gas share of the value of exports increased from 6.3% to 43%.⁸ While the value of garments and clothing exports has substantially declined over this period (8% of exports), there is the potential given the lifting of sanctions, improved infrastructure and the comparatively low wages, for this industry to substantially increase production. Other key exports are dried and shelled legumes (17%) and logs (8%).

6. Foreign direct investment (FDI) in Myanmar has substantially increased in Myanmar over time but mainly now flows into the oil, gas and power sectors as Table 3 shows. In cumulative terms the PRC, Hong Kong-PRC and Thailand account for almost three quarters of the investment.⁹ Data reveals no FDI was received in agriculture, construction, industrial estate, real estate, transport and other services during the period FY2010/11. Nonetheless, as the cumulative amount shows there is a level of foreign investment in most sectors albeit small. More FDI is required in other sectors in order to grow a more diversified economy that is less vulnerable to declining markets in specific products.

7. A foreign investment law has been promulgated that is intended to make foreign investment more attractive. The law allows for investment in many sectors but restricts investment in specified sectors. Analysts are reserving their judgment until the associated regulations are promulgated. The IMF has identified a number of constraints for economic development (footnote 6). In the case of agriculture, development is suppressed by poor access to credit, lack of private land ownership, and inadequate infrastructure and inputs. For other industries, high costs of starting a business by world standards is an impediment to growth. For the manufacturing sector, poor infrastructure, inadequate know-how, and extensive administrative constraints limit expansion.

⁷ Ministry of National Planning and Economic Development (MNPED), Myanmar. 2012. Selected Monthly Economic Indicators. (September 2012). Foreign Trade. Table 7. Export by Major Trading Country. https://www.mnped.gov.mm/index.php?option=com_content&view=article&id=95&Itemid=112&lang=en (accessed 14 December 2012).

⁸ Footnote 3, p.29.

⁹ United Nations Economic and Social Asia Program (UNESCAP). 2012. *Asia-Pacific Trade and Investment Report 2012. Recent Trends and Developments*. Bangkok: UNESCAP.

Table 3: FDI Inflows by Sector

(\$ million)

Sector	Fiscal Year						2005-2010
	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11 ^a	
Oil and Gas	229.9	417.2	478.4	743.2	750	287.9	2906.6
Mining	2.2	2.6	3.2	46.6	200.1	160.3	415
Power	0	0	220	170	0	0	390
Manufacturing	1.1	1.6	13.2	14.2	11.6	1.5	43.2
Hotel and Tourism	2.7	6.3	0.1	1	0	0.3	10.4
Livestock and Fisheries	0	0	0	0.6	1.6	0.2	2.4
	235.9	427.7	714.9	975.6	963.3	450.2	3767.6

Note: ^a partial year figures onlySource: ADB. 2012. *Myanmar in Transition. Opportunities and Challenges*. Manila. p.32.

8. For many potential investors, there will be a cautious approach to investing in Myanmar. The existing business and government operations are perceived to not have the practical experience to deal with the challenge.¹⁰ There is a view that it is very difficult to do business in Myanmar and that the key hindrances are restrictive legal and economic conditions.¹¹ Poor legal and economic conditions include: arbitrary tax policies, marginal enforcement of property rights and weak rule of law.¹² These conditions have favored an informal rather than a formal sector for local investors.

9. A major constraint is the Myanmar financial sector which is generally regarded as primitive by international standards because of its isolation from the growth of this sector internationally. Like many other sectors, it is heavily populated by state institutions and tight government controls. However foreign banks will be able to operate by 2015 and along with a greater liberalizing of the economy, there should be increasing improvements such as the recent introduction of ATMs (for domestic transactions) and foreign exchange facilities (in lieu of the black market). The financial sector illustrates the immense capacity gap that exists in the workforce moving to a knowledge era economy.

¹⁰ Hewett, J. 2012. Myanmar Joins the Map. *The Australian Financial Review*. 30 October.

¹¹ Bruce, V. 2012. Burma comes in from the cold, gold and all. *Sydney Morning Herald*. 11 August.

¹² Heritage Organisation. Myanmar Country Brief. <http://www.heritage.org/index/country/burma> (accessed 20 December).

10. An additional difficulty for the private sector is government owned and operated enterprises which cover a large part of the economy. The Myanmar Ministries of Industry for example operate manufacturing enterprises covering automobiles, trucks, agricultural machinery, vehicle tires, textiles, pharmaceuticals and foodstuffs, ceramics, chemicals, engineering machinery and heavy vehicles.¹³ There is government recognition of the need to privatize its enterprises and a process has been in place for undertaking this. At the end of the 1990s, there were approximately 700 government enterprises and a number of the most profitable have been sold (footnote 6). However this still means currently for the private sector, that the party that regulates you is also your competitor.

3. Overview of Major Economic Sectors

a. Agriculture

11. Rice production is a key determinant of food security for ASEAN nations. While the importance of agriculture in the Myanmar economy is set to decline, the overall increase in production and consumption is expected to increase respectively at 1.8% and 0.92% allowing for a steady increase in the amount exported.¹⁴ In 2009, rice constituted almost 2% of export earnings.¹⁵ Rice production exceeds all other agricultural commodities in value and weight as demonstrated in appendix 2.

12. The agriculture sector is not as productive as it should be. While the overall acreage has increased, this has not occurred with significant productivity increases.¹⁶ According to a Harvard University Kennedy School of Management report, farmers have a high level of debt and that this mitigates against the purchase of key inputs such as high yielding crop seed, fertilizers and pesticides.¹⁷ Gaining more credit may not necessarily be the answer, as one loan is often used to pay off another higher interest loan. Ultimately repossession of land may be the outcome with the potential for greater productivity through land consolidation.

¹³ Myanmar Ministry of Industry 2. 2012. webpage.<http://www.myanmarindustry2.com/> and Myanmar Ministry of Industry 1. 2012. webpage <http://www.industry1myanmar.com/English/index.html> (accessed 4 January).

¹⁴ Wailes, E and Chavez, E. 2012. *ASEAN and Global Rice Situation and Outlook*. ADB Sustainable Development Working Paper Series No. 22. Manila.

¹⁵ Footnote 3, p.29

¹⁶ Do, K and Ando, Kazuo. 2012. *Improving Myanmar Agricultural Extension Services: Empirical Study on Views and Perception of Field Extension Agents in Mandalay Division of Myanmar*. Kyoto: Kyoto University Centre for South East Asian Studies.

¹⁷ Dapice, D. et. al. 2011. *Myanmar Agriculture in 2011: Old Problems and New Challenges*. Cambridge (Mass.): Ash Centre for Democratic Governance and Innovations, Harvard Kennedy School.

13. The government wishes to expand agricultural production especially for export earnings. It has invited foreign investment in agricultural production and industries servicing the agricultural sector. Already Myanmar is a major exporter of pulses and sesame. Expansion is sought for a range of crops including rubber, palm oil, jute, cotton, cashews, mangos and pineapples.¹⁸ Significant growth in agriculture is dependent on a number of factors including infrastructure development such as roads and irrigation systems and the utilization of inputs that will drive higher levels of productivity. Current indebtedness is preventing the uptake of some of these inputs.

b Energy

14. Myanmar has a major strength in energy production which assists in achieving balance of payments. There are substantial reserves of oil and petroleum gas as well as largely untapped hydropower. Currently hydropower accounts for three quarters of the electricity produced, allowing much of the petroleum gas produced to be exported. However only about 5 % of the renewable water resources are actually used, thus providing immense potential for hydropower generation (which can be exported) as well as irrigation. This however will require substantial investment for the development of the necessary civil infrastructure.

c. Tourism

15. Myanmar has a range of tourist attractions such as beaches and ancient sites such as Bagan. Comparatively inexpensive air fares from other Asian destinations such as Bangkok and Singapore, along with ease of entry (in comparison to a limited time visa of the past), has made Myanmar an increasingly popular tourist destination. Tourist arrivals gradually rose from 660,206 in 2005 to 816,369 in 2011 representing a growth of about 4.3 % per year.¹⁹ Arrivals up to November 2012 totaled 933,910 suggesting a growth rate of in 2012 of around 15%. A comparison of the number of tourist arrivals with data from other South East Asian destinations suggests that Myanmar is matching the tourist growth in other ASEAN countries. Over the same period, tourist arrivals grew 11% in Cambodia and 20% in Laos.²⁰ Nonetheless sustainability of growth will be dependent of adequate infrastructure being in place. For example, current hotel capacity is overstretched resulting in a shortage of

¹⁸ Ministry of Agriculture and Irrigation. 2012. Business Opportunities in Myanmar Agriculture. <http://www.moai.gov.mm/index.php/business-opportunities.html> (accessed 30 December).

