

Private Sector Views on Road Transport along the Yangon – Mandalay – Muse/Ruili – Kunming Corridor

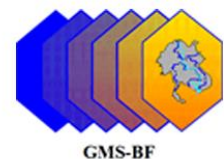
Greater Mekong Subregion Freight Transport Association (GMS FRETA)

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Executive Summary

The Yangon – Mandalay – Muse/Ruili – Kunming Corridor is Myanmar’s principal artery for international trade. Around 90% of the country’s trade volume passes via Yangon and 88.6% of cross-border trade moves via Muse/Ruili. The objective of this study is to

1. Provide a private sector view on present road transport challenges along this corridor;
2. Voice concerns and opportunities from the private sector perspective; and
3. Identify priority activities for both the private and public sector to further develop this trade route into an economic corridor.

This study is carried out by the Greater Mekong Subregion Freight Transport Association (GMS-FRETA) together with its member, the Myanmar International Freight Forwarders Association (MIFFA), and with the strong support of the ADB. Besides desk research, a total of 46 interviews and site visits have been conducted in order to qualitatively evaluate the performance of the corridor, its service providers, and infrastructure from the private sector view.

Transport

Organization of the Industry

In Myanmar, the trucking industry is organized in so-called “gates”. Gates exist in each major city and each gate specializes on one trunk route, e.g. Yangon-Mandalay. Every gate consists of a pool of operators. Membership in the gates is usually not obligatory. Newer and larger operators do generally not participate in the gate system. The gate manager has also the task of consolidating loads. The consolidated cargo is transshipped at a truck park adjacent to the office area. Full truck loads are collected directly at the shipper’s (e.g. factory) premises and do not go through the gate area. In the PRC, the trucking sector is organized similarly but with a greater proportion of large transport operators and without a focus on special routes.

Information on Trucks

The age of the Myanmar trucking fleet varies from new trucks (from the PRC) to old-timers (30+ years). On long-haul routes newer 22-wheel Chinese trucks as well as 7-15 year old 12-14-wheel Japanese trucks are dominant. Older models, such as some trucks left from the British Army days, are still used for rural and urban distribution. The Chinese trucks are left-hand drive while the Japanese imports are right-hand drive trucks. The new trucks from the PRC are a relatively new phenomenon (purchased all in the last 1-2 years) and purchased more by newcomers to the industry.

Operating Costs

Fuel efficiency varies greatly as it is strongly connected to the age of the truck. The general operating costs depend on the route. The variable costs such as fuel/lube as well as tires make up on average around 85% of all operating costs. However, the costs are much higher on the Mandalay-Muse route compared to the Yangon-Mandalay route due to the large difference in terrain. The Yangon-Mandalay route (1,500 km roundtrip) leads through flat terrain and is therefore much cheaper to operate than the Mandalay-Muse part (900 km roundtrip), that leads through mountainous countryside. Also the driver’s wages differ widely between the two road segments. Generally, the condition of the tires on trucks in Myanmar is very good. Tires all have to be imported and their quality and price depends on the origin and brand.

Traffic and Freight Rates

The road transport sector in Myanmar can be divided into three segments: (1) distribution of cargo between the port and the greater Yangon area; (2) long-haul transport service, and (3) local services up-country.

Most traffic in the country occurs along the Yangon – Mandalay – Muse – Kunming corridor. Traffic volumes at the border amount to 1,000-1,500 trucks per day. Similarly, Yangon is the major traffic generator in the country. With its port and airport, the capital acts as the main gateway for both imports and exports with the exception of international truck traffic.

Freight rates in Myanmar seem to vary greatly even on the same routes. Factors influencing the rates are

- (i) seasonal fluctuations (e.g. quantity of individual crops and their harvest time within a year),
- (ii) the weather pattern (e.g. monsoon influencing the quantity harvested between years),
- (iii) the permissible axle load (e.g. enforcement of axle load regulations), and
- (iv) the number of trucks and their individual loading capacity (total fleet capacity).

Infrastructure

Road

Along the NSC the road infrastructure varies. In the PRC, the highway between Kunming and the border of Ruili is in the final stages of construction. The last 130 km are projected to be completed by the end of 2013/beginning 2014. In the meantime, the conventional road is being used that is still in good condition. On the Myanmar side, the road infrastructure is generally in much worse condition. On the Highway No. 1 no heavy traffic is permitted, only private cars and buses. Trucks and other heavy traffic must use the conventional road, which is part of the ASEAN highway network (ASEAN Highway No. 14). While the concrete surface of the National Highway No. 1 is of low standard, it is still better than the tarmac of the ASEAN Highway No. 14. On the section from Mandalay to Muse border there are some steep climbs with tight curves. On this section the road is sometimes also narrow as it leads through hilly/mountainous terrain which is particularly dangerous for longer vehicles which struggle to go around the tight curves.

Along the corridor, there is permanent road maintenance work ongoing. Nevertheless, the maintenance quality is low and the fixes are only temporary. Consequently, due to the high traffic volume the road surface is run-down which allows only slow traffic speeds and causes high operating costs.

Ports

Myanmar has in total nine sea ports. Yangon port, the largest port in Myanmar, is the only port that handles both import and export cargo and is the major gateway for international trade. Volumes in the port have doubled from just above 10 million tons in 2002/03 to close to 20.4 million tons in 2011/12.

Transshipment Areas and Supply Chain Facilities

Along the NSC, cargo is transshipped often two or three times although it is actually necessary only once. This is because the cargo is handled by various middlemen throughout the chain and every time the ownership changes the cargo is transshipped. Consequently, there are various transshipment areas along the NSC.

The existing trucking gate facilities in Yangon and Mandalay are cramped, primitive, and dirty. In Mandalay, however, the gates and their operators will move to a new purpose-build facility as of

December 2012. Since the outline of the old and new facilities is sub-optimal for efficient transport operations, the construction of this new facility presents a missed opportunity. Good practices from other countries suggest that modern facilities are better based on a multi-user, common warehouse/transshipment shed with separate office units for each operator within the same building. On the positive side, the new facilities are adjacent to the new, planned dry port in Mandalay with easy access to the main road linking Yangon with the PRC via Muse/Ruili border.

The transshipment areas on the Myanmar side of the border are not per se to transship the cargo but are often a place where the ownership of the cargo changes (e.g. through selling or auctioning the cargo). There is no single transshipment area for Myanmar/PRC trade on the Chinese side. Depending on whether Customs has been cleared already on the Chinese side by the time the goods arrive in Jiegao, the cargo is often directly transported to Ruili. Otherwise it is stored in any of the various storage/transshipment areas in Jiegao.

Competitiveness of Myanmar's Logistics Industry from a Supply Chain Perspective

Government investments in the transport sector have largely concentrated on highways and new railways whereas the operations of the transport network, including maintenance, have been neglected. Particularly the lower-level road network has been ignored. Similarly, the private sector has invested little in the past. The transport industry has to cope with three challenges:

- (i) An outdated trucking fleet,
- (ii) Under-utilization of their trucks, and
- (iii) Low profit margins.

With the further liberalization of the country, both economically and politically, an increased inflow of private sector investment can be expected. In fact, the first wave of investment can already be observed. This investment will have also a large impact on the country's logistics, including the transport industry. A likely development example can be found in Thailand.

Recommendations

Short-term priorities (Starting as soon as possible)

The highest priority should be given to **permitting trucks using the Highway No. 1 between Yangon and Mandalay** in order to better manage present traffic volumes along the corridor. Using the highway will reduce travel time and operating costs significantly. However, the surface of the highway will likely deteriorate within few years and will need to be completely reconstructed. Since reconstruction will take several years, it should start as soon as possible.

In order to attract Chinese trucks into Myanmar, the **weight limits of the road between Mile 105 and the Myanmar/PRC border need to be adjusted** to the higher weight limits of the PRC. Enabling Chinese trucks to fully load their trucks already in Myanmar, would eliminate economic reasons not to go into Myanmar and make the exchange of traffic rights viable. Additionally, **enlarging the area of exchange of traffic rights** beyond the border towns Muse (Myanmar) and Ruili (PRC) should be pursued in the short-term. The effect of these measures in the short-run, however, will be negligible as there is presently little demand for it. Nevertheless, in the long-run transport operations should be governed by economic decisions rather than regulations. Both measures will also contribute to increase competition for logistics services at the border and as a consequence increase service quality in the medium/long-term.

Raising the **awareness of corridor users about existing laws, rules, and regulations** (especially transport-related ones) is another short-term priority because many logistics service providers are not aware about laws, rules, regulations, and standards concerning their business such as axle load limits. This can be done through associations and other relevant institutions.

Medium-term priorities (within 1-3 years)

Providing appropriate insurance for transport operators with clear regulated liability should be given high priority in the medium-term. This is a task for both the private and public sector. Private insurances should consider offering insurance coverage outside Myanmar, supported by transport operators introducing way-bills and complying with insurance policies. The public sector can support this by making way-bills mandatory.

In order to increase predictability of toll fees for the private sector and revenues for the government, a **cash-free road toll system together with priority lanes should be introduced**. This will also increase transparency and reduce the amount of cash that drivers need to carry with them.

Permitting the heavier Chinese trucks on the road section between Mile 105 and the Myanmar/PRC border will eventually require the **upgrade of the existing road between Mile 105 and the Myanmar/PRC border**. However, this has a relatively low priority since demand for using this road section by Chinese transporters is low at present and might only increase in the medium-term.

Long-term priorities (more than 3 years)

In order to fully utilize the benefits from road upgrades and reconstruction, **overhauling the whole corridor** should be considered including constructing a bridge at the Ko Krain Gauge. Undoubtedly, upgrading the whole corridor is expensive and a long-term effort. But the alternatives of upgrading various girder bridges and the worst road sections are not cheap either. Particularly when considering the benefits of upgrading only certain sections of the infrastructure are limited (e.g. time savings of few hours of a 3-day journey from Yangon to Muse), upgrading the whole corridor becomes a viable option.

In addition, **building by-passes around villages and towns** should be considered where possible to enhance traffic safety for pedestrians and truckers.

Eradicating illegal checkpoints along the corridor is also a key concern for the private sector. However, it is recognized that this is a long-term effort and requires a broad-based approach.

Continuous effort

Some private sector suggestions need to be continuously pursued. The most important of all is the **capacity and skill development along the corridor**. This has two components: (1) training for the private sector to enable them to comply with standards required in the future, and, connected to that, (2) awareness building to understand demand and seizing business opportunities in the future. These training activities offer an opportunity for a public-private-partnership where the private and the public sector each bring their individual strengths. Also, associations can play a key role and should be consulted when designing training programs.

Due to the limited international exposure of logistics service providers along the corridor, their knowledge about international best practices is very low. Enhancing this understanding will be of particular relevance because the transport industry is likely to change dramatically over the next few years and transport operators must be made aware of such developments (e.g. demand for logistics services such as temperature controlled transport and other supply chain requirements).

Further, the cross-border exchange and communication must be facilitated by **language training**. This should include components on culture and broad understanding of business practices.

Associations play also a key role in **providing information on standards, laws, rules, and regulations** concerning transport and under which conditions they apply. Such effort should be supported also by the public sector by making information easily available and accessible.

Table of Contents

Executive Summary.....	1
Abbreviations.....	8
Currency Conversions.....	8
Introduction and Background.....	9
Trade and Transport along the NSC.....	11
Definitions of Trade and Transport.....	11
Road Infrastructure.....	13
Issues and Concerns.....	13
Private sector suggestions for the <i>public sector</i>	14
Private sector suggestions for the <i>public sector</i> or in a <i>public-private partnership</i>	15
Road Safety along the Corridor.....	15
Issues and Concerns.....	15
Private sector suggestions for the <i>public sector</i>	16
Capacity and Skill Development along the Corridor.....	16
Issues and Concerns.....	16
Private sector suggestions for the <i>private sector</i> and <i>public sector</i>	17
Supply Chain Infrastructure.....	18
Issues and Concerns.....	18
Private sector suggestions for the <i>private sector</i>	18
Transport Regulations.....	19
Issues and Concerns.....	19
Private sector suggestions for the <i>private sector</i>	21
Private sector suggestions for the <i>public sector</i>	21
Banking and Insurance.....	22
Issues and Concerns.....	22
Private sector suggestions for the <i>private sector</i>	24
Private sector suggestions for the <i>public sector</i> or in a <i>public-private partnership</i>	24
Guidance for Stakeholders.....	24
Short-term priorities (Starting as soon as possible).....	24
Medium-term priorities (within 1-3 years).....	25
Long-term priorities (more than 3 years).....	25
Continuous effort.....	25
Appendices.....	27

Appendix I: Methodology	27
Survey Design	27
Sample Selection	27
Limitations	28
Appendix II: Trade	28
National Trade	28
Products	30
Trading Terms of International Trade	31
Border Trade vs. Normal Trade	32
Myanmar and PRC Border Trade	35
Informal and Semi-Formal Trade between Myanmar and the PRC	37
Appendix III: Transport	37
Organization of the Industry	37
Information on Trucks	38
Operating Costs	39
Appendix IV: Traffic	40
Traffic Statistics and Products	40
Freight Rates	42
Appendix V: The Current Weight Limits in Myanmar 2012	44
Appendix VI: The Infrastructure along the North South Corridor	45
Road	45
Ports	49
Rail	51
Transshipment Areas and Supply Chain Facilities	51
Appendix VII: Competitiveness of Myanmar’s Logistics Industry from a Supply Chain Perspective	53
Appendix VIII: Transport and Trade Patterns for Selected Products	56
Appendix IX: Status of CBTA Annex and Protocol Ratification by GMS Country, July 2012	57
Appendix X: The Economist: “Less Thunder out of China”	58
Bibliography	61

Abbreviations

ADB	Asian Development Bank
CNY	Chinese Yuan Renminbi
FCB	Free-Carrier Border
FOB	Free-on-Board
FRETA	Freight Transport Association
GIT	Goods in Transit
GMS	Greater Mekong Subregion
LC	Letter of Credit
LTL	Less than Truckload
MFN	Most-Favored Nation
MIFFA	Myanmar International Freight Forwarders Association
MMK	Myanmar Kyat
NSC	North South Corridor (Yangon – Mandalay – PRC trade route)
NSEC	North South Economic Corridor (Thailand - Lao PDR - PRC)
PRC	People's Republic of China
TEU	Twenty-Foot Equivalent Unit
TT	Telegraphic Transfer
USD	United States Dollar
yoy	Year-on-Year
3-PL	Third Party Logistics
4-PL	Fourth Party Logistics

Currency Conversions

1 USD	= 850 MMK
1 USD	= 6.2 CNY

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Introduction and Background

Myanmar is part of the Asian Development Bank's (ADB) Greater Mekong Subregion (GMS) program since its inception in 1992. But until recently, the extent of engagement of donors and development partners including ADB was very limited. In recent months however, reacting to the commencement of political and economic reforms., many countries have started to lift or suspend sanctions on the government of Myanmar. Since then, the country has seen unprecedented enthusiasm about its re-introduction into the global community and both the private and public sector see promising business and investment opportunities.

Myanmar's main trade corridor links the economic centers Yangon and Mandalay with the port of Yangon and the People's Republic of China (PRC). As this route represents the lifeline of the country, it is critical for Myanmar's future development. The Myanmar government, together with development partners, is presently evaluating the transport infrastructure and potential needs for improvement. This is also an opportunity for the private sector to voice its interests and concerns.

The objective of this study is to

4. Provide a private sector view on present road transport challenges along this corridor;
5. Highlight concerns and opportunities from the private sector perspective; and
6. Identify priority activities for both the private and public sector to further develop this trade route into an economic corridor.

This study is carried out by the Greater Mekong Subregion Freight Transport Association (GMS-FRETA) together with its member, the Myanmar International Freight Forwarders Association (MIFFA), and with the strong support of the ADB¹. The GMS-FRETA was established in 2012 with the objective of providing a private sector perspective on GMS transport and trade facilitation efforts and serving as a platform for trade and transport companies to work with the governments of GMS member countries.

Besides desk research, a total of 46 interviews and site visits have been conducted in order to qualitatively evaluate the performance of the corridor, its service providers, and infrastructure. This report marries the results from the interviews, the observations of the field trip and site visits, and desk research in order to provide an objective input for governments, the private sector, and development partners.

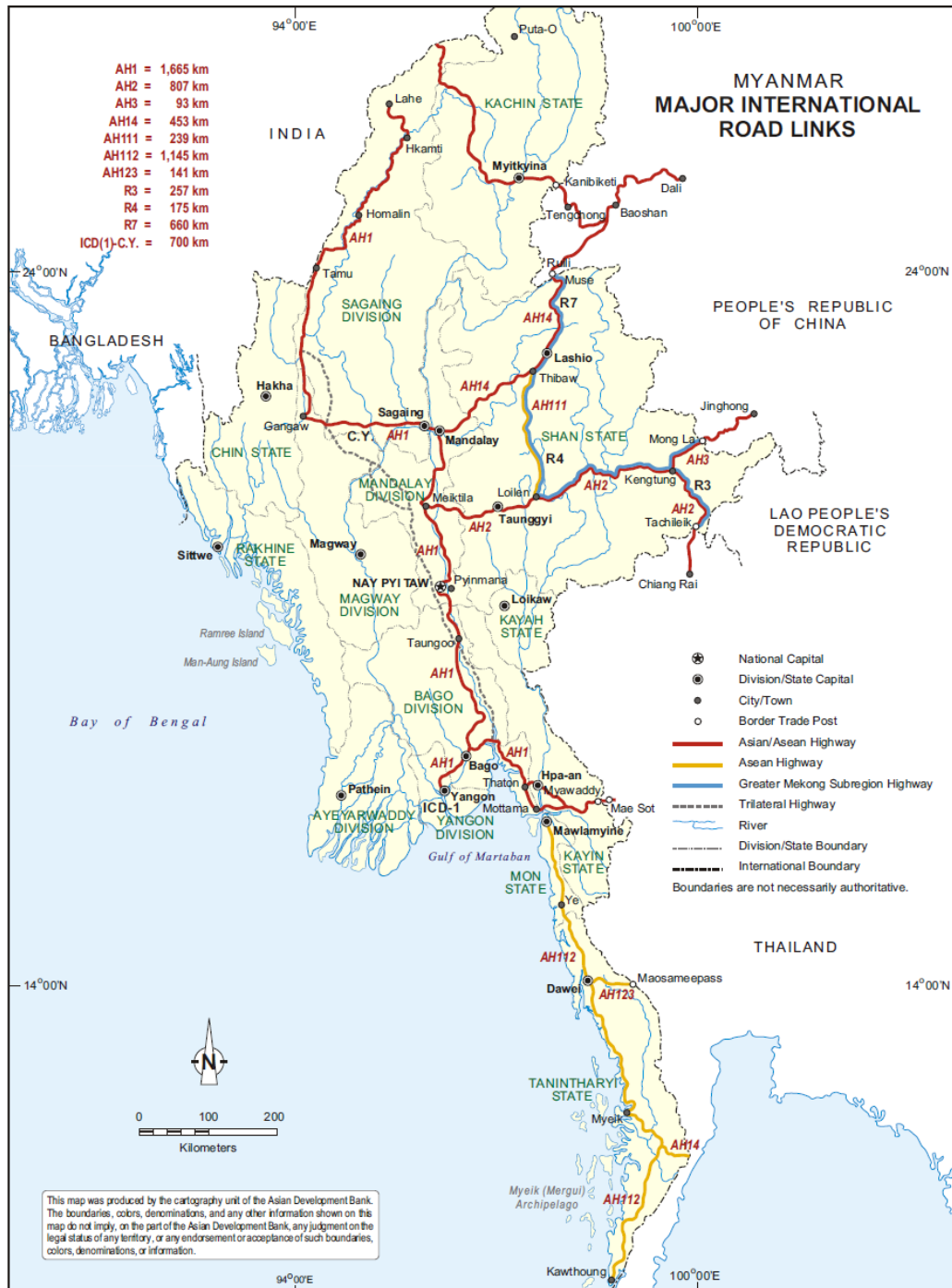
During the study period, six priority areas, where improvements are needed, became apparent:

- (i) Road Infrastructure
- (ii) Road Safety along the Corridor
- (iii) Capacity and Skill Development along the Corridor
- (iv) Supply Chain Infrastructure
- (v) Transport Regulations
- (vi) Banking and Insurance

¹ This study was financed by the Asian Development Bank (ADB) under the Regional Technical Assistance Project TA-7851 (REG): Support for Implementing the Action Plan for Transport and Trade Facilitation in the Greater Mekong Subregion.

