

CRITICAL EVALUATION OF MANDALAY DRY PORT, MYANMAR

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Introduction

ASEAN is at the geographic centre of the emerging global centre of production and demand - the South Asia-Southeast Asia-Northeast Asia-Australia/New Zealand corridor. ASEAN has the highest share of intra-regional trade to total trade (26.3% in 2008) among the regional economic groupings in the developing world. This reflects the high level of inter-dependence between regional production networks operated by both manufacturers and producers (ASEAN Secretariat, 2011: 20). ASEAN cooperation in transport connectivity aims to establish efficient, integrated, safe and environmentally sustainable regional land transport corridors linking all ASEAN Member States and countries beyond. ASEAN has introduced a number of transport facilitation initiatives over to create a more efficient logistics and multimodal transport system for a seamless movement of goods, connecting land, maritime, and air transport. A Roadmap for the Integration of Logistics Services (RILS) was endorsed in August 2008 to strengthen ASEAN as a single market and production base, and enhance its competitiveness through trade and transport facilitation. However, as far as the missing links of the Asian Highway Network are concerned, they are located mostly in Myanmar – which is used as a case study for this paper.

We argue that major ASEAN transport corridors must be integrated with economic development corridors. First, we outline the general concepts of dry ports and special economic zones based on some of our previous research (Roso, 2009a; Black, *et al*, 2012). The critical success factors for the planning and implementation processes for successful dry ports are presented based on a search of best international practice (Table 1). In nominating the potential dry ports to be included in the UNESCAP Intergovernmental Agreement on dry ports, Myanmar has proposed potential dry ports in Mandalay, Tamu, Muse, Mawlamyine, Bago, Monywa and Pyay. Mandalay is selected as a case study of a dry port as part of ASEAN connectivity, and we critically evaluate its location (Table 3) within the context of Myanmar's import and export of commodities. Furthermore, special economic zones (especially the strategic and master planning exercises to be undertaken by governments to attract private-sector finance) can be created around ports, dry ports and airports to help create economic development along major international transport corridors, and potential policies for the Government of Myanmar are discussed in the final section.

Dry Ports and Special Economic Zones

The concept of “dry ports” was neglected for many years (Hanappe, 1986; Munford, 1980) until increased interest in environmental issues related to growing containerised maritime transport, where seaport inland access becomes a critical factor for the seaports' competitive advantage (Roso, 2009a: 3). An inland freight terminal is “any facility, other than a port or an airport, operated on a common-user basis, at which cargo in international trade is received or dispatched” (UN ECE, 1998). Inland ports supply regions with an intermodal terminal offering value added services or a merging point for different traffic modes involved in distributing merchandise that comes from ports. The term dry port is used synonymously.

The dry port concept (Cullinane, *et al*, 2012) goes beyond the conventional use of railway shuttles for connecting a seaport with its hinterland. Being strategically and consciously implemented jointly by several actors from the public and private sectors, it also goes beyond the common practice in the transport industry of “silos”. In addition to the general benefits to the ecological environment and the quality of life of people living near main roads by shifting flows from road to rail, the dry port concept mainly offers seaports a possibility to secure a market in the hinterland, increasing the throughput without physical port expansion as well as better services to shippers and transport operators.

The Republic of the Union of Myanmar (henceforth Myanmar in this paper noting that some In terms of policy, special economic zones (SEZ) are useful tools (as part of an overall economic growth strategy)

to enhance industry competitiveness and attract foreign direct investment (FDI). The popularity of special economic zones (SEZ) as a national government policy instrument has taken off since the 1990s, especially in developing economies. The International Labour Organization's database of special economic zones reported 176 zones in 47 countries in 1986; by 2006 this had risen to 3,500 zones in 130 countries (Boyenge, 2007). Advanced economies also use special economic zones as policy instruments to influence the location of economic investment. For example, in the election campaign for the Australian Federal Government (September 2013) both major political parties announced policies on special economic zones in northern Australia. Furthermore, local governments apply SEZ policies: the Tokyo Metropolitan Government recently launched the Special Zone for Asian Headquarters project as a new plan to attract foreign companies to Tokyo, with the aim to make Tokyo the preferred site in the Asian region for regional headquarters and R&D centres. Foreign companies newly headquartered in five central zones (Central Tokyo Waterfront area, Shibuya, Shinjuku, Shinagawa, and vacant land near Hanada airport) will benefit from preferential tax treatment, as well as deregulation and a generous package of fiscal and financial assistance (http://www.chijihon.metro.tokyo.jp/ahq_project/index.html., accessed 29 August, 2013).