¹⁹ Ministry of Hotels and Tourism (MHT), Myanmar. 2011. *Myanmar Tourism Statistics 2011*. <http://www.myanmar-tourism.org/tourismstatistics.htm> (accessed 12 December 2012).

²⁰ MHT. 2012. Mekong Tourism Travel Leaders Symposium: Looking at a Sustainable Future for Myanmar Tourism. Myanmar Tourism Journal. January. pp. 16,18.

rooms and high tariffs all of which reduce the competitiveness of Myanmar with other countries. Estimates from the Ministry of Hotels and Tourism are that existing and planned construction will provide sufficient rooms only through 2013, with shortages of rooms occurring in 2014 onwards.

16. Most visitors come from Asia (66%). Western Europe, North America and Oceania respectively represent 21%, 6% and 3% of arrivals. Chinese and Thais constitute about 25 % of all arrivals (footnote 19). Not all visitors however are necessarily seeking tourist services. The current number of specific language speaking guides provides an estimation of the tourist demand. Out of a total of 3,160 licensed tourist guides, 1931 (61 %) are English speakers suggesting that the tourist market is dominated by citizens of Anglophone countries. There are 343 (11 %) Japanese speaking guides and there are 450 (14 %) guides who speak either French or German. Tourism is labor intensive and will create considerable employment opportunities. One job is that of tourist guides. Without attrition of tourist guides, a modest 5% increase in the number of tourists each year will demand about 160 additional guides each year all of whom will need foreign language skills especially English.

d. Construction

17. Myanmar's construction sector is underdeveloped, small and lacks the technical expertise and experience in undertaking large and complex construction projects (footnote 5). DAWN (AH YONE OO) is an example of a significant Myanmar construction company. Their current work includes construction of jetties, commercial buildings, a university and residential housing. Previous work includes government buildings, multi-story commercial buildings, hotels, embassies, storage tanks, waterfront structures, foreshore work and factories. Their past experience includes contracting for Myanmar public and private sector organizations and sub-contracting to foreign construction companies for works in Myanmar such as embassies.

18. Myanmar is a land bridge between South Asia, the PRC and South East Asia. Substantial growth in the economies of the PRC, India and other South East Asian countries has created substantial demand for rapid movement of goods. This can only be achieved through substantially improving infrastructure such as roads, rail and ports. The Greater Mekong Sub Region Program (GMS) constitutes an agreement between a number of countries including Myanmar for cooperation in a range of areas especially roads. Three road corridors are proposed: North to South (North Myanmar through the PRC); East to

West (Mawlamyine, Myanmar through to Viet Nameese coastal cities ending at Da Nang, Viet Nam); and Southern (Dawei, Myanmar through to Qui Nhon, Viet Nam).

19. Three Special Economic Zones (SEZ) with deep water seaports are planned or are under development to substantially transform transportation in the region. One is at Dawei which with the Southern Corridor will enable goods to go to Thailand without the need for moving through the Malacca Straits.²¹ Similarly the facility at Kyauk Phyu will allow goods to be directly transported to the PRC. In addition, pipelines are under construction to allow the movement of Middle Eastern oil and gas from the Shwe Gas Project in Myanmar directly through to the PRC also without movement through the Malacca Straits. The other SEZ is at Thilawa near Yangon. While all are major construction projects in their own right, they also require the completion of substantial roads to be fully effective.

20. Myanmar significantly lags behind the transport infrastructure of other ASEAN nations. Road density in Myanmar is 2 km./1000 people compared to an ASEAN overall amount of 11 km./1000 people.²² Land transport is important for tourism as it provides for much greater flexibility (footnote 20). Much of the tourism in the Lao PDR involves land rather than air transport. Land transport will also be needed for the export of Myanmar manufactured goods.

21. Although there has been an expansion of the rail system, this has primarily been to remote areas which have limited economic and revenue value. Expansion has also come at the cost of maintenance. The system along with its track and locomotives is aging and in need of significant maintenance. Rail systems are complementary to road transport offering economies in transporting bulk goods over large distances' particularly if new port facilities are to be used as a transit stop for goods intended for international destinations.²³ This is even more advantageous given opportunities to connect to the Thai and Chinese rail networks.

22. For significant development to take place, Myanmar will need substantial foreign investment, foreign expertise and a workforce that has 21st.century capability to undertake

²¹ Aung, W and Kudo, T. 2012. Chapter 6. Newly Emerging Industrial Development Nodes in Myanmar. In Masami Ishida ed. *Ports, Roads, Economic Zones Along Economic Corridors in Emerging Economic Corridors in the Mekong Region. BRC Research Report No. 8.* Bangkok: Bangkok Research Centre, IDE-JETRO.

²² ADB.2012b. *Myanmar. Transport Infrastructure Initial Assessment.* Manila

²³ Bureau of Infrastructure, Transport and Regional Economics (BITRE), Australia. *Road or Rail Freight – Competitors or Complements.* http://www.bitre.gov.au/publications/2009/is_034.aspx

the necessary infrastructure developments. The Italian-Thai Development Public Company Ltd. (ITD) for example, is undertaking the Dawei port development.

e. Manufacturing

23. Manufacturing is a diverse sector focusing on either the domestic or the export market. Domestic focused industries include those dealing with food processing such as beverages, rice, oil, sugar, confectionery and snack food. The domestic industries also include those serving the agricultural sector such as tractors, pumps, farm implements, pesticides and fertilizer. Export industries include canned fruits and vegetables, wood products, rubber products and garments and textiles. The export sector is likely to be enhanced with the establishment of SEZs.

24. Each SEZ in the three port developments will have light and/or heavy industrial parks. It is anticipated that the overall developments of the ports, road corridors, industrial parks and the comparatively low wage rates will foster substantial industrial development in close proximity to these developments. Infrastructure development and the availability of a large young low wage workforce will make Myanmar an attractive investment proposition especially given rising wages in the PRC and Thailand. The development of factories in Thailand along the border with Myanmar provides an estimation of the potential.

25. Along the border with Myanmar, many factories have been established in Thailand to capitalize on labor availability and the lower wages of the Myanmar work force.²⁴ At Sangkhlaburi, Thailand there are between 80 to 90 factories producing shoes, garments and sewing materials employing approximately 4,000 Myanmar workers. Bacini Enterprise Ltd. is a shoe producing factory which sews leather already cut in their main factory in Nakhon Prathom province. The senior levels of the factory are all Thai and the remaining workers are from Myanmar. In Tak province Thailand, there are approximately 600 labor intensive factories including 400 in Mae Sot. Approximately 80% of the workforce is from Myanmar. Labor shortages have been reported as workers have migrated to other areas in Thailand where wages are higher. A major concern for factory owners in Thailand, is that workers may be attracted to SEZ factories in Myanmar should a major expansion in activity take place. The latter however will necessitate investor confidence.

²⁴ Limskol, K . 2012. Progress Report. Job Creation by Border Area Development between Thailand and Myanmar. Unpublished.

26. Sanctions have constrained the development of the manufacturing sector in Myanmar. Prior to the sanctions, South Korean investment led to approximately 300 export oriented garment and textile factories being set up (footnote 5). Although sanctions are being gradually lifted, the general recession in the European Union (EU) and the US have reduced demand especially for higher value products such as furniture. A key determinant will be the overall relative cost of production between Thailand and Myanmar. The lack of overall capacity in Myanmar will mean that the main advantage will be in high labor rather than capital intensive production such as shoes and garments.

4. Development Partner Activity in Myanmar TVET and Higher Education

27. The British Council, Open Society Foundation and JICA are providing direct assistance to specific higher education sector (HES) institutions. In order to support secondary education, the British Council is providing on-going assistance to teacher training institutions. The Open Society Foundation is focusing its support on the faculties of Archaeology, Law and International Relations of Yangon University especially through the provision of international visiting academics. The Open Society Foundation is also prepared to offer support for the development of university level e-libraries (with the assistance of Cornell University). JICA has focused on the development of engineering faculties of Yangon and Mandalay Universities to support Myanmar universities participating in the ASEAN University Network / Southeast Asia Engineering Education Development Network project (AUN/SEED-Net). The support is aimed at enhancing teaching and research in engineering in ASEAN institutions. The Network consists of 19 leading engineering institutions with the support of 11 leading Japanese supporting Universities.²⁵ The two Myanmar institutions involved are the University of Yangon and the Yangon Technological University. Phase 2 ends in February, with phase 3 due to commence in March 2013.