Addressing those challenges will further enhance the corridor performance necessary for deeper supply and value chain integration. To succeed, the full commitment of both the private and public sector will be necessary.

Figure 1: Map of Major International Road Links Passing through Myanmar



AH = Asian Highway, ASEAN Highway; R = GMS Highway
 Note: The map shows existing and future links.

Source: ADB

Trade and Transport along the NSC

The logistics industry permanently struggles to balance time, cost, and reliability. Road transport offers many advantages over other modes of transport (water, air) such as door-to-door service, fast delivery times and high flexibility. These advantages, however, can only come into effect if transport is smooth, cost efficient, and without delays.

The North South Corridor (NSC)² linking Yangon, Mandalay and the PRC is the major lifeline for Myanmar. It connects the two major economic centers Yangon and Mandalay with international markets through Yangon port as well as with the largest cross-border trade partner PRC through Muse/Ruili. Yangon port is to date also the only port that handles both imports and exports and around 90% of all Myanmar international trade (by weight). Mile 105, the main Customs gate to the PRC handles more than 90% of Myanmar's total border trade (by value).³

Along the NSC, road transport is the dominant mode. There are very few alternatives to road transport such as air transport (from Yangon international airport and soon from Mandalay international airport) and rail transport. Air transport capacity between the airports of Yangon and Kunming is small and, although exports from Yangon to the rest of the world are significant in terms of value, volumes are not.

Compared to other countries in the region, the railway system in Myanmar is relatively well maintained, but it remains insignificant in terms of cargo volume due to its inflexibility and age of the rolling stock.

There are also various smaller rivers and streams throughout Myanmar but only very few of them are actually used, or have significant potential at present for cargo transport.

Traffic along the corridor consists of both domestic and international trade. Most of the trade, both domestic

² The term North-South Corridor is not an official name of the corridor but used by the authors in this article to refer to the Yangon – Mandalay – Muse/Ruili – Kunming Corridor.

³ Department of Border Trade, Ministry of Commerce (2012).

Definitions of Trade and Transport

There are numerous terms in the field of trade and transport that are used sometimes interchangeably and lead to confusion, even among experts. For this paper trade and transport terms are defined and used as follows:

Normal Trade refers to official trade between two countries by any mode of transport.

Border Trade is official trade between two neighboring countries. Border trade is restricted to the respective border area (e.g. two adjacent border provinces of two countries) and has usually both quantity and value restrictions. Those restrictions vary from country to country.

Informal Trade describes any trade that is not officially declared to Customs on either side of the border. Along this corridor, such cargo is often transported by unregistered trucks across routes outside the official border crossings.

Semi-Formal Trade is not official in so far as it is declared to Customs on only one side of the border and not on the other regardless of whether it is import or export for the respective countries.

Cross-Border Trade refers to any cargo movement across borders, including official and unofficial trade. In practice, on this route, this is only road transport

Transloading refers to the physical movement of cargo from one unit to another (e.g. from one container into another container). Transloading is often done with manual laborers, but also forklifts or other equipment could be used.

Exchange of trailers or trailer swap refers to a change of the motor tractor unit of an articulated truck. In this case, the cargo remains untouched on the trailer and only the front part ("head") of the truck changes.

Transshipment refers to the whole process of changing the vehicle/container/cargo regardless of the method (transloading, lift-on/lift-off, exchange of trailer) and is therefore a more generic term.

Container swap refers to an agreement between two truckers to accept, handle, and return containers belonging to the other. Such agreements normally specify the specification and condition of the container used, responsibility for damage, etc.

and international, is generated around the two economic centers Yangon and Mandalay.

While Yangon generates significant trade in light industrial goods such as garments, the central part of Myanmar produces lots of agricultural products, which are then supplied to Mandalay, Yangon and international markets. Yangon port is the main gateway for maritime trade while the PRC mainly buys agricultural products. Conversely, the PRC supplies consumer goods, temperate agricultural products and construction equipment to Myanmar.

The above considerations were taken into account for the recommendations below to improve transport performance in terms of time, cost, and reliability. The supply chains of some products have special logistics requirements (e.g. cold chain for agricultural products) which are integrated into this report where possible. As the knowledge of international best practices of logistics service providers⁴ in Myanmar is generally low, some of the responses given in the interviews reflect outdated views on transport and logistics. As this report reflects private sector views, also those responses have been included in this report but reconciled with modern views. In addition, some recommendations are based on further background information or are interlinked with other recommendations. Where such linkages occur, reference is made to relevant sections/appendices in the report.

⁴ The term logistics service providers refers in this paper to firms providing any kind of logistics services. This is regardless of the level of integration of the different services provided within a company. Therefore, this definition in this paper goes against the more common definition of providing different, integrated logistics services within one company such as third party logistics (3-PL) or fourth party logistics (4-PL) services.

Road Infrastructure

Issues and Concerns

Along the NSC the road infrastructure varies. In the PRC, road conditions are very good and allow fast and efficient transport.

On the Myanmar side of the border, the road infrastructure is in much worse condition. The road has two lanes (one lane in each direction) along the majority of the route between Yangon and the Muse border with only a small section of 4-lane road. There are some steep climbs with tight curves (among others at the Ko Kraing Gorge [127 km Northeast of Mandalay]; from Neen to Hsenwi [330 km Northeast of Mandalay]) on the section from Mandalay to Muse border (→ see Appendix VI: The Infrastructure along the North South Corridor). On this section, the road is sometimes also narrow as it leads through hilly/mountainous terrain. Despite permanent ongoing road maintenance work, the road surface is run-down from the high traffic volume, allowing only slow traffic speeds and causing high operating costs.

In addition, there are various bridges (weight limit 13 tons) with by-passes for heavier traffic just South of Mandalay. However, the by-passes remain unused because they are inconvenient for the drivers. Hence, trucks with a gross weight of 50 tons use the 13-ton bridges.

Main concerns regarding the road infrastructure are

- (i) The whole corridor is insufficient to handle the present traffic volume
- (ii) The overall condition of the road infrastructure is poor, especially the surface. Some road sections are very narrow, with steep climbs and descents and tight curves
- (iii) Infrastructure (weight limit) prevents Chinese trucks from entering into Myanmar
- (iv) The remaining section of the highway in the PRC linking Kunming with the border is not completed

(i) Myanmar's major traffic and trade artery connects Yangon with Mandalay. All trucks must use the conventional road between Yangon and Mandalay (Asian Highway 14) and are not permitted to use the existing parallel highway between Yangon and Mandalay (Highway No. 1). The conventional road has two lanes and leads through many villages and towns whereas the highway has at least four lanes (two in each direction) throughout. Traffic speed is therefore much lower than it could be on the Highway No. 1.

Considerations for Upgrading Specific Road Sections on the example of Mandalay-Muse:

When it comes to upgrading specific road sections, there is one consideration that should be taken into account.

While the overall impact of upgrading an individual road section between two major trading points (e.g. Mandalay and Muse) could be relatively small, the benefits from upgrading the whole road could be tremendous.

For example, the average speed between Mandalay and Muse is at present around 25 km/h. At certain sections, the trucks can only move at walking pace due to the steep climbs/descents, the heavy cargo (gross truck weight up to 50 tons), and tight curves on a damaged road. Any mistake by the driver will have dramatic consequences. Building e.g. a bridge, which is expensive, will lead to significant improvements in terms of speed and safety. The estimated time savings are between one and two hours. Nevertheless the overall transit time on the road, will not be heavily impacted. Therefore, the returns on investment will be moderate.

However, upgrading the whole road between Mandalay and Muse (around 450 km) will significantly reduce transport time. It is estimated that transit time could be reduced by at least 50% of the current figure. In addition, operating costs (e.g. fuel and tires) will be reduced significantly and road safety will increase. A side effect will be that the effective transport capacity will nearly double (under the assumption that traffic speed will increase from 25 km/h to 50 km/h). Hence, the returns on investment will be much beyond the simple sum of the returns from each single road section.

(ii) The overall condition of the road infrastructure in Myanmar is poor, especially the surface. This despite permanently ongoing road maintenance along the whole corridor (→ see Appendix VI: The Infrastructure along the North South Corridor). This increases not only truck maintenance costs but also the operating costs as the surface condition significantly slows the trucks. The average speed of a truck is below 40 km/h between Yangon and Mandalay (flat terrain) and only 20-25 km/h from Mandalay to Muse (mountainous terrain). In some parts, the climbs and descents are very steep.

Especially on the section between Mandalay to Muse, trucks (12-wheelers and 22-wheelers) are going around tight curves on narrow roads with steep climbs/descents. Road damage is particularly obvious as the non-steering tires slowly shave off the tarmac. Despite permanent maintenance work ongoing, the quality of the road is deteriorating very fast.

The surface quality of Highway No. 1 (mostly concrete) is also of low standard, but still better than the conventional road. The highway also by-passes towns and cities and the sides are cleared of any trees and bushes. Nevertheless, heavy traffic would probably destroy the highway within few years.

(iii) At present, Chinese trucks do not enter Myanmar despite the municipal agreement between Muse and Ruili border towns. Besides the general lack of knowledge about Myanmar and their fear of entering the country (→ see section Capacity and Skill Development along the Corridor), there is also a valid economic argument: due to the higher weight limit in the PRC (than Myanmar), Chinese trucks can not fully utilize their truck capacity on Myanmar roads; especially as axle load regulations are strictly enforced by the Myanmar government since last year.

(iv) The highway between the provincial capital of Kunming and the border at Ruili is in the final stages of construction. The last 130 km are projected to be completed by the end of 2013/beginning 2014. Until then, the conventional road is used. From the border to the highway connection transporters need around 3-4 hours as the terrain is mountainous with many curves and traffic gets congested. Once truckers reach the highway, road conditions are very good. Completing the highway between Kunming and the PRC border should be given utmost priority.

Private sector suggestions for the *public sector*

- (a) Permit trucks to use the highway between Yangon and Mandalay. In order to control road damage from trucks and other heavy vehicles, the axle weight of vehicles could be limited (rather than limiting gross truck weight). This would prolong the life of the road as the damage is not caused by the gross weight of the truck but by heavy axles. In order to determine the maximum

Port Development in Kyaukphyu, Myanmar

The PRC is developing the port in Kyaukphyu. The port will be connected with two pipelines for oil and gas, a rail link and a road link. Both the port development itself as well as the connecting infrastructure will be financed by the government of the PRC. Laying the pipeline progresses well, both road and rail links will still take time to complete.*

Both road and rail link will connect the port of Kyaukphyu via Mandalay and Muse with Kunming. An estimate heard from one interviewee was that the rail link will not be finished before 2017.

It is also interesting to note that the rail link will be in standard gauge while the rest of the country runs on 1-meter gauge.

Since this development overlaps with the corridor between Mandalay-Muse, there should be close coordination between the governments of Myanmar, PRC, and implementing agencies to avoid duplication.

** The rail link is already complete from Kunming to Dali. The road section needs 160 km more to complete.*

permitted axle weight, further investigation into the road design and foundation would need to be undertaken.

- (b) Simultaneously upgrade the highway as it will deteriorate within few years once heavy traffic is permitted. Upgrading needs to include a total reconstruction of the highway including the foundation and widening of the road. Widening the road should be no problem as the sides are cleared already.
- (c) Alternatively (if options (a) and (b) are not considered) upgrade of the conventional road (Asian Highway 14). Upgrading should include widening of the road, resurfacing and by-passes around all towns and villages (→ see section Road Safety along the Corridor).⁵
- (d) Upgrade the road section between Mile 105 and the border in order to allow Chinese trucks to fully utilize their truck capacity. This would provide the basis for a commercially viable exchange of traffic rights between Myanmar and the PRC (→ see section Transport Regulations).

Private sector suggestions for the *public sector* or in a *public-private partnership*

- (e) Build a bridge at Ko Kraing to eliminate the steepest climb/descent combined with a narrow road and tight curves. This project could either be accomplished by the public sector or in a public-private partnership. The costs of constructing the bridge can be, at least partially, passed on to the users (user pays principle e.g. through a toll gate) (→ see graph in Appendix VI: The Infrastructure along the North South Corridor). In addition, synergies between the building of the bridge as well as with the development of the land connection between port Kyaukphyu and the PRC are expected.

Road Safety along the Corridor

Issues and Concerns

Main concerns regarding road safety along the corridor are:

- (i) Weight limit of some bridges is insufficient for current traffic
- (ii) The corridor passes through towns and villages which increases transit time, fuel consumption, and driver fatigue

(i) Along the corridor, South of Mandalay there are several old girder-bridges. Despite available by-passes for heavy traffic, the bridges are used by all trucks (including heavy traffic with a gross weight of up to 50 tons) although there is a weight limit of 13 tons (sign in Myanmar language). As the bridges are long, each bridge carries the full weight of the truck which is a serious safety concern.

(ii) The corridor in Myanmar leads through villages and smaller towns and there are many pedestrians, among them many children, walking and playing along the road. In the evenings farmers and workers walk home after work, carrying their harvest and tools. Road safety is important, but equally this is a vital source for the livelihood and mobility of villagers and farmers.

⁵ As the road leads through towns and cities, widening the road might require resettlement.

Private sector suggestions for the *public sector*

- (a) Upgrade bridges to handle traffic grossing 50 tons (or more). However, if trucks could use the highway (as proposed in the Road Infrastructure section) the bridges would not need to be upgraded for heavy traffic.
- (b) Build by-passes to take heavy traffic around villages and towns

Capacity and Skill Development along the Corridor

Issues and Concerns

The capacity of logistics service providers along the corridor is very different between Myanmar and the PRC. In the PRC, the logistics industry is generally much better developed. In Myanmar, due to the long isolation of the country from world markets, the exposure and hence experience of logistics service providers in foreign best practices is very low. At the same time, Myanmar has accepted various international commitments such as the ASEAN Economic Community, ASEAN Highway Network, GMS integration (e.g. CBTA [→ see Appendix IX: Status of CBTA Annex and Protocol Ratification by GMS Country, July 2012], etc.) which will expose the country to fierce competition with its neighbors in the future, particularly from Thailand and the PRC.

The main concerns regarding the capacity of the logistics providers along the corridor are

- (i) The logistics service capabilities are insufficient for new industries and investments
- (ii) Very few people speak any of foreign language, especially in the PRC
- (iii) Chinese traders and service providers know very little about Myanmar

(i) The general service quality along the corridor has room for improvement. On the Chinese side the quality is slightly better, partly facilitated through easier trade and transport procedures but also because all cross-border logistics activities take place in the PRC and the Chinese service providers have therefore a “home-advantage”. In Myanmar the logistics service providers operate well under the constraints they face, but shortcomings became apparent during the during the field visit.

For example, the lack of proper business management is particularly obvious in areas such as concluding sales (only handshake deals – unacceptable for modern manufacturers), business risk (taking on risk they can not manage), and business planning (no depreciation or future planning). Respondents also reported that their growth in the future might be limited by finding qualified personnel (e.g. drivers, managers, etc.) for their operations.

In addition, there is a lack of basic understanding of supply and value chains. This can be attributed to the long isolation of Myanmar from international markets and the resulting lack of experience handling cargo with international standards. In addition, as many large, foreign firms refrained from investing in Myanmar for the past decades, there has been simply no demand for high-quality service. However, considering Myanmar’s rapid economic development and the kind of investors the country is attracting, such demand will quickly emerge in some business sectors.

The expected fast liberalization of the economy through the various international commitments of the country will expose the private sector domestic transport operators to international competition and,

more significantly, to new demands from the manufacturing industry. The inflow of foreign investment (including logistics service providers) can however also offer an opportunity to domestic firms. Large international 3-PL companies usually do not operate their own trucking fleet but outsource this service to local firms who can meet the high standards imposed on the 3-PL companies by their multi-national manufacturing customers. While the foreign firms will bring international standards to Myanmar, domestic firms can learn from them (especially those being selected to carry out the service). (→ see Appendix VII: Competitiveness of Myanmar's Logistics Industry from a Supply Chain Perspective).

(ii) There is a lack of foreign language skills among users and service providers along the corridor. While this concerns both countries (Myanmar and the PRC), it is most apparent in the PRC. To date, most logistics activities are conducted on the Chinese side; some Myanmar business people speak also Chinese and English while Chinese usually speak neither Burmese nor English. This could be in the long-run a major disadvantage in attracting international business.

(iii) One reason why most of the logistics activities are concentrated on the Chinese side is the lack of knowledge among Chinese citizens about Myanmar. Despite regular trade fairs (alternating between Ruili and Muse) the response of interviewees why local Chinese do not want to enter Myanmar was consistently consistent with what "The Economist" magazine has found: "The local Chinese know almost nothing about Myanmar, other than the fact that it is poor and, they believe, dangerous" (The Economist, 2012, p. 42; → see Appendix X: The Economist: "Less Thunder out of China"). While these allegations certainly do not match our experiences in Myanmar during the field trip, they obviously prevent Chinese business people from realizing business opportunities in Myanmar.

Private sector suggestions for the *private sector* and *public sector*

Raise awareness and provide training for all stakeholders operating along the corridor to prepare firms in Myanmar and the PRC for future business opportunities is a major task for both the private sector (e.g. associations etc.) and public sector.

This is a major task which offers a good opportunity for collaboration between the public and private sector where each can contribute its individual strengths. The GMS-FRETA in particular could play a key role in addressing the above issues and facilitating the coordination between the two sectors. Individual components include

- (a) Raise awareness of the private sector of business opportunities:
 - a. Business Management
 - b. Supply and value chain training
- (b) Provide training to meet future demand for high-quality services:
 - a. Service-provider specific training (drivers, managers, etc.)
 - b. Supply and value chain training
 - c. Training on standards and regulations
 - d. Training for banks and insurance companies (→ see section Banking and Insurance)
- (c) Provide language training to facilitate cross-border exchange and communication with customers from outside the region.
- (d) Provide training and organize events for the private sector to enhance understanding between the Chinese and Myanmar business sectors and create cross-border business opportunities.

Supply Chain Infrastructure

Issues and Concerns

Along the corridor, there is large trade in fresh agricultural products and some frozen seafood. Once agricultural products are harvested, the shelf life is usually very short if no special precautions are taken. For example, while a mango remains fresh for around 5-6 days without special treatment, it can be kept for 10-15 days in a cooled environment (10-12 degrees).

The main concern regarding the supply chains along the corridor is

The limited availability of temperature controlled facilities at key nodes and the lack of temperature-controlled vehicles or containers along the corridor

Most of the fruit and vegetables exported to the PRC are grown in the central part of Myanmar. At present, the agricultural produce is collected by smaller traders and either first brought to the trader's premises for consolidation with other growers' produce, or transported directly to Muse (near Mile 105 – 12 km from the border) where it is auctioned. Consolidation of products can take up to one day and the cargo is often stored outside where it is exposed to outside influences.

The transport usually takes place in open trucks sometimes protected by tarpaulins. Depending on the cargo, the cargo protection varies. For example, water melons (with seeds) are only cushioned with some straw while seedless water melons and mangos are usually packaged in cartons that provide at least some protection against outside influences. Nevertheless, the losses from transport and transshipment amount to around 4-5%. The total cargo volume during main season is between 100-150 trucks per day per fruit.

While the manual transshipment of goods takes around 3-4 hours, delays in the acceptance of the cargo in Jiegao/Ruili can delay delivery another 2-3 days. By the time the mango is loaded onto the Chinese truck (non-temperature controlled) the fruit is often past its optimal maturity. The Chinese traders may use any delay, whatever the cause, to demand a discount, alleging that the cargo has deteriorated.

Similarly, frozen seafood is transported from Yangon to the PRC in open trucks covered with tarpaulin and lashing. To keep the cargo cool, small cushions filled with rice husk are laid on the floor and sides of the truck. However, this does not keep the cargo at the required temperature on the 3-4-day journey. After three days of transit to the Myanmar/PRC border, it is stored in a refrigerated warehouse next to the 105 Miles depot for 2-3 days at -18 degrees to re-freeze the cargo. Subsequently, small, open Chinese trucks pick up the cargo from the warehouse and transport it across the border where it is loaded onto bigger, non-refrigerated Chinese trucks for distribution in Yunnan province of the PRC. Since no temperature-controlled equipment (e.g. containers) is used along the whole corridor, there is, effectively, no cold chain during transport. Besides a shorter shelf-life and general lower quality of the products, this procedure entails a significant health risk (→ see also Appendix II: Trade, Myanmar and PRC Border Trade).

Private sector suggestions for the *private sector*

- (a) Use temperature-controlled containers to transport sensitive cargo (fresh fruits, frozen fish, etc.) and invest in refrigerated warehouses at key nodes in order to guarantee the cool chain. This will

eliminate health risks, improve the quality/shelf-life of the products, and should, if implemented throughout the route, lead to fewer losses during transport and higher selling prices of the fruits. Transporters will also need to buy generator units for their trucks to provide power for the reefer containers. Strategic locations for refrigerated warehouses would be at collection and consolidation points e.g. in Mandalay or, where volumes are large enough, closer to the farm. Nevertheless, it has to be recognized that such cold chain operations are expensive and are only viable under the following conditions:

- a. The supply chain must be smooth and seamless. This can be achieved by forming partnerships within Myanmar between traders, transporters and growers. For example, along the North-South Economic Corridor (NSEC), connecting Thailand, Lao PDR and the PRC, traders, growers and transporters are operating closely together to ensure seamless operations (Ksoll & Quarmby, 2012).
- b. Return loads must be secured. Particularly for transporters, buying and operating temperature-controlled equipment is only viable if the containers can run loaded both ways. For example, Thai traders/exporters along the NSEC have established partnerships with their Chinese counterparts. As a result, before they export any goods, they contact their Chinese business partner who then organizes also a backload (e.g. temperate fruits or vegetables in exchange for tropical fruits) and thus they are both able to fill the trucks both ways with temperature-sensitive cargo (Ksoll & Quarmby, 2012).
- c. Whilst on the Northbound-leg the most critical question is whether better quality is rewarded by the buyer, on the Southbound-leg the question is whether there is a sufficient market demand for temperature-controlled products in Myanmar to allow a balanced traffic-flow. The most critical part in the chain is therefore the consumer. The above suggestions are only feasible in practice, if the buyers/consumers reward better product quality with a price premium and if consumers Southbound in Myanmar are able to afford higher value products. Without such demand, any effort in improving the quality will not pay off.

Transport Regulations

Issues and Concerns

There are myriads of agreements, laws, rules and regulations governing domestic and cross-border road transport. Whilst each country has different national standards, there are also regional agreements of which some are implemented and others are not.

Main concerns regarding the present transport regulations along the corridor are

- (i) The exchange of traffic rights between Myanmar and the PRC is limited to a municipal agreement
- (ii) Lack of transparency about the exact transport regulations along the corridor
- (iii) Sporadic and ad-hoc enforcement of transport regulations and other laws/rules/regulations along the corridor
- (iv) Road tolls can only be paid in cash

(i) There is a limited exchange of traffic rights between Myanmar and the PRC, regulated by a municipal agreement between Muse and Ruili. According to that agreement Chinese trucks may cross into Myanmar

(up to the Mile 105 Logistics Center – 12 km from the border) and Myanmar trucks may cross into the PRC (up to the city of Ruili – 8 km from the border).

The cross-border traffic volume between the two countries is significant. There are various types of truckers performing cross-border transport and it depends on the kind of trade (normal trade, border trade, informal trade, semi-formal trade) who will carry the goods (→ see Appendix II: Trade).

For example, for border trade and informal trade there exists a large fleet of old, unregistered Chinese, light trucks carrying mostly informal cargo, 3-7 tons each, between the PRC and Myanmar.

Normal trade and semi-formal trade is usually transported by Myanmar truckers because sales are concluded on a free-carrier border (FCB) basis⁶ where Myanmar traders are responsible for the export cargo until it is loaded onto the truck or into the warehouse of the buyer. Similarly, for imports Myanmar traders have to pick up the cargo at a transshipment facility in the PRC. An exception is the live eel and crab trade from Myanmar into the PRC. In this case, Chinese transporters pick up the seafood at the auction center adjacent to Mile 105. Thus, for normal trade, the majority of transshipment activities take place in the PRC and very few Chinese long-haul trucks enter Myanmar.

The limited entry of Chinese trucks into Myanmar can be explained by the general lack of knowledge among Chinese about Myanmar and their fear of entering the country (→ see section Capacity and Skill Development along the Corridor, → see Appendix X: The Economist: “Less Thunder out of China”), as well as the strict enforcement of the weight limit in Myanmar. With a higher axle load limit in the PRC, Chinese trucks can not fully utilize their truck capacity in Myanmar and therefore prefer to load their truck in the PRC.

In total, heavy traffic volumes across the border are around 1,000 trucks per day (total both directions). Although the municipal agreement is not yet fully utilized because Chinese long-haul trucks do not cross into Myanmar, the exchange of traffic rights beyond the municipal level should be further pursued. In spite of the modest demand for such exchange of traffic rights, it would (1) eliminate barriers to transport, and (2) allow both Chinese and Myanmar truckers to base their decision on whether to cross the border or not on commercial/business grounds rather than regulations, fears, or prejudices.

The greater exchange of traffic rights would need to be accompanied by a harmonization of axle loads and other transport regulations in order to make such an expansion also economically and commercially viable. For this the road between the border and the Mile 105 needs to be upgraded as the heavier traffic from the PRC will destroy the road over time (→ see also section Road Infrastructure).

(ii) There is also a lack of transparency about the exact transport regulations applying along the corridor. For example, there are national axle load regulations in the PRC and Myanmar, but simultaneously ASEAN weight limits apply on the ASEAN highway network. Transport operators and users of the corridor did not know which regulation (e.g. ASEAN or national) would apply in different cases. In light of the strict enforcement of axle load limits in Myanmar since 2011, operators must be made aware of what set of regulations applies in different cases. This is related to the low levels of training and international experience of logistics service providers (→ see section Capacity and Skill Development along the Corridor).

⁶ For more details see Appendix II: Trade, Myanmar and PRC Border Trade.

(iii) Transport operators and corridor users also reported irregular enforcement of transport regulations and other laws/rules/regulations. Regulations are permanently enforced at major checkpoints such as Mile 105 (near PRC border), Mile 16 (near Mandalay), and others. At those major checkpoints every truck will be inspected physically. Along the way, there are also toll gates at every larger city/town where all trucks are weighed at weigh-bridges. However, truckers report that the weigh-bridges show different weights for the same truck along the way (without changing the cargo)⁷. In addition, there are illegal checkpoints of various agencies (Customs, traffic police, etc.) demanding “tea money” for breaking traffic laws. While these violations are at times only false pretenses, truckers are often also unaware of existing regulation and hence at the mercy of government authorities.

(iv) Private operators along the corridor reported that the road toll can only be paid in cash. While there is no particular problem with such a system, transporters suggested introducing a cash-free system together with priority lanes at toll gates. According to operators, the toll fees amount to around USD 0.11/0.09 per km for a 12-wheeler/10-wheeler truck with a load of 25 tons/21 tons, which is around USD 200 on a 2,000 km trip.

Private sector suggestions for the *private sector*

- (a) Better communicate standards and regulations to private sector operators, e.g. through associations and other relevant institutions.
- (b) Increase the support and institutional capacity of associations to better fulfill their role as intermediaries between government and private sector.

Private sector suggestions for the *public sector*

- (c) Enlarge the area for the exchange of traffic rights to include Kunming in the PRC and Mandalay in Myanmar.
- (d) Harmonizing Myanmar and Chinese axle load regulations. The effect of expanding the exchange of traffic rights and increasing the axle load regulations might eventually draw some logistics services across the border to Myanmar. Increasing the competitiveness of Myanmar then increases competition which should lead to better service quality in the medium/long-term.
- (e) Better communicate current standards including the conditions under which they apply e.g. through associations, conferences, trainings (→ see section Capacity and Skill Development along the Corridor) and other events. This would on the one hand raise awareness among operators about traffic and transport regulations and on the other hand increase transparency.
- (f) Eradicate all illegal checkpoints along the corridor.
- (g) Introduce a cash-free road toll system together with priority lanes. In such a system, transporters would be allowed to pay the road toll in advance for a certain period of time (e.g. 1 year) and would get e.g. a sticker with which they can pass at the toll gates through priority lanes. A similar system can be found e.g. in Switzerland and other countries. The positive aspects of such a system would be that drivers do not need to carry as much cash as well as costs to the private sector and revenues for the government would become more predictable. In addition, such a system would contribute to greater transparency.

⁷ Due to these differences, the Myanmar Highway Freight Transport Services Association is installing their own weigh-bridges, separate from those operated by the government and the concession holder for road maintenance.

Banking and Insurance

Issues and Concerns

Under consideration of the potential future demand for safe and secure transport and transport services within supply chains, the banking and insurance sector must adjust and expand their products to cover basic risks and offer greater choice as well as tailor-made solutions in the area of banking/finance and insurance. Main concerns regarding banking and insurance are

- (i) The present use of traditional cargo liability schemes in transport operations
- (ii) The lack of insurance coverage outside Myanmar (for Myanmar transporters) and outside China (for Chinese transporters)
- (iii) The lack of waybills in road transport
- (iv) The limited access to finance and restrictions in trade finance products

(i) Myanma Insurance, a fully government-owned insurance company, is the only insurance company licensed to operate in Myanmar. There are mainly two insurance products offered in Myanmar: liability insurance and cargo insurance. While trucks have compulsory third party insurance, cargo insurance is practically non-existent and covers only domestic loads. Reasons for that are the government policy to export on FOB/import on CIF basis, thereby requiring the foreign trading partners to buy insurance, as well as the unfavorable insurance terms (Japan International Freight Forwarders Association, 2012).

Generally, payouts of the insurance are extremely limited due to the strict limitation of liability. Liability is restricted by both the maximum payout (they are extremely low for both cargo and liability insurance) as well as due to the terms when the insured event occurs. For example in the case of cargo insurance, only total loss of cargo is covered by the insurance policy (accidents without full loss of cargo are not covered) and the policies are applied very stringent. Also filing police reports and claim payouts from the insurance is very cumbersome (Japan International Freight Forwarders Association, 2012).

Consequently, transport operators rely on traditional practice in case of serious cargo damage. In this case, the consignee, the shipper, and the transport operators share the damages equally among themselves.

However, whilst traditional practice has been sufficient in the past, the increasing inflow of foreign investments and greater integration of Myanmar into supply and value chains will require more sophisticated logistics services, including proper Goods-in-Transit (GIT) insurance contracts. The insurance contracts need to be based on full declared value and a clear regulation of liability. Large international logistics firms are usually able to offer clear terms of liability and optional GIT insurance through their own company's insurance. They will however, at the insistence of underwriters, insist in their turn that local operators working as subcontractors also accept specified liability (in principle underwriters could seek regress). Very often international operators also insist that the subcontractor demonstrates insurance coverage for their declared liability to ensure that, in the worst case, a claim could also be paid. It will thus become important to offer liability insurance in Myanmar in order to enable local operators to participate in modern supply chain services. Traditional practices may still be used for e.g. local agricultural products, but for industrial and manufacturing cargo the liability and hence risk becomes too high for individual service providers due to the high cargo value. The loss of cargo (e.g. through an accident) without insurance could easily wipe out a whole company.

(ii) There is no insurance coverage at all for Myanmar transporters outside Myanmar territory as well as for Chinese transporters outside the PRC. Transporters who leave Myanmar/the PRC do that on their own risk. The transporter is liable for any cargo damage, truck damage, or bodily injury completely on their own account (although transporters in Myanmar might be able to pass on some of the costs through traditional practices). If they have no cover they may be obliged to take out nominal cover (for third party liability at least) with an insurance company within the country which they enter.

(iii) Cargo insurance will also require proper documentation such as a waybill. The road waybill is a document containing the details of the international transportation of goods by road, set out by the Convention for the Contract of the International Carriage of Goods by Road 1956 (the CMR Convention). It enables the consignor to have the goods at his disposal during the transportation. In road transport, waybills are widely used internationally including other parts of the GMS but at present not in Myanmar.

(iv) The banking sector in Myanmar does offer various standardized products for trade such as letters of credit (LC), access to finance (based on real-estate and land as collateral) and others. While obtaining for example LCs is relatively easy (within 1 week), changing the contract terms and thereby deviating from the standard is complicated and prolongs the process another week. The Myanma Economic Bank is the only Bank offering LCs for the PRC. On the Chinese side, there are three banks working with the Myanma Economic Bank.

Also, some firms reported that they have difficulties in accessing credit to finance new equipment such as trucks. With newer trucks firms would be able to reduce their operating costs and thereby become more competitive.⁸ At the moment, access to credit is only available with real estate or land as collateral. Considering the large number of relatively new trucks registered along the corridor during the field visit, this seems to be a problem only for some.

In addition, there are presently restrictions on mode of payments for commodities such as rice as well as the shipping terms. For example, all exports by sea transport from Myanmar must be shipped on FOB terms (→ see Appendix II: Trade; Trading Terms of International Trade). Payments for those commodities may only be made by telegraphic transfer and not, as common business practice, with a LC. However, restricting the methods of payments as well as the shipping terms does not add any advantages to any of the parties involved and should be guided by business considerations rather than government regulations. However, both the liberalization of the shipping terms must be supplemented by a liberalization of the payment terms in order to make it financially viable since the cycle of working capital required by the seller/trader is, by selling CIF, longer by the travel time of the ship. Normally, using a LC allows buyers to clear payment within a pre-specified time after the cargo is loaded on the vessel (e.g. 30/60/90 days). By selling CIF with TT or further down the chain (→ see Box 1, Appendix II: Trade; Trading Terms of International Trade), the buyer clears the payment only once the cargo arrives at the destination port, warehouse, etc. This is not insignificant as the cargo value can easily amount several million dollar. However, if the government would allow payment with a LC, this challenge could be overcome because payment could then be cleared as soon as the seller presents all necessary documentation to the LC handling bank.

⁸ For example, while older 12-wheeler trucks run around 1.85 km/liter of fuel, the new 22-wheeler trucks are much more efficient with around 3.5 km/liter of fuel. Even in mountainous areas, the newer trucks are able to drive for around 2.5 km/liter.

Private sector suggestions for the *private sector*

- (a) Insurance industry should revise the cargo insurance terms (for the insurance industry).
- (b) Introduce standard waybills (for the transport industry). Today, the CMR convention offers a standard road waybill that is already widely accepted internationally. This standard could be adopted in Myanmar. The GMS-FRETA could assist the private sector in introducing waybills for example by creating an internationally recognized standard form as well as with the implementation through workshops and trainings.
- (c) Enlarge the product portfolio of trade finance instruments of banks as well as the flexibility within such instruments (for the banking industry).
- (d) Consider other assets as collateral in lieu of land/real estate (for the banking industry).

Private sector suggestions for the *public sector* or in a *public-private partnership*

- (e) Encourage insurance firms to revise their cargo insurance terms. This could be either direct support by providing facilities to reduce risk or indirect support such as providing training to better understand the risks and opportunities within such insurance schemes. There are also various possibilities to offer assistance in public-private-partnerships.
- (f) Support the introduction of waybills by making a standard form waybill a mandatory document.
- (g) Support other sources of financing by providing facilities to reduce risk or indirect support such as providing training. There are also various possibilities to offer assistance in public-private-partnerships.

Guidance for Stakeholders

The above mentioned private sector suggestions should be treated with different priorities. This section aims to provide stakeholders with a clear list of priorities to improve transport operations along the NSC as well as raise awareness among transport operators about likely future developments of the industry in Myanmar.

Short-term priorities (Starting as soon as possible)

The highest priority should be given to **permitting trucks to use the Highway No. 1 between Yangon and Mandalay** in order to better manage present traffic volumes along the corridor. Using the highway will reduce travel time and operating costs significantly. However, the surface of the highway will likely deteriorate within a few years and will need to be completely reconstructed. Since reconstruction will take several years, it should start as soon as possible.

In order to attract Chinese trucks into Myanmar, the **weight limits of the road between Mile 105 and the Myanmar/PRC border need to be harmonized** with the higher weight limits of the PRC. Enabling Chinese trucks to fully load their trucks already in Myanmar, would eliminate economic reasons not to go into Myanmar and make the exchange of traffic rights viable. Additionally, **enlarging the area of exchange of traffic rights** beyond the border towns Muse (Myanmar) and Ruili (PRC) should be pursued in the short-term. The effect of these measures in the short-run, will be negligible as there is presently little demand for it. Nevertheless, in the long-run, transport operations should be governed by economic decisions rather than regulations. Both measures will also contribute to increase competition for logistics services at the border and, as a consequence, increase service quality in the medium/long-term.

Raising the **awareness of corridor users about existing laws, rules, and regulations** (especially transport-related ones) is another short-term priority because many logistics service providers are not aware of laws, rules, regulations, and standards concerning their business. This can be done through associations and other relevant institutions.

Medium-term priorities (within 1-3 years)

Providing appropriate insurance for transport operators with clear regulated liability should be given high priority in the medium-term. This includes not only third party liability but also full cover, GIT insurance, and coverage outside the home country in cooperation with foreign insurers. **Transport operators and their associations should give high priority in the medium-term to clearly defined trading terms and limits of liability for cargo transported.** Transport operators will need to introduce way-bills and complying with insurance policies. The public sector can support this by making way-bills mandatory.

In order to increase predictability of toll fees for the private sector transport companies and of revenues for the government, a **cash-free road toll system together with priority lanes should be introduced.** This will increase transparency and reduce the amount of cash that drivers need to carry with them.

Permitting the heavier Chinese trucks on the road section between Mile 105 and the Myanmar/PRC border will eventually require the **upgrade of the existing road between Mile 105 and the Myanmar/PRC border.** However, this has a relatively low priority since demand for using this road section by Chinese transporters is low at present and might only increase in the medium-term.

Long-term priorities (more than 3 years)

In order to fully utilize the benefits from road upgrades and reconstruction, **overhauling road infrastructure throughout the whole corridor** should be considered, including constructing a bridge over the Ko Krain Gorge. Undoubtedly, upgrading the whole corridor is expensive and a long-term effort. But the alternatives of replacing many old bridges, bypassing hundreds of small towns and villages and the worst road sections are not cheap either. Whilst the benefits of upgrading only certain sections of the infrastructure are limited (e.g. time savings of few hours of a 3-day journey from Yangon to Muse), upgrading the whole corridor would at least half transit times and produce benefits likely to outweigh the costs.. This project should be discussed together with the PRC authorities who have proposed a new road from Ruili to Mandalay as part of their transport corridor to the new port at Kyaukphyu.

In any case, **building by-passes around villages and towns** should be considered where possible to enhance traffic safety for pedestrians and truckers.

Eradicating illegal checkpoints along the corridor is also a key concern for the private sector. However, it is recognized that this is a long-term effort and requires a broad-based approach.

Continuous effort

Some private sector suggestions need to be continuously pursued. The most important of all is the **capacity and skill development along the corridor.** This has two components: (1) awareness building to understand demand and seizing business opportunities in the future, and, connected to that,

(2) training for the private sector to enable them to comply with standards which we anticipate will be required in the future, and, connected to that, (2) awareness building to enable local transport companies to better understand how demand may develop in the future and how they might seize future business opportunities . These training activities offer an opportunity for a public-private-partnership where the private and the public sector each bring their individual strengths. Also, associations can play a key role and should be consulted when designing training programs.

Due to the limited international exposure of logistics service providers along the corridor, their knowledge about international best practices is very low. Enhancing this understanding will be of particular relevance because the transport industry is likely to change dramatically over the next few years and transport operators must be made aware of such developments (e.g. demand for logistics services such as temperature controlled transport and other supply chain requirements).

Further, the cross-border exchange and communication must be facilitated by **language training**. This should include components on culture and broad understanding of business practices.

Associations play also a key role in **providing information on standards, laws, rules, and regulations** concerning transport and under which conditions they apply. Such effort should be supported also by the public sector by making information easily available and accessible.

Appendices

Appendix I: Methodology

Survey Design

This study relies on qualitative and quantitative research methods, including desk research and fieldwork. The desk research provides a broad understanding of current agreements in place and an overview of general logistics and transport challenges for the private sector in the region. The field research compliments and clarifies open questions and offers first-hand insights into the situation on the ground.

Within the field research, extensive interviews are conducted with transporters, freight forwarders and logistics companies as well as with importers, exporters and traders, as they are the organizers of supply chains. Whereas transport service providers help shed light on present logistic challenges on the ground, the importers, exporters and traders provide valuable information on the selection of particular trade routes and the considerations that play the most important role when organizing the supply chain.

Field research took place in:

- Myanmar: Yangon, Mandalay, and the border area of Muse
- The PRC: Kunming and the border area of Jiegao and Ruili

Sample Selection

A total of 32 interviews took place over a period of five weeks (October/November 2012). The sample consists of the following types of firms (see Table 1 below):

Table 1: Overview of Meetings and Site Visits by Stakeholder

2	Freight Forwarders
8	Transporters
2	Customs Brokers
8	Manufacturers of Industrial Products
12	Other Meetings*
14	Other Activities**
46	Total

* Incl. meetings with trade promotion agencies, chambers of commerce, informal meetings with government agencies

**Incl. site visits to transshipment facilities, border points, construction sites, etc.

Transporters/freight forwarders/logistics companies: firms operating along the NSC and involved in international transport operations, either through providing the cross-border movement by themselves, with foreign partners, in joint-ventures, etc. Companies were selected with the assistance of local associations, referrals from other respondents (snowball sampling), and personal contacts.

Importers/exporters: firms that either buy/sell their goods from/to sellers/buyers within the region and use the NSC to transport their imports/exports or from/to overseas sellers/buyers using the NSC as a transport route. The firms were selected according to referrals from other respondents (in many cases their client or business partner) (snowball sampling), local associations, and personal contacts.

Limitations

Since the majority of firms operating along the NSC (both transport service operators and importers/exporters/traders) are small, contacts could only be established with the aid of local associations or other local partners. Hence, the selection was not random and the sample size relatively small. In addition, it has to be noted that trust is an important element for successful interviews, especially in the GMS. As some interviewees did not know GMS-FRETA nor the interviewers, few interviewees disclosed all information despite a lengthy introduction of this survey. This is particularly true for interviews conducted in the PRC.

Appendix II: Trade

In Myanmar, data is being collected by a large number of agencies and institutions, but not in a coordinated and systematic manner. Despite the good cooperation of stakeholders in providing data, there are large discrepancies due to different methodologies and counting methods applied. Some data is simply not available.

Trade data was obtained from UN-Comtrade as well as from the Department of Border Trade, Myanmar Ministry of Commerce. It is important to note that there are significant differences between the mirror data retrieved from UN-Comtrade⁹ and trade data provided by the Myanmar government. The divergence between the two data sets can be attributed to various factors:

- The incentive of firms to under-/over-report;
- Different measurement periods (UN-Comtrade: January to December; Myanmar government: April to March (fiscal year));
- The fact that some goods are officially exported/imported from/into one country while illegally imported/exported by the trading partner. Several of such cases were observed at the border between Myanmar and the PRC (→ see also Appendix II: Trade; Informal and Semi-Formal Trade between Myanmar and the PRC).

Despite the large differences between the data sets, both sets are utilized in this study in order to show indications and tendencies. When trade statistics are utilized in this section, the source is always indicated.

National Trade

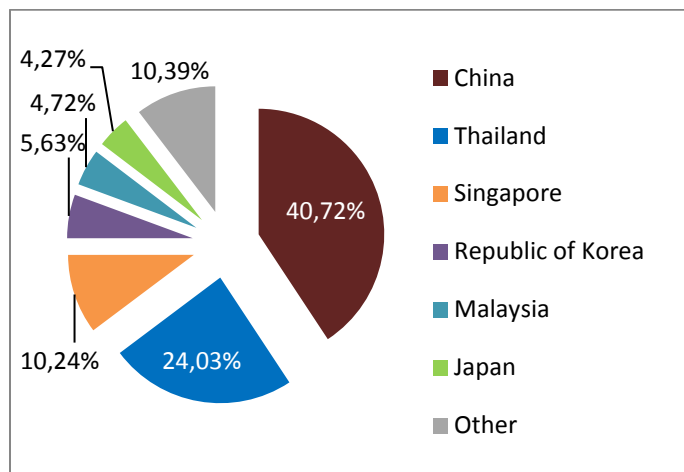
Over the past ten years, Myanmar's trade has become much more concentrated. For example, in 2002 the top-six trading partners held a share of 50% of total exports and 78% of total imports. In 2011, this share had increased to 89% for both imports and exports. For both traffics, Myanmar's most important trading partners are the PRC and Thailand. Most of this concentration in trade can be attributed to the sanctions imposed by the international community. The market share of countries adhering to the sanctions decreased while overall trade increased in the period between 2002 and 2011.

For imports, the overall volume increased from USD 2.6 billion in 2002 to more than USD 11.8 billion in 2011, generated by 63 trading partners. As can be seen in Figure 2, the PRC and Thailand together held a share of close to 65% of all imports in 2011 (40.7% PRC and 24% Thailand). Compared to 2002, both the PRC and Thailand have increased their share, the PRC up from 27.4% and Thailand up from 12.3%. The third largest source of imports in 2011 for Myanmar was Singapore with little more than 10%.

⁹ The mirror data is provided by the partner countries.

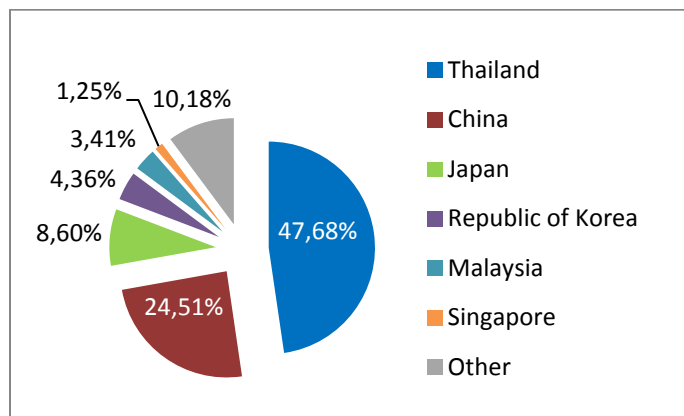
Singapore however is often used by importers only as a transit hub where traders from Myanmar maintain a letterbox company in order to circumvent the sanctions imposed by the international community. The share of Singapore in Myanmar's total trade between 2002 and 2011 varied between 10.2% (2011) and 22.5% (2003). This share is expected to decrease significantly once major markets (US, Europe, Japan, etc.) allow payments to/from Myanmar directly and lift or suspend their sanctions altogether.

Figure 2: Myanmar's Import Partners, 2011



Source: UN-Comtrade (2012), Authors' Calculations

Figure 3: Myanmar's Export Destinations, 2011



Source: UN-Comtrade (2012), Authors' Calculations

Exports in 2011 were to 84 trading partners. The overall volume between 2002 and 2011 increased from USD 2.8 billion to USD 6.8 billion, or an increase of 142%. As can be seen in Figure 3, the share of Thailand and the PRC amounted to more than 70% in 2011. Compared to 2002, this share has almost doubled (up from around 37%). But also trade with Japan and Korea at least doubled. Singapore's share was, compared to the share in imports, much smaller and further decreased over the respective time period from 3.8% to 1.3%. In fact, it is also expected that the number of both export and import partner countries will increase as sanctions are gradually lifted/suspended with progressive political and economic reforms.

Products

In terms of products traded, the import and export structures differ – not only in terms of type of products traded but also in terms of concentration. For example, in 2011 the top-15 import products covered a total share of imports of 37% whereas in exports this number is 85%.

The most dominant import products (by value) are refined petroleum oils (6.9%), palm oil (4.1%), construction equipment such as bulldozer, grader etc. (3.8%), as well as transport vehicles and motorcycles (3.7% and 2.9% respectively).

Myanmar's exports (by value) are dominated by natural resources which account for more than 60% of all trade, such as petroleum gases (44.9%), precious and semi-precious stones (11.5%) and wood (4.2%). However, Myanmar exports also lots of vegetables (less valuable but high in volume), rubber, garments, and some other food products. A more detailed overview of the products imported and exported in 2011 can be found in Table 2.

Table 2: Myanmar's Top-15 Import and Export Products, 2011

	Import Product	Value (in USD)	In %		Export Product	Value (in USD)	In %
1	Petroleum oil	817,183,000	6.90	1	Petroleum gases	3,074,830,000	44.86
2	Palm oil	490,144,000	4.14	2	Precious & semi-precious stones	789,757,000	11.52
3	Bulldozer, Grader, etc.	446,221,000	3.77	3	Wood	285,878,000	4.17
4	Trucks for the transport of goods	435,273,000	3.68	4	Dried vegetables	248,697,000	3.63
5	Motorcycles, side-cars	347,039,000	2.93	5	Natural rubber	214,009,000	3.12
6	Tubes & pipes (iron and steel)	276,638,000	2.34	6	Men's overcoats, capes, wind jackets etc	200,286,000	2.92
7	Moving/grading/scraping/boiling machinery for earth	271,042,000	2.29	7	Men's suits, jackets, trousers & shorts	160,538,000	2.34
8	Cars (incl. station wagon)	195,723,000	1.65	8	Crustaceans	137,908,000	2.01
9	Iron or steel articles	167,999,000	1.42	9	Women's overcoats, capes, wind jackets	134,423,000	1.96
10	Electric appliances and lines for line telephony	161,090,000	1.36	10	Rice	120,940,000	1.76
11	Woven fabrics of synthetic yarn	156,398,000	1.32	11	Men's shirts	108,485,000	1.58
12	Flat-rolled products of iron	155,547,000	1.31	12	Iron ores & concentrates	102,211,000	1.49
13	Structures (rods, angle, plates) of iron & steel	146,355,000	1.24	13	Footwear, upper of leather	97,605,000	1.42
14	New pneumatic rubber tires	142,514,000	1.20	14	Wood sawn/chipped lengthwise, sliced/peeled	84,315,000	1.23
15	Cements, portland, aluminous, slag, supersulfate	139,421,000	1.18	15	Electrical energy	69,462,000	1.01
	Other	7,492,610,000	63.28		Other	1,024,923,000	14.95
	Total Top-15	4,348,587,000	36.72		Total Top-15	5,829,344,000	85.05
	Total Trade	11,841,197,000	100.00		Total Trade	6,854,267,000	100.00

Source: UN-Comtrade (2012)

There are some typical destinations/origins for certain products (official trade). For example, palm oil is usually imported from Malaysia, trucks and construction equipment and material (e.g. bulldozers, graders, etc.) come from the PRC and Japan, as well as garment inputs from the PRC and Hong Kong. Similarly, there are typical export destinations. Thailand buys particularly petroleum gases, and the PRC

precious and semi-precious stones, wood (especially teak wood) as well as vegetables and rubber. Myanmar’s rice is of low quality and often bought by West African countries.

Trading Terms of International Trade

Myanmar’s government has still restrictions on the terms of sale for all imports and exports. For example, for imports the government requires buyers to conclude the contract on CIF basis whereas exports have to be sold on FOB basis. This policy has both advantages and disadvantages:

The advantage is that once the sellers delivered the cargo onto the buyer’s/trader’s ship, the responsibility for any loss, damage or delay of the cargo lays with the buyer/trader. In addition, since the Myanmar government allows for certain commodities such as rice only payment by telegraphic transfer (TT), the cycle of working capital required by the seller/trader is by selling FOB shorter by the travel time of the ship. Normally, using a LC allows buyers to clear payment within a pre-specified time after the cargo is loaded on the vessel (e.g. 30/60/90 days). By selling CIF with TT or further down the chain (see Box 1), the buyer clears the payment only once the cargo arrives at the destination port, warehouse, etc. This is not insignificant as the cargo value can easily amounts several million dollar. However, if the government would allow payment with a LC, this challenge could be overcome because payment could then be cleared as soon as the seller presents all necessary documentation to the LC handling bank.

Box 1: Overview of Duties of Buyer/Seller according to Incoterms 2010

Inco term	Loading on truck (carrier)	Export- Customs declaration	Carriage to port of export	Unloading of truck in port of export	Loading charges in port of export	Carriage to port of import	Unloading charges in port of import	Loading on truck in port of import	Carriage to place of destination	Insurance	Import customs clearance	Import taxes
EXW	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer
FCA	Seller	Seller	Seller	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer
FAS	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer
FOB	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer
CFR	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer	Buyer	Buyer	Buyer
CIF	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer	Seller	Buyer	Buyer
DAT	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer	Buyer	Buyer
CPT	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer	Buyer
DAP	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer
CIP	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Buyer	Buyer
DDP	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller	Seller

Source: <http://blog.biztrumpet.com/2012/07/shipping-terms-you-need-to-know.html> (2012).

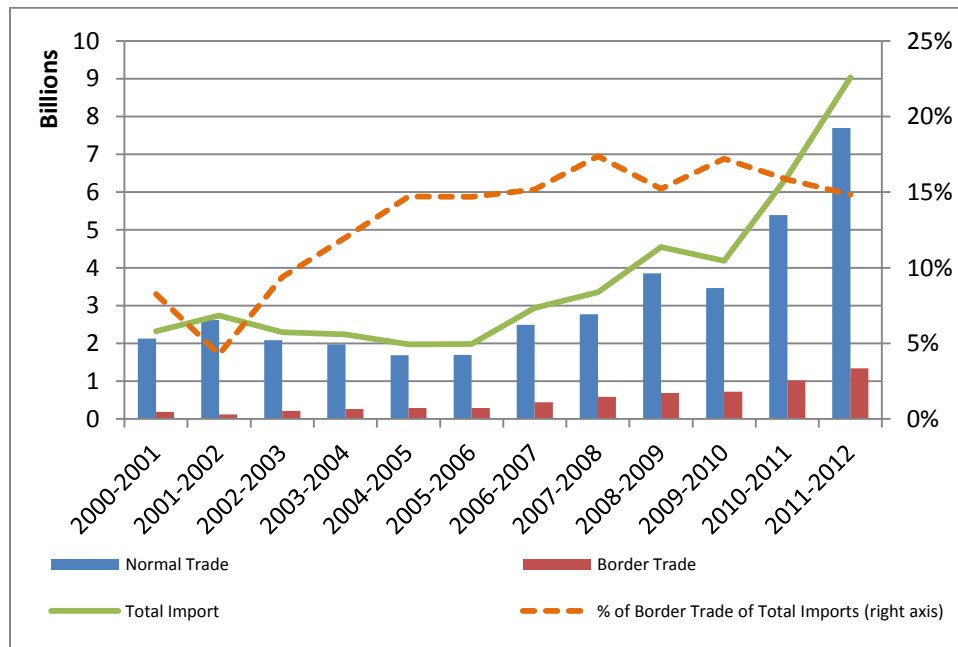
The disadvantage of this policy is that the private sector is limited in the services they can provide. For example, exporters are limited to the geographical border in providing value added. This might not play a major role at the moment as the exporting industry is just starting to take off, but this might become a competitiveness issue in the future. In addition, there is also a working capital implication. The seller

prepares the cargo ready for shipment at a warehouse in Yangon as soon as the sales contract is concluded. Since the buyer arranges the ship for exports, the buyer determines also the shipping schedule. In case of a dropping commodity price, the buyer could delay the vessel arrival to wait for the price to increase again. In this case, the seller would be paid later, limiting the working capital. In addition, the seller bears the cost of storage. This happens especially in commodity sales such as rice.

Border Trade vs. Normal Trade

Generally, there are two main types of trade: normal trade and border trade. Figure 4 provides country level data¹⁰ of Myanmar's imports by type of trade.

Figure 4: Myanmar's Imports (by type of trade) and Share of Border Trade of Total Trade, 2000/2001-2011/2012



Source: Department of Border Trade, Ministry of Commerce (2012).

Total imports of Myanmar have increased significantly from a value of about USD 2.3 billion in 2000/2001 to more than USD 9 billion in 2011/2012 (green line)¹¹. The bulk of imports are normal trade transported by sea, air, and land. The majority both in terms of volume and value is transported by sea (maritime transport). Nevertheless, the share of air transport is significant in value although volumes are generally small.

Border trade imports have increased as well over the past decade, both in terms of absolute value (from USD 191 million in 2000/2001 to more than USD 1.3 billion in 2011/2012) as well as in terms of share on total trade (from about 4.3% to about 14.8% - orange line).

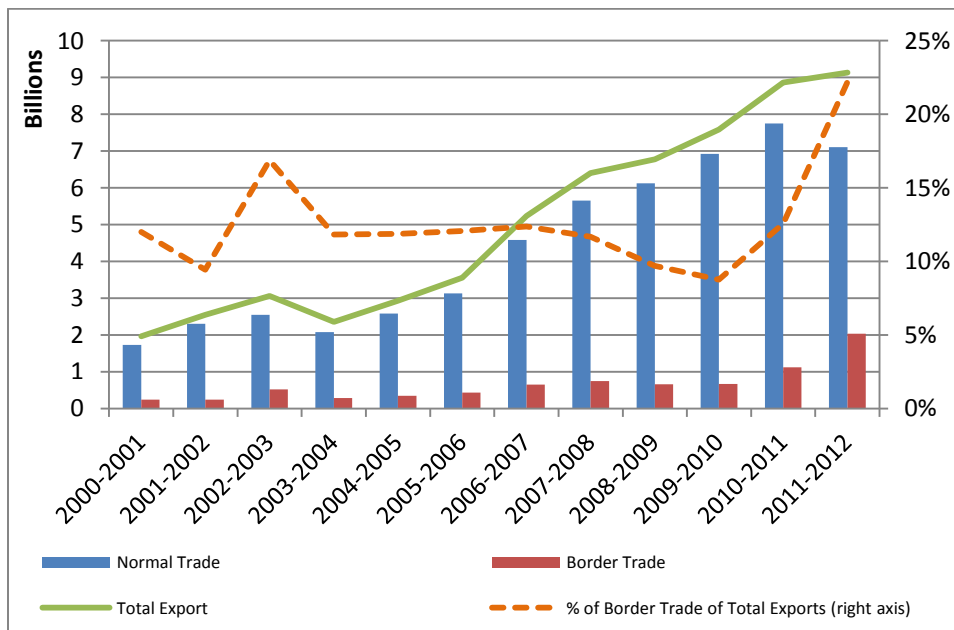
Data from the Ministry of Commerce further provides some detailed insights on what products are exported by what kind of trade (normal trade vs. border trade). The ratio of border trade and normal

¹⁰ Data is based on national statistics provided by the Department of Border Trade, Myanmar Ministry of Commerce.

¹¹ UN-Comtrade data reports imports of USD 11.8 billion in 2011.

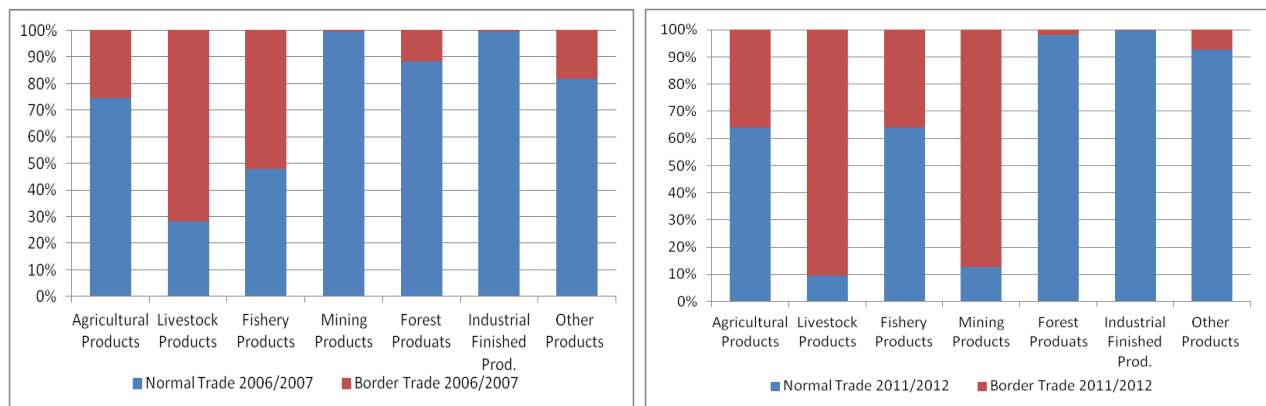
trade between 2006/2007 and 2011/2012 (see Figure 6) has changed for certain product groups. For example, mining products almost completely reversed from normal trade only to almost 90% border trade. One explanation could be the jade trade between Myanmar and the PRC at the Muse/Ruili border. While changes are in no product group as extreme as in mining products, border trade has increased in importance especially in agricultural and livestock products. This can partly be explained by the rise in fruits and vegetable trade with the PRC. On the other hand, border trade decreased for forest products as well as fishery products. This may be attributed to the import restrictions of both products by Thailand.

Figure 5: Myanmar's Exports (by type of trade) and Share of Border Trade of Total Trade, 2000/2001-2011/2012



Source: Department of Border Trade, Ministry of Commerce (2012).

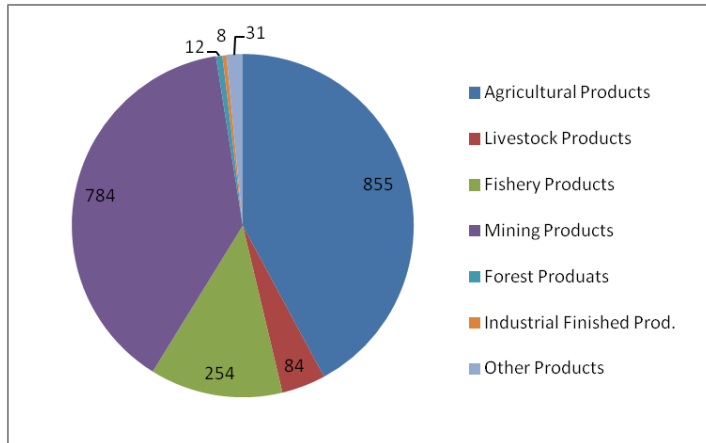
Figure 6: Ratio of Border Trade vs. Normal Trade by Type of Product (Exports), 2006/2007 (left) and 2011/2012 (right)



Source: Department of Border Trade, Ministry of Commerce (2012).

As a result from the changes in border trade exports (in terms of value), border trade is now (2011/2012) highly concentrated on agricultural products and mining products (USD 855 million and 784 million respectively) (see Figure 7). Fishery products (USD 254 million) still have a large share, whereas livestock remains small. In fact, Myanmar has just recently banned any export from or transit of cows and beef through Myanmar (e.g. from India to the PRC).

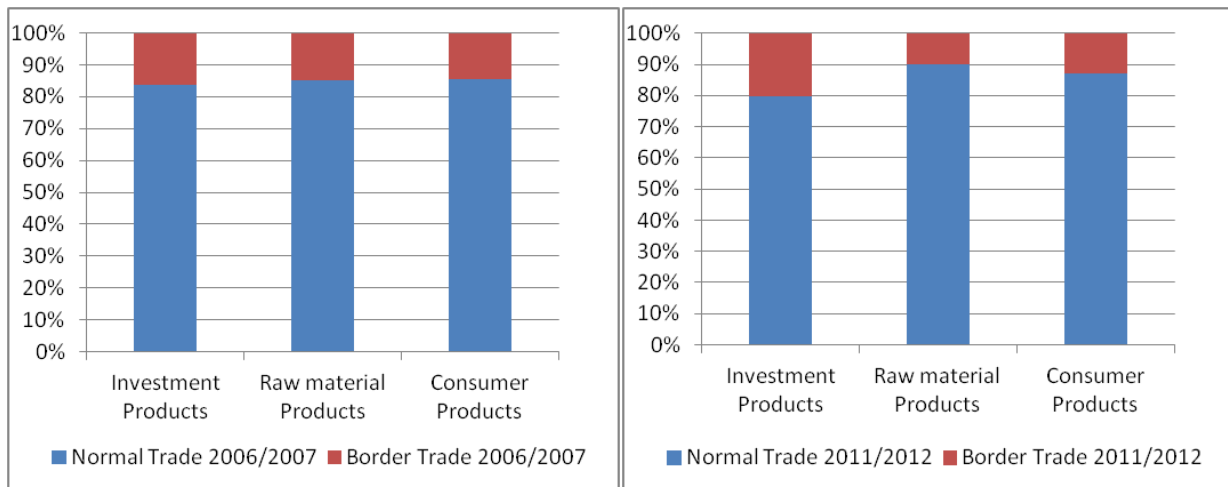
Figure 7: Myanmar's Border Trade by Product Group (Exports in USD), 2011/2012



Source: Department of Border Trade, Ministry of Commerce (2012).

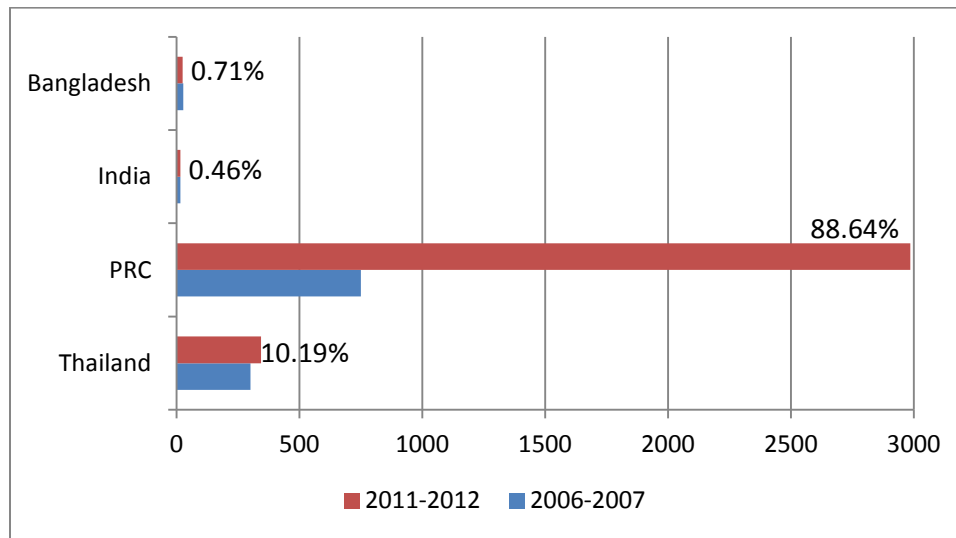
On the import side, both normal trade and border trade increased significantly as well as the import values within each category. For example, investment products rose within five years (2006/2007 to 2011/2012) from USD 839 million to USD 3.8 billion. Border trade in this category accounts for around 20% in 2011/2012. Raw materials rose from USD 1.4 billion to USD 3.5 billion within the same period with the share of border trade actually decreasing from around 15% to 10%. Similarly, consumer products are also increasingly traded through normal trade. A detailed breakdown of the ratios between border trade and normal trade is provided in Figure 8.

Figure 8: Ratio of Border Trade vs. Normal Trade (Exports), 2006/2007 (left) and 2011/2012 (right)



Source: Department of Border Trade, Ministry of Commerce (2012).

Figure 9: Border Trade (Import+Export) 2006/2007 vs. 2011/2012 (in million USD) and each Country's Share of Border Trade (in parentheses)



Source: Department of Border Trade, Ministry of Commerce (2012).

Among the border trade partners (PRC, Thailand, India, Bangladesh), the PRC is the largest border trading partner of Myanmar with around 88% (+20%) of border trade (Figure 9). While Thailand is the second largest trading partner with little more than 10%, Myanmar maintains only marginal formal trade with Bangladesh and India. Trade with them is hampered by the lack of sufficient infrastructure as well as due to the closure of roads (because of ongoing protests). However, one survey participant reported that informal trade on the India/Myanmar border amounts to around 20 12-wheeler trucks per day. Products traded along this border are on the way to India fruits and vegetables (e.g. water melon, bananas, apples, avocados, etc.) and, on the way to Myanmar, items such as blankets, bitternuts, edible oil etc. The potential for trade between Myanmar and India as well as the trade between the PRC and India (with transit through Myanmar) however is huge. Besides, there are also lots of illegal activities such as the smuggling of narcotics and weapons.

Myanmar and PRC Border Trade

The value of trade between the PRC and Myanmar as well as between Yunnan province of the PRC and Myanmar has increased steadily over the past years. For example, according to a news website¹², trade between Myanmar and the Yunnan province of the PRC has increased around 3-fold between 2006 and 2011, and trade between Myanmar and the PRC as a whole of 4.5 times. The share of trade of Yunnan province of the PRC in the total PRC-Myanmar trade has therefore decreased from 47.3% to 31.6% in this period. Thus, the relative importance of Yunnan province of the PRC as trading partner for Myanmar is declining.

The share of the PRC on Myanmar's border trade accounts for 88.6% or USD 2.9 billion. This is approximately 16.3% of total trade.¹³ In terms of products, land exports from Myanmar to the PRC consist of agricultural products (e.g. mango, water melon, bananas, vegetables etc.) and live sea food.

¹² <http://www.cnriio.com/News/Showit.asp?id=228> (accessed 10 November 2012).

¹³ Data from the Department of Border Trade, Myanmar Ministry of Commerce (2012).

In the case of sea food, small quantities (on average around 30 tons/6 trucks daily; maximum 50 tons/10 trucks daily) of live eel and shrimp are exported from Myanmar into the PRC. Transporters carry the livestock from Yangon in wooden crates up to the auction centers near Mile 105. From there, small Chinese trucks pick up the cargo for distribution in the PRC.

Frozen seafood is transported from Yangon to the PRC. In order to ensure freshness, the seafood is frozen in Yangon and then loaded onto trucks cushioned with rice husk and covered with an awning. After three days of transit to the Myanmar/PRC border, it is stored in a cold chain warehouse for 2-3 days at -18 degrees to re-freeze the cargo. Subsequently, small, open Chinese trucks pick up the cargo from the warehouse and transport it across the border and load it onto bigger, non-cooled Chinese truck for distribution in Yunnan province of the PRC. Since no cooling equipment (e.g. containers) is used along the whole corridor, there is effectively no cool chain during transport.

In the case of fruit exports from Myanmar, a large part of the products come from the Mandalay region, where the fruits are collected and consolidated by Myanmar traders. The fruit is then transported in open trucks to an auction center near Mile 105, the Myanmar Customs point at the Myanmar/PRC border. At the auction center, Chinese traders buy the agricultural produce.

The products are sold basically on a handshake-basis (buyer and seller only agree on the price and quantity without sales contract) under free-carrier border (FCB)¹⁴ terms. The seller has to deliver the goods usually to a warehouse in Jiegao, a “duty-free” zone on the Chinese side, if the goods have not been cleared at Chinese Customs yet, or to a warehouse in Ruili if all Customs formalities are completed. Transport between the auction point and the warehouse in the PRC is either done by the Myanmar seller/trader or by small (4-10-wheel) Chinese trucks, often not registered in neither country. Once the products are on the Chinese side, the Chinese trader arranges the transport from the border to the major markets in Kunming. These traders also have the connections to supermarkets and other distributors.

In some cases there are delays in receiving the goods on the Chinese side. Since the responsibility for the cargo is transferred only once the freight is received into the trader’s warehouse or onto his truck, the Myanmar seller bears the costs of any delays¹⁵. In addition, since the cargo is usually transported and stored in a non-temperature controlled environment, the ripening process of the fruits continues (particularly in the case of sensitive fruits such as mango). The value of the cargo therefore decreases with any additional day of delay. On official handover the trader inspects again the cargo, and if the condition and quality of the cargo is much lower re-negotiates the price. The Myanmar traders/exporters therefore carry various risks:

- No enforcement of prices (no sales contract – once the seller has transported the goods to the PRC there are very limited options to enforce the agreed price or quantity)
- Risk of delays in the border process
- Risk of damage during transport and logistics operations (buyer’s responsibility starts when the cargo is physically received by the purchaser – hence, any costs for delays, even caused by the buyer, have to be borne by the seller)
- Exchange rate risk (the seller is exposed to currency fluctuations as all transactions are completed in CNY)

¹⁴ Free carrier border (FCB) is the equivalent to Free-on-Board (FOB) terms for border trade. In this case the seller delivers the goods to a pre-specified location at the border (in FOB terms the ship). After the delivery at this border point, the seller takes over the goods and responsibility.

¹⁵ Usually in terms of detention charges on the truck or occasionally transshipment via a temporary storage.

Informal and Semi-Formal Trade between Myanmar and the PRC

Informal and semi-formal trade at the Chinese/Myanmar border is significant and must therefore at least be tolerated by both governments. For example, there are a large number of trucks (150-200 trucks per day) with mostly maize but also some rice going from Myanmar to the PRC (Northbound). Those trucks are usually cleared by Myanmar Customs but not by Chinese Customs (semi-formal trade). One reason for the semi-formal trade could be the import restrictions of the Chinese government as they protect their farmers from foreign competition through setting import limits (quotas) for rice and maize. Even if a quota is available the rice and maize carries a MFN tariff rate of 65% (compared to 180% normal tariff rate). Traders mentioned an extra charge of 12% of the cargo value which may be the costs to them of buying the quota.¹⁶ As quotas become more difficult to obtain, semi-formal trade becomes the only option. The rice/maize is sold on a FCB-basis on the Chinese side of the border. The transport into the PRC without quota is illegal and Myanmar traders/transporters are thus exposed to the full risk of getting caught and the cargo being seized.

Some respondents reported also that they would prefer to formally trade their products but simultaneously claimed that the import quotas make it difficult to comply with existing rules, especially given that there is at the moment no alternative market they could sell to.

Fertilizer from the PRC has been imported by Myanmar for a long time and in significant quantities. For example, according to UN-Comtrade, PRC export of fertilizer to Myanmar amounted to USD 52.6 million in 2011. While most of it is imported via Yangon, there is some fertilizer (specifications suited to Shan State soils/crops) locally imported via the land border of Ruili/Muse (Southbound). With the introduction of a 100% export tax on fertilizer by the PRC, local fertilizer import from the PRC to Myanmar has changed to a semi-formal mode - not declared in the PRC but officially imported at Myanmar Customs. Myanmar traders/transporters carry the fertilizer as return cargo (from the maize/rice exports). Since the cargo is not officially exported, the risk is usually on the Myanmar trader/transporter.

There exists a fleet of old, unregistered, Chinese light trucks (3-7 tonnes cap) carrying mostly informal cargo between the PRC and Myanmar. Those truckers are, according to interviewees, former farmers whose land was bought by the government to build infrastructure. From the compensation, they bought those trucks which they operate in an owner/driver mode.

Appendix III: Transport

Organization of the Industry

In Myanmar, the trucking industry is organized in so-called "Gates". Within the GMS, the Gates are unique to the Myanmar transport sector. Gates exist in each major city and each Gate specializes on one trunk route, e.g. Yangon-Mandalay. Every Gate consists of a pool of operators. The Gate manager negotiates rates on behalf of the operators. Those rates are then binding for each load. In most cases, the Gate manager also has his own trucks.

Membership in the Gates is usually not obligatory. Newer and larger operators do generally not participate in the Gate system. In both Myanmar and the PRC, however the majority of truck owners are owner-operator trucks and a large percentage of those are operated through associations on the Chinese

¹⁶ Anecdotal information as no hard evidence could be obtained on this issue.

side or the Gates on the Myanmar side. The Gates usually have some core operators as well as some ad-hoc participants which help out in case more trucks are needed at peak periods.

The Gates are typically concentrated in a market-style area where each Gate operator has its own, small warehousing space (→ see section Appendix VI: The Infrastructure along the North South Corridor, Transshipment Areas and Supply Chain Facilities). The Gate manager has also the task of consolidating loads (less than truckloads). The consolidated cargo is transshipped at a truck park adjacent to the office area. Full truck loads are collected directly at the shipper's (e.g. factory) premises and do not go through the Gate area.

Even the most advanced Gates have no customer service facility, e.g. email, phone directory not widely known/findable, etc. Generally, the operations of the Gates as well as the firms within the Gates are well below international standards and rely on informal arrangements. At present, some attempts are being made to formalize some of the business transactions.

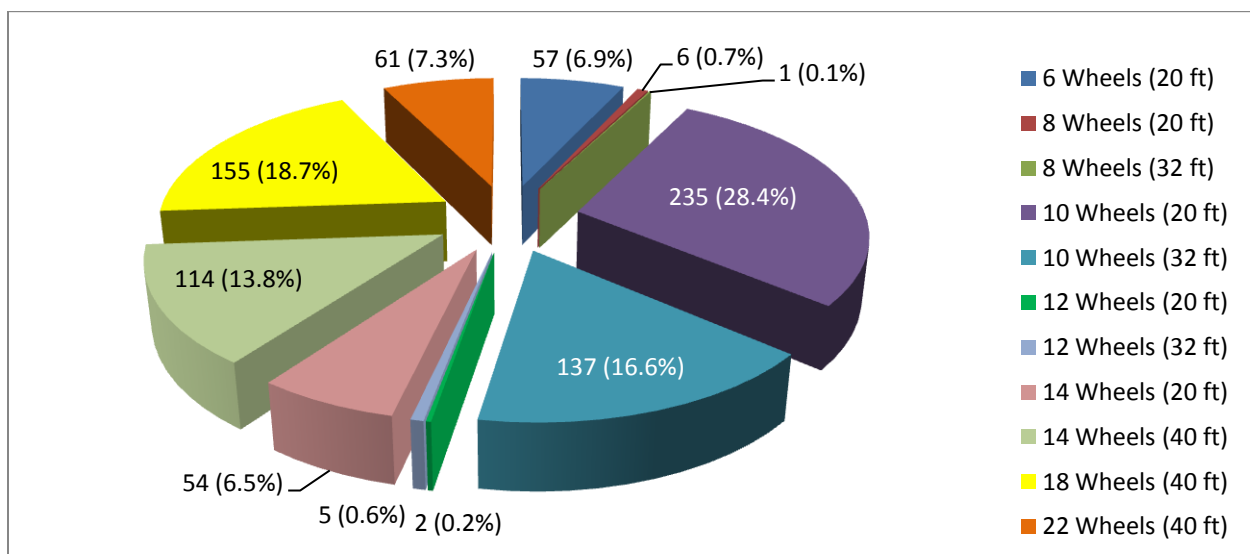
In the PRC, the trucking sector is organized similarly but with a greater proportion of large transport operators. In practice, however, most cargo goes to Kunming, the provincial capital. Return loads from Ruili to Kunming are advertised on blackboards at open-air truck parks.

While generally the percentage of container transport in Myanmar is low, an exception is the capital with its port. Container transport to/from Yangon port is handled by a separate grouping of truckers, the Yangon Container Truck Association.

Information on Trucks

The Container Truck Association uses various types of vehicles (see Figure 10). Most commonly used for the distribution of goods throughout the country are 10-wheeler trucks (20 ft. and 32 ft. – 45%), 14-wheeler trucks (20 ft. and 40 ft. – 20.3%), and 22-wheeler trucks (18.7%).

Figure 10: Types of Trucks used by the Myanmar Container Truck Association, 2012



Source: Myanmar Container Trucks Association (2012).

No similar statistics are available from other trucking associations in the country. However, observations along the NSC, both in Myanmar and the PRC, showed a much higher ratio of 12-wheel and 22-wheel trucks. Along the corridor between Mandalay and Muse, the long-distance truck fleet is estimated to be around 50% 12/14-wheel trucks, 30% 22-wheel trucks, and around 20% 6-10-wheel trucks. While the 12-wheel are mostly 2nd-hand Japanese imports, usually Nissan, the 22-wheelers are new models from the PRC. The Chinese trucks are now competitive because of their high value-for-money, but still the Japanese trucks remain popular because of their fuel efficiency and endurance (especially in mountainous terrain).

The following Table 3 provides an overview over the truck brands observed along the NSC.

Table 3: Commonly used Truck Brands in Myanmar, 2012

Brands			
Cargo	GMC	Magirus-Deutz	TE
Dong Feng	Hino	Mercedes	V8-10
FAW	Hyundai	Mitsubishi	Volvo
Ford	Isuzu	Nissan	
Foton	Jingont	Scania	
Fuso	Leyland	Sinotruck	

Source: Myanmar Container Trucks Association (2012) and Authors' observation.

The age of the Myanmar trucking fleet varies from new trucks (from the PRC) to old-timers (40+ years). On long-haul routes newer 22-wheel Chinese trucks as well as 7-15 year old 12-14-wheel Japanese trucks are dominant. Older models, such as some trucks left from the British Army days, are still used for rural and urban distribution. The Chinese trucks are left-hand drive while the Japanese imports are right-hand drive trucks. The new trucks from the PRC are a relatively new phenomenon (purchased all in the last 1-2 years) and purchased more by newcomers to the industry. The new fleet was mainly self-funded as there is funding neither available through banks nor through foreign sources. Truck dealers offer some credit terms up to two years. The great increase in new truck imports from the PRC is due to the easing of restrictions on import licenses. The condition, however, is that the imported trucks must be relatively new. The truckers, on the other hand, prefer to import older Japanese trucks because they consider them more reliable.

Due to the recent rigorous enforcement of weight limits by the Myanmar government, transport operators have started to minimize the tare weight of their trucks. For example, they have removed superstructure parts from their trailers. Box trucks have disappeared completely. Ex-box trucks are now operating as flats or high-sided open trucks. Cargo protection is by tarpaulin and lashing. Refrigerated trucks operate only around Yangon. Fruits (with different origins) and even frozen fish (from Yangon) destined for the PRC are usually transported in open trucks and covered with tarpaulin and lashing. To keep the cargo cool, small cushions filled with rice husk are laid beneath and on the side of the truck. However, this does not keep the cargo at the required temperature on the 3-4-day journey. On the Chinese side too, no refrigerated trucks are in use.

Operating Costs

Fuel efficiency varies greatly as it is strongly connected to the age of the truck and the route. For example, while older 12-wheeler trucks run approximately 1.85 km/liter of fuel, the newer 22-wheeler

trucks are much more efficient with around 3.5 km/liter of fuel. Even on mountainous terrain, the newer trucks are able to drive for around 2.5 km/liter (all figures are for loaded trucks at 30 tons and 50 tons gross weight).

The total operating costs depend on the route. Variable costs such as fuel/lube as well as tires make up on average around 85% of all operating costs. However, the costs are much higher on the Mandalay-Muse route compared to the Yangon-Mandalay route due to the large difference in terrain. The Yangon-Mandalay route (1,500 km roundtrip) leads through flat terrain and is therefore much cheaper to operate (roundtrip fuel costs of around USD 450). The Yangon-Muse trip (2,400 km roundtrip) encompasses the Yangon-Mandalay section but generates roundtrip fuel costs of USD 800.

Table 4: Wages of Drivers/Assistant Drivers along the NSC

Driver / Assistant Driver	Yangon-Mandalay	Yangon-Muse
12-wheeler	USD 60 / USD 30	USD 120 / USD 60
22-wheeler	USD 120 / USD 60	USD 240 / USD 120

Source: Interviews.

Also the driver's wages differ widely between the two road segments. For example, a roundtrip from Mandalay to Yangon costs a transport operator of a 12-wheeler truck USD 60 for the driver plus USD 30 for the assistant. From Mandalay to Muse, the wages are double for both the driver and the assistant as the terrain is very difficult to drive (see Table 4). Generally, the wages are relatively high due to the shortage of qualified drivers.

Generally, the condition of the tires on trucks in Myanmar is very good. Tires all have to be imported because there is no tire factory in Myanmar. Tires are mainly imported from the PRC, India, Indonesia and Thailand. The prices for tires vary, depending on the brand and origin. Chinese, Indian and Indonesian tires are considered inferior compared to Thai tires and are therefore much cheaper. The cheaper tires range from USD 160 to USD 480, while Thai tires cost around USD 600 per tire.

Appendix IV: Traffic

Myanmar's transport sector is relatively diverse with road, rail, and water (sea and river) transport options. The road transport sector in Myanmar can be divided into three segments: (1) distribution of cargo between the port and the greater Yangon area; (2) long-haul transport service, and (3) local services up-country.

The country's lifeline is the corridor between Yangon – Mandalay – Muse (PRC border). Although there is the modern 4-6 lane Highway No. 1 (from Yangon to Mandalay), trucks are not allowed to drive on that highway. The actual truck route is the older, conventional road which is part of the ASEAN Highway Network (ASEAN Highway No. 14).

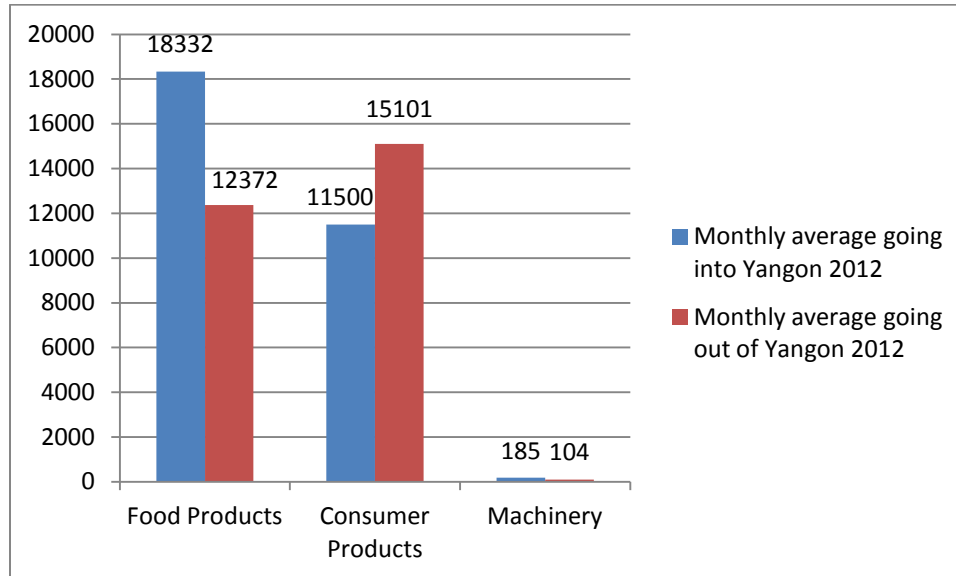
Traffic Statistics and Products

Although there are some traffic statistics available from various agencies, the numbers are not consistent. The most credible number is 1,000 trucks per day (in- and out traffic) at the Customs point at Muse border, as this matches the indications from exporters, traders and transporters.¹⁷ For example,

¹⁷ According to representatives from Mile 105, the Myanmar Customs gate.

transporters in Mandalay estimate traffic to around 250-300 outgoing trucks to Muse and 200 trucks outgoing to Yangon (plus the same number incoming trucks).

Figure 11: Average Monthly Cargo going in and out of Yangon by Cargo Type (in metric tons), 2012



Source: Truck and Vehicle Supervision Committee (Yangon Division)

Yangon, with its port and airport, acts as the main gateway to supply each state with the required products and commodities. Similarly, most exports with the exception of international truck traffic and air cargo are transported through Yangon port, which handles around 90% of Myanmar's total trade (imports and exports by volume).¹⁸ Figure 11 provides an overview of the average monthly cargo volume (in metric tons) going in and out of Yangon by product group.

Table 5 together with Figure 12 (map) provides an overview of the products distributed from/to Yangon by state.

Table 5: Overview of Goods/Commodities Distributed to/from Yangon by State (2012)

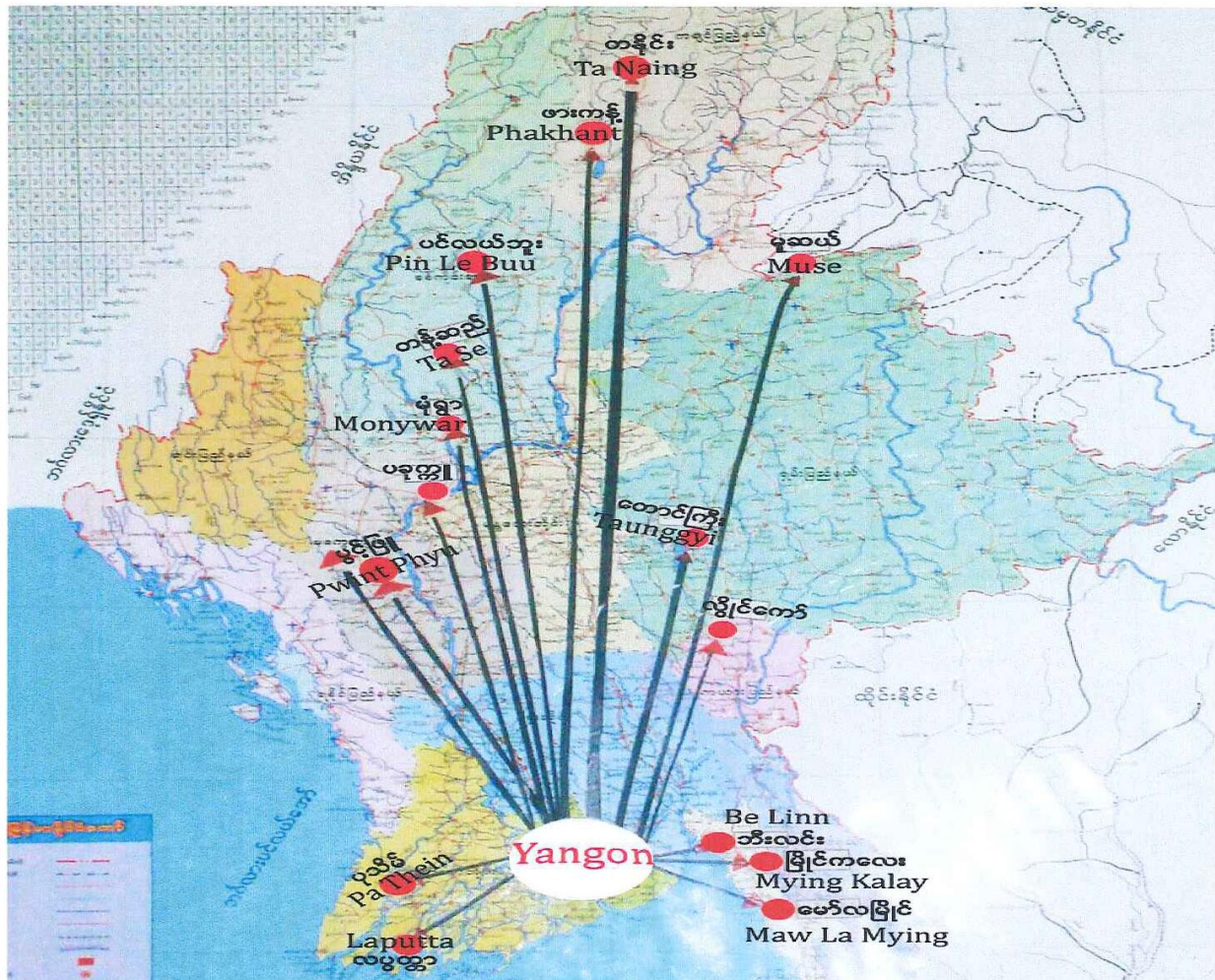
State/City (Destination)	Commodity/Goods Transported
Ayeyarwaddy	
Patheingyi	Fertilizer, Marine Products, Rice
Laputa	Raw Materials for Glass Factories, Jute
Bago Division	
Bago	Cotton, Rubber, Plywood, Sugar, Paper
Kachin State	
Pharkant	Machines
Ta Naing	Iron, Metal
Yuzana	Agriculture Products
Pinle` buu	Crude oil, Machines
Magway Division	
Pwint Phyu	Machines for Rice drying

¹⁸ Calculations by the authors based on data of the Department of Border Trade, Ministry of Commerce (2012).

Mandalay Division Mandalay	Food stuff, Consumer Goods, Fertilizer, Machines, Gems and Jewellery, Equipment and Products for Industrial Zones
Sagaing Division Mon Ywar Tant Se`	Copper, Crude Oil, Cotton Materials and Equipment for Hospitals
Shan State Muse (North) Taunggyi (South)	Pulses and Beans, Water Melon, Mango, Yellow Maize, Jade Machines produced for Azetharyar Industrial Zone, Construction Material, Materials and Equipment for Grape wine
Pinn Pet	Iron, Metal, Machines

Source: Myanmar Container Trucks Association (2012); Myanmar International Freight Forwarder Association (2012).

Figure 12: Distribution of Cargo in Myanmar



Source: Myanmar Container Trucks Association (2012).

Freight Rates

Freight rates in Myanmar vary wildly and are strongly related to the harvest season since much cargo is agricultural produce. Factors influencing the rates are

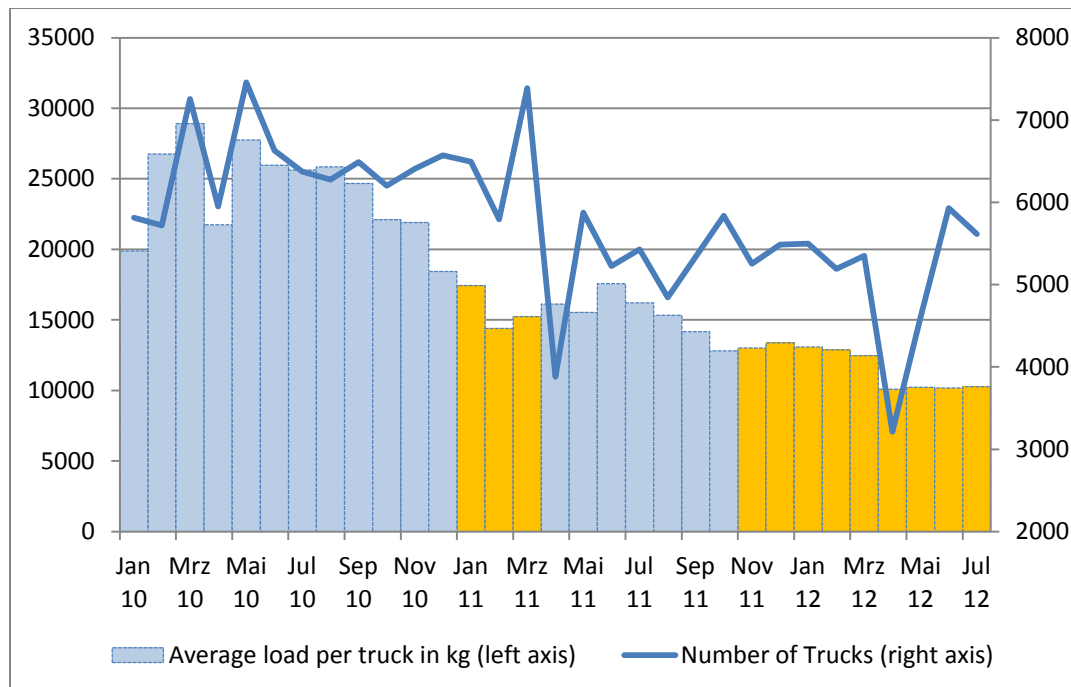
- (v) seasonal fluctuations (e.g. quantity of individual crops and their harvest time within a year),
- (vi) the weather pattern (e.g. monsoon influencing the quantity harvested between years),
- (vii) the permissible axle load (e.g. enforcement of axle load regulations), and
- (viii) the number of trucks and their individual loading capacity (total fleet capacity).

(i) During the harvest season of mangos, water melons, and other fruits, the demand for transport from e.g. Mandalay to Muse increases by around 100-150 trucks per day per crop. Hence, freight prices vary greatly and increase during each individual season on this route from as low as USD 40 per ton to as much as USD 75. On the Mandalay to Yangon route, prices increase from USD 20 to USD 50. An overlap between the different harvest seasons can exacerbate demand for transport and impact prices even more. On the other hand, during the low season (3-4 months out of the year), many of the trucks are idle. Transporters use that time to perform basic maintenance work on their fleet.

(ii) The monsoon has a general impact on the quantity harvested and thereby on the overall demand for transport. While seasonal fluctuations influence short-term price and demand, the monsoon impacts overall price levels between seasons.

(iii) The enforcement of axle load regulations limits the overall capacity of the trucking fleet and hence how much cargo can be carried along the road. The government of Myanmar has enforced axle load regulations intermittently. For example, axle load regulations were strictly enforced from January to March 2011 and then again since November 2011. During those times, transport operators do not overload as the penalties would eat up the profit. As overloading amounted up to 20% of the maximum allowed weight, the government has effectively decreased truck capacity by the same amount by enforcing weight limits. Consequently, prices spiked during those periods.

Figure 13: Quantity of Vehicles and Cargo Load Out of Yangon 2010-2012



























Source: Truck and Vehicle Supervision Committee, Yangon Division (2012).

The axle weight enforcement effect can be seen in Figure 13. With the stricter enforcement of the weight limits (→ see Appendix V), the average load factor of the trucks has sharply decreased (January to March 2011; since November 2011), During the period where axle loads were less strictly enforced (orange bars), the average load factor increased.

(iv) Shortly after the price spike due to the axle load enforcement, the government of Myanmar relaxed import license restrictions on new trucks. As operators started to purchase new 22-wheeler trucks (from the PRC) as well as further used 12-wheeler trucks from Japan the capacity of the fleet increased dramatically. Furthermore, 22-wheeler trucks are much more cost-efficient compared to the 12-wheeler trucks (the capacity of a 12-wheeler truck is 15 tons vs. 30 tons for a 22-wheeler truck). The effect on the unit price per freight ton has been dramatic and many smaller trucks and truck operators have been forced out of the market.

Appendix V: The Current Weight Limits in Myanmar 2012

Vehicle Type	Axle Configuration and Axle Weight			Total Weight (national)	Total Weight (ASEAN)
 Semi-Trailer (6 axles)	 5	 18	 27	50	50.5
 Semi-Trailer (5 axles)	 5	 18	 18	41	46
 Semi-Trailer (4 axles)	 5	 10	 18	33	34
 Single Rigid Vehicle (4 axles)	 5	 5	 18	28	27
 Single Rigid Vehicle (3 axles)	 5	 18		23	23
 Single Rigid Vehicle (2 axles)	 5	 10		15	15-16
Legend					
Single Wheel  Double Wheel 					

Appendix VI: The Infrastructure along the North South Corridor

The NSC is the major lifeline for Myanmar. It connects the two major economic centers Yangon and Mandalay with international markets through Yangon port to the South and the largest border trade partner, the PRC to the North.

There are few alternatives to road transport along the NSC. Capacity for air freight out of Mandalay and Yangon airports is limited as only small planes serve those airports. River transport is undependable as the Irryawaydy is subject to wide seasonal variations in water levels, and the rail network suffers from low capacity and under-investment.

Road

Generally, Myanmar's road density lags behind other ASEAN countries. Whilst the average road density for ASEAN is about 11 km per 1,000 people, in Myanmar it is only about 2 km per 1,000 people. Similarly, the number of motor vehicles is lower than other ASEAN countries. Indonesia and Thailand have about 250 and 370 vehicles per 1,000 people respectively vs. 18 in Myanmar. However, the recent liberalization of import licenses has created a massive increase of vehicles in Myanmar, especially in Yangon. The consequences are chronic congestion, especially in and around Yangon.

The close proximity of the port to the city and the limited port area exacerbates this problem. The port has insufficient cargo handling equipment, there are frequent delays in operations and trucks have to queue in the city.

Along the NSC the road infrastructure varies. In the PRC, the highway between Kunming and the border of Ruili is in the final stages of construction. The last 130 km are projected to be completed by the end of 2013/beginning 2014. Until then, the conventional road is used. From the border to the highway connection transporters need around 3-4 hours as the terrain is mountainous with many curves and traffic gets congested. Once truckers reach the highway, conditions are very good and allows for fast and efficient transport. The highway complies with high international standards and has four or more lanes throughout.

On the Myanmar side, the road infrastructure is generally in much worse condition. Between Yangon and Mandalay, there is the National Highway No. 1. This highway has four lanes (two in each direction) throughout and by-passes towns and cities. The road sides are cleared of any trees and bushes. However, no heavy traffic is permitted along this highway, only private cars and buses.

Trucks and other heavy traffic must use the conventional road, which is part of the ASEAN highway network (ASEAN Highway No. 14). While the concrete surface of the National Highway No. 1 is of low standard, it is still better than the tarmac of the conventional road (ASEAN Highway No. 14). Highway No. 14 has two lanes (one lane in each direction) along the majority of the route between Yangon and the Muse border. South of Mandalay there is a short section of dual carriageway from an abandoned expansion project where there are four lanes. The conventional road leads also through many villages and towns and therefore slows traffic speed further down.

Table 6: Climbs and Descents along the Route between Mandalay and Muse

Km from Mandalay	Location	Information
28-55 km	May Mio	Climb with some harpins, road in good condition; Big checkpoint for trucks at Mile 16 (km 24), the road has on some parts separate lanes
127-140 km	Ko Krain Gorge	Steep descend with a steep climb on the other side. The road is narrow with severe harpins, degraded road surface and permanent road works
330-335 km	Neen-Kutkai	Two stage climb, severe harpins, narrow road, degraded road surface, road widening efforts aggravating short-term situation
367-380 km	Ko Kraing	Steep descend with severe harpins, road degradation
400-410 km	Nanpakh	Slight climb and steep descend on a winding road into Muse

On the section from Mandalay to Muse border there are some steep climbs with tight curves (see Table 6). On this section the road is sometimes also narrow as it leads through hilly/mountainous terrain. This is particularly dangerous for longer vehicles (e.g. 22-wheelers) which struggle to go around the tight curves.

The most significant slope can be observed around Kutkhaing. In this section, the road descends within a distance of 20 km from 845 meters altitude to around 475 meters and then re-ascends to an altitude of 845 meters (see Figure 14, Figure 15, and Figure 16).

Along the corridor, road maintenance work is permanently ongoing. Nevertheless, the maintenance quality is low and the fixes are only temporary. Road damage is obvious as the non-steering tires slowly shave off the tarmac on sharp curves. Consequently, due to the high traffic volume the road surface is run-down allowing only slow traffic speeds and contributing to high operating costs. For example, while the average traffic speed between Yangon and Mandalay is below 40 km/h, on the road between Mandalay to Muse it is only 20-25 km/h.

In addition, there are, south of Mandalay, various bridges with a weight limit of 13 tons where heavy trucks are forbidden to pass and required to use the by-pass provided. However, the by-passes remain unused because they are inconvenient for the drivers. Hence, trucks with a weight of 50 tons use the 13-ton bridges.

Figure 14: Map of Ko Kraing Area

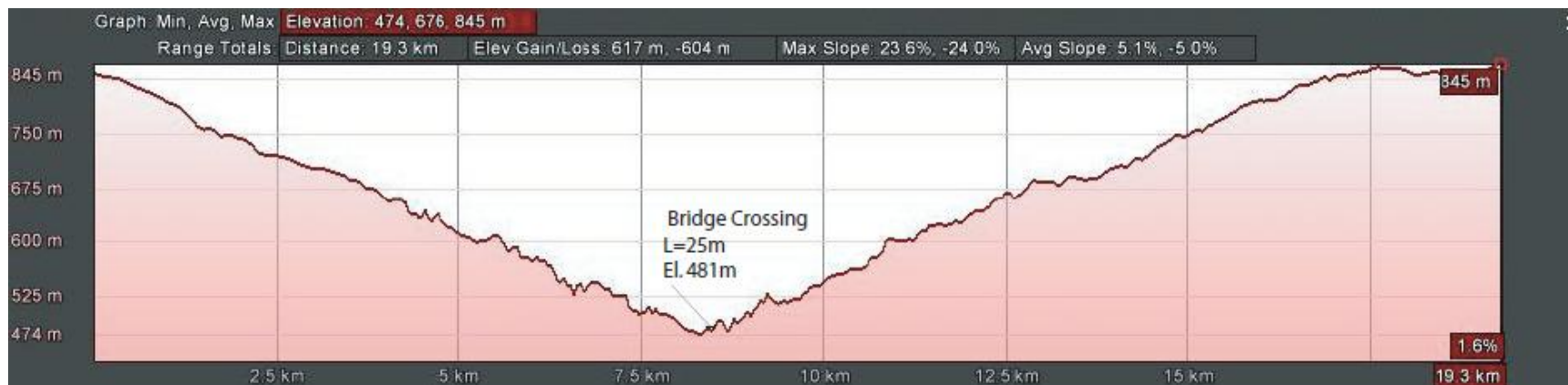


Red line: National Highway No. 3/ASEAN Highway No. 14

Blue line: Existing Railroad

Source: Asian Development Bank (2012). ADB Technical Assistance Consultant's Report TA-7851 (REG). Manila, Asian Development Bank.

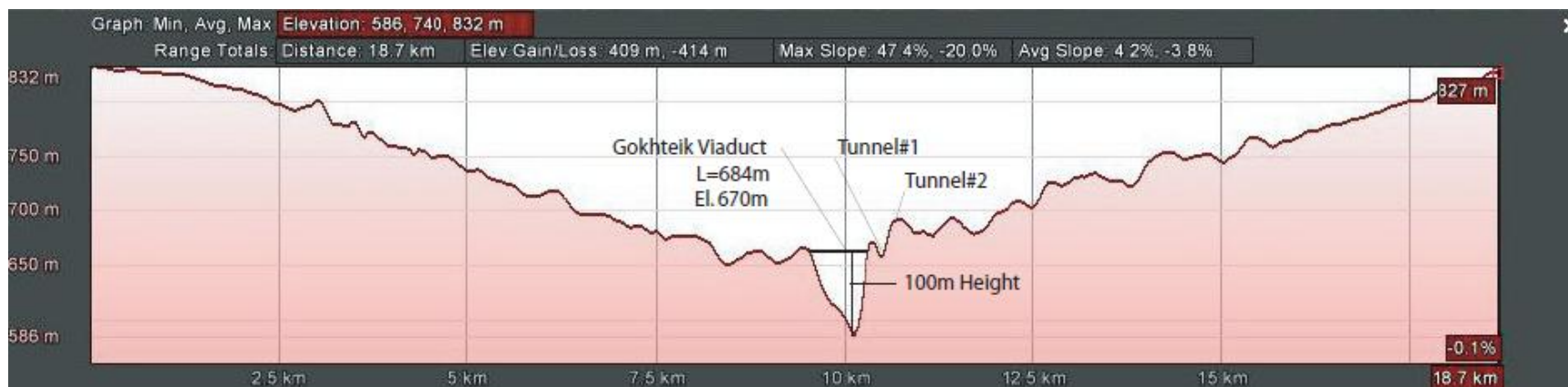
Figure 15: Elevation Profile of Road through Ko Kraing Area



See Figure 14 (red line)

Source: Asian Development Bank (2012). ADB Technical Assistance Consultant's Report TA-7851 (REG). Manila, Asian Development Bank.

Figure 16: Elevation Profile of Rail through Ko Kraing Area



See Figure 14 (blue line)

Source: Asian Development Bank (2012). ADB Technical Assistance Consultant's Report TA-7851 (REG). Manila, Asian Development Bank.

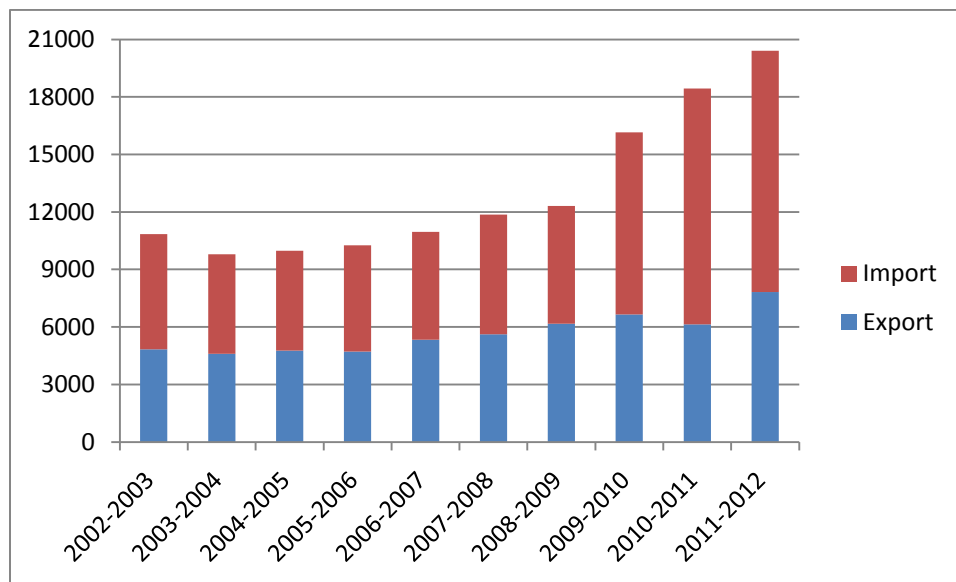
Ports

Myanmar has in total 9 sea ports. In practice, Yangon port is the only port that handles both import and export cargo because a permit from Myanmar Port Authority is needed to handle foreign vessels. Consequently, Yangon is the largest port. The other eight ports are divided equally between import and domestic goods handling. All ports are administered by the Myanmar Port Authority (MPA) under the management of Ministry of Transport.¹⁹

In Yangon there are a total of six terminals with 23 berths of which 14 are used for container ships. Several of them have been privatized in the past and to date the majority of berths are under private management. The Yangon port is divided into the inner and outer port. The inner port is about 16 km up the Yangon River. The size of ships is presently constrained by the draft of the river (8 meters), allowing the port to handle ships with up to 20,000 dwt (800 TEU). However, there are plans to dredge the river in order to enable ships with around 35,000 dwt (or around 2,800 TEU).²⁰

Around 90% of Myanmar's import and export goods (by weight) pass through this gateway. In terms of total cargo handled at the Yangon port, the following Figure 17 provides an overview:

Figure 17: Total Cargo Handled in Yangon Port (in thousand metric tons including container)



Source: Myanmar Port Authority, Ministry of Transport (2012).

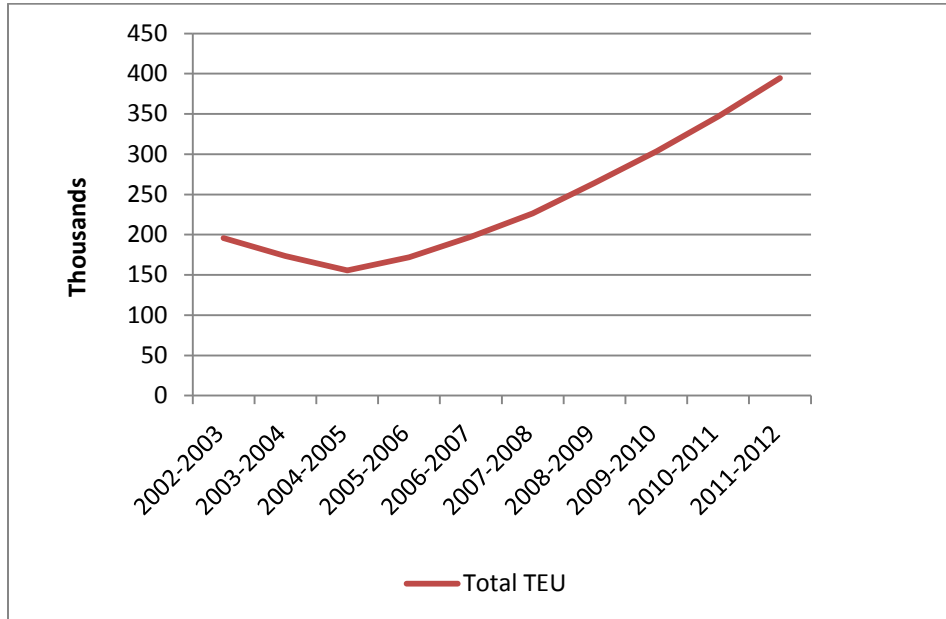
As shown in Figure 17, the total cargo increased from just above 10 million tons in 2002/03 to close to 20.4 million tons in 2011/12 (12.6 million tons of imports and 7.8 million tons of exports) of which around 20% are presently containerized. It is interesting to note, that the majority of the growth came from imports while exports only grew moderately. With the increasing trade overall, the port has seen tremendous growth in cargo throughput over the past years with imports and exports roughly in balance. In the period from 2002/03-2011/12 containerized goods increased from 195,713 TEU total to 394,431

¹⁹ Myanmar International Freight Forwarders Association: *Development of the Port Industry and Logistics environment in Myanmar*. Myanmar International Freight Forwarders Association (2012).

²⁰ Myanmar Port Authority, Ministry of Transport (2012). Retrieved 18 November 2012, from: http://www.mot.gov.mm/mpa/ygn_ports.html

TEU total (see Figure 18), whereby TEU volume dropped by more than 20% from 2002/03-2004/05 and increased rapidly since then. Despite the cargo growth over the past few years, Yangon port is still very small by international standards.

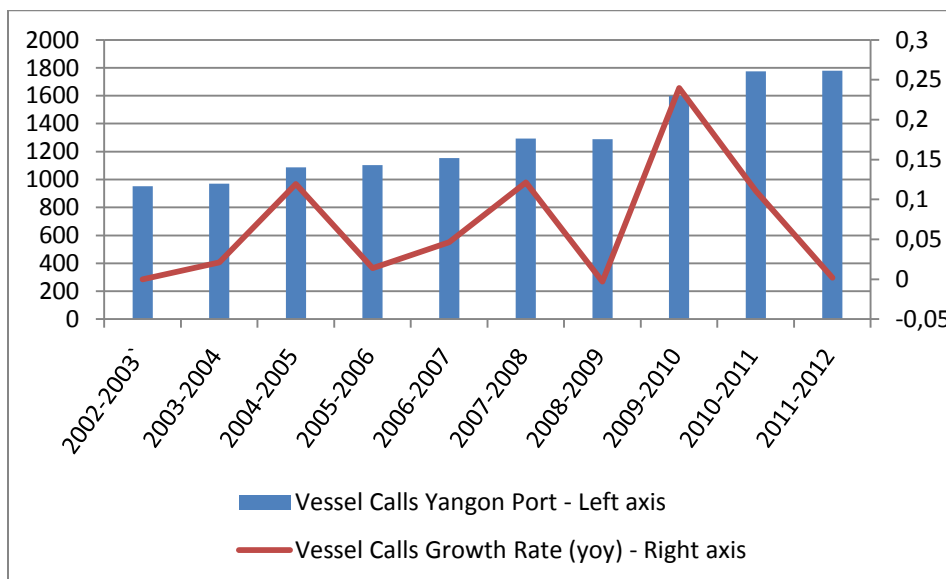
Figure 18: Total TEU Throughput and Share of Exports/Imports at Yangon Port from 2002/03-2011/12



Source: Myanmar Port Authority, Ministry of Transport (2012).

The increase in cargo was also reflected in a strong increase in vessel calls in Yangon from 2002-2012. As indicated by Figure 19, the number of vessels calling Yangon port increased from 951 in 2002/03 to 1,778 in 2011/12.

Figure 19: Vessel Calls and Annual Growth Rate from 2002-2012



Source: Myanmar Port Authority, Ministry of Transport (2012).

Rail

Compared to other countries in the region, the railway system in Myanmar is relatively well maintained but rolling stock, locomotives, track and handling facilities are all very old and of limited capacity. Furthermore, the network does not run north of Lashio. Thus the rail network is not significant in terms of cargo volume. For these reasons the rail system is not further investigated in this report.

Transshipment Areas and Supply Chain Facilities

Along the NSC, cargo is often transshipped two or three times although it is actually necessary only once (from a regulatory perspective). This is because the cargo is handled by various middlemen throughout the chain and every time the ownership changes the cargo is transshipped. Consequently, there are various transshipment areas along the NSC. Some of these transshipment areas are described in greater detail below:

Yangon and Mandalay, Myanmar: The existing trucking Gate facilities in Yangon and Mandalay are cramped, primitive, and dirty. In Mandalay, however, the Gates and their operators will move to a new purpose-built facility as of December 2012. The operators are obliged to buy the office warehouse units (which are a re-build of the old site) at the new facilities on a lease-hold basis. The operators complained about the high price of these units. Since the format of both old and new facilities is sub-optimal for efficient transport operations, the construction of this new facility presents a missed opportunity. Good practices from other countries suggest that modern facilities are better based on a multi-user, common warehouse/transshipment shed with separate office units for each operator within the same building. On the positive side, the new facilities are adjacent to the new, planned dry port in Mandalay with easy access to the main road linking Yangon with the PRC via Muse/Ruili border.

Muse border area, Myanmar: The transshipment areas on the Myanmar side of the border are not per se to transship the cargo but are often a place where the ownership of the cargo changes (e.g. through selling or auctioning the cargo). The trading center for fruits (e.g. water melon and mango), adjacent to Mile 105, is a small area where mango and water melon are auctioned. The area comprises of a building with small office/warehouse units owned by individual traders. The cargo is not necessarily offloaded in this area as trucks are often used as storage space until the cargo is sold onwards. In the case of water melons, the cargo is inspected by potential buyers from a structure that allows a view on the top of the truck. At times, Chinese trucks are already waiting in this area to directly transship the cargo by manual labor onto the Chinese trucks.

The eel and crab trading center is an auction center. The auctions for these products are handled by two separate companies who handle in total around 30 tons daily (6 trucks), and 50 tons in peak season. The seafood is transported from Yangon live in wooden crates. During transport, transporters pour fresh water over the fish at regular stops.

The area offers also around 100 private warehouses with a capacity of 1,000 tons each. The warehouses are all owned by Myanmar citizens, bonded, and generally in good condition. However, none of them offer cold storage. The storage space is to some extent also used by traders waiting until prices increase. Some of the warehouses offer also value-added services such as sorting and grading. Three warehouses also filter maize, sesame, beans and conduct quality control services.

In addition, there is one cold storage warehouse. This warehouse has six chambers with a capacity of 200 tons each (1,200 tons total). This warehouse is mainly used for frozen seafood such as shrimp and prawns. The cargo is usually transported frozen from Yangon. But since there are no refrigerated trucks deployed along this route, the warehouse is used to re-freeze the cargo (-18 degrees) for 2-3 days before it is further transported to the PRC. (→ see also Appendix II: Trade, Myanmar and PRC Border Trade).

Mile 105, the official Customs gate of Myanmar, is around 12 km from the border. Mile 105 used to be a transshipment area as all cargo had to be transshipped but this is not the case anymore. Today, only physical cargo inspections of import and export cargo take place there. Mile 105 also functions as a one-stop shop with various government agencies having branch offices. The most recent to open was the Food and Drug Administration. The zone itself extends over 370 acres of which the inspection area comprises 48 acres. The area is fully sufficient to handle the present trading volume. If trade were to expand greatly and the area becomes too small, there is the possibility to expand the site by another 103 acres. Not all cargo is manually inspected as there is also a scanner. The scanner can handle 60 trucks per day and the trucks to be scanned are assigned randomly although mixed-commodity trucks are always physically inspected. The scanning process of a single truck takes about 5 minutes. The manual inspection takes between a half hour and 4 hours.