In contrast, free-trade zones are fenced, tax-free areas that provide warehousing and distribution facilities for import/export operations, sometimes with reduced customs, labour and environmental controls. To maintain control, EPZs have normally been fenced-in estates with strict customs controls at entry, and sales are typically restricted mainly to export markets. Traditional export-processing zones (EPZs) were designed to attract investment by enabling countries to better exploit low-cost labour – which was otherwise under-utilised because of low levels of domestic investment and barriers (regulatory, infrastructure, and so on) preventing foreign direct investment (FDI). EPZs allow investors to import and export free of duties and exchange controls; they facilitate licencing and other regulatory processes; and divest firms from obligations to pay corporate taxes, VAT, or other local taxes. According to a World Bank source (Farole, 2011), achieving success with zone programs in the future will require adopting a more flexible approach to using the instruments of special economic zones in the most effective way to make the most of the country's sources of comparative advantage. This will require much broader policies than the narrow scope of any special economic zone programme alone, such as: promoting skills development, training, and knowledge sharing; promoting industry clusters; supporting the integration of regional value chains; and supporting public-private institutions, both industry specific and transversal. More fundamentally, this will require a change in mindset away from the traditional reliance on fiscal incentives and wage restraint, to a focus on facilitating a more effective business environment to foster firm-level competitiveness, local economic integration, innovation, and social and environmental sustainability. It will require supporting economic and social infrastructure, and other residential and business amenities, as illustrated by the Asian Headquarters Project in Tokyo with its articulated locational advantages of the five zones.

Dry Ports – Critical Success Factors

There are a number of factors that influence the implementation process of a dry port. In the first place, there must be capacity problems in the seaport and suitable infrastructure connectivity (Roso *et al*, 2009; Roso, 2008; Rodrigue and Notteboom, 2012). There must be a suitable location for the dry port that offer environmental advantages (Roso, 2008; Hanaoka and Regmi, 2010; Cullinane and Wilmsmeier, 2011) and this will be partly dictated by geographical characteristics of the country. It is noted that the road lobby often impede railway development (Roso, 2008) and that cooperation amongst all key stakeholders in the multi-modal transport system is required (Roso, 2012) of which the regulatory environment is important. Finally, there must be the finance available to build the dry port. However, as the case studies of Falköping dry port in Sweden (Roso and Lumsden, 2009) or Nepal's dry port at Birgunj (Hanaoka and Regmi, 2010) demonstrate, it is relatively easy to develop a dry port facility but it is a considerable challenge to put it into operation. Based on a review of the international literature, Table 1 presents the factors that influence dry ports operations and, consequently, their success.

