RORO SHIPPING IN SUPPORT OF ASEAN PHYSICAL CONNECTIVITY

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INTRODUCTION

• Geographically situated at the centre of the east ASEAN sub-region, Sabah has the natural attributes to attract bigger ships to call at her ports.

• However, with a population of only 3.7 million and a total work force of 1.9 million, Sabah may not be able to generate the volume of demand and export cargo that could sufficiently entice the main liner operators into her ports.

• Fortunately, a Master Plan was launched as an effort to enhance ASEAN physical connectivity in 2010/2011 with the objective of connecting most of the ASEAN ports through the ASEAN Nautical Highway system with RoRo vessels as the preferred mode.

• This augurs well for Sabah as many of her ports could be connected with other sub-regional ports through the RoRo SSS services and will consequently enhance the potential for her main port to be a sub-regional hub.
MASTER PLAN ON ASEAN CONNECTIVITY

• MPAC was introduced in 2010/2011 as an effort to enhance national and regional physical, institutional and people-to-people linkages by adopting seven physical strategies.

• In support of the 4th strategy of establishing an integrated, efficient & competitive maritime transport system, one of the key actions is to establish efficient & reliable shipping route that would connect mainland & archipelagic Southeast Asia (ASEAN, 2011).

• This is implemented through the establishment of the ASEAN Nautical Highway where RoRo vessels will play the primary role to connect between ports identified (ASEAN, 2011).
AIM

- To present the challenges that need to be addressed to ensure successful RoRo SSS operations in the East ASEAN Growth Area (EAGA) in support of ASEAN physical connectivity.
Vessels designed to carry wheeled cargo such as automobiles, trucks, semi-trailer trucks, trailers or railroad cars that are driven or towed on and off the ship on their own wheels. This ships “Roll-on” and “Roll-off” its cargo through its built-in ramps. The ramps could be located at the stern or and on at the bow. Some ships have ramps installed on the port side of the hull (Shippepedia, 2017).
Types of RoRo Vessels

Landing Ship

Ferry
Con-Ro

Ro-Pax
Pure Car Carrier

PCTC
### Advantages & Disadvantages of Ro-Ro

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Popular for SSS as it is seen as extension of the road/rail</td>
<td>• High construction cost</td>
</tr>
<tr>
<td>• Fast loading/unloading and port turnaround time</td>
<td>• High stowage factor i.e. occupy more space relative to its weight</td>
</tr>
<tr>
<td>• Integrates well with other transport facilities</td>
<td>• Double load factor problem is common</td>
</tr>
<tr>
<td>• Popular among holiday makers &amp; private car owners</td>
<td></td>
</tr>
</tbody>
</table>
# Ro-Ro Vs. Lo-Lo/Container Barges

<table>
<thead>
<tr>
<th>Vessels</th>
<th>Ro-Ro Vessels</th>
<th>Lo-Lo Vessels/Container Barges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo carrying units</td>
<td>Trailers</td>
<td>ISO Containers</td>
</tr>
<tr>
<td>Time sensitivity</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Load/Unload time</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Port turnaround time</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Infrastructure costs</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Cargo handling costs</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Projected freight rate/unit</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Potential alliance</td>
<td>Trucking company</td>
<td>Ports</td>
</tr>
</tbody>
</table>

(Source: Perakis & Denisis, 2008; Lopez-Navarro et al., 2011)
INTRA–ASEAN RO-RO CONNECTIONS

• 1\textsuperscript{st} connection in archipelagic Southeast Asia was launched in late 2009 connecting Menumbok in Sabah and Muara in Brunei Darussalam but terminated after less than a year.

• 2\textsuperscript{nd} connection was from Labuan to Muara that started operation in 2010.
POTENTIAL CONNECTIONS
Feasibility Studies (JICA, 2013)
<table>
<thead>
<tr>
<th>Rating</th>
<th>Route</th>
<th>Connecting Countries</th>
<th>Divertible Existing Traffic</th>
<th>Available Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dumai – Malacca</td>
<td>Indonesia, Malaysia</td>
<td>A</td>
<td>B (Dumai)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (Malacca)</td>
</tr>
<tr>
<td>2</td>
<td>Belawan – Penang</td>
<td>Indonesia, Malaysia</td>
<td>A</td>
<td>B (Belawan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (Penang)</td>
</tr>
<tr>
<td>3</td>
<td>Davao/General Santos – