Chapter 6

Myanmar Country Report

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CHAPTER 6

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Introduction

Myanmar, formerly known as Burma, is now in the spotlight both politically and economically. Of late, it has been the go-to site of a growing number of individual and study missions for business, political and humanitarian reasons.

During the 22nd World Economic Forum held in Myanmar on 5-7 June 2013, discussions around Myanmar's booming economy also touched on its lack of infrastructure, particularly in the electricity, telecommunications, and energy sectors. For the country, it is all about its courageous transformation for inclusion and integration.

The Economy

Myanmar's fifth Five-Year Plan for the period 2015-2016 shows targets of 6-percent gross domestic product (GDP) growth for 2011-2012, 6.7 percent for 2012-2013, 8.3 percent for 2013-2014, 8.2 percent for 2014-2015, and 9.6 percent for 2015-2016. The average annual GDP growth rate target for the fifth Five-Year Plan is 7.7 percent.

Over the years, Myanmar’s gross domestic investment (GDI) ratio averaged around 12 percent per year. However, in the fifth Five-Year Plan, the investment ratio is at 30 percent and savings ratio at 20 percent while the tax

revenue is only 3 percent of GDP.

A change in the relative shares of agriculture, industry, and services in GDP over time is generally accepted as a measure of structural change in an economy undergoing both industrialisation and modernisation. Figures of previous years show that the share of agriculture in GDP did not fall significantly.

Today, however, industry's share in GDP is estimated to increase from 26 percent in 2010-2011 to 36.4 percent in 2015-2016 while that of agricultural will decrease from 36.4 percent in 2010-2011 to 28 percent in 2015-2016. The services' share will drop from 37.6 percent in 2010-2011 to 35.2 percent in 2015-2016. This shows that Myanmar is going for a drastic structural change under the new economic system associated with the overtly proclaimed democratic political system.

Maintaining macroeconomic stability—e.g., low price inflation and stable exchange rate—has been a major challenge for the government. Weaknesses in fiscal policy management associated with poor monetary policy management are the main contributors to Myanmar's macroeconomic instability. Fiscal deficits have been in the range of 2 percent to 6 percent of GDP since 2005. The estimated deficit for the fiscal year ended March 2012 is 4.5 percent of GDP, down from a deficit of 6 percent for the year ended March 2011. The government finances its deficit by selling treasury bills to the Central Bank of Myanmar (CBM), which then monetises the deficit (or prints money) to pay for the deficit. In the past, monetising the fiscal deficit has led to a persistently high expansion in money supply and macroeconomic instability, as reflected in the parallel market exchange rate volatility and periods of very high inflation.

The weak fiscal situation is primarily due to poor tax revenue performance. Total national budget revenues were recorded as approximately 7 percent of GDP in 2011, of which tax revenue collection only accounts for half of the budget revenues. Transfers from state enterprises and other non-tax revenues account for the other half of total revenue. Apparently, more tax revenues are required to support the government's priority development spending initiatives over the medium term.

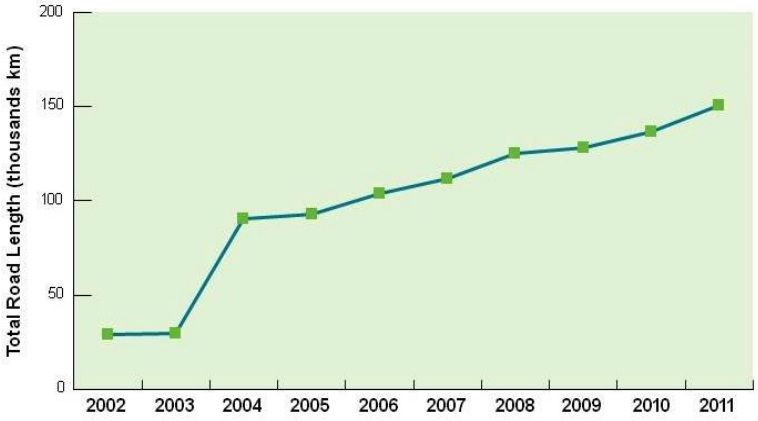
Infrastructure Development Situation

Myanmar lags behind many of its regional neighbours in both the availability and quality of key infrastructure and related services. Sectors such as transport, electricity access, and telecommunication merit particular attention. The national transport networks, including roads, railways, and inland waterways, are out-dated and remain insufficient to support the growing economic activity. Only about 26 percent of Myanmar's population had access to electricity in 2011 and even then faced frequent power outages. Similarly, teledensity (both fixed and mobile) and internet access are among the lowest in the region.

Roads

The country has a total road network of about 130,000 km, and roads are the dominant transport subsector (Figure 6.1). The road density is low at 40 km per 1,000 sq. km, when compared with 480 in Viet Nam, 350 in Thailand, 200 in Cambodia, and 60 in the Lao PDR (ADB, 2011). In addition, only 20 percent of the roads are paved to all-weather standards. The core road network of 38,000 km provides access to most of the country's regions and about 46 percent of the core roads have a paved all-weather surface. By comparison, only 13 percent of the noncore secondary and local roads have some form of all-weather surfacing. The rest are in a rather poor condition in other respects (Annex 1's Table 6.A.1 for more on Myanmar's road transport).

Figure 6.1: Growth of Roads in Myanmar



Source: ADB, 2011b.

a. Local Roads

- The Yangon-Pyay route is considered the best highway in Myanmar. It was funded by the Japanese government.
- The Pyay-Magway Road is a continuation of the road mentioned above. It runs on the east bank of the Irrawaddy River and continues to Bagan via Yenanchaung, the major oil drilling town in central Myanmar.
- The road from Mandalay to Lashio and Muse is another decent highway.
- There is a 695-km highway connecting Yangon and Mandalay. The road passes through Bago, Taungoo, Pyinmana, Naypyidaw, and Meikhtila and is the main commercial link. This is a two-lane highway for the most part, but turns into four-lanes near Yangon and Mandalay. Currently, six-lane sections are being constructed.
- The Western Union Highway connects towns and cities west of the Irrawaddy River. It is considered the worst highway in the country. In some places, it is simply a dirt road.

b. ***International Roads.*** To support Myanmar's regional cooperation with neighbouring countries, the government is now creating international highways (Figures 6.2 and 6.3 and Figure 6.A.1).

- *ASEAN Highways*
  1. AH 1- Myawaddy-Tamu (1,665 km)
  2. AH 2- Tachilake-Kyaington-Taunggyi-Meikhtilla- Tamu
  3. AH 3- Kyaington-Mylar (93 km)

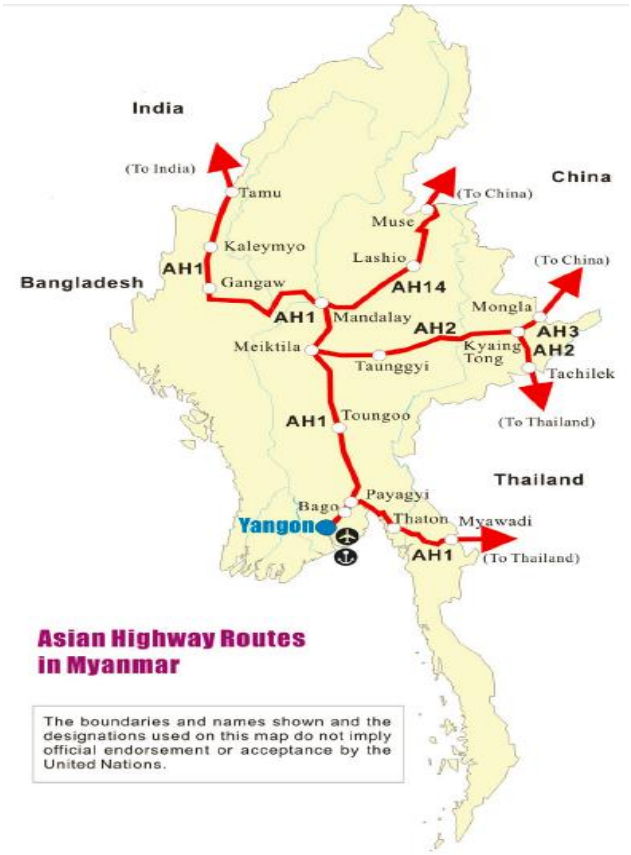
4. Ah 14- Mandalay-Muse (453 km)
5. AH 111- Loinlin-Thibaw (239 km)
6. AH 112- Thahtone-Kyaukthoung (239 km)
7. AH 123- Dewai-Minthame Valley in Thai-Myanmar Border (141 km)
8. AH 123- Laynyar Ywe-Khalonloin in Thai (60 km)

- *Asian Highways*
  1. AH 1-Myawaddy-Tamu (1,665 km)
  2. AH 2-Tachilake-Kyaington-Taunggyi-Meikhtila (807 km) and then link with AH 1
  3. AH 3-Kyaington-Mylar (93 km)
  4. AH 4-Mandalay-Muse (453 km)
- *GMS Highways*
  1. R3-Tachilake-Kyaington-Mylar (257 km)
  2. R4-Lasho-Muse (176 km)
  3. R5-Kyaington-Loinlin-Thibaw-Lasho (666 km)

Figure 6.2: International Highway Linkages from Myanmar

Source: (UN, 2012).

Figure 6.3: Asian Highway Routes in Myanmar



Source: UN, 2012.

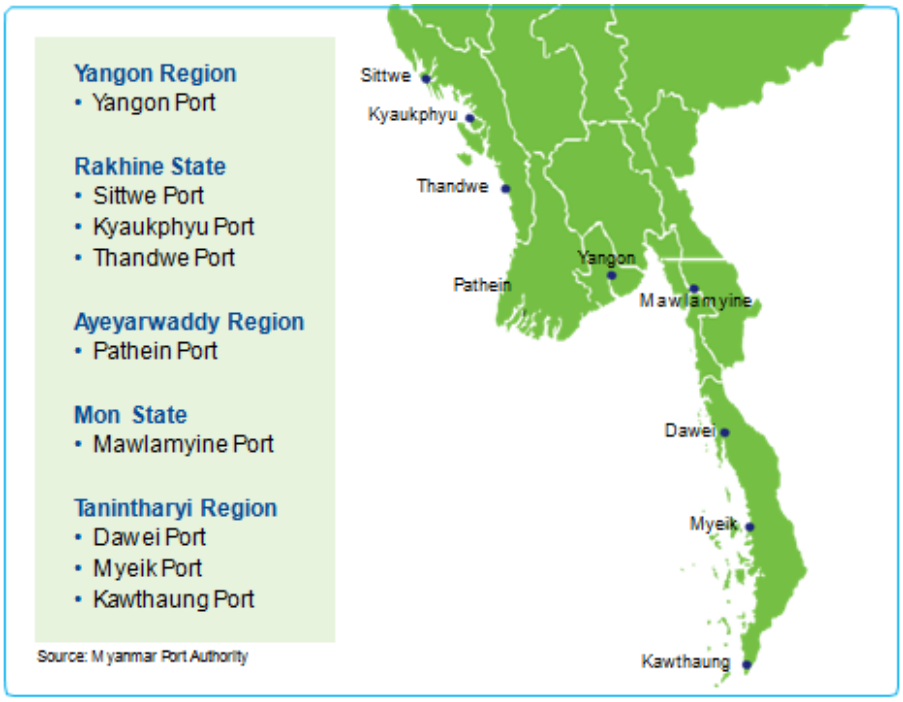
Ports

Myanmar's favourable geographic location makes it an attractive location to develop port facilities. The country's 2,800 km coastline runs along the eastern side of the Bay of Bengal and has the potential to become an alternative international trade route to Asia, bypassing the longer route through the Straits of Malacca. The development of its ports can turn Myanmar into a potential regional trade and transport hub. The Bay of Bengal is already home to some of the biggest ports in the world—i.e., Chittagong in Bangladesh and Chennai in India—a good indicator of the location's strong potential.

Myanmar currently has nine ports along the western and south eastern coast of the country, namely: Yangon, Sittwe, Kyaukphyu, Thandwe, Pathein, Mawlamyine, Dawei, Myeik, and Kawthaung (Figure 6.4). In addition, Myanmar International Terminals Thilawa (MITT) is a private multi-purpose

container terminal owned and operated by Hutchinson Port Holdings. Myanmar's ports handled 24 million tons of import and export freight in 2011, with the Port of Yangon taking care of 90 percent of the cargo throughput (See Annex 2's Tables 6.A.2 to 6.A.6 for more details.).

Figure 6.4: Seaports in Myanmar



[9] "Myanmar: Transport Sector Initial Assessment", ADB, Oct 2012.

Opportunities for the Private Sector. A long coastline and growth in volume of imports and exports as a result of increased demand for the country's agricultural commodities, minerals, and natural resources are reasons enough to develop the port infrastructure in Myanmar. Myanmar's ports have the potential to become regional transportation hubs serving markets in China, India, and the Indo-China region.

Deep water ports are currently being jointly developed at the southern city of Dawei (in association with Thailand) and Kyaukphyu in the north. There, too, are interests in developing ports in Thilawa and Sittwe. The government has likewise identified sites in Kalegauk and Bokpyin for the development of ports (See Annex 3's Table 6.A.7 for details on Myanmar's water transport).

Railways

The railway network expanded from about 2,000 km in 1988 to about 3,500 km in 2010. Most of the expansion has been in the more remote regions, in support of the government's policy of connecting all parts of the country through transport infrastructure. Most new lines carry little traffic and were very expensive to construct, as they are typically in mountainous terrain, leaving limited funds to maintain and improve the core network. Thus, the network's infrastructure is now in very poor condition.

Japan has completed a feasibility study on the proposed US$1.7 billion modernisation of the Yangon-Mandalay railway link. The rehabilitation contract for the 640-km link will be given to Japanese companies because the study was funded by a grant from Japan. Japan is also expected to provide a loan to the project.

In another development, the Myanmar government plans to set up manufacturing facilities for diesel locomotives and rolling stock such as coaches and wagons in the country by 2015. These facilities will require an investment of US$100 million. While 90 percent of the investment will be covered through the Chinese loan, 10 percent will be sourced from Myanmar's annual budget. The diesel engines will be manufactured in Nay Pyi Taw, the Myanmar capital while the coaches and wagons will be built in Mandalay.

Myanmar has a railway network length of 4,000 km of tracks, with 926 stations and a fleet of 436 locomotives. The state-run railway system has 412 trains that lug 1,281 passenger coaches and 3,204 wagons. Much of the railway network is old and in urgent need of modernisation. A planned Trans-Asian Railway link aims to connect the railway systems of 28 countries in Asia, and Europe. There is also a plan to establish a rail link between India and Myanmar, which will join Jiribam, Assam, in India with Kalay in Myanmar. Such connectivity will also help in the economic integration of the Association of Southeast Asian Nations (ASEAN).

Trade between India and ASEAN was US$76.3 billion in 2012-2013 and is expected to increase to US$100 billion by 2015. Thus, India has been involved in strengthening Myanmar's railway infrastructure. Of a US$500 million credit line extended to the Myanmar government by India, US$155 million has been earmarked for developing the railway infrastructure.

Opportunities for Private Sector. Under the Framework for Economic and Social Reform, the government has committed to improve the quality of the railroad sections that connect important economic centres in the country; namely, the Yangon-Mandalay-Myitkyina section and the Bago-Mawlamyine section. Hence, greater attention will be given to regional connectivity and to bridging the gaps in operations and compatibility in alignment with region-wide transport strategies.

There are likewise existing plans under the Singapore-Kunming Rail Link (SKRL) project to build a high-speed railway that will connect Kunming in Southwest China, with mainland Southeast Asia. Three routes—each respectively going through Vietnam, Lao PDR, and Myanmar—have been planned for the rail link. The project is a priority agenda under the ASEAN transport cooperation. Once completed, the SKRL project will become part of the 14,080 km Trans-Asian Railway network across Europe and Asia (See Annex 4's Table 6.A.8 for details on Myanmar's railway transport).

Inland Waterways

Myanmar has about 5,000 km of navigable waterways, of which about 2,400 km make up the primary inland waterway network. The state enterprise Myanmar Inland Water Transport (MIWT) has about 240 powered vessels available, with a total capacity of about 70,000 tons, although many of these vessels are old. In 2011, the MIWT carried about 28 million passengers and 5 million tons of freight.

The Myanmar Port Authority is responsible for the port in Yangon and eight coastal ports—four on the west coast, and four on the southeast coast. Most coastal traffic is between coastal ports and Yangon.

The port subsector currently has no major constraints, but it would make sense for Myanmar to start preparing for heightened traffic flows that may result from economic liberalisation and growth. Improving the coastal ports would allow for more effective use of coastal shipping as part of the country’s overall transport mix.

Air Transportation

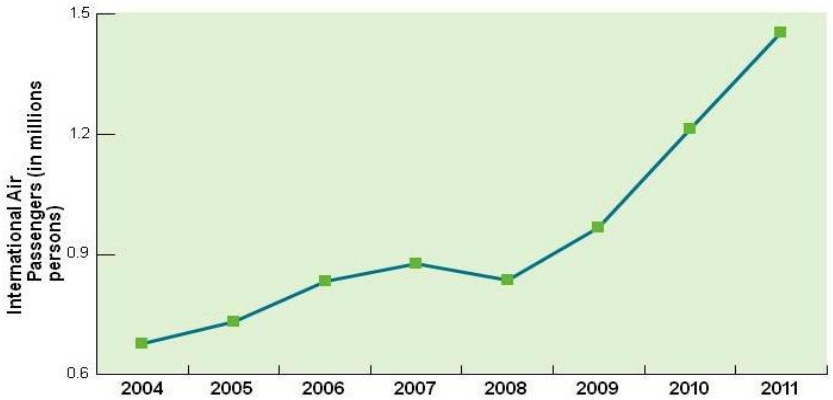
Myanmar’s civil aviation subsector consists of three international airports at

Yangon and Mandalay, and Nay Pyi Taw (which was opened in 2011) and 69 local airports. Domestic air services are provided by Myanma Airways, a state enterprise under the Ministry of Transport. Private airlines that offer domestic services include Air Mandalay (a joint venture of Myanma Airways and Singaporean interests) and Air Bagan. Myanmar Airways International, a subsidiary of Myanma Airways, provides some international services to regional destinations, using more modern aircraft such as the Airbus A320 and A321.

Myanmar currently has a total of 69 airports, of which only 32 are operational. There are three international airports—in Yangon, Mandalay, and Nay Pyi Taw—where 19 international airlines and four domestic airlines operate regular flights between Myanmar and 17 regional destinations. In 2011, there were 1.5 million international passengers and 1.4 million domestic passengers (Figure 6.5).

The Myanmar Department of Civil Aviation (DCA) hopes to double the capacity at Yangon International Airport from 2.7 million passengers a year to 5.5 million annually. The government also aims to transform some of the existing domestic airports into international airports to serve the growing number of foreign investors and tourists. The DCA has in fact announced plans to re-develop airports in Yangon and Mandalay.

Figure 6.5: Annual International Air Passenger Traffic into Myanmar



Source: CAPA – Centre for Aviation & Myanmar Department of Civil Aviation.

Opportunities for the Private Sector. In February 2012, the government announced plans to add two new international airports to meet future air traffic demand in the country. These airports are the Hanthawaddy International Airport in central Bago region and Dawei International Airport in the Dawei special economic zone.

Authorities are in the process of identifying a partner for the development of the Hanthawaddy airport under a public-private partnership (PPP) scheme. As of this writing, seven consortia have pre-qualified for the project, with the Request for Proposals set to be sent to pre-qualified bidders shortly. The government has also declared its plans to re-develop the Yangon and Mandalay Airports as PPP projects. Eleven consortia and seven groups have respectively pre-qualified for the Yangon and Mandalay projects.

To manage the risks in PPP projects, a number of preparatory activities are being undertaken. The objectives for a National Air Transport Policy have been laid down. In the offing is the plan to develop a Civil Aviation Master Plan with assistance from the Japan International Cooperation Agency (JICA). Meanwhile, the DCA plans to reform its institutional set-up, where it now differentiates its role as regulator versus that of a service-provider. Specifically, it has invited the private sector to participate as the service-provider. Note though that under the nation's new Foreign Investment Law, foreign investment is prohibited in air navigation services. Foreigners can only invest in the domestic and international air transport services if they are part of a joint venture with Myanmar nationals (See Annex 5's Table 9A for more details on Myanmar 's air transport).

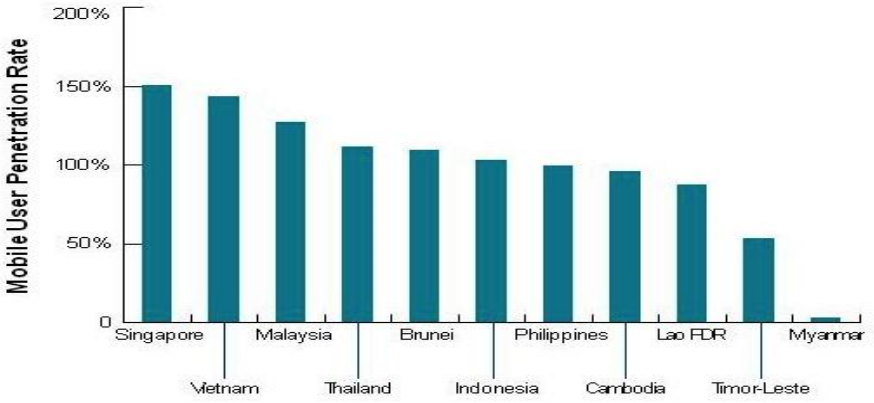
Information and Communications Technology

Myanmar’s telecommunications sector is significantly underserved, with exceptionally low penetration rates given the size and potential of the market. Although the mobile subscriber base has grown five-fold in the last four years, official statistics report that there are 5.4 million subscribers as at December 2012, or a penetration rate of only 9 percent of the population (Figure 6.6).

Fixed-line subscriber numbers are growing erratically, with an overall penetration of around 1 percent of the population (0.6 million subscribers). Internet user penetration is even lower at less than 1 percent of the population (0.5 million subscribers). Yangon and Mandalay account for majority of the

mobile and fixed-line subscribers.

Figure 6.6: Mobile User Penetration Rate in Southeast Asia, 2011



Source: World Bank

Opportunities for the Private Sector. To achieve the target of increasing mobile phone density to 75 percent to 80 percent and internet penetration by over 50 percent by FY2015-2016, the government has committed to undertake several reforms:

- Under the Framework for Economic and Social Reform, the government is developing an Information and Communications Technologies (ICT) Master Plan. This plan aims to enhance ICT adoption in the country and strengthen industrial competitiveness by promoting information technology and knowledge management.

- The proposed Telecommunications Law and the Cyber Law are expected to set out the government's plans to separate the policy, regulatory and operational roles of the government in the telecommunications sector. An independent regulator will be established to supervise the ongoing process of liberalisation and opening up of the telecommunication sector.

- State-owned Myanmar Post and Telecommunication, currently the country's sole operator, will be privatised into the Myanmar Telecoms Company and awarded one of the country's mobile phone licenses. Another license will be given to local internet service provider Yatanapon Teleport.

A significant development in the sector was when the government invited foreign investors to register their interest to bid for two of four remaining national telecommunications licenses in January 2013 as part of the planned expansion of mobile networks. The government was able to award the licenses to two international operators.

Meanwhile, Sumitomo Corporation and NEC Corporation, in cooperation with NTT Communications Corporation, concluded a network upgrade contract with the Ministry of Communications and Information Technology of Myanmar on 14 May 2013. This is the first infrastructure project in Myanmar that capitalises on Official Development Assistance (ODA) from Japan since the latter's adoption of a new economic cooperation policy towards Myanmar in April 2012.

On 28 December 2012, JICA concluded a grant agreement with Myanmar, amounting to 1.71 billion yen in ODA. This grant will fund Myanmar's improvement plan on its communications network, which includes strengthening the connections between Myanmar's three leading cities, and improving the procurement of equipment as well as installation and operation of internet connections.

Energy & Power

In a knowledge and network age, electricity is essential in all sectors of the economy. Thus, the state works to provide sufficient electricity to the public by all possible means. Electricity generation plants, including hydro-electricity projects, are under way.

Myanmar would need about 112,000 MW to service all households at the minimum consumption level of 10 kW per household per day. Currently, Myanmar's electricity installation capacity is still very low. Myanmar will need a huge investment in the electric sector if it were to meet the average electricity consumption level of developing economies of the ESCAP region of 382 kWh per capita annually (UN/ESCAP).

In 2010, Myanmar produced 7,543 million kWh of electricity, the bulk of which was from hydropower (68%), followed by gas-fired (23%) and thermal (9%) sources (Central Statistical Organization, 2012). Although the country’s installed capacity exceeds the peak load (by about 130%), plants' output is low

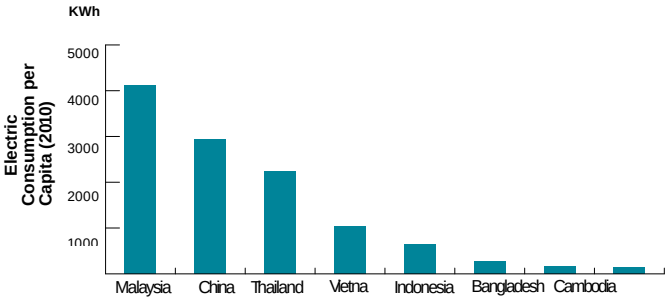
due to inadequate maintenance and lack of compression in the gas pipeline, which reduces the flow of gas. Moreover, during the dry season, the hydropower plants receive insufficient water to generate at full capacity.

Myanmar now hopes to develop a comprehensive energy framework that will make the best use of its resources. Obviously, its own energy development potential reflects at least three significant trends: the significant growth of power generation based on natural gas, a fuel with which Myanmar is richly endowed; the modernisation of transmission and distribution (and eventually, the so-called smart grid); and the growth of distributed power or the creation of off-grid solutions that are particularly important for rural areas.

Myanmar's abundant energy resources include renewable alternatives such as hydropower, biomass, wind, and solar energy. Its primary energy supply includes coal, oil, gas, hydropower, and biomass. Hydropower is the main source of fuel as it accounts for nearly 70 percent of the total electricity generated in the country. Other main sources are natural gas and coal at 22 percent and 8 percent of the total energy generated, respectively.

Myanmar’s per-capita electricity consumption is the lowest among the 10 ASEAN at 100 KWh in 2010, compared to a consumption of around 600 KWh in Indonesia and over 2,000 KWh in Thailand (Figure 6.7). It is estimated that only a quarter of Myanmar's population currently has access to a regular supply of electricity, and even Yangon is plagued by frequent outages, limiting economic growth and development. The low national average per-capita electricity consumption is due to the low electrification rate (Table 6.1), low industrial development and lack of investments.

Figure 6.7: Electric Consumption per Capita in 2010



Source: World Bank.
Energy Statistics, International Energy Agency (IEA)
International Energy Statistics, US Energy Information Administration.

Table 6.1: Electricity Connectivity and Consumption (2009) in Selected Asian Nations

	Electrification Rate (%)	Millions without Power	Consumption (kWh/person)
Malaysia	99.4%	0.2	3614
China	99.4%	8	2631
Thailand	99.3%	0.5	2045
Vietnam	97.6%	2.1	918
Indonesia	64.5%	82	590
Bangladesh	41.0%	96	252
Cambodia	24%	11	131
Myanmar	13.0%	44	104

Source: IEA, World Bank.

The country's average electrification grew from 16 percent in 2006 to 26 percent in 2011. Big cities are relatively well electrified: 67 percent for Yangon, 54 percent for Nay Pyi Taw, and 31 percent for Mandalay, while rural areas remain poorly supplied at an electrification ratio of about 16 percent only. Out of 62,218 villages, 2,765 are electrified by the nation's distribution network and 14,195 villages via a "self-help basis" (such as biomass, solar, wind, diesel, mini hydro, biogas).

Myanmar's Framework for Economic and Social Reform states that the energy sector will be further liberalised through the deregulation of prices, adoption of appropriate taxes, and elimination of across-the-board subsidies in the energy sector. Myanmar is also developing a master plan for the electricity sector that

will project future electricity consumption, design a strategy to meet those consumption requirements and identify necessary regulatory reforms.

Opportunities for the Private Sector. There are significant opportunities for both foreign and domestic companies to invest in the generation, transmission and distribution of power. With a population of 60 million and rapid economic growth, Myanmar has the potential to attain higher power consumption levels over the next two decades. Provided the economic reforms in the country are sustained, the country can see a capacity uplift of up to 50 GW in the timeframe. This would entail an investment of roughly US$50 billion in the power generation sector.

According to the Foreign Investment Law released in November 2012 and the subsequent rules issued in January 2013, foreign investments in the production of electricity through hydropower and coal-fired plants have to be approved by the government, and can only be effected through a joint venture with the state or via a Build-Operate-Transfer (BOT) arrangement. Foreign investment is not allowed in the trading of electricity or inspection services in this sector.

National Development Plan for Infrastructure Myanmar's fifth Five-Year Plan (2011-2012 to 2015-2016) specifies the following infrastructure policies:

Roads and Bridges

- With the change in the political system, roads in the country should be upgraded to international standards.
- International routes connecting to Myanmar and have a daily traffic density of over 5,000 shall be 72 feet wide of tarred and concrete roads while daily density of 2,000 to 5,000 must have a width of 48 feet. Furthermore, those with daily traffic density of 300 to 2,000 shall be 24 feet wide, and those with 200 to 300 daily traffic density should measure 22 feet wide.
- Bridges on the highways should be of international standards.

- Under a PPP programme, national entrepreneurs will be invited to engage in the BOT system and thus promote private sector development.

- Invite foreign direct investments (FDI) to engage in road and bridge projects and use loans from Asian Development Bank (ADB) and World Bank to upgrade roads and bridges.

Transportation Sector

- To develop both domestic and external water transportation and air transportation under the prevailing political and economic systems, efforts should be made to implement the regulation set down by the International Civil Aviation and marine federations.

- The Ministry of Rail Transportation will provide services for the industrial sector and help promote a progressive nation.

Communications Sector

- Amend laws and regulations or create new ones to be in line with the changing environment.

- Allow private participation in the construction of communication facilities and invite domestic and foreign companies to invest under the PPP system. Also, promote communication services of both domestic and foreign private sectors.

- Provide communication services of international standards and find ways and means to acquire international investment.

- Find ways and means to cooperate with experienced international communication companies.

- Provide standard mobile telephones to the public at less price and continue to extend these services to the rural areas.

- Promote and upgrade both foreign and local quality postal services by means of information technology and modern facilities in collaboration with the private sector.

- Create investment opportunities for both national and foreign investors in the production of communication products.
- Connect telegraphic activities with information technology so as to provide effective services to the public.
- Upgrade postal and telecommunication training schools so as to produce skilled personnel.

Energy Sector

- Sustain the country's non-dependence on energy imports.
- Exert efforts to use new and renewable energy resources.
- Promote efficiency and conservation of energy use.
- Promote the use of other energy substitutes for domestic purposes.
- Encourage the public to effectively use extracted oil and natural gas.
- Urge private participation in the energy sector.

Power Sector

- Ongoing power projects should be completed at high quality and on time.
- In constructing large, medium and small power projects, explorations should be done continuously.
- Get power generation plants to produce at full capacity.
- Mitigate the negative impact of power projects and electricity supply facilities on the natural environment; encourage proper maintenance of facilities.
- Supply and distribute electricity nationwide.

The government has strong and clear intent to improve infrastructure so that it becomes an enabler of economic growth. It is implementing its targets by taking the following steps:

- **Creating clarity and predictability in its regulatory framework for infrastructure sectors.** The promulgation of the Foreign Investment Law and drafting of the Telecom Law, Special Economic Zones Law, and Condominium Law are steps in the right direction;

- **Building institutional capacity within the government to prioritise and procure the needed infrastructure that provides "value for money".** Experiences gained in the energy sector and existing knowledge obtained by telecommunications and transport sectors regarding procurement methods can serve as templates that can be adopted by procurement teams in other infrastructure sectors;

- **Actively encouraging the development of partnerships between foreign and local participants to bring together international know-how and local context.** Because the Foreign Investment Law makes joint ventures the preferred mode for several sectors, infrastructure providers gain local know-how and context. This international collaboration also helps in the development of local enterprises, and transfer of technology and managerial capabilities;

- **Developing the banking system and financial markets so as to allow free flow of capital to support infrastructure investment.** The Central Bank of Myanmar Law can address some of the outstanding issues in the sector---particularly issues on foreign banking, establishment of capital markets, and price stabilization.

- **Fostering public goodwill towards infrastructure projects by demonstrating their economic benefits and potential for creating jobs.** Requiring all large projects in the future to be environmentally sound and to work for a positive socio-economic impact will help achieve sustainable and inclusive development.

Myanmar has made enormous strides in integrating into the global community and promoting economic development. The government is focused on sustaining that momentum, but significant challenges remain. Most pressing is the country's need to develop its infrastructure and increase its power-generation capacity so as to continue its growth.

Without electricity, developing countries such as Myanmar have no chance of addressing basic requirements in health, job creation, and sustainable

development. Per-capita electricity consumption in Myanmar is among the lowest in Asia at 27 percent. The rate is even lower in most rural areas.

Myanmar plans to develop a comprehensive energy framework that will make the best use of its resources. Obviously, its own energy development potential reflects at least three significant trends: the significant growth of power generation based on natural gas, a fuel with which Myanmar is richly endowed; the modernisation of transmission and distribution facilities (and eventually, the so-called smart grid); and the growth of distributed power or the creation of off-grid solutions that are particularly important in the rural areas.

A good government policy that enables and attracts effective cooperation with the private sector is also critical. This can lead to more investments and long-term commitments from companies, allowing Myanmar to develop infrastructure that will promote growth and improve the quality of people's lives.

Infrastructure Financing

National Source of Infrastructure

The Myanmar government has allocated a total of 7.8 trillion kyat (US$9.5 billion) for the construction and renovation of roads and bridges during the period 2012-2031. This initiative is divided into four phases, the first (2012-2016) of which will require 2.82 trillion kyat (US$3.3 billion) of the budget (Table 6.2).

Development partner ADB has likewise placed the maintenance and construction of infrastructure on top of its list of priorities for its country partnership strategy with the Myanmar government. Needless to say, infrastructure projects will play a crucial role in bridging Myanmar’s rural and urban divide and give the floundering economy more connectivity with its ASEAN neighbours.

The infrastructure expansion portion of the government programme foresees 28 companies working with the government under BOT arrangements to complete 60 main roads measuring 4,700 km. Companies entering into these contracts with Myanmar will be exempted from incomes tax for 30 years.

Beyond the development of domestic roads, Myanmar is looking to link up with international transport systems, preparing itself for the formation of the ASEAN Economic Community (AEC) in 2015.

The lack of water infrastructure in the country has also come under scrutiny. Thus, the Ministry of Transport will partially privatise the Inland Water Transport Corporation and create joint ventures to turn some companies that are under the Corporation into economically independent entities.

Because inland waterways are already a major form of transport—particularly since Myanmar is endowed with one of the largest river networks in the world—the privatisation measure will offer opportunities for investors to tap into a socially accepted form of transit that is cheap for commuters. Inland waterways carry an estimated 25 million passengers and 4 million tonnes of cargo in the country every year.

Table 6.2: Government's Financing of Infrastructure (Kyat million)

Item	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Roads and Bridges	509,331.0	240,507.6	550,650.7	913,836.7	748,684.3
Railways	113,073.8	226,762.8	375,117.3	314,236.7	258,769.7
Communications	39,974.3	31,169.2	112,698.8	192,695.9	96,283.9
Airways	17,625.3	15,679.7	31,669.7	32,907.6	32,502.2
Inland Waterways	1,298.3	500.0	714.0	728.3	742.8
Electric Power	142,937.0	308,652.2	1,191,123.6	1,177,989.6	948,572.2
Energy	16,260.8	128,575.0	254,348.4	575,558.6	412,219.6

Source: Fifth Five-Year Plan, Ministry of National Planning and Economic Development.

Capital Market Development

The country's Capital Market Development Committee was organised on 1 July 2008, while the road map for the development of its capital market was already aligned with the timeframe for the development of the ASEAN Integrated Capital Market. There are three phases in that road map. The first phase was implemented from 2008 to 2009; the second phase, from 2010 to 2012; and the third phase, from 2013 to 2015.

The Central Bank of Myanmar has been issuing two-year government treasury bonds and 10 million kyat-denominated treasury bonds since 1January 2010, with Myanma Economic Bank (MEB) and Myanmar Securities Exchange Centre Co., Ltd (MSEC) as underwriters.

To further develop the country's bond market, Myanmar became part of the ASEAN Bond Market Initiative (ABMI) programme. With support from the Japan-ASEAN Financial Technical Assistance (JAFTA), the country received technical assistance from the ASEAN Secretariat-assigned company, Daiwa Institute of Research. The technical assistance under the first phase was implemented from June 2011 to May 2012.

A memorandum of understanding on the "Capital Market Development in Myanmar" was likewise signed by the Central Bank of Myanmar and Tokyo Stock Exchange (TSE)/Daiwa Institute of Research on 29 May 2012. Subsequent memoranda of understanding between Myanmar, and TSE/Daiwa Institute and Policy Research Institute of Japan involved additional technical assistance to the country.

Meanwhile, the draft of the Securities and Exchange Law has been approved by the National Parliament and submitted to the People's Parliament.

Projects with International Investments

Projects with India:

- Kalay-Tamu route (160.9 km) upgraded into tarred and cemented roads.
- Kalaywa-Yargyi route (121.7 km) MOU on upgrade activities was signed.

- Paletwa-Setpyit Pyin-Myeikwa route (121.9 km) will be built by Max Myanmar with the help of a US$120 million loan from India.

- Teetein-Reid road upgrade (50.9 km) MOU signed with a US$60 million loan from India.

Projects with China:

- Shweli-Kyaukpyu highway to connect Kyaukpyu deep seaport (1,000 km) was completed.

- Minbu-Aan-Kyaukpyu road and the Sipaw-Shweli road are to be connected.

Projects with Thailand:

- Myawaddy-Thingun Nyi Naung route (18 km) to be upgraded via Thai loans.

- Thingun Nyi Naung-Kaukareik road (28.6 km) to be upgraded into a 24-feet wide, international-standard road.

- Tavoy-Funarum road (132 km) that links Tavoy Deep Seaport and Thai Funarum village is under discussion as a BOT project.

- Myanmar-Thai Friendship Bridge No. 2, Myawadi is to be built with the Thai government's assistance; feasibility study has been completed.

Projects with Korea:

- Minbu-Ann road (156.1 km) is built by Korea Expressway Co.

- Taunggyi-Kyaington road (452 km) is to be built by Korea Expressway Co.

- Kawkrate-Mudon road (102 km) is being discussed to be built by Korea Expressway Co.

Projects with Japan:

- Storm-ravaged Pokkoku region will be assisted by contributing 53 machineries worth 0.8 billion yen; MOU already signed.
- Kyeinpin Dam-Setkawt-Danupyu-Zalun road is to be upgraded via JICA's assistance.
- Roads in Karen State and Rakhine State to be upgraded with Japanese assistance.

Projects Under Discussions

With Korea:

- Monwya-Pale-Gangaw road (180.2 km), part of Asia-ASEAN Highway 1 is to be upgraded; discussions with KOICA in progress.

With Japan:

- Three bridges on Hlaing bwe-Paing Kyone road in Karen State to be built.
- Run-down Thakayta bridge in Yangon Region to be rebuilt.
- Roads in Karen state and Boothi Taung-Maung Taw road in Rakhine State are being upgraded and maintained.

With China:

- Nang Pan Chaung bridge (Shan State)
- Thet Ke Taung bridge in Irrawaddy Region
- Than Lwin river bridge
- Hinegyi Kyun bridge
- Kyun Pyattad bridge in Irrawaddy Region

Public-Private Partnerships (PPP)

Public-Private Partnerships dominate long-term projects on roads and bridges through the BOT system. There are rules and regulations on such provided by the State Law as well as the ASEAN BOT scheme. Myanmar currently has 61 road projects covering 5,895 km under the BOT system and being carried out mostly by local companies. Around 15 percent of these projects are managed by the Ministry of Construction, Public Works.

Major Challenges

At present, Myanmar needs to deal with the following problems in infrastructure development:

- **Lack of technical knowledge:** Myanmar lacks knowledge and experience in building or even planning its most needed infrastructure. It is impossible to make major economic progress without an appropriate infrastructure development knowhow.

- **Lack of skilled domestic workers:** Even if there is technical knowledge on the construction and maintenance of infrastructure, there remains inadequate technically skilled workforce that can build and maintain the infrastructure. Finding or developing the necessary skills for infrastructure development and maintenance is the first major challenge to hurdle.

- **Unsound foreign advices:** Inappropriate or flawed advices can have a negative impact on Myanmar's changing economy. Thus, outside sources must maintain transparency as well as objectivity in their advices on infrastructure projects.

- **Problems with prioritisation:** There is a strong positive association between public investment in infrastructure and economic growth. Infrastructure development, however, involves two dimensions: the physical and the human capital, both of which are critical and necessary. Under a scenario where funds are constrained, there should be a delicate balance between these two dimensions. After all, together, they will have a

synergistic impact on Myanmar's economic development. There has to be a framework that will consider this all-important point on prioritisation.

- **FDI-related infrastructure issues:** FDI-related economic activities can expand international trade but not necessarily achieve internal economic development. There are countries that have some of the most modern seaports and airports, but have poorly developed domestic infrastructure. Thus, while they may be enjoying high revenues from exports (In Myanmar case, gas export), their GDP per-capita remains low.

Conditions surrounding infrastructure for domestic productivity needs somewhat differ from that of export-oriented infrastructure, including smaller volumes of products moving shorter but varied distances. With the prevailing poverty level in Myanmar, management of the massive FDI inflows would also mean factoring in this challenge on domestic productivity into the nation's infrastructure decisions.

One of the key issues in Myanmar is that there are too many priorities from all sides for the limited funds. The government may be even more sensitive to political pressures. As a result of this sensitivity, prioritisation and maintenance of the country's infrastructure are likely to be politicised. Under such a scenario, the country's economic progress will most likely be disrupted.

Given that various problems in the planning and maintenance of infrastructure can occur and that Myanmar still lacks an infrastructure maintenance tradition, the need for a strategy on how to continue the development and maintenance of infrastructure-related activities is all-too important to ignore. An infrastructure development plan for a rapidly changing country such as Myanmar is the first step to take.

Conclusions and Recommendations

Financing of infrastructure development will involve both domestic and foreign sources, thus:

- Myanmar should seek resources from public savings and private savings to finance its infrastructure programmes. The Central Bank of Myanmar Law should address some of the outstanding issues in the financial sector if it were

to help develop its banking system and financial markets and to allow the free flow of capital into infrastructure projects.

- A clear regulatory framework on the PPP scheme should be created for the infrastructure sector by promulgating a Private Citizen Investment Law and Enterprise Law.

- Capacity building and skill trainings should be part of the infrastructure development.

- Given the prevailing poverty level of the people, the massive FDI inflows into Myanmar should accommodate infrastructure projects that promote domestic productivity.

- Infrastructure, which powers all kinds of economic activities in Myanmar's case, needs financing, including FDIs. It thus makes sense to encourage the partnership between foreign and local participants because it brings together both international know-how and local context knowledge. The Foreign Investment Law should accommodate this requirement as such can help transfer technological and managerial capabilities/knowledge to local enterprises.

- With its bountiful natural resources in both land and labour, Myanmar has been called by the international business community as the last economic frontier. Myanmar's ability to translate natural resource wealth into prosperity will be dependent upon its skill to nurture domestic capacities, including human capital, and to create infrastructure and services that drive industries and benefit supply chains.

- Despite the rich natural resources, the per-capita consumption of energy in the country is the lowest in Asia. Only 26 percent of the population has access to electricity via the national grid, while domestic supply falls far short of the demand needed by 60 million citizens. Therefore, it is important to create new opportunities for domestic companies to enter the energy market at key points in the value chain.

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Annex 1

Table 6.A.1: Road Transport in Myanmar

Code	Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
A.	**Road infrastructure**									
001	Total road length		Thousand Kilometre	90.713	92.859	104.05	111.74	125.355	127.942	136.749
002	Length of paved road		Kilometre	22,153	22,830	23,955	24,670	25,553	26,333	28,569
003	Ratio of paved road to total road length		Percent	24.42	24.58	23.02	22.08	20.38	20.58	20.89
004	Total length of expressways		Kilometre	-	-	-	-	-	323.6	587
B.	**Road transport equipment**									
005	Total number of registered road motor vehicles		Thousand	960	979	992	1,024	1,994	2,068	2,299
006	Number of registered passenger cars		Thousand	186	193	200	214	230	243	260
007	Number of taxis or taxicabs		Thousand	38	39	38	38	28	27	28

Code	Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
008	Number of registered trucks		Thousand	53	54	55	57	59	60	64
009	Total number of registered buses		Thousand	18	18	19	19	20	20	21
010	Number of public buses		Thousand	15	15	16	17	29	25	28
011	Total number of registered motorcycles		Thousand	638	640	646	655	1,607	1,674	1,881
C.	**Road transport measurement**									
012	Total number of road passengers		Thousand	38,100	38,885	40,257	40,657	1,631,886	1,997,371	1,294,129
013	Number of taxi passengers (million)		Thousand	N/A	N/A	N/A	N/A	N/A	N/A	N/A
014	Number of public bus passengers		Thousand	38,100	38,885	40,257	40,657	1,647,623	1,150,066	1,303,175
015	Road passenger-kilometre		Million passenger-kilometre	2,280	2,329	2,381	2,464	16,872	150,596	270,536

Code	Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
016	Total operational mileage of public buses		Million kilometre	19	18	18	19	20,794	7,756	3,759
017	Freight		Thousand ton	2,099	2,289	2,377	2,395	22,733	30,474	20,664
018	Freight-kilometre		Thousand ton-kilometre	393,597	421,198	448,693	478,848	1,128,224	2,320,487	2,206,485
019	Number of traffic accidents		Cases / Numbers	28	19	27	15	12	11	8
020	Number of traffic accident casualties (dead)		Person	1,273	1,331	1,362	1,638	1778	1845	2,264
020	Number of traffic accident casualties (injuries)		Person	10,452	10,484	11,358	12,358	11,558	13,180	14,130
D.	**Others (enterprises, logistics & economic performance)**									
021	Number of trucking companies		Person					638	527	546
022	Number of domestic forwarders		Company					644	716	734
023	Number of warehouse companies		Company							
024	Number of fixed route bus operators		Company					1,582	1,129	1,184

Code	Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
025	Total number of new driving licenses issued for automobiles		License	966,472	1,011,864	1,048,990	1,073,455	1,093,239	1,099,738	1,177,204
026	Total number of new licenses issued for motorcycles		License	388,940	529,928	668,462	760,601	985,758	1,101,450	1,291,087
027	Total domestic freight volume by road		Thousand ton					20,317	34,991	20,560
028	Total domestic freight movement by road		Million ton-kilometre							
029	Total import cargo by road		Thousand ton					457	1,105	1,076
030	Total export cargo by road		Thousand ton							

Annex 2

Table 6.A.2: Length and Width of Sule Pagoda Wharves and Type of Cargo Handling

No	Name Of Wharf	Type Of Terminal	Quay Length (M)	Apron Width (M)	Vessel DWT
1	SPW(1)	General Cargo	137	12.2	15,000
2	SPW(2)	General Cargo	137	12.2	15,000
3	SPW(3)	General Cargo	137	12.2	15,000
4	SPW(4)	General Cargo	137	12.2	15,000
5	SPW(5)	General Cargo	168	15.2	15,000
6	SPW(6)	General Cargo	162	15.2	15,000
7	SPW(7)	General Cargo	162	15.2	15,000

Source: Myanmar Port Authority (MPA).

Table 6.A.3: Container Handling at Bo Aung Gyaw Street Wharves

Sr.	Year	Import		Export		Total	
		(TEU)	M' Ton	(TEU)	M' Ton	(TEU)	M' Ton
1	2000-01	58938	666757	58702	791908	117641	1458665
2	2001-02	46034	562548	46007	645404	92041	1207952
3	2002-03	32241	369775	32912	429306	65153	799081
4	2003-04	26544	328983	24940	384997	51484	713980
5	2004-05	21565	275714	19988	348121	41553	623835
6	2005-06	26980	370008	23594	403491	50574	773499
7	2006-07	26179	331708	26069	497884	52248	829592
8	2007-08	32803	459295	31075	593533	63878	1052828
9	2008-09	28101	400943	23046	437074	51147	838017
10	2009-10	33193	495016	25727	394720	58920	889736

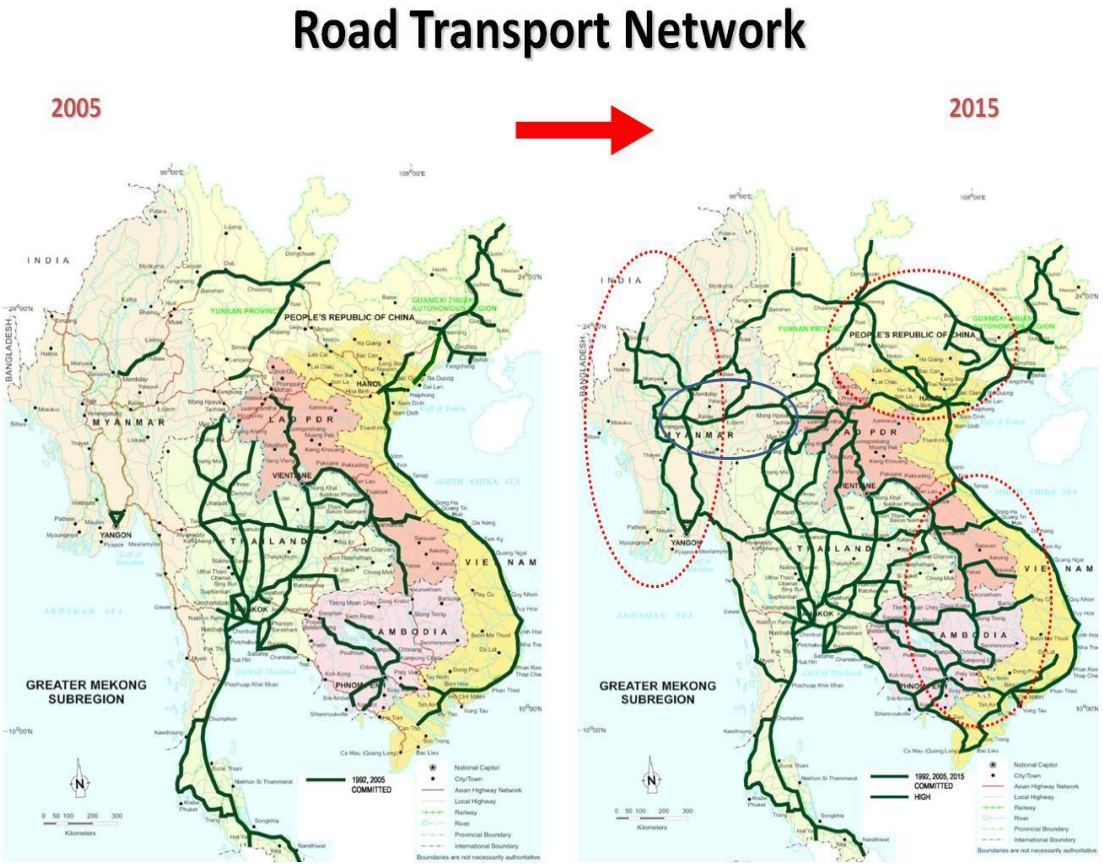
Source : Myanmar Port Authority (MPA).

Table 6.A.4: Number of Vessels Called, Container and General Cargo Handling at MITT*

Year	General Cargo		Container		
	Number Of Vessel Called	Tonnage	Number Of Vessel Called	TEU	Tonnage
2000-2001	83	544,009	96	41,856	644,699
2001-2002	86	669,545	105	58,248	890,023
2002-2003	82	779,808	94	54,918	861,603
2003-2004	93	636,642	43	31,354	563,149
2004-2005	96	615,832	42	34,964	615,059
2005-2006	102	676,706	39	35,728	600,121
2006-2007	98	584,907	46	47,467	778,586
2007-2008	116	822,735	54	42,771	626,205
2008-2009	104	954,799	70	37,585	605,628
2009-2010	166	1,479,726	52	23,267	655,099

Source : **Myanmar International Terminals Thilawa (*MITT).

Figure 6.A.1: Road Transport Network in Myanmar 2005 vs 2015



Myanmar Industrial Port

Myanmar Industrial Port (MIP) is situated downstream of the Asia World Port in Yangon River. Its land area is owned by Ministry of No. (1) Industry and built by Myanmar engineers under the Build-Operate-Transfer system. Managed and operated by Myanmar Anawar Swan Arh Sin Group Co., Ltd, the port officially opened on 4 January 2003. It has island-type wharf with three trestles measuring 110 metres long and 12.2 metres wide. The three trestles connect the two wharves with the land and each wharf is 155 metres in length with apron width of 18 metres. The available water depth alongside the wharf-head of both wharves is 10 metres below datum so that the largest available vessel entering the Yangon River can be accommodated at the MIP. It has space for custom examination of 26 tracks for import and 26 tracks for export. It also has main container freight station, customs office, administration office, and security office.

The porthas an inland container depot and container terminal area of 102,385 sq m. Total container freight station area (including No.1, No.2 and main container freight stations) is 6,140 sq m.

Container storage capacity is 3,260 TEU for laden container at three heights, 360 TEU for refer container at two heights, and 4,500 TEU for empty container at six heights.

Table 6.A.5: Number of Vessels, G.C. and Container Handling in Each Budget Year at MIP*

Sr.	Budget Year	No. of Vessel	Container and General Cargo		Total Tonnage
			Import	Export	
1	2003 (Jan - Mar)	10	38,559	53,409	91,968
2	2003-2004	48	109,054	244,177	353,231
3	2004-2005	65	111,813	271,700	383,513
4	2005-2006	96	142,983	416,867	559,850
5	2006-2007	91	133,741	385,143	518,784
6	2007-2008	70	180,607	339,307	519,914
7	2008-2009	84	284,176	405,315	689,419
8	2009-2010	93	424,729	327,920	752,649
9	2010-2011	139	729,800	480,490	1,210,290

Source : *Myanmar Industrial Port (MIP).

Table 6.A.6: Cargo Handled in All Ports of Yangon (by TEU and metric ton)

No	Year	Import (TEU)	Export (TEU)	Total (TEU)	Total MT
1	2000-2001	80,406	79,091	159,497	2262,428
2	2001-2002	95,366	93,483	188,849	2658,216
3	2002-2003	97,573	98,140	195,713	2838,689
4	2003-2004	86,867	86,457	173,324	2676,184
5	2004-2005	78,223	77,361	155,584	2664,521
6	2005-2006	86,130	85,775	171,905	2606,160
7	2006-2007	99,942	97,337	197,279	3148,045
8	2007-2008	115,267	111,236	226,503	3462,489
9	2008-2009	133,712	130,294	264,006	3937,131
10	2009-2010	152,077	151,333	303,410	4372,025

Source : Myanmar Port Authority (MPA).

