

POTENTIAL MARKET FOR MODAL SHIFT FROM ROAD TO RAIL FREIGHT Case Study: South Sumatera-Lampung Line

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Abstract

Modal shift from a road to rail freight has been examined at last decades throughout many regions globally. The shifting decision tends to be considered on some comparative advantages such as more efficient land use, delivery time, frequent, capacity, costs, less environmental and social impacts. Otherwise, the long-distance heavy trucks can be contributed to road congestion that may lead to unplanned maintenance and unpredicted rate of road deterioration. In context of South Sumatera-Lampung line, the modal shift can be arranged to explore the potential market along its line. Finding shows, the existing commodities have an opportunity to be extended, following by its potential market, including energy (especially coal) , mining, agriculture, plantation, fishery, livestock, wood industry.

Keywords : modal shift, road to rail freight, potential market, South Sumatera-Lampung line

Abstrak

Dokumen ini berisi rincian panduan penulisan makalah dari the 18th FSTPT International Symposium. Untuk memasukkan makalah untuk dipresentasikan dalam simposium, ikutilah instruksi dalam dokumen ini. Penulis (para penulis) wajib mengikuti semua informasi yang ada di dalam dokumen ini sebelum memasukkan makalah untuk di-review. Makalah yang tidak mengikuti panduan ini tidak akan dipertimbangkan untuk dipresentasikan dan dipublikasikan. Batas terakhir pemasukan *draft* makalah adalah 27 Juni 2015. Makalah akan di-review oleh Komite Ilmiah FSTPT dan hasilnya akan diinformasikan kepada penulis kontak. Penulis (para penulis) wajib merevisi makalah sesuai dengan semua komentar dari Komite Ilmiah dan memasukkan ulang makalah paling lambat pada tanggal 9 Agustus 2015. Semua makalah yang telah dimasukkan ulang akan dipublikasi di dalam prosiding simposium. Selanjutnya, 16 (enam belas) makalah terbaik yang telah dipresentasikan akan dipublikasikan dalam JURNAL TRANSPORTASI. Abstrak ditulis dalam maksimal 150 kata.

Kata Kunci: kata kunci A, kata kunci B, kata kunci C, kata kunci D, kata kunci E

INTRODUCTION

The main reasons for encourage rail freight, which has been developed as integrated freight transport in UK, mainland Europe, and America in recent years, were considered with environmental and social impact reduction, effective supply chain, and keep the long-distance heavy trucks off the road, (Barkeley, 2005; Woodburn, 2003). Moreover, due to freight traffic rapid growth, the road congestion has been increased, and may affect the

delivery time. Powrie (2014) points out the rail advantages compare to road such as more efficient land-use, faster, frequent, higher capacity.

As a prospective transportation modal, the following factors can be influenced the shift decision: relocation activity, manufacture system and distribution networks, trading relationships, production and distribution scheduling (Woodburn, 2003). In addition, the hinterland-port link is one of the attractive inter-modal systems to be implemented (Woodburn, 2012).

In context freight transportation from South Sumatera to Lampung Province, the proper rail freight is needed as a modal shift from the road to prevent its exceed load thus may lead to unplanned maintenance and unpredicted rate of road deterioration. Recent inter-modal development on this freight line involves reconnection and revitalization the freight line with port Panjang-Lampung. As a result, an appropriate supply chain improvement can be performed (Leplit Unila, 2014).

To address the modal shift decision with its relevant factors, this paper is examined to describe the potential market for that purpose, considering some prospective commodities along this distribution line.

LITERATURE REVIEW ON MODAL SHIFT FROM ROAD TO RAIL FREIGHT

Road vs Rail Freight

To compare road and rail in term of public investment, the following cost parameters are described in quantitative manner (Affuso et al., 2003) :

a)Construction cost (1999 prices) :

Road : bypass (£ 3.95 million per km), carriageway (£ 2.88 million per km)
Rail : new line (£7.00 million per km), upgrading (£ 3.44 million per km)

b)Environmental cost (1999 prices) :

Road : noise and vibration (0.26 - 0.58 pence per passanger km)
air quality (0.61 - 1.06 pence per passanger km)
climate change (0.19 – 0.56 pence per passanger km)
Rail : noise and vibration (0.35 pence per passanger km)
air quality (0.18 pence per passanger km)
climate change (0.26 pence per passanger km)

c)Safety cost (1998 prices) :

Road : D3-D4 motorway (0.77 pence per vehicle km) –
Modern S/C road (2.97 pence per vehicle km)
Rail : 0.23 pence per passanger km

d)Time savings (1999 prices) :

Road : 1744 (pence per hour)(per passanger)

Rail : 803 (pence per hour)(per passanger)

e)Fuel duties (1999 prices) :

Road : cars (5.83 pence per km), other goods vehicle (17.53 pence per km)

f)Train fares : “fares may be allowed to increase if service quality improves”

g)Maintenance and Vehicle Operating Costs (1999 prices).