28. A number of agencies are also involved with general capacity building, policy and research for the higher education sector. The ADB is involved with the Regional Education Technical Assistance (RETA) for HRD and HES. A second RETA is to take place in early 2013 to involve two universities linked to ASEAN University Network. JICA has undertaken a study of the HES. UNESCO has focused entirely on policy development. ADB, AusAID, UNESCO, and UNDP have provided general support for the CESR. A matrix of development partner effort in HES is provided in Table 4.

²⁵ ASEAN. AUN/SEED. 2012. Website. <http://www.seed-net.org/index.php> (accessed 22 December)

29. Little has happened in the small definable TVET sector apart from the assistance given to CESR and the study undertaken by JICA on both the TVET sector and the labor market. Apart from the contribution given to the CESR, UNESCO is also focused on policy development for the sector. GIZ is set to contribute further particularly in capacity building and policy development in at least one of the ministries connected with technical education. ILO has concentrated on supporting retraining both state and non-state child soldiers to make the transition to civil society. The ILO also desires to work with the Ministry of Labour, Employment and Social Security and the Ministry of Industry particularly in capacity and policy development. One possibility is assisting in improving labor market information systems. A matrix of development partner effort in TVET is provided in Table 5.

30. Myanmar and Singapore have an agreement whereby Singapore will provide priority assistance in three priority areas including public administration, economic development and human resource development.²⁶ The help will cover every aspect of economic development, from macroeconomic policy to investment and trade facilitation, as well as central banking and banking supervision. The banking sector is being provided support by the Singapore government to build its capacity. United Overseas Bank (UOB) and Overseas Chinese Banking Corporation will train bank staff from government and private banks in the country and successful graduates will be awarded certificates that are said to have international recognition.

31. UNDP are supporting the informal sector with a microfinance project. The UNDP microfinance project in Myanmar is currently servicing more than 440,000 clients, of whom 97% are women.²⁷ This constitutes 92% of microfinance clients and 93% of the total portfolio in Myanmar microfinance sector. Coverage of microfinance however is inadequate as only 46 townships out of 330 are serviced by the entirety of microfinance schemes.

32. The Korea International Cooperation Agency (KOICA) is assisting the Ministry of Industry's Industrial Training Centre as well as supporting the Asian Cyber University Network.

²⁶ ASEAN-China Free Trade Area. . 2012. Myanmar President's Singapore visit opens up new chapter of bilateral ties. <http://www.asean-cn.org/Item/4502.aspx> (accessed 30 December).

²⁷ UNDP. <http://www.mm.undp.org/HDI/MICRO.html> (accessed 2 January).

Table 4: Matrix of Development Partner Support to the Higher Education Sector

	Policy and Legislation	CESR	Teacher Education	ASEAN UNIVERSITY NETWORK-KEY - Engineering	Centre of Excellence in Business	Yangon University- Law, International Relations Archaeology	E Libraries
ADB							
AusAID							
British Council							
JICA							
Open Society							
UNDIP							
UNESCO							

Source: Interviews

Table 5: Matrix of Development Partner Support to the TVET Sector

	Policy and legislation	CESR	Retraining Child Soldiers	Specific Institutions
ADB				
AusAID				
ILO				
GIZ				
UNESCO				
ILO				
KOICA				

Source: Interviews

5. Financing Education and Training

33. In 2011-12, only 4.8% of the Government budget was allocated to education (Ministry of Education only) constituting only 0.78% of GDP. For 2012-13, the share of Government budget allocated to education is projected to increase to 5.08%, when it will account for

1.43% of GDP.²⁸ The total amount allocated to education will of course be slightly higher when the expenditure in all other government ministries on higher education and TVET is taken into account. Government finances are a major limiting factor. Further allocations to the education sector can only occur through reallocations (e.g. reduction in defense expenditure) or through increased revenue. An IMF assessment of Myanmar is that it is in debt distress, with the overall debt in 2012 of 47.9 % of GDP at non present value (footnote 6). Although the debt situation is improving, Myanmar is currently heavily dependent on revenue from non-renewable resources. There is however the potential to increase the level of taxation through sales tax.

B. THE MYANMAR LABOR MARKET

1. Basic Labor Market Data

34. The last labor force survey was published in 1990 hence details of the current situation are limited. The total labor force is estimated (2011) to be 32.5 million people.²⁹ Data from 2010 indicates that women constitute 46% of the labor force with 70% of participating in the labor force.³⁰

35. The most recent data on the labor force is provided from the Integrated Household Living Conditions Survey (IHLCS) report of 2011. There are some limitations given that this is a sample. The data is provided in Tables 6 and 7 which also provide some comparison with data from 2005.

²⁸ Japan International Cooperation Agency (JICA). 2012. *Data Collection Survey on Education Sector in Myanmar*. Draft Interim Report, Table 2.4.

²⁹ Aung, W. 2012. Business Opportunities in Myanmar.

www.asean.or.jp/ja/invest/about/.../2012/.../U%20Win%20Aung.pdf (accessed 5 December).

³⁰ United Nations. Undated. Work: Labor Force Participation, Unemployment and Economic Data of Employment.

<http://unstats.un.org/unsd/demographic/products/Worldswomen/Annex%20tables%20by%20chapter%20-%20pdf/Table4Ato4D.pdf> (accessed 30 December).

Table 6: Employment by Employment Status

Employment Status	2011 Report Data			2005 Report Data Total (% of total)
	Male (% of male workforce)	Female (% of female workforce)	Total (% of total workforce)	
Employer	6.4	4.1	5.4	9.1
Own Account Worker	40.9	39.8	40.4	36.4
Employee	18.7	18.3	18.5	17.6
Member Producers Cooperative	0	0	0	0.2
Contributing Family Worker	11.5	18.5	14.5	16.9
Casual Laborer	19.0	16.6	18.0	15.9
Workers not otherwise classified	3.5	2.7	3.2	3.9

Source: Ministry of National Planning and Economic Development (MNPED) et al. 2011. *Integrated Household Living Conditions Survey (2009-2010). Poverty Profile*. Nay Phi Daw. p. 39.

36. In some of the data above there are significant differences between the rural and urban areas. Casual laborers and contributing family workers constitute respectively 21.2 % and 16.1 % of the rural workforce but respectively only 7.7% and 9.4% of the urban workforce. Employees constitute 36.2 % of the urban workforce but only 12.9 % of the rural workforce. Although a low percentage of rural workers are employees, 24% of the rural population are landless. The average farm size of 6.7 acres (2.71 hectares) is deemed to be moderate by South East Asian standards.

37. Prevailing conditions in Myanmar have not favored a strong formal sector. Consequently most people are employed in the informal sector. One estimate of the informal sector is to summate all those classified as own account workers, contributing family worker and casual laborers using IHLCS data. This estimate is respectively for urban and rural areas, 54% and 79%. Data based on a 1996 survey of establishments and hence urban based concluded that 54% of the workforce are in the informal sector and that a slightly higher percentage of women are involved over men.³¹ Many people in agriculture also engage in other informal sector activities. A survey of seven villages found approximately one quarter of income was derived from non-agricultural informal sector

³¹ Amin, N. 2002. *The Informal Sector in Asia from the Decent Work Perspective. Working Paper on the Informal Economy*. Geneva: ILO.

activities.³² The informal sector when the agriculture sector is excluded is comprised of street hawkers, rickshaw drivers, waste pickers, home based workers, construction workers and informal manufacturing (footnote 31). In Yangon visible examples of the informal sector include roadside eateries, roadside sellers of fruit, vegetables, flowers, garments and phones, car tire fitters, car exhaust fitters, producers of processed food items and betel nut stalls.

38. Agriculture is still a major livelihood for most people. This is likely to decline over time as people seek better opportunities in manufacturing and other sectors. Already there are indications that there is a decline in the availability of casual laborers as they seek opportunities elsewhere including other countries resulting in a demand for higher wages (footnote 17). The level of indebtedness of many farmers and low returns has the potential to reduce further the percentage of the workforce engaged in agriculture.

39. A comparison of data from 2005 and 2010 in Table 7 shows that the percentage share of people employed in manufacturing declined. However the lifting of sanctions and significant infrastructure development may stimulate further employment in manufacturing in the medium term future.

40. There is limited data on employment in specific industry sectors. Additional data from interviews indicated the following: the garment industry has 156,000 employees including Koreans and Japanese who occupy technician levels; the wood processing industry has a workforce of 9,000. Assuming each industry sector's share of the workforce in 2011 is the same as that in 2010, an estimation of the workforce in specific industry sectors is as follows: construction (1.4 million); manufacturing (1.9 million); hotels and restaurants (422,000); retail and wholesale trade (3 million). An estimate of the number of employees in licensed hotels in Yangon, Mandalay, Bagan and Thanintharyi is 18,780.

41. Labor participation rates are high at 67% with respective rates in the rural and urban sectors at 70% and 60%. Estimates of unemployment from the ILHCS are around 2 % although other sources place this at around 4%.³³ However underemployment rates are high especially in rural areas (38 %). Data from the ILHCS indicates it is 37% of the working population and is more prevalent among females (41%) than males (35%). Underemployment is seasonally related.

³² Kaino, T. 2007. Rural Credit Market in Myanmar. A Study of Formal and Non-Formal Lenders. *Asian Journal of Agriculture and Development*. 4(1). pp. 1-15

³³ World Bank. 2012. *Myanmar at a glance*. <http://devdata.worldbank.org> (accessed 9 December 2012).

42. Businesses as elsewhere are often gender dominant. For example, the garment industry has largely a female workforce. In the plantation sector, the workforce can be up to 70% female. Engineering works however are largely male dominant. Senior positions in all industries are largely male. Employers have a preference to recruit women to office positions. The Myanmar Women Entrepreneurs Association has 1600 members all of whom either run businesses or are in senior or professional positions. There are however approximately one million senior level positions using the percentage share of different occupational groups from the 1990 labor force survey. Although these figures are only a guide, they illustrate the low level of participation by women in senior levels. Much of this is cultural and is changing especially by government advocacy for greater participation of women at all levels.

43. Labor market data from 1990 indicates approximately 2.8% of the workforce are professional level, 2.0% are technician level and 11.7% are trade level.³⁴ Using these figures as a guide, an estimate of the number of professionals and trade level workers in key industries is provided in Table 8. Discussions with industry representatives however revealed large differences in the percentage of skilled to unskilled. Figures ranged from 5% to less than 50%. The variation is most likely due to how individuals define skilled staff. This suggests that businesses may have limited means of differentiating the levels of skills held by staff. There was general agreement however that most manufacturing businesses largely recruit unskilled people and then train them on the job. Difficulties are sometimes experienced because of the poor schooling employees have received. The lack of visible specific technical skills training means there are no benchmarks against which to classify staff and hence no systematic means for workforce development in an industry. The development of national qualifications can assist here provided they reflect jobs and functions rather than curriculum.

³⁴ Department of Labour (DOL), Myanmar. 2011. *2009 Human Resources Development Indicators*. Nay Pi Daw: Ministry of Labor, Employment and Social Security.

Table 7: Distribution of Workforce in Economic Sectors

(% Share)

Economic Sector	2011 Report Data			2005 Report Data Total (% of total)
	Male (% of male workforce)	Female (% of female workforce)	Total (% of total workforce)	
Agriculture, hunting and forestry	52.3	47.4	50.2	50.2
Fishing	3.2	0.7	2.2	2.8
Mining & Quarrying	2.2	0.7	1.6	1.2
Manufacturing	5.0	7.2	5.9	7.4
Electricity, Gas and Water Supply	0.7	0.2	0.5	0.3
Construction	6.1	1.1	4.0	2.7
Wholesale and retail trade, repair of motor vehicles, motorcycles, personal and household goods	8.0	13.9	10.5	11.6
Hotels and restaurants	1.3	1.4	1.3	0.9
Transport, storage and	6.1	0.7	3.8	3.3
Financial intermediations	0.1	0.3	0.2	0.2
Real estate, renting and business activities	4.1	10.8	7.1	5.8
Public administration and defense, compulsory social security	1.5	1.1	1.3	2.0
Education	1.0	4.9	2.7	2.0
Health and social work	0.6	0.8	0.7	5.6
Activities of private households as employers & undifferentiated production activities	7.3	8.7	7.9	1.5
Extra territorial organizations and bodies	0.1	0.1	0.1	0

Source: Ministry of National Planning and Economic Development (MNPED) et al. 2011. Integrated Household Living Conditions Survey (2009-2010). Poverty Profile. Nay Phi Daw. p. 36.

Table 8: Estimate of Numbers of People at Different Skilled Occupational Levels

Occupational level	Key Industry Sector		
	Construction	Manufacturing	Hotels and Restaurants
Professional	39,000	53,000	12,000
Technician	28,000	38,000	8,000
Trade	163,800	222,000	49,000

Source: Study

44. Low income is a push factor in Myanmar resulting in citizens seeking work in other countries which provide a pull factor in the comparatively higher wages provided. There is no accurate data available as many Myanmar citizens are not processed through formal channels. The long border with Thailand particularly allows people to move informally from one nation to the other. Many companies have established businesses on the Thai side of the border to take advantage of low wages and lower costs of living than in main Thai cities. One estimate is that approximately 10% of the Myanmar population are working in other countries especially Thailand.³⁵ Estimates of Myanmar citizens in other countries are provided in Table 9. Interviewees commented on the problems of attracting and securing fully skilled labor given the pull factor of higher wages in other countries.

Table 9: Immigrant Myanmar Labor Force

(No. of Immigrants)

Country	Officially Registered	Estimates of Real Numbers
Thailand	1,450,000	2,000,000 – 4,000,000
Malaysia	150,000	Up to 500,000
Singapore	-	100,000 – 200,000
Japan	8,577	7,000 -15,000
Korea	6,309	4,000 – 10,000
PRC, India, Indonesia	-	No estimates

Source: Win, M and Naing, K. 2012. Job Creation and Skill Development by Border Area Development between Myanmar and Thailand. Presentation at ILO/JICA workshop on Skills Development in the Thai-Myanmar Border Areas. Yangon. 29 November.

³⁵ Hall, A. 2012. *Myanmar and Migrant Workers: Briefing and Recommendations*. Bangkok: Mahidol Migration Centre Institute for Population and Social Research.

2.Labor Market Systems and Programs

45. The only labor market information collected comes from offices of the Department of Labour. Individuals who are out of work can express interest in any vacancies referred to the offices by employers. Hence the data available is entirely restricted to areas where the Department has offices and to the vacancies referred to the offices by employers. No labor programs were visible.

C. EMPLOYMENT DEMAND FOR HIGHER EDUCATION AND TVET GRADUATES

1. Introduction

46. Information on the demand for higher education and TVET graduates has been gathered from representatives of industry associations, professional associations and enterprises. Many industry associations are affiliated with the Union of Myanmar Federation of Chambers of Commerce and Industry (UMFCCI) which functions as an employer peak body. The objectives of UMFCCI are in broad terms to act as an advocate for the private sector especially in terms of their interests in government policy formulation and to lead the Myanmar business community into the globalized economy. Membership includes 53 business and industry associations, 18310 Myanmar companies, 1742 Enterprises, 800 foreign companies and 235 cooperatives.

47. Industry associations were initially established by the government with government appointees to act as intermediaries between specific ministries and industry. Now they are reoriented in focus as advocates for the industry to government ministries and elect their own officials. Generally they look to orient government policy towards the interests of their members. The Travel Industry Association has a membership of 500 companies involved with tourist ground handling, travel agencies and tour operators. The Myanmar Timber Merchants Association has 383 individuals and 1034 companies as members. The Myanmar Agro Based Food Processors and Exporters Association has 300 members.

48. Professional associations advocate for the employment interests of people in specific occupations. Members can both be employers and employees. Typically they have an interest in regulating who can practice in their occupational area but also advocate for members in areas of government policy that affect them. Entry to a professional association can vary from a requirement to possess specific qualifications through to verifiable

competencies and exams. In some cases, such as Myanmar Engineering Society, there are different classes of membership in order to define distinct levels of skill and responsibility. This assists differentiating between junior, certified professional and technician (or paraprofessional) levels and who in the case of engineers, can call themselves an engineer. Myanmar Engineering Association has over 31,000 members of whom over three thousand are classified as “members” and two thousand are classified as “associate members”. Over 12,000 and 13,000 respectively are “junior” and “student members”.³⁶

49. International recognition is increasingly important with engineering societies tasked with determining who has reached a satisfactory level for certification. The ASEAN Engineers register is an important step for engineers in Myanmar to be able to work in any other ASEAN country. Applications must be made through the relevant engineers society of the given country such as the Myanmar Engineering Society. Two major registers exist for international recognition but Myanmar is not a member under these agreements. One is the APEC Engineering Register (which includes the US, Australia, Singapore, Malaysia and Thailand) and the International Professional Engineers Agreement (which includes the US, UK, Malaysia, India and Singapore).³⁷ In addition, there are two international agreements for the recognition of university engineering qualifications namely: the Washington Accord and the Sydney Accord. Although other ASEAN nations are members of these agreements, Myanmar is not. The Myanmar Engineering Society thus has a major quality assurance task with universities in order that the standards are raised for transportability of qualifications.

50. The creation of the ASEAN Economic Community by 2015 will involve the free movement of skilled labor across the member countries. This will require the existence of significant recognition of qualifications. The development of an NQF and the ASEAN Universities Network (AUN) are major steps in this process. However progress to date is limited. Only two universities, namely Yangon University and the Yangon Institute of Economics are members of AUN. The hospitality and tourism sector however has made significant progress towards a regional system of mutual recognition called the Mutual Recognition Agreement which will be assisted by regional qualifications, competency standards and curriculum.

³⁶ Myanmar Engineering Society. 2012. Membership. <http://www.mes.org.mm/membership.php?count=> (accessed 27 December).

³⁷ International Engineering Alliance. 2012. Website. <http://www.washingtonaccord.org/emf/> (accessed 23 December)

2. Training Role of Professional Associations and Industry Associations

51. Professional Associations and Industry Associations usually have an educational role which extends from formal courses to informal addresses, conferences and seminars to help improve professional practice. Both types of institutions are involved in training that bridges the gap between the academic knowledge possessed by graduates and the skills and knowledge that makes them work ready. The associations may directly run the training or they may give a preference to specific providers of training.

52. The Myanmar Gems and Jewellery Association (which has 20 members) has a small training school for their members providing theory and some practical training in cutting gems. The Myanmar Timber Merchants Association (1400 members) runs a short course on timber machining. Other training schools are operated by the Myanmar Industries Association and the Myanmar Garments Association. The UMFCCI provides work orientation and management training to the staff of all the chambers generally on a weekend. The Myanmar Women Entrepreneurs Association is conducting training for women generally in the informal sector. The Myanmar Hospitality Professionals Association runs seminars three times a year and short courses for hotel staff to upgrade themselves.

53. Preferred industry training providers include Columbus Travel Agency for travel operations such as reservations and ticketing using systems that are commonly found in travel agencies (for example Global Distribution Systems).

54. Some training is sourced internationally. A Singapore based provider is a preferred supplier of between two to four weeks upgrading training (such as tourism management and destination marketing) for those in travel agencies. The Malaysian Timber Industry Board is providing training to the Myanmar Timber Merchants Association in timber processing and finishing technology (including wood identification, grading, machining furniture design drawing). The UMFCCI is accessing the services of the Thai Chamber of Commerce which has its own university offering master's degree programs.

55. The Computer Professionals Association which has 10,000 registered members, conducts one to two month programs and exams for individuals wishing certification for ITPEC (ASEAN recognized certification). It also conducts training and exams for those wishing to gain membership of the association. Similarly, the Myanmar Engineering Society

runs programs and exams for those wishing to graduate through the various levels for certification purposes.

56. The Accountants Association has been conducting a training school for accountants since 1937. The courses are conducted in the weekends over three years. Even those who have studied aspects of accountancy in higher education institutions, such as the Institute of Economics, must still undertake the Association's course to understand Myanmar terms. Admission to the various grades of accountant is achieved through exams conducted by the association.

57. Individual enterprises also conduct their own training. Training at the Summit Park View Hotel includes hygiene, grooming, customer service, communication and cashier training. DAWN (AH YONE OO) Construction Co. Ltd. has a training program for all new engineering graduates. The Italian-Thai Development Public Company Ltd. (ITD) runs one day per week, three month computer training at Dawei as well as Thai language.

58. Farmers generally do not undertake vocational training in institutions but can seek information from the extension services of the Myanmar Ministry of Agriculture and Irrigation.

3. Linkages of Professional Associations and Industry Associations to Higher Education and TVET.

59. Professional associations appear to have much stronger linkages to higher education than they do to the TVET sector. This is consistent with a desire to regulate admission to the highest levels of membership to those with significant qualifications. Examples of linkages provided in the survey included: a professional association member being chair of the council of a Higher education institution; industry personnel training Ministry of Education staff in IT; industry personnel lecturing in institutions and advice sought on curriculum content. Overall however the influence of professional associations with higher education is not robust. However some associations such as the Myanmar Engineering Society can apply strong leverage in encouraging universities to adhere to regional standards such as the ASEAN Engineering Register up to the degree that the universities have the resources to do so.

60. There are also linkages between Industry associations and higher education in so far as the former are involved in advising on curricula. However information provided in the study showed that there was no follow up to the advice provided or a reluctance to accept

such advice or to accept advice that largely fitted with a predetermined scheme. In an example given, two ministries conceived and developed a bachelor degree program with limited industry involvement. While a bachelor degree program is desired by the industry, the overall programs outcomes do not match industry needs.

61. Government ministries appear reluctant to engage the private sector. In turn, the private sector has no real experience in how to apply leverage on the public sector in assisting in their skill performance strategies. Industry shows evidence through the programs set up, on the job training, engagement with private training providers and training committees that it has significant interest in training. Industry is largely unaware of any government training below bachelor degree and diploma programs. Interviewees were of the opinion that former technical schools no longer exist. Whatever can be defined as TVET is largely invisible.

62. Private sector representatives generally regarded the education and training sector to be deficient in its approach to learning by emphasizing rote learning of given textbooks. A few representatives particularly contrasted management training in Myanmar and elsewhere. In Myanmar, the emphasis is on learning a set of management theories. Elsewhere, it is about making management decisions. There is an industry acceptance that the quality of graduates is poor and that employers must provide initial training. Attrition is high as some graduates fail to adjust. It has also been found that performance in an education and training institution has no bearing on the workplace adjustment process. A general failure of the training and education system has resulted in industry increasingly being interested in dealing with private institutions.

63. The overall design of programs is undertaken largely in isolation to industry. Design is largely a process where government industries meet and make decisions about programs based on what they think industry needs. Partly due to a lack of real experience in industry, a preference for creating bachelor degree programs and a knowledge about programs elsewhere results in theory oriented programs that fail to meet the reality of the workplace. An example was given where industry had found a one year Diploma program did not provide the skills they require. The response was simply to create a bachelor degree program which although longer, still did not adequately address the needs.

4. Supply and Demand for Higher Education and TVET Graduates

64. A major supply problem is that graduates are not work ready. Graduates have knowledge but have difficulty applying the knowledge because the learning process in institutions is largely at the low levels of the cognitive domain. A major causal factor of poor educational outcomes is that the teachers themselves lack any significant industry experience and hence themselves lack any experience in performing skills and applying knowledge. A lack of physical infrastructure, curriculum and printed resources compounds the problem. Nor do university programs have any form of internship so that students are better acquainted with the nature of the industry and the occupation. Another factor is the low level of input industry has in the design of programs. The dominance of ministries in the design of programs often means that the design is largely determined by those with outdated knowledge of an industry but without past and current experience in an industry.

65. There is a general shortage of skilled workers at all levels. This is not due to an inadequate supply of graduates but largely an issue of retaining staff with the skills and knowledge in demand. A shortage particularly exists with experienced personnel. There is an overall shortage of IT professionals with a specific shortage of project managers. The furniture industry lacks people who can create new designs. The garment industry has to use Japanese and Koreans as production technicians. There is an overall shortage of skilled people in the light manufacturing sector including senior staff with management ability. In the construction sector there are shortages of experienced engineers as well as those occupations involved with electrical and mechanical work of building services. The hotel sector has shortages of skilled maintenance personnel and chefs. The problem of shortages of skilled personnel is magnified by skilled staff seeking higher paid work in other countries. A case was cited where one restaurant lost 90% of their staff over twelve months. In regional areas shortages can be acute. The Italian-Thai Development Public Company Ltd. reported difficulties at Dawei in recruiting lawyers, registered nurses, IT specialists and agriculturalists

66. There are significant skill gaps where foreign workers will be the only possibility in the short to medium term. There however is some resistance to hiring foreign workers despite the reality that local capacity is low. The general isolation of Myanmar also means that local businesses may not also have fully grasped the magnitude of change that is required. Meeting international requirements such as occupational health and safety as well as the environment were reported as a challenge to the workforce. Foreign investment although not increasing in some sectors, is viewed with some concern particularly with the prospect that they may pay higher salaries and hence poach the current skilled workforce.

67. Given the mismatch between supply and demand, industry has to invest in their workforce using a combination of on the job training and courses, some of which are held in the weekend. There is therefore a cost factor for industry in firstly making employees job ready and secondly building their proficiency. An estimate for computer professionals is that it might take six months for a graduate to become useful but up to two years to achieve a professional level of practice.

68. A major problem for employers is that their investment in training new employees is often lost as employees leave. Because the training period is an employee low productivity phase, naturally a low wage is paid. However dissatisfaction with the low wage and the nature of the work, employees leave for alternative employment which might be in other countries. Graduates usually lack a career plan beyond achievement of the qualification and hence have a major adjustment period from participation in the world of education to participation in the world of work. Turnover of IT graduates is very high as they seek more lucrative careers or return to the education sector as teachers. An estimate of the attrition rate of IT professionals is around 90%.

69. An estimate of the time for engineering graduates to be of value is between two to three years and up to five years to be able to take full responsibility. Interviewees generally indicated that they accept that new civil engineering graduates have no technical or work sense and in some cases accommodate this through putting them through an in-house training program.

70. Another demand issue is the absorptive capacity of industry for higher education graduates. The education and training sector has placed an emphasis on bachelor degrees and diplomas at the expense of lower level qualifications despite the reality employment will largely be in the lower level positions. There is simply not the number of vacancies for professional level jobs to absorb the comparatively large number of higher education graduates. Graduates are likely then to seek technician or lower level positions for which they then need additional training. In the case of IT, many local businesses are small and given limitations to electricity supply and the internet, there has been limited uptake of computer networks. Consequently there have not been strong demands for ICT professionals. However foreign companies which have an increasing presence tend to seek ICT support and offer above average wages for proficient staff.

71. There are approximately 12,000 engineering and architecture graduates each year but vacancies are limited (footnote 34). Without any work placement for the duration of the courses, new graduates are not attractive to employers. However those who find work in the construction industry may be able to use this experience to ultimately competitively gain a position as a junior engineer under training.

72. The post-secondary education landscape is typified by a large number of institutions offering largely theory based programs. Consequently there is little differentiation between institutions. The largely undifferentiated post school education and training system is also mirrored by what appears to be a lack of job definition in enterprises. Interviewees in this study generally talked in general terms such as skilled or unskilled without specifying specific functional areas. A lack of skills by most newly recruited employees and the reality that most end up performing functional roles through on the job training does not foster recognition of the comparative level of skills required for different job functions. Interviewees also commented on how strikes are becoming an increasing problem. This suggests that enterprises could gain substantially by defining their job tasks, providing incentive payments for specific tasks and developing training plans for staff to access these positions.

73. The informal sector generally lacks business skills (e.g. determining demand and supply) and related technical skills to the products being sold. There is also a lack of creativity in the products being marketed so that people copy existing products rather than create new products. Lack of access to microfinance also limits most people in starting businesses.

74. The agriculture sector suffers from low productivity due largely to not employing modern techniques and inputs such as high yielding seed. One key factor in productivity is the training of farmers in modern techniques. However there is evidence that the main trainers of farmers, the agricultural extension service officers themselves lack both technical and modern extension methodology expertise. A survey of extension officers revealed that more than 50% of the respondents indicated “very much needed” and “quite needed” additional training in extension education, crop technology, market information and plant protection.³⁸ One view is that extension work needs to shift from top down approaches to participatory strategies to make the overall effort more effective (footnote 17).

³⁸ Cho, K and Boland, H. 2004. Agricultural Training in Myanmar: Extension Agents' Perceptions of Training Needs. *Journal of International Agricultural and Extension Education*. Vol 11(1). pp. 5-15.

5. Labor Force in Specific Enterprises

75. An example of the workforce of a significant Myanmar construction is provided by DAWN (AH YONE OO). Their workforce in total is about 1500 including current contracted labor. They have core staff and subcontract unskilled and skilled labor. Core staff include 35 civil engineers, 9 mechanical engineers, 1 petroleum engineer and five electrical engineers all with bachelor and above degrees. A further 173 core engineering staff (without bachelor degrees) perform at the level of engineer or technician. The organization has seven departments, four of which are administrative in nature (with a total of 21 functional areas). The other three departments are contracts and tenders, project and construction and design. Functional areas include; architecture; surveying; quality surveying; maintenance repair & decoration; soil testing; maintenance engineering; procurement; and site engineering. The need for personnel at skilled worker level is evident because of their inventory of heavy equipment which includes: cranes, pile driving machines, concrete batching plant, heavy mobile vehicles, trucks and workshop machines.

76. In contrast to DAWN, Dynamic Engineering Group has no more than ten permanent staff some of whom are engineers. They primarily project manage, employing a range of construction sub- contractors to undertake whatever projects they manage to win.

77. ITD is a significant international construction company. There are currently 1300 staff (including 240 female staff) in total working at the Dawei SEZ comprising local, locally contracted staff as well as non-Myanmar staff. Occupations currently employed include: surveyors (69), civil engineers (66), mechanical engineers (4), electrical engineers (2), survey engineers (5), environmental engineers (2), mechanics (63), carpenters (177), welders (51), electricians (8), blacksmiths (6), technicians (40) and laboratory staff (12). There is a dominance of non-Myanmar staff in the highly skilled areas.

78. The Summit Park View Hotel has approximately 250 staff of whom 170 are male. Key skill areas are the kitchen with about 35 staff (including 2 executive chefs and 6 supervisors) and maintenance with 30 people. The sharp increase in the number of tourists has placed substantial demands on staff achieving international rather than local standards.

6. Training Needs for Border Areas

79. Information from the Department of Labour provides an overview of the key skill areas of the border areas (Appendix 3). It strongly reflects the key national economic growth

sectors of garments/ textiles, civil infrastructure, building construction and tourism. It is useful then as a sample of key national skill requirements.

7. Overcoming the Mismatch Between Demand and Supply

a. Education and Training Reflecting the Needs of the Labor Market

80 To meet the needs of the labor market there must firstly be data about jobs. However, there is no systematic analysis of the Myanmar labor market to the level of the international occupational classification system ISCO 08.³⁹ To assist educational planning it would be useful if enterprises were able to define their workforce more accurately so that the training system can then target those functional areas that are in shortest supply. Better definitions of the workforce will also be a fundamental requirement of a labor market information system especially in data collection. A start to this process is being made by the National Skill Standard Authority (NSSA) which has firstly classified 179 jobs and secondly developed standards for them. Appendix 5 contains a list of jobs in the construction, tourism and manufacturing sectors.

81 Fundamental to a demand driven system is accurate information about the skills required in enterprises. Only industry has accurate knowledge about this. Given the introduction of a national qualification framework (NQF) in Myanmar, industry should play the lead role in defining national qualifications and their associated units of competency. To expedite the process, it is desirable that a few key sectors are targeted and the units of competency kept as simple as possible. The existing industry and professional associations should be used to make decisions in this process rather than ministries.

82 The key value of an NQF is compelling training to be demand driven and thus address the functions employees are expected to perform. The process of accreditation is fundamental to achieving the latter. Consequently the process of accreditation of courses should result in only in those courses that address national qualifications being registered.

83 Courses should fit the needs of the industry sector and the nature of the training. It was reported that there are no problems in training on the job civil construction workers below professional/ paraprofessional levels. In this case, short Induction programs are likely to be of value. These programs could provide some in depth knowledge about international

³⁹ ILO. 2008. *ISCO 08*. <http://www.ilo.org/public/english/bureau/stat/isco/isco08/index.htm>

level standards, introduce students to some theoretical aspects of equipment and construction design, develop skills in plan interpretation and generally prepare students for life-long learning. In the case of mechanical and electrical programs, these should be job specific in nature, have a duration of no more than 12 months but have an effective balance of theory and practical.

b. Shifting to Learning Compatible with the Knowledge Age

84. The approach to learning that takes place in the education and training sector needs to be substantially changed to address the needs of the knowledge age rather than the industrial era. Appendix 4 provides an overview of the differences between industrial and knowledge era enterprises. The approach to learning in Myanmar currently reflects an industrial era philosophy such as centralized curriculum including textbooks and conformist training that is repeated year after year.

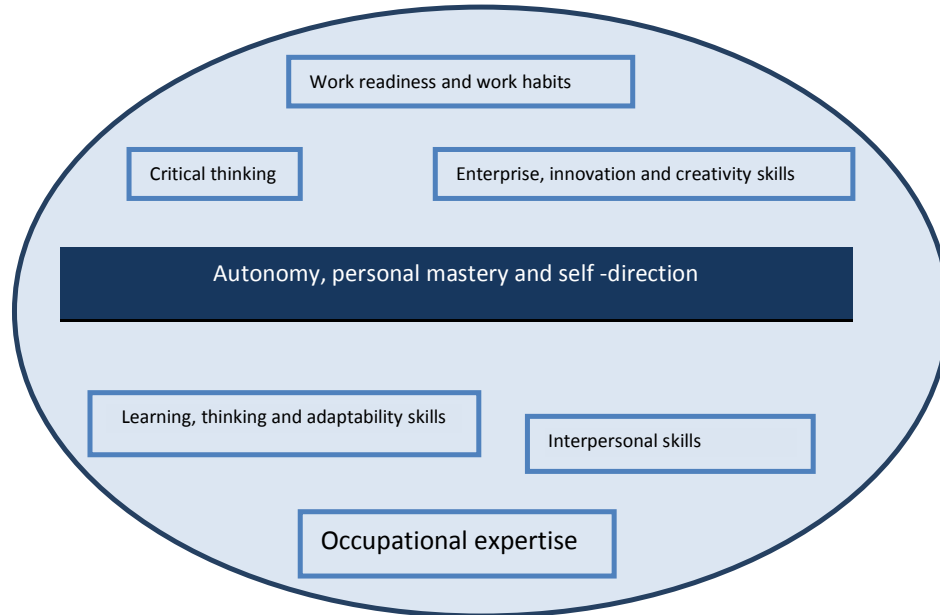
85. Many countries have reacted to the changing nature of the workforce by substantially changing their education and training systems. National qualification frameworks (NQFs) and national qualifications have been a major mechanisms used to transform training. However the benefits of NQFs require a compatible change in the approach to learning so that the full benefits can be realized. Otherwise it is akin to attaching a jet engine onto a biplane.

86. One of the dominating factors of industrial era learning is curriculum which can include set texts. Curriculum has its origins in *Taylor's principles of scientific management*, a basis for organization of the industrial era workplace. A production model of vocational education emerged based on the structure of factory production.⁴⁰ Like a factory process, a student was regarded as raw material that became a finished product, the skilled worker. Just as factories under scientific management had standardization of jobs, education adopted standardization of curriculum and teaching method.⁴¹ Just as standardization and stability are the hallmarks of industrial era learning, the knowledge age requires flexibility and loose-tight properties.

⁴⁰ Kliebard, H. *Bureaucracy and curriculum theory*. and Cremin, L. *Curriculum Making in the United States*. In W. Pinar (Ed.), *Curriculum theorizing. The Reconceptualists*. Berkeley, CA: McCutchan Publishing Corporation.

⁴¹ Kincheloe, J. 1995. *Toil and trouble*. NY: Peter Lang.

Figure 1: Capability of a Knowledge Age Worker



Source: Brady, P. 2005. *A Curriculum Design Framework For The Transition From School To Work Within The Urban Post-Industrial Economy Of Australia*. Ph.D. thesis. Macquarie University, Australia. Adapted from *Review of Research, Generic Skills for the New Economy* (p.52) by P.Kearns, 2001, Adelaide: NCVER.

87. A knowledge age approach to planning vocational education requires a different approach to centralized curriculum development. In the Myanmar situation curriculum guidance is certainly required but it needs to be a flexible approach to assist an instructor facilitate the delivery and assessment of competency standards. Part of this approach involves teachers developing their own curriculum.

88. A major focus should be on what is a knowledge age worker. One perspective on this is provided in Figure 1. A very different capability is required in a post-industrial or knowledge economy to that of the industrial era economy. The major difference is in the level of creativity and decision making that the individual must perform due to the changed nature of enterprises. Simply facilitating the learning of theory from a textbook will not achieve this level of capability.

D CONCLUSIONS AND OPTIONS

1. Conclusions

89. The conduct of phase 1 provides some experience to base the detailed analysis under phase 2. Gathering data and information is difficult as decades of isolation prevented people from gaining experience in the transactions of the global economy. Engagement with private and public organizations in Myanmar is difficult because of: the hierarchical nature of organizations; limited English; the internet does not function well; the need to provide formal letters; and, general reluctance to provide appointments and disclose information. In the short term, the large level of interview requests by foreign organizations lured by the opening up of Myanmar's economy is also straining the capacity of those few people who act as spokespersons. The capacity of people and organizations is also limited so that a lot of information is simply not available. The difficulty of engaging both the private and public sectors cannot be underestimated for any in depth analysis.

90. There is limited engagement by private industry in the education and training sector. Decisions about what courses are offered and the design of the programs appears to be largely undertaken by government ministries.

91. There does not appear to be generally a supply problem from the education and training system. However there is a mismatch between the performance sought by industry in their workforce and the outcomes from the education and training sector. The outcomes from various levels of post school programs are people who have a substantial level of knowledge (which may be dated or irrelevant) but lack practical application of that knowledge as well as practical skills. Many graduates are reluctant to undertake manual work. Graduates are not work ready and require significant work experience and further training to achieve the performance required in workplaces.

92. There are three key economic growth sectors. The most fundamental is construction because without adequate investment in this sector, there will not be the infrastructure to support other sectors. Tourism is the next most important sector which be driven by external demand. However it will suffer limitations if hotel supply fails to meet the demand. The other sector is light manufacturing including garments. Expansion of this sector will be dependent on investor confidence and infrastructure development.

93. Agriculture remains an important sector because of its current and potential export value, food security and the large percentage of people employed in the sector. Productivity however remains a major problem. Agricultural extension through training farmers in better practices is one means to help achieve greater productivity. There are indications however that agricultural extension officers lack technical expertise as well as capability in modern approaches to extension.

94. The informal sector is much larger than the formal sector in terms of those who are employed. Legal factors impede the development of the formal sector. There is limited labor market data on both the formal and informal sectors.

95. Higher education and TVET are largely undifferentiated from each other. Similarly there does not appear to be any systematic differentiation of the labor force across enterprises.

96. Given the limitations of government education and training provision including the available funding, quality assured private training provision should be encouraged and fostered.

2. Options

97. Prepare a plan for specific occupation training up to National Skill Standard Authority Certificate 3 level for industry selected occupations (see list in Appendix 5) in 1-3 of the following industry sectors: construction, tourism, manufacturing. This will require; a selection of the sectors and sub-sectors; an analysis of current training in the sector/s and subsectors; and a strategy for meaningful industry engagement. In the case of hospitality this could address qualifications from Certificate II to Advanced Diploma of the ASEAN Common Competency Standards for Tourism Professionals and according to the requirements of the ASEAN Mutual Recognition Arrangement for Tourism Professionals.

98. Prepare a plan to build the capacity of two higher education institutions outside the ASEAN network to provide training to ASEAN standards for industry selected professional level occupations relevant to the construction and manufacturing sectors such as civil, mechanical, electrical, electronics, chemical and production engineers. The plan will encompass all requirements needed by the Myanmar Engineering Society for registration on the ASEAN Engineers Register.

99. Prepare a plan to upgrade the training under the Ministry of Agriculture and Irrigation at the University of and the seven SAls.