Success factor	Reference
Discuss operational agreements in advance	Hanaoka and Regmi (2010)
Emission reductions	Roso and Rosa (2012), Hanaoka and Regmi (2010)
Government logistics policies/support	Hanaoka and Regmi (2010)
Public-private ownership or government	Hanaoka and Regmi (2010)
Railway connection	Roso <i>et al</i> (2009), Roso and Lumsden (2010), Hanaoka and Regmi (2010)
Modal shift from road to rail	Roso <i>et al</i> (2009), Hanaoka and Regmi (2010), Cullinane and Wilmsmeier (2011)
Stimulating economic development	Roso (2009b), Hanaoka and Regmi (2010)
Facilitating international trade	Hanaoka and Regmi (2010)
Development of supporting infrastructure	Hanaoka and Regmi (2010)
Streamlining of institutional and regulatory frameworks	Hanaoka and Regmi (2010)
Double-stack trains	Hanaoka and Regmi (2010)
Advanced information systems	Roso (2012), Hanaoka and Regmi (2010)
Container tracking	Hanaoka and Regmi (2010), Roso (2012)
Market driven development	Hanaoka and Regmi (2010)
Cooperation between the actors of the transport system	Roso (2012), Hanaoka and Regmi (2010)
Coordination among various government agencies	Hanaoka and Regmi (2010)
Temporary warehousing facility	Rodrigue and Notteboom (2012), Cullinane and Wilmsmeier (2011)
Capacity problems in seaport reduced	Roso <i>et al</i> (2009), Roso (2008), Rodrigue and Notteboom (2012), Cullinane and Wilmsmeier (2011)
Development of value added services	Back <i>et al</i> (2013), Roso and Andersson (2010)
Lower distribution cost	Rodrigue and Notteboom (2012), Roso <i>et al</i> (2009), Cullinane and Wilmsmeier (2011)
Good intermediary location	Rodrigue and Notteboom (2012)
Better usage of regional transport infrastructure	Rodrigue and Notteboom (2012)
Expanding or reinforcing hinterland	Cullinane and Wilmsmeier (2011), Roso (2012), Roso and Rosa (2012)
Marketing support by local economic agencies and state	Cullinane and Wilmsmeier (2011)
Lower land cost and taxes	Cullinane and Wilmsmeier (2011)
Lower cost of living to attract distributions centres into area	Cullinane and Wilmsmeier (2011)

Table 1: Success Factors in the Operations of Dry Ports

Myanmar – Economic Background Data

The Republic of the Union of Myanmar (henceforth Myanmar in this paper noting that some western countries such as Australia and the USA use the former name of the country, Burma) is the largest country in mainland South-East Asia with a total land area of 676,578 square kilometres. In 2010, the total population was estimated at 60.6 million with an estimated growth rate of 1.29 percent. Myanmar is located between latitudes 09°32'N and 28°31'N and longitudes 92°10'E and 101°11'E with much of the country located between the Tropic of Cancer and the Equator. Distances range from 936 kilometres from east to west and 2,051 kilometres from north to south. Myanmar shares 5,858 kilometres of international borders with Bangladesh and India, on the northwest, The People's Republic of China, on the northeast, and Lao PDR and Thailand, on the southeast.

From 1962 to 2011, the country was ruled by a military junta – justified internally on the grounds that a military regime was necessary to prevent the regional and ethnic conflicts escalating into civil war. After a general election in 2010 a nominally civilian government installed, although the military retained a considerable influence that is now in decline with various policy reforms. Myanmar has a high socio-economic potential as a result of its abundant natural and human resources that are currently underused. In 2011, the agriculture sector contributed 32 percent of Gross Domestic Product (GDP) and generated 17.5 percent of total export earnings. Myanmar is a predominantly rural country with only 31 per cent of the population living in urban areas. Table 2 provides information from Myanmar between 1995 and 2010 but based on different data sources. Myanmar remains a predominantly rural country with only 31 per cent of the population living in urban areas.

In accordance with the market-oriented policy of the government in Myanmar, restrictions on trade and investment were removed progressively since 1988. Private-sector participation in domestic and foreign trade - previously monopolised by the state - are allowed. Border trade was regularised to facilitate cross border trade with the five neighbouring countries with the Department of Border Trade established and its 13 branch offices providing one-stop service for border trade matters in collaboration with various departments concerned. For example, the Muse Border Trade Commercial

Zone has been constructed at the China-Myanmar border area to smooth border trade transiting. The customs procedures in Myanmar are provided in the Sea Customs Act and Land Customs Act. A notification was issued to regulate the classification of imported goods and assessment of duties in accordance with the tariff law that was enacted to assist the market economic system on March 12, 1992. The Green Lane System (GLS), which has been laid out by ASEAN Customs Administrations for the rapid clearance of goods of ASEAN origins for the development of intra-ASEAN Trade, has been being implemented in Myanmar since 1st January 1999. The Harmonized Commodity Description and Coding System (HS) were introduced in April 1992 for modernisation and standardisation. In 1988, the risk management technique was initiated by Customs to avoid 100 per cent physical checking of all exports and imports following WTO recommendations. Transit duty was abolished in 2000. Customs Value Declaration Form (CUSDEC 4) was prescribed to provide the implementation of the WTO Valuation Agreement in 1999.

Indicator	1995	2000	2005	2010
GDP (kyat billion)	604.7	2552.7	12286.8	40507.9
Annual growth of GDP (%)	2.8	6.9	13.7	11.9
Per capita real GDP (kyat)	1,232.0	1,492.0	2,000.0	564,091.0
Total population (millions)	44.74	50.13	55.4	59.78
Urban population (percent of total)	26.1	29.1	30.4	30.7
Labor Force (millions)	20.5	24.3	27.4	31.0
Human Development Index*	0.481	0.552	0.406	0.483**

*Human Development Index is Composite index of longevity (measured by life expectancy at birth), knowledge (measured by expected years of schooling and mean years of schooling), and decent standard of living (measured by the adjusted per capita income in PPP US\$).

** for 2011

Table 2: Macro - Economic Indicators for Myanmar, 1995 - 2010
(Sources: Key Indicators for Asia and the Pacific, 2011 and 2012)

Southeast Asian and Asian countries dominate the pattern of trade to and from Myanmar. In 2008/9 the bulk of Myanmar's exports in value (57%) went to countries in South-east Asia, predominantly Thailand (39%) and Singapore (13%), and to other Asian countries (37%) - primarily to India (12%), Hong Kong (10%) and the People's Republic of China (9%). There is a similar geographical distribution with the value of import: in 2009/10 imports came from the People's Republic of China (30%), Singapore (29%), Thailand (9%), Japan (6%), Korea (6%) and India (5%).

Evaluation of Mandalay Dry Port Concept

A report for the United Nations ESCAP recommends a dry port of area of 8.5 hectares be established near the existing Merchandise Center in Mandalay (Ryoo *et al*, n.d.) at a total cost of \$US10.5 million. The report provides detailed costs of land acquisition, site preparation and utility services, together with the necessary dry port infrastructure, based on unit rates and typical designs on other Asian countries, especially Laos and Thailand. The criteria in Table 1 are applied to our case study of planning a dry port in Mandalay in order to assess its potential success in implementation and operations (Table 3). Internal transport is a major barrier to economic development. Myanmar is the poorest performer amongst ASEAN countries and this acts against a dry port in Mandalay. The World Bank has published the Logistics Performance Index (LPI) which is a multidimensional assessment of logistics performance that compares the trade logistics refers to trade- and transport-related infrastructure (e.g., ports, railroads, roads, information technology). Among 155 countries, Myanmar is ranked 129th (with a score of 2.37) in terms of the LPI, and 133rd (with a score of 2.10) in terms of the quality of infrastructure (ADB 2012, p. 22). According to truck drivers, the transit time between Mandalay and Yangon is about 24 hours (including 6 hours rest).

Success factor	Positive	Negative
Congestion in main port	Yangon has landside space constraints	
Government logistics policies/support		In progress
Public-private ownership or government		
Railway and waterway connections		Poor freight services and river navigation constraints
Modal shift from road to rail		Road sector developing rapidly
Stimulating economic development	Yes in Upper Myanmar	
Facilitating international trade	Between China and India	
Development of supporting infrastructure	With commitment of provisional government	
Streamlining of institutional and regulatory frameworks		Too challenging at present
Double-stack trains		No
Advanced information systems		No
Container tracking		No
Market driven development		In progress
Cooperation between the actors of the transport system		No evidence
Coordination among various government agencies		No evidence but being driven by Ministry of Economic Development
Temporary warehousing facility	Merchandise City	
Capacity problems in seaport reduced		Too far from congested Yangon unless rail is improved
Development of value added services	Potentially in Mandalay	
Good intermediary location	Between Muse (China trade) and Yangon	
Better usage of regional transport infrastructure		Requires construction of new railway to Muse
Expanding or reinforcing hinterland		Yes
Marketing support by local economic agencies and state	Requires work	
Lower land cost and taxes	Action by provincial and city governments	
Lower cost of living to attract distributions centres into area	Lower than in Yangon	

Table 3: Mandalay Dry Port – Qualitative Evaluation of its Implementation and Operation

There is a good case for a dry port to serve Yangon. The Port of Yangon is the premier port and handles approximately 90% of the country's normal exports and imports. Cargo throughput using Yangon port has been increasing markedly each year with containerised cargo at an annual growth rate of approximately 16% for the last six years. The port is located in the downtown area of Yangon with limited space for expansion and severe road traffic congestion on surrounding streets. However, whether Mandalay is an optimal location warrants careful scrutiny, and Table 3 is our critical appraisal of this dry port concept. Mandalay is the second largest city in Myanmar, situated 716 kilometres by road from Yangon and located in an arid area. It is an important point for land transport services. Most of the cargoes handled at the city are exports of beans and pulses and imports (primarily agricultural equipment and fertilizers) by land from China (via Muse) and India (via Tamu), some of which are distributed to municipalities in southern Myanmar.

It takes about a week to carry cargoes by water between Yangon and Mandalay, where freight rates are lower than trucking and railway services. The dominant provider of freight services on the inland network of waterways is the Myanmar Inland Water Transport (IWT), a state enterprise of the Ministry of Transportation. In 2011, IWT handled 5 million tons of freight – about 50 per cent more freight than carried by the railways. IWT has approximately 240 powered vessels, many of which are old, with a total capacity of about 70,000 tons. Myanmar has some 5,000 km of navigable waterways, of which about 2,400 km make up the primary inland waterway network, including the Ayeyarwaddy River on which Mandalay is located. The lack of budgetary resources for dredging activities and navigation facilities is a major constraint. Extensive and repeated dredging is required on all river systems, as well as effective navigation and communications facilities. For most locations where IWT provides services, the river ports are little more than landing beaches. Vessels are loaded and unloaded from the beach by means of a simple gangplank. At some locations, specialized cargo-handling facilities are available for bulk commodities.

With constantly increasing cargo throughput the port of Yangon is facing severe congestion problems at the seaport terminals but also on nearby connecting roads in the city centre. Congestion does not only create delays and frustration but also financial loss for carriers. Implementation of a dry port at a convenient location in Mandalay could solve the seaport's congestion issues and increase the seaport's capacity and consequently productivity so that more container vessels could call at the port. Well functioning distant dry port could significantly improve customer service, in particular regarding lower transport cost, faster delivery and safety of cargo. Today it takes about 24 hours by road to cover a distance of about 700km between Yangon and Mandalay; with well functioning rail it should go much faster and safer. For example, before Isaka Dry Port implementation in Tanzania, it took more than a week to transport and clear containers at the 800km distant Dar es Salam seaport (Roso and Lumsden, 2010); now with the dry port in the system it takes two days. Furthermore, the Mandalay area could benefit from availability of logistics solutions in the area, which usually attracts industries in the area and creates new jobs, consequently supporting regional development. In addition, there is the current and buoyant truck cross-border truck traffic with China (Shibasaki *et al*, 2010:43). However, the role of Mandalay assumes that rail infrastructure is in place and well functioning – a considerable challenge given the current state of the national railway system (Thida Kyu, *et al*, 2013).

The busiest railway route in Myanmar is between Yangon and Mandalay, and in many cases, commodities imported from China (Yunnan) are transshipped to freight cars at Mandalay and forwarded to Yangon. On this route, 40 one-way freight train services (80 round-trip services) are operated every month. One train is made up of 15 freight cars. One freight car weights 32 tons, meaning that one train of 15 cars is as heavy as 480 tons. (JIFFA, 2012: 28). The transit time between the cities is approximately 20 hours. The following challenges facing Myanmar's railway sector; all routes are still unelectrified. As passengers enjoy priority over cargoes, freight trains are not allowed to travel in the morning. For the same reason, it is difficult to develop schedules for cargo services. As such, there is no established freight train schedule. Rails and other facilities are not well maintained. Moreover, it is not easy to buy spare parts and components. Therefore, there is a difficulty in managing and operating the railway system. - Basically, cargo loading and unloading activities at train terminals are performed manually. Furthermore, they are provided so poorly that cargoes are sometimes damaged severely.

Discussion

The Master Plan for ASEAN Connectivity (ASEAN Secretariat, 2010:30) identifies that the key issue and challenge facing the sub-regional connectivity of the Greater Mekong (including Myanmar) is in transforming the transport corridors into economic corridors and ensuring optimal use of the transport infrastructure. The report calls for the establishment of appropriate policy, regulatory, and institutional frameworks. Enhanced physical infrastructure development (physical connectivity), and effective institutions, mechanisms and processes (institutional connectivity) are two of the three-pronged strategies of the Master Plan on ASEAN Connectivity (ASEAN Secretariat, 2011). In addition to physical connectivity, a Roadmap for the Integration of Logistics Services (RILS) was endorsed in August 2008 to strengthen ASEAN as a single market and production base, and enhance its competitiveness through trade and transport facilitation. These include: (a) ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT), (b) ASEAN Framework Agreement on Multimodal Transport (AFAMT), (c) ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST), (d) Roadmap for Integration of Air Travel Sector (RIATS), and (e) Roadmap Towards an Integrated and Competitive Maritime Transport in ASEAN (RICMT).

A report for the United Nations ESCAP has recommended a dry port of area of 8.5 hectares be established near the existing Merchandise Center in Mandalay at a total cost of \$US10.5 million. The report (Ryoo *et al*, n.d.) provides detailed costs of land acquisition, site preparation and utility services, together with the necessary dry port infrastructure, based on unit rates and typical designs on other Asian countries, especially Laos and Thailand. We have presented the criteria for the successful planning and operations in Table 1 and have applied these to the planning of a dry port in Mandalay (Table 3). Whilst there is a strong case for a dry port to complement the port of Yangon there are numerous adverse factors working against Mandalay as a suitable location. Therefore, to bolster Mandalay as a location we recommend that a special economic zone be promulgated around the dry port with the vision of creating a "smart city".

Smart cities – irrespective of whether they are new towns or part of the revitalization of existing cities – must address economic sustainability in addition to social and environmental sustainability. Our

previous research has formulated a “triple bottom line” evaluation framework that allows urban planning policies and strategic plans to be compared quantitatively (Doust and Black, 2009). One issue in the economic sustainability of is employment creation especially in new niche industries. The challenges (Black, *et al*, 2012) are employment creation, the necessary internal and external infrastructure required to support the local economy, and effective urban management and planning to deliver an appropriate urban form that could be considered as a “smart city”. The conclusions from this previous research suggest in the case of successful special economic zones with a smart city component the need for the Government of Myanmar to set strategic directions, leading edge urban planning and development controls and a strong private-sector participation in the implementation of a dry port and a special economic zone, including job creation.

Conclusions

The *Master Plan on ASEAN Connectivity* (ASEAN Secretariat, 2011) recognises that the development of international transport corridors should be integrated with spatial economic planning. The Government of Myanmar has nominated Mandalay as a potential location to be included in the UNESCAP Intergovernmental Agreement on dry ports, where a pre-feasibility study has been recently undertaken (Ryoo, *et al*, n.d.). This paper has undertaken a critical appraisal of the Mandalay dry port concept by first examining all of the success factors in planning and operating dry ports based on a review of the international literature (Table 1) and then applying these criteria to the Mandalay case study to make a qualitative assessment of its location as a dry port (Table 3). Given the current poor state of transport and logistics in Myanmar the case for private-sector investment is far from compelling. However, we have argued that integrating a special economic zone with the planning of a dry port will enhance the likelihood of success. Previous research (Black, *et al*, 2012) suggest that successful special economic zones with a smart city component require the Government of Myanmar, when planning a dry port at Mandalay, to set strategic directions, formulate leading edge urban planning and development controls, and to encourage strong private-sector participation in the implementation of infrastructure in both the special economic zone and the dry port.

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