Ruili/Jiegao border area, PRC: The Chinese border area consists basically of two municipalities: Jiegao and Ruili. While Jiegao is on the south bank of the Shweli River, which for the most part in this area defines the border and is thus contiguous with Myanmar territory, Ruili is on the northern side of the river. The Customs gate is at the bridge across the river, between Jiegao and Ruili. As this is several kilometers away from the actual border, between the Myanmar/PRC border and the bridge (Customs gate in the PRC), there exists a free zone.

There is no single transshipment area for Myanmar/PRC trade on the Chinese side. If Chinese import Customs formalities have been prepared already by the time the goods arrive in Jiegao, the cargo often moves directly on through into Ruili. If Customs documentation is not yet ready (usually because final importer/purchaser did not yet decide) cargo is stored in any of the various storage/transshipment areas in Jiegao Free Zone.

The Jiegao Transshipment Facility for fruits, vegetables and other perishable cargo offers a 5 acre large area with covered loading areas and various supporting services for the transshipment process (e.g. padding material for fruit transport, temporary storage, a small cold-storage facility, etc.). Transshipment is done by manual labor and normally takes around 3-4 hours per truck. In peak season, the waiting time for transshipment can be up to one day.

The transshipment facility for general cargo is immediately adjacent to the most westerly of the three Customs gates between Ruili and Muse (The central gate is for pedestrians and officials only, the most easterly for private cars and light vehicles). The facility handles both import and export cargo. Transshipment is usually conducted by manual labor, however, forklifts and other equipment can be arranged. This facility is surrounded by shophouses used by traders and suppliers to the trucking industry.

Near to the transshipment facility for general cargo is also a small consolidation area for Chinese export cargo. The consolidation area consists of around 100 units of small stores for rent.

There are other truck parks within Ruili focused on providing return loads from the area back towards Kunming. One is located close to at the border crossing for heavy trucks, the others are located a few kilometers away from the border. Each of the major facilities handles around 50-60 trucks per day. The truck parks are usually privately operated on government-owned land and fulfill an important backload coordination function as they all have blackboards with backloads announced and a contact number to call. Contact between demand and supply is direct without middlemen. The truck parks are not commodity-specific but most cargo handled is fruit, vegetables, livestock (though beef and cows currently being banned for export and transit by the Myanmar government), and timber.

Appendix VII: Competitiveness of Myanmar's Logistics Industry from a Supply Chain Perspective

According to ADB's Transport Sector Assessment (ADB, 2012), there is no transport sector strategy in Myanmar. Government investments in the transport sector have largely concentrated on highways and new railways. The operations of the transport network, including maintenance, have been neglected or been of poor quality, especially in the road sector. Particularly the lower-level road network has been ignored.

Similarly, the private sector has invested little in the past. The transport industry has to cope with three challenges: (i) an outdated trucking fleet, (ii) under-utilization of their trucks, and (iii) low profit margins.

(i) Only recently, with the liberalization of the import licenses for trucks by the Myanmar government, have newer trucks been imported, mainly 22-wheeler from the PRC. Otherwise, the trucking fleet is generally very old with an average truck age of around 15-20 years. There are some second-hand Japanese trucks (7-15 years old) and also some old-timers from the British army times.

(ii) One reason for the outdated trucking fleet is the low average utilization of a truck in Myanmar. The average annual mileage is estimated to be around 80-100,000 km per year. This is very low compared to other countries and does not justify investment in new trucks especially since it was, for a long time, difficult to obtain an import license and prices were very high. In addition, poor management practices in small companies prevent accumulation of capital for investment. Depreciation as a cost element is often ignored and revenue treated as profit (→ see also section Capacity and Skill Development along the Corridor).

(iii) Another reason for the outdated trucking fleet can be found in the low profit margins of the transport sector. Most of the transport operators are small with only few trucks. The majority have just one truck (operator/owner). Competition among transport operators is mainly on price although competition for organized transport operators (Gate members) is somewhat restricted because the transport price is negotiated by the Gate manager (→ see Appendix III: Transport). Nevertheless, overall margins in the sector are very low also because of the large volatility of demand. During low season in the agricultural sector, trucks are idle for 2-3 months per year. Strict axle weight enforcement (limiting the capacity) by the Myanmar government has increased prices in the short-run but this effect was outweighed by the influx of 22-wheeler truckers from the PRC shortly thereafter. The 22-wheeler trucks, owned to a large extent by non-organized industry new-comers, impacted the margins of the Gate members as the new

trucks can operate much more cost-efficiently than the smaller trucks owned by Gate members and lower the unit price of transport.

With the further liberalization of the country, both economically and politically, an increased inflow of private sector investment can be expected. This investment will have also a large impact on the country's logistics, including the transport industry. A likely development example can be found in Thailand (see

Box 2: Development of the Thai Logistics Industry

In Thailand, the transport industry 40 years ago was very similar to that of Myanmar today. The industry faced similar challenges such as an outdated trucking fleet, low profit margins, and under-utilization of their fleet due to seasonal transport of agricultural products.

With the industrialization of the 1970s/1980s, fuelled by the inflow of foreign direct investment, the transport market changed. The newly set-up factories offered year-round business and growing international trade led to ever-increasing volumes. But the new customers had new requirements. These included for example

- Modern and standard specification trucks;
- Specialized vehicles i.e. tanker trucks, container chassis, car carriers, refrigerated and van-trucks;
- 30-60 days credit after transport;
- liability for losses of their high-value cargo during transport;
- Operations at the highest legal weight limits without tolerance for overloading; and
- High levels of safety, security, and en-route visibility including total punctuality.

But those factories offered an attractive transport rate. The transport costs, as a percentage of total production costs, were relatively low. Thus they were prepared to pay high rates to contractors that were able to meet their required standards.

With the development of Thailand's industry and integration into production networks, shippers demanded integrated logistics systems linking their factories with suppliers and customers to ensure just-in-time flows of goods and low inventory. These supply chains function only with adequate logistics services. As the local trucking industry was not able to deliver such sophisticated services, manufacturers turned to large, foreign-managed 3-PLs who had experience with such sophisticated supply chains. Consequently, logistics service providers such as shipping lines and freight forwarders set-up operations in Thailand acting as lead logistics providers.

These companies were constrained from operating large fleets of their own trucks both by government regulation and their "asset-light" policies. Therefore, they sought out and developed local trucking companies who were prepared to invest in good equipment and adopt international best practice. The foreign 3-PLs provided the necessary management systems, cash-flow, and liability coverage, the local trucking firms had to invest both in "hardware and software" to meet the same standards as set by the manufacturer and passed on to Thai subcontractors by the lead logistics providers.

Complying with those standards incurs higher costs thus the rates paid to those trucking firms are higher than in conventional trucking. Operations of well-managed companies in this sector are profitable. In this segment, transport companies generally report that the only constraints on further profitable growth are

- The availability of top-class drivers, and
- Management time

Eventually, subcontracted, local trucking firms were able to learn from 3-PLs how to comply with the required standards in international production networks. The experience from Thailand shows, that learning and adopting from multinationals enabled some local firms to develop from a dependent subcontractor to an independent competitor for service contracts. Other companies serving multinationals decided that it was overall better to remain a subcontractor and not deal with all the requirements. They were technically able to compete but would have had problems meeting the commercial conditions of the factories, such as very long payment terms, very high “goods-in-transit” liability conditions, or the very demanding rules on compliance to various international conventions.

Not every local trucking company was able to upgrade, and not every company wanted to, as funding was not equally available to every operator to make such an investment. In addition, there are also significant risks (e.g. high investments) involved. For the companies that did not want to upgrade, there was still a large market. Traditional/conventional cargo such as construction material, agricultural products, low-value consumer products, etc. is still carried by those transporters today. The traditional markets are less demanding and the investment required is much lower. Margins are, however, significantly lower.

Consequently, today in Thailand two segments exist in parallel within the trucking industry. Whilst the truckers operating for multinational clients experience high margins, high demand, and high requirements in terms of management and equipment, low-spec trucking companies continue to exist. In this segment, transport operators have on average older vehicles and lower profit margins with highly volatile demand. Yet, this segment is also an integral part of the Thai logistics industry as it provides a low-cost transport option for low-value goods (for which the other segment would be too expensive).

Appendix VIII: Transport and Trade Patterns for Selected Products


Product	Rice	Mango (Export by Air)	Mango (Export by Road)
Traded between	Yangon and West Africa (the vessels sails directly, the documents are sent via Singapore because intermediaries in Singapore establish the contact and contract – therefore the documents have to be sent via Singapore)	Yangon to Singapore	Mandalay to Kunming, PRC via Muse/Ruili
Average value	USD 6-10 million	USD 6,000-7,200 (USD 12 per kg)	USD 4,500-15,550 (depending on the truck size)
Alternative routes/ modes of transport		In 2013, it is expected that Mandalay international airport will open for air transport. It is expected that the transport price will be around the same as from Yangon.	-
Average transport price	USD 70 per ton (total domestic logistics cost from farm to port; international transport costs not known)	USD 250-300 (USD 0.50 per kg)	USD 850
Average load factor	18,000 tons (min. 15,000; max. 28,000 tons)	500-600 kg	10-14 tons (open 12-wheeler truck)
Lead time	45 days	3.5 hours (plus 24-36 hours advance time to bring the cargo from the farm to Yangon airport by express bus as well as selecting and packaging the fruits and conducting hot water treatment).	4.5-7 days
Clients	Traders	Traders, Singaporean supermarket chain	Chinese Traders
Who determines the supply chain	Trader/Importer	Trader/Exporter	For the Myanmar section: Myanmar traders For the Chinese section: Chinese traders
Peak season	November – April (+20%)	May – June (2-3 tons per week), and less in July because mangos only available from Shan State	May – July (100-150 trucks per day)
Contract basis	Shipment by shipment	Seasonal contract with price fixed only once in April Transport is arranged through a freight forwarder as the freight forwarder is able to obtain better freight rates due to the higher consolidated volume	Shipment by shipment
Customers value	Cheap price (the quality is low with up to 25% broken). The price is between USD 350-450 per ton	The freshness and high quality of the Myanmar mango (fragrance and texture – no fiber in the flesh.	Cheap transport
Terms of sale	FOB	Contract: FOB; actual shipment: CIF	Free border carrier
Damage/loss	Unknown during sea transport – the foreign trader is fully responsible with the FOB terms. However, foreign traders nominate usually an inspection team at the port to check for quality, quantity, vessel cleanliness, fumigation, etc.	No losses or damage during air shipment	~5% per shipment Mainly during manual transloading and transport
Risks in the supply chain	For foreign buyer: Payment by telegraphic transfer 2 weeks in advance of shipment (100%) For seller: If buyer delays arrival of ship, the seller bears the responsibility for cargo damage and storage costs	For the trader: the selling price is fixed once per year (April) for the whole season but the buying price varies during the year. Exchange rate risk because the contract is in USD	<ul style="list-style-type: none"> - No cargo protection during transport in open trucks - No insurance of cargo due to adverse insurance terms - No insurance coverage outside Myanmar - No sales contracts (handshake deals on price and quantity) - Unfavorable payment terms for exporter - Seller carries risks of exchange rate, delays in acceptance by buyer, payment risks, etc.
Principal difficulties	The government requires advance payment for rice exports. This makes it difficult to find buyers as the shipment value varies between USD 5.25 million up to USD 12.6 million.	In order to obtain the export license from MOC, exporters need to provide the necessary SPS certificates. However, at the time of application for the export license, the fruits are still on the tree (at the moment exporters provide different mangos for the export license application). Logistics challenges hinder Myanmar exporters to explore other markets. Among the biggest challenges are logistics costs, transport time, lacking temperature-control equipment, etc. Exporting larger volumes would also require an improved collection system.	<ul style="list-style-type: none"> - No contract enforcement mechanism (once the seller delivered to the warehouse in PRC, there are no options to enforce the agreed terms) - Acceptance of cargo is often delayed and when the condition of the cargo deteriorated, Chinese traders ask for a discount - Road infrastructure in poor condition - Two times manual transshipment of cargo (high risk of damage) - No temperature-control equipment deployed along the route and affecting quality (hence price) - Logistics operations are almost exclusively carried out on the Chinese side

Appendix IX: Status of CBTA Annex and Protocol Ratification by GMS Country, July 2012

<u>Item</u>	<u>Description / Title</u>	<u>CAMBODIA</u>	<u>PRC</u>	<u>LAO PDR</u>	<u>MYANMAR</u>	<u>THAILAND</u>	<u>VIET NAM</u>
ANNEX 1	Carriage of Dangerous Goods	Ratified	Ratified	Ratified	Ratified	Signed	Ratified
ANNEX 2	Registration of Vehicles in International Traffic	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 3	Carriage of Perishable Goods	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 4	Facilitation of Frontier-Crossing Formalities	Ratified	Ratified	Ratified	Ratified	Signed	Ratified
ANNEX 5	Cross-Border Movement of People	Ratified	Ratified	Ratified	Signed	Ratified (Part 1-4)	Ratified
ANNEX 6	Transit and Inland Clearance Customs Regime	Ratified	Ratified	Ratified	Ratified	Signed	Signed
ANNEX 7	Road Traffic Regulation and Signage	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 8	Temporary Importation of Motor Vehicles	Ratified	Ratified	Ratified	Ratified	Signed	Signed
ANNEX 9	Criteria for Licensing of Transport Operators for Cross-Border	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 10	Conditions of Transport	Ratified	Ratified	Ratified	Ratified	Signed	Ratified
ANNEX 11	Road and Bridge Design and Construction Standards & Specifications	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 12	Border Crossing and Transit Facilities and Services	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 13a	Multimodal Carrier Liability Regime	Ratified	Ratified	Ratified	Signed	Ratified	Ratified
ANNEX 13b	Criteria for Licensing of Multimodal Transport Operators for Cross-Border Transport Operations	Ratified	Ratified	Ratified	Signed	Ratified	Ratified
ANNEX 14	Container Customs Regime	Ratified	Ratified	Ratified	Ratified	Signed	Signed
ANNEX 15	Commodity Classifications Systems	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
ANNEX 16	Criteria for Driving Licenses	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
Protocol 1	Designation of Corridors, Routes and Points of Entry & Exit Border Cross-	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
Protocol 2	Charges Concerning Transit Traffic	Ratified	Ratified	Ratified	Ratified	Ratified	Ratified
Protocol 3	Frequency and Capacity of Services and Issuance of Quotas and Permits	Ratified	Ratified	Ratified	Signed	Ratified	Ratified

Legend:

 = Ratification completed

 = Signed but Ratification still pending

Source: ADB, 2012

Appendix X: The Economist: "Less Thunder out of China"

Relations with Myanmar

Less thunder out of China

China has been stung by a sudden reversal of fortune in its own back yard

Oct 6th 2012 | BEIJING AND RUILI | from the print edition

VISITORS to the showroom of the "Everything is Good" jade company in the Chinese border town of Ruili are swiftly steered towards one particular lump of black rock among many thousands on display. It looks innocuous enough, but a small slash on one side, revealing a translucent green and purple interior, betrays its true worth: this is the highest-quality jade from Myanmar, and to discerning Chinese customers that means the best in the world. The price tag is \$1.2m.

There are hundreds of such shops in Ruili, many of them turning the jade into ordinary bracelets and pendants, valued as lucky charms by Chinese shoppers. For the Chinese, it is just good business; selling the stones, fossils and wood of Myanmar. To many Burmese, however, it represents nothing less than the plunder of their country. Since Myanmar was subjected to Western economic sanctions in the mid-1990s, China has had virtually a free rein. The booming economy of Ruili is testimony to that. But the Burmese grumble that whereas the Chinese businessmen of Yunnan have made fortunes marking up their imports, often in collusion with corrupt Burmese officials, most Burmese have benefited little from the cross-border trade.



None of this used to matter much until the stirrings of political reform in Myanmar. Together with trade, the other traditional Chinese interest along their border has been stability. The Chinese authorities have long sought to contain spillover from battles between the armed militias of the Kachin and Karen ethnic groups and the Myanmar government; they have also tried to stop the flow of drugs from neighbouring Shan state into China. The recent high-profile trial of a Shan drug lord, Naw Kham, in Kunming, the capital of Yunnan province, demonstrates how seriously the Chinese authorities take this threat, and how influential they have become in the region. But in focusing on these issues, the Chinese missed the bigger picture of how resentments were building towards their presence in, and economic exploitation of, Myanmar. The result is that what the Chinese took to be a solid, mutually beneficial relationship with the Burmese has exploded in their faces—with long-term consequences for Myanmar, the balance of power in South-East Asia and the whole way that China does business with poorer countries.

Zhu Feng, a professor of international relations at Peking University, says that the “alarm bells started ringing” for the Chinese over Myanmar with the abrupt suspension of the Myitsone dam project just over a year ago. Costing \$3.6 billion, this was the largest of several dams that Chinese state-owned enterprises (SOEs) were building on the Irrawaddy river in Kachin state. The Chinese had assumed that such development work would be welcomed by the Burmese. To many Burmese, however, Myitsone came to represent everything that they hate about the unequal terms of trade between resource-rich Myanmar and its resource-hungry neighbour. Villages were to be displaced and land flooded to make way for the dam, yet most of the electricity was earmarked to go to China, leaving the local Kachin people little better off than before.

Thus when the new Burmese president, Thein Sein, suspended construction of the dam, at one stroke he asserted his credentials in Myanmar as a man prepared to listen to his own people and stand up to the exploitative Chinese. It was an astute domestic political move and a milestone in the country’s unfolding reform programme. Scholars and officials in China, however, still talk of their “shock” and “surprise” at a decision for which they were utterly unprepared and which they are still trying to digest.

In retrospect, explains Mr Zhu, the Chinese mistake in Myanmar was to focus only on building relationships with government officials, without paying any attention to “domestic political nuances”. Thus China missed the vital shifts in policies, words and political thinking that they might have picked up had they listened to voices other than the government’s and engaged the country at a local level. This was stupid, says Mr Zhu: “It’s a big lesson, and we have to learn from it.”

This lack of political antennae on the ground is, perhaps, inevitable given the standard Chinese policy of “non-interference” in other countries’ internal affairs. Too often, it seems, this merely encourages wilful ignorance—which is, indeed, much in evidence in Ruili. The local Chinese know almost nothing about Myanmar, other than the fact that it is poor and, they believe, dangerous.

Be nicer

As one Chinese expert on the country’s aid policy, Zhang Xiaomin of Beijing Foreign Studies University, points out, China has already run into some of these issues in Africa. But their experience in Myanmar has really crystallised the problem, he says. As a result, the Chinese government is now telling businesses—especially SOEs—operating overseas to be more respectful of local customs and people, and to invest more in what Westerners would call corporate social responsibility. Thus, for instance, the China National Petroleum Corporation, which is building a controversial oil pipeline across Myanmar from the west coast to the border at Ruili (and then on into China), is now building lots of schools in villages near the pipeline.

The Chinese are largely right in this analysis of what went wrong in Myanmar, but it is not the whole story. The Burmese also complained that for all the roads and bridges constructed, the Chinese were unable, or unwilling, to provide other, more sophisticated, services such as banking or advice on issues such as government administration, the sort of soft-power issues at which Western countries excel.

Indeed, for many Chinese foreign-policy experts the other worrying aspect of China's stumble in Myanmar is that Beijing's loss has been Washington's gain. In an era of renewed tension between America and China in the region, Myanmar's recent opening up is thus usually interpreted by these experts as a tilt towards the West, all part of America's "pivot" towards Asia. Indeed, the more conspiratorial-minded Chinese ascribe the changes in Myanmar entirely to the machinations of a resurgent America determined to contain the rise of China. A further concern, as another Chinese expert puts it, is that a democratic movement in Myanmar would, in some way, "influence the situation in China".

All in all, the democratic transformation of Myanmar has been a searing experience for the Chinese government. At least, however, they look set to draw some lessons from it all.

from the print edition | China

Source: The Economist, Less Thunder out of China, 6 October 2012, China Section, Page 42.

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