Appendix 1

Table A1: Persons Interviewed

Fuchsia Hepworth, Assistant Programme Specialist Education, UNESCO
Aung Aung, Chair Administration Committee and Treasurer Yangon Region Computer Professionals Association
Piyamal Pichaiwongse, Deputy Liaison Officer, ILO Liaison Office
Naung Naung Han, Secretary General , Union of Myanmar Travel Association
Myint Soe, Chair, Garment Manufacturers Association
Aye Han, Chief of Staff, Myanmar Gems and Jewellery Association
Barber Cho, Joint Secretary General, Myanmar Timber Merchants Association
Aye Win, Myanmar Agro-Based Food Processors and Exporters Association
Zaw Min Win, Chairman, Myanmar Industries Association and Myanmar Food Processors and Exporters Association
Aye Tun, Joint Secretary, Myanmar Industries Association
Kyaw Thane, Secretary Human Resource Development Committee, Union of Myanmar Federation of Chambers of Commerce and Industry
Ye Aung, Director, Tin Ye Win Manufacturing Co. Ltd.
Naoko Kitadate CESR and Aid Coordination JICA
San Wei, Head, Myanmar Accountants Association Training School
Lwin Lwin Win, Deputy Director, DAWN (AH YONE OO) Construction Co. Ltd.
San Pe, Director Engineer (Design and Q.S) DAWN (AH YONE OO) Construction Co. Ltd.
Win Htein, Director Administration, DAWN (AH YONE OO) Construction Co. Ltd.
Zon Zon Win, Deputy Director (Engineer), DAWN (AH YONE OO) Construction Co. Ltd.
Kwaw Soe, Director (Marketing), DAWN (AH YONE OO) Construction Co. Ltd.
Shwe Zin, Dynamic Engineering
Hnin Wai, General Secretary, Myanmar Women Entrepreneurs Association
Koko Aung, Human Resource Manager, Summit Park View Hotel
Kay Thi Naing, Chair, Myanmar Hospitality Professionals Association
Thura Aung Zaw, General Secretary, Myanmar Hospitality Professionals Association
Aung Mya Soe, Vice Principal, Hospitality & Tourism Management Academy
Tin Ko Ko, Trainer, Hospitality & Tourism Management Academy
Thura Aung Zaw, Director, Golden Bell Family Travel & Tours
Kyi Kyi Aye, National Tourism Planner (ADB TA8136: Myanmar Tourism Master Plan)
Than Zaw OO, Joint Secretary, Myanmar Hospitality Professionals Association
Thet Htar, Manager, Corporate Social Responsibility, Italian –Thai Development Co. Ltd.

Appendix 2

Table A2: Myanmar -Twenty Most Important Agricultural Commodities

Commodity	Value (\$1000)	Weight (million of tons)
Rice, paddy	8,109,981	33,204,500
Indigenous chicken meat	1,176,445	825,919
Beans, dry	1,155,280	3,029,800
Indigenous pig meat	704,810	458,490
Fresh vegetable	700,869	3,719,300
Sesame seed	587,328	880,000
Groundnut in shells	538,809	1,341,000
Fresh fruit	471,196	1,350,000
Indigenous cattle meat	405,363	150,058
Pigeon peas	377,089	724,200
Cow milk	355,313	1,138,600
Sugar cane	305,384	9,700,000
Onions, dry	238,997	1,137,900
Hen eggs in shell	231,897	279,600
Areca nuts	220,511	126,200
Sunflower seed	204,624	770,000
Chick peas	187,982	401,800
Plantains	162,090	785,100
Indigenous duck meat	137,642	83,543
Chilies and dry peppers	122,031	111,400

Source: Food and Agriculture Organisation (FAO). 2012. Food and Agricultural Commodities Production-2010 data.

201<http://faostat.fao.org/DesktopDefault.aspx?PageID=339&lang=en&country=28> (accessed 8 January).

Appendix 3

Table A3: Key Skill Needs in Myanmar/Thai Border Areas

Industry Sector and Skill Requirements	Border Area		
	Shan States	Karen and Mon States	Tanintharri
Hotel/Tourism			
Food & Beverage Services			
Housekeeping			
Reception			
Front Office			
Food Preparation			
Tour guide-English			
Tour guide-Thai			
Tour guide-Chinese			
Garment & Textiles			
Garment production			
Textile production			
Civil and Building Construction			
Carpenter			
Mason			
Electrical installation			
Plumbing			
Steel reinforcement			
Tiling			
General Engineering			
Welding			
Machinist			
Auto CAD			
General engineering			
Other			
Certified accountant			
Mechanic			
Electronics			

Source: Win,M and Naing,K. 2012. Job Creation and Skill Development by Border Area Development between Myanmar and Thailand. Presentation at ILO/JICA workshop on Skills Development in the Thai-Myanmar Border Areas. Yangon.29 November.

Appendix 4
Table A4: Comparison of Industrial and Knowledge Age Workplaces

Industrial Age	Knowledge Age	Comments on Knowledge Age
Domestic market focused.	Globally focused	A strong focus on identifying and meeting the needs of a wide and diverse range of customers. Work is subject to rapid change as new products, services and processes are introduced in response to new markets and needs. Work includes continuous improvement processes to better meet customer expectations.
Mass production	Customized production	Work involves strong customer focus. There is continual change in products and services to meet new customer needs.
Capital based	Knowledge based	Work involves the ongoing generation of knowledge about products, services and processes. Knowledge in turn is the key factor in competitiveness.
Hierarchical and departmentalized	Flat structures	Work involves workers taking strong responsibility for their own actions.
Division between conception and execution	Unity of conception and execution	All levels of staff engage in decision making.
Fragmented	Broad based	Work involves a range of skills and functions in response to team based approaches and continual change in products, services and processes.
Repetitious, monotonous and routine.	Change and uncertainty	Work continually changes with the introduction of new products/ services introduced in response to customer demand and new processes to remain competitive.
Isolated	Teams	Work involves greater levels of interactivity among people and is often team based with varying degrees of responsibility. Teams in turn are often associated with continuous improvement processes including TQM.
Unimaginative	Creative and innovative	Creativity and innovation is required from the workforce. Teams are expected to exercise creativity and innovation in solving problems for which there are no known solutions.
Full-time employment	Self-employment	Individuals are increasingly behaving as entrepreneurs marketing their own services.
-	Electronic technology	Work involves the use and manipulation of knowledge giving rise to a need for knowledge rather than unskilled workers.
Socially fragmented	Socially integrated	Workers are expected to take responsibility for their actions in accordance with community expectations.

Source: Brady, P. 2005. *A Curriculum Design Framework For The Transition From School To Work Within The Urban Post-Industrial Economy Of Australia*. Ph.D. thesis. Macquarie University, Australia.

Appendix 5

Table A5: National Skill Standard Authority Occupational Standards Up to Certificate 3 for Three Key Industry Sectors

Construction	Manufacturing	Tourism
General Electrical Worker	Program Logic Control Programmer	
Electrical Wiring Installer	Lathe Machine Operator	Bell Boy
Electrical Maintenance Concreter	Boring Machine Operator Milling Machine Operator	Waiter Hotel Housekeeping Operators (Laundry Attendant) Public Area Clearer / Attendant Hotel Housekeeping Operators (Room Attendant)
Carpenter Bricklayer	Machinery Fitter Computerized Numerical	Bartender Cook Baker Butcher Commis Pastry
Painter Tiler Structural Steel Worker Scaffolder Pipe Fitter / Plumber Roofer Electrician (Building) Construction Machine Maintenance Mechanic Air Conditioning Mechanic	Control (CNC) Machinist Jig & Fixture Conventional Machinist Tool and Die maker Production Assembler Metal Finishing Technician Iron & Steel Worker Mill Wright Technician Pneumatic / Hydraulic Technician Machine Tool Operator Tool and Die Setter	
Crane Operator Excavator Operator	Boiler Operator Foundry Worker Forging / Smithy Craftsman Pattern Maker Foundry Technician Metal and Steel Fabricator Heat Treatment Technician Press Worker Electric Welder Gas Welder Welder (Pipes) Welding Inspector Garment Sewing Machine Operator Draft and cut pattern of garment Prepare and cut materials of garment Apply Finishing touches on garment Lacquer Ware Make Weaving Upper Maker (Shoes) Skiving Operator (Shoes) Assembler (Shoes) Upper Sewer Pattern Maker (Shoes) Ceramic Sponger / Trimmer	

Ceramic Glazier
 Potter
 Jiggering Machine Operator
 Caster
 Filling Machine Operator
 Cabinet Maker
 Saw Bencher
 Wood Saw Operator
 Veneering Operator
 Electrical Fitter
 Electrical Machine
 Mechanic
 Electrical Machine
 Controller
 Electrical Machine Repairer

 Electrical (ship Building)

 Fork-lift Operator
 Structural Steel Ship's Hull
 Painter
 Ship Fabricator

Source: National Skill Standard Authority (NSSA). 2012. Presentation at ILO/JICA workshop on Skills Development in the Thai-Myanmar Border Areas. Yangon. 29 November.