Road : standard (S2, 2 lanes) (£ 6,887 per km per annum)

Rail : including train fares

INTEGRATED FREIGHT TRANSPORT AND SUPPLY CHAINS

The integrated freight transport through the proper supply chains system is needed to ensure all commodities are delivered just in time with its specific quantity and quality. However, many of them are consisted long and complex. In contrast, customer intent on shortest delivering time at reasonable price (Barkeley, 2005). Hence, the inter-modal supply chain should be developed effectively.

Dai et al.(2012) examined one of the preferred inter-modal systems is rail freight-port. On the other hand, to achieve the goal, these following issues are important to be examined, including competition between train operators due to efficiency and innovation, competitive track-access charges, sufficient terminals for commodities collecting, efficient bureaucracy (Barkeley, 2005).

COMMODITIES ALONG SOUTH SUMATERA-LAMPUNG

South Sumatera Commodities

In energy sector, South Sumatera contributes significant role nationally, supporting by an abundant deposit such as: coal(22.24 billion tonnes), natural gas(19,149 TSCF), oil(812,960MSTB), geothermal (1,911 MWe), methane gas(183 TSCF), metal mining (gold 1,000,964 Oz; copper 12,831,586 Oz; iron ore 7,547,043 MT, granite 7,120,000 MT; lead 4,383,019 MTIn addition, coal deposit recorded as 53% of Indonesan coal national deposit, otherwise it just produced 8% of national production (92% in Kalimantan, which has 47% national deposit))(South Sumatera Bappeda, 2012, cited in Lemlit Unila, 2014). Other sectors also contribute a huge number annual production, including agriculture, plantation, livestock. In 2011, some agriculture commodities with high demand, produced paddy (3,83 million tonnes), corn (123,3 thousand tonnes), soybeans (18,9 thousand tonnes), then beef livestock (13,6 thousand tonnes), sugar plantation (74,8 thousand tonnes), palm plantation (13.4 million tonnes per annum with 1.8 million tonnes CPO

yearly (crude palm oil) approximately.(South Sumatera Dewan Ketahanan Pangan, 2012 cited in Lemlit Unila, 2014)

Lampung Commodities

As a hinterland of Panjang hub port, Lampung has strategic position in the Indonesian supply chain system. Large number of these following commodities are produced in Lampung (Lemlit Unila, 2014) :

- Agriculture (paddy 2.98 million tonnes per year, sugar cane 0.99 million tonnes per year, corn 1.92 million tonnes per year, cassava 9.02 million tonnes per year, robusta coffee 150.42 thousand tonnes per year, pepper 21.92 thousand tonnes per year, sugar (33.4 % of national production), tapioca powder(60 % of national production), canned pineapple (265 thousand tonnes per year), cocoa 3.22% of national production)
- Fishery (327.132 thousand tonnes per year, including 44.167 thousand tonnes prawn)
- Livestock (712.43 thousand cattle per year)
- Wood industry (228,5 thousand m3 per year)
- Energy (geothermal 600 MW)

POTENTIAL MARKET FOR SOUTH SUMATERA-LAMPUNG RAIL FREIGHT LINE

Intermodal Rail Freight – Panjang Port

Port Panjang is one of the international hub ports in Sumatera Island. State-run port management company, PT Pelabuhan Indonesia (Pelindo II), is further modernizing the Panjang Port in Lampung to transform it into an international port as an alternative to the Tanjung Priok Port in Jakarta. Besides modernizing port facilities and equipment in order to improve services and work productivity, PT Pelindo II will also revitalize the railway track from Pidada to Panjang Port, stretching to 3 kilometers. The presence of modern loading equipment has already minimized queuing time at the docks.

In 2010, as many as 30 ships queued at the port daily. In 2012, the number dropped to between three and six ships daily. Before the presence of new equipment, the unloading time for a ship at Panjang Port was 30 tons per gang hour (TGH). With the modernization of equipment and port infrastructure, Panjang Port expected to offer zero waiting times in the near future. The port area planed to expand by reclaiming up to 30 hectares of the coast. Goods from around Sumatra could be transported by train and directly loaded onto ships at the port should the railway lines be revived. Crude palm oil (CPO) from South Sumatra, Jambi and Bengkulu need no longer be transported by trucks for exporting from the port, thus saving time and money. To revive the railway lines, PT Pelindo II and state railway firm PT KAI are currently holding technical discussions.

With the modernization of equipment and increasing the depth of the shipping lane around the docks, or Mean Low Water Spring (MLWS), up to 14 meters, large ships from Europe could now directly enter the docks at the port, so exporters did not have to send export goods from Tanjung Priok Port. The loading and unloading time will also be quicker compared to previous years. Various export commodities and those volumes through this hub show in Figure 1.

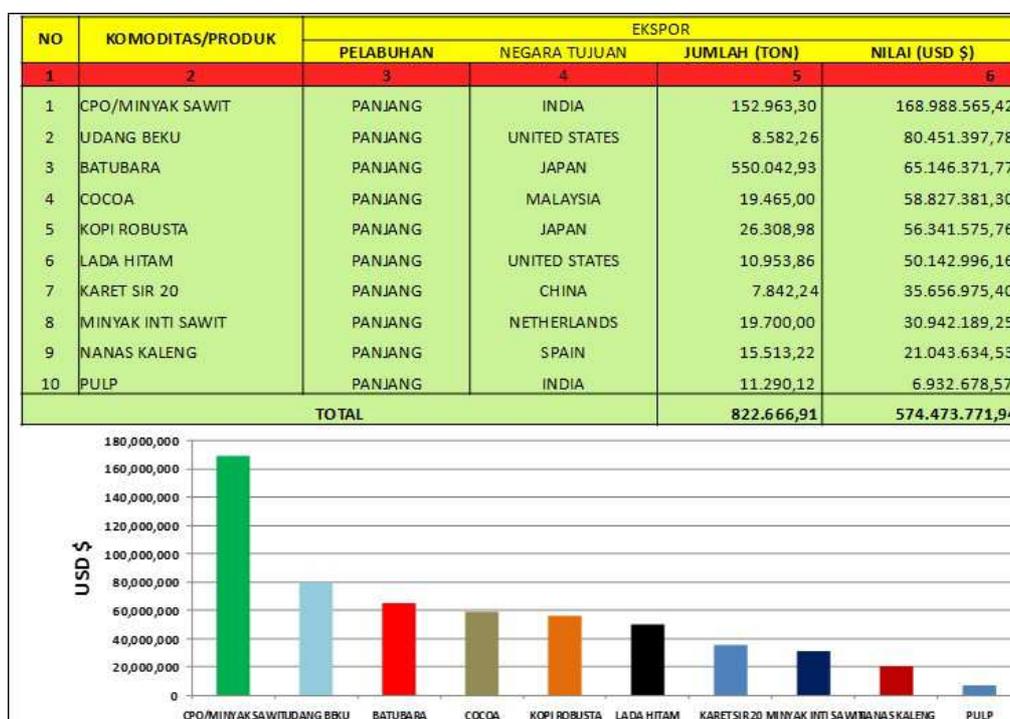


Figure 1. Export commodities through Panjang Port (Source : PT. Pelindo II Panjang Branch, 2012 cited in Lemlit Unila, 2014)

CPO consignments from Sumatra to Rotterdam, the Netherlands, can be directly carried out through Panjang Port, because the port's performance is now the best in Sumatra and it is the main supporting port in the Sumatra region for Tanjung Priok Port. The Panjang Port currently has four Gantry Jib cranes from China, each with a capacity of 40 tons, or 180 tons per hour per unit. The improvements and additions have had a positive impact on ship arrivals at the port. In 2010, 2,402 ships arrived at the port. That number increased to 2,848 in 2011.

The flow of containers was recorded at 99,821 boxes in 2010, rising to 112,200 boxes in 2011, while the flow of goods in 2010 was 13.72 million tons, increasing to 15.51 million tons in 2011. With the improved performance of Panjang Port, the Lampung provincial administration expects that Lampung can open an import route via the port. But, in order to achieve that, it has to wait for a decision from the industry and trade ministers. In order to accommodate rapid growth (doubled in last decade), and potential market along South

Sumatera–Lampung province, freight line into Port Panjang phase I (Pidada-Port Panjang) has been reconnected and revitalized for that purpose as shows in Figure 2.

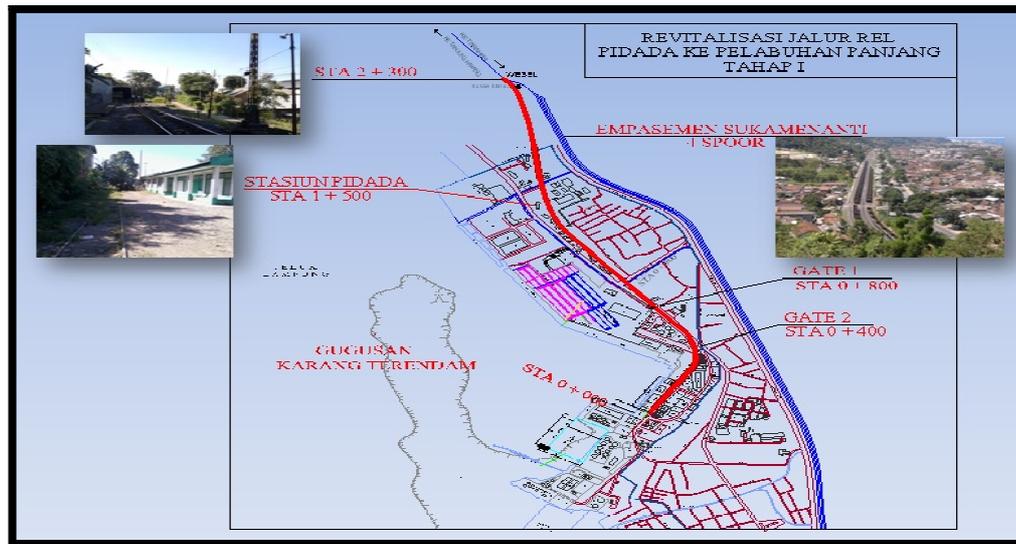


Figure 2. Pidada-Port Panjang Rail Freight Line Revitalization Phase I
(Source, Lemlit Unila, 2014)

EXISTING AND POTENTIAL MARKET FOR INTERMODAL PIDADA-PANJANG (RAIL FREIGHT-PORT)

As mentioned in previous section, some potential commodities have been exported through Panjang Port such as CPO, frozen prawn, coal, robusta coffee, black pepper, pepper, rubber, PKO, canned pineapple. However, the export volumes through this port still under its capacity, for example, coal freight from South Sumatera through PT Bukit Asam port reached 10.22 million tonnes in 2012 (Annual report PT. Bukit Asam, 2012 cited in Lemlit 2014), compare to 0.55 million tonnes through Panjang Port, which has been transported by trucks-port inter-modal.

Moreover, for coal freight, refer to its abundant deposit and existing volume through Panjang Port, the revitalized inter-modal connection can be used to explore the potential market by a modal shift from truck-port to rail freight-port, especially to accommodate the coal exporters along South Sumatera-Lampung. As a comparison, one truck has capacity 10 tonnes per trip, whereas rail freight can be loaded up to 3000 tonnes per trip (Lemlit Unila, 2014).

Other existing market to be extended such as cement (up to 42 tonnes per wagon), pulp, (50 tonnes per wagon), CPO (30 tonnes per wagon), PKO (30 tonnes per wagon), lateks (30 tonnes per wagon), general cargo (20 tonnes per wagon), container (up to 45 tonnes per wagon), fuel (up to 38 kilo litres), fertilizer (Lemlit Unila, 2014).

Many of the commodities along South Sumatera Lampung have yet transported through rail freight lines (see section 3) whereas most of these probably transports using trucks.

CONCLUSION

In conclusion, rail freight can be used for modal shift from trucks consider with these following comparative advantages: higher capacity, faster, frequent, just in time delivery, less environmental impacts and costs, less safety cost, competitive maintenance and operating cost, long-term investment, although the higher initial cost is needed to allocate. The potential market for modal shift from road to rail freight can be focused to extend the capacity of existing market and examined the others. The existing market to be extended including coal, cement, pulp, CPO, PKO, lateks, general cargo, container, fuel, fertilizer. Furthermore, the potential market to be examined can be explored through these following commodities: energy, mining, agriculture, plantation, fishery, livestock, wood industry.

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