Annex 3

Table 6.A.7: Water Transport in Myanmar

Code	Indicator name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measurement	2004	2005	2006	2007	2008	2009	2010
A.	**Maritime transport infrastructure**									
201	Number of domestic ports		Count	22	22	22	22	22	22	22
202	Number of international ports		Count	9	9	9	9	9	9	9
B.	**Maritime transport equipment (vessels)**									
203	Number of domestic passenger fleet		Count				16	16	16	12
204	Number of domestic cargo fleet		Count				166	166	139	104
205	Gross tonnage of domestic passenger fleet		Thousand ton				10.75	11.75	12.13	10.67
206	Gross tonnage of domestic merchant fleet		Thousand ton				47.46	47.46	44.16	73.46
207	Number of international merchant fleet		Count				20	23	12	19
208	Number of international container vessel fleet		Count				4	4	4	2
209	Gross tonnage of international merchant fleet		Thousand ton				135.66	155.01	239.60	131.55
210	Gross tonnage of international container vessel fleet		Thousand ton				39.55	39.55	37.80	19.77

Code	Indicator name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measurement	2004	2005	2006	2007	2008	2009	2010
C.	**Maritime transport measurement and traffic**									
211	Domestic sea passenger traffic		Thousand person				363	n/a	205	31
212	Domestic sea cargo throughput		Thousand ton	1,574	1.477	1,816	2,177	1,921	1,929	1,901
213	Number of domestic ship calls		Thousand times	1,400	1,205	1,142	1,221		812	912
214	International sea passenger traffic		Thousand person	3.868	3.072	7.030	3.476		3.888	3.692
215	International sea cargo throughput		Thousand ton	9,799	10,181	10,955	10,922	11,541	9,021	15,947
216	International sea container throughput		Thousand TEUs	116	172	197	267	264	303	347
217	Number of international ship calls		Thousand times	1.691	1.228	1.310	1.336	1.448	1.743	2.023
D.	**River transport infrastructure**									
218	Number of river ports		Count	249	249	249	249	249	249	235
219	Total waterway route length		Kilometre	21,561	21,561	21,561	21,561	21,561	21,561	16,055
E.	**River transport equipment (vessels)**									
220	Number of passenger river fleet (domestic/international)		Count	197	200	201	194	182	146	146
221	Number of domestic cargo river fleet (domestic/international)		Count	105	103	100	103	92	80	80
F.	**River transport measurement and traffic**									
222	River passenger traffic (domestic/international)		Thousand person	24,719	25,345	26,328	26,886	27,418	27,109	27,571

Code	Indicator name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measurement	2004	2005	2006	2007	2008	2009	2010
223	River cargo throughput (domestic/international)		Thousand ton	4,307	4,262	4,284	4,479	4,657	4,684	4,791
G.	**Others (enterprises, logistics and economic performance)**									
224	Total domestic freight volume by sea		Thousand ton	1,574	1,477	1,816	2,177	1,921	1,928	1,901
225	Total domestic freight movement by sea		Million ton-kilometre	1,574	1,477	1,816	2,177	1,921	1,928	206
226	Total import cargo by sea		Thousand ton	n/a	n/a	n/a	n/a	n/a	6,550	9,933
227	Total export cargo by sea		Thousand ton	n/a	n/a	n/a	n/a	n/a	9,237	12,287
228	Total domestic freight volume by river		Thousand ton	4,307	4,262	4,284	4,479	n/a	4,733	4,786
229	Total domestic freight movement by river		Million ton-kilometre	n/a	n/a	n/a	n/a	n/a	1,092	1,394
230	Total import cargo by river		Thousand ton	n/a	n/a	n/a	n/a	n/a	n/a	
231	Total export cargo by river		Thousand ton	-	-	-	-	-	-	Non

Annex 4

Table 6.A.8: Railway Transport in Myanmar

Code	Indicator name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
A.	**Railway transport infrastructure**									
101	Total railway route length		Kilometre	4,867.8	4,867.8	4,946.8	5,038.2	5,124.8	5,301.3	5,672.2
102	Double-track railway route length		Kilometre	449.6	449.6	481.6	700.8	700.8	700.8	700.8
103	Electrified track railway route length		Kilometre	Nil	Nil	Nil	Nil	Nil	Nil	Non
104	Urban railway route length		Kilometre	74.4	74.4	74.4	74.4	74.4	74.4	82.8
B.	**Railway transport equipment**									
105	Number of railway locomotives ready for operation		Count	217	239	261	262	271	294	332
106	Number of passenger coaches		Count	1,117	1,104	1,186	1,203	1,201	1,238	1,257
107	Number of freight wagons		Count	3,698	3,471	3,304	3,248	3,252	3,427	3,355
C.	**Railway transport measurement; traffic**									
108	Total number of rail passengers		Million persons	57.7	65.4	73.6	73.6	75.2	72.3	68.8

Code	Indicator name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measure-Ment	2004	2005	2006	2007	2008	2009	2010
109	Rail passenger-kilometre		Million passenger-kilometre	1,440.3	4,565.9	5,232.8	5,278.8	5,481.8	5,296.4	5,335.6
110	Freight		Thousand ton	2,847	2,894	2,901	2,825	2,976	3,236	3,322
111	Freight-kilometre		Million ton-kilometre	866.7	922.3	908.6	827.8	904.9	1,020.7	1,085.2
D.	**Others (enterprises, logistics, and economic performance)**									
112	Total domestic freight volume by rail		Thousand ton						3,236	3,322
113	Total domestic freight movement by rail		Million ton-kilometre						1,020.7	1,085.2
114	Total import cargo by rail		Thousand ton							Non
115	Total export cargo by rail		Thousand ton						Nil	Non

Annex 5

Table 6.A.9: Air Transport in Myanmar

Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measurement	2004	2005	2006	2007	2008	2009	2010
Air transport infrastructure									
Total number of airports		Count	59	60	62	62	62	32	32
Number of international airports		Count	2	2	2	2	2	2	2
Number of domestic airports		Count	57	58	60	60	60	30	30
Air transport equipment (aircraft)									
Commercial aircraft fleet		Count	21	24	27	26	25	22	29
Air transport measurement; traffic and accidents									
Domestic air passenger traffic		Thousand person	1,284.8	1,322.6	1,897.0	1,089.4	826.1	772.6	862.1
Domestic air cargo traffic		Thousand ton	2.80	1.52	0.86	2.21	0.74	3.39	0.76
Domestic aircraft traffic		Count	22,546	29,933	16,119	16,824	22,263	21,834	23,880
International air passenger traffic		Thousand person	677.60	733.18	834.48	877.96	836.83	967.45	1,212.33
International passengers in transit		Thousand person	0.00	0.00	0.00	0.00	0.00	0.00	0.00
International air cargo loaded		Thousand ton	4.93	4.74	5.09	5.38	5.88	7.16	9.31

Indicator Name	Actual Definition Used/ Difference from the Suggested Definition	Unit/Scale of Measurement	2004	2005	2006	2007	2008	2009	2010
International air cargo unloaded		Thousand ton	4.46	4.56	4.62	4.73	6.35	6.28	6.36
International aircraft traffic		Count	7,600	7,870	8,026	8,602	7,184	7,889	11,234
Others (enterprises, logistics and economic performance)									
Number of airline companies		Count	5	5	5	5	5	5	5
Number of customs clearance points		place	8	8	8	8	2	2	2
Total domestic freight volume by air		Thousand tons	2.80	1.52	0.86	2.21	0.62	5.58	0.69
Total domestic freight movement by air		Million tons-km	-	-	-	-	0.034	0.067	0.041
Total import cargo by air		Thousand tons	4.93	4.74	5.09	5.38	6.35	6.28	6.36
Total export cargo by air		Thousand tons	4.46	4.56	4.62	4.73	5.88	7.16	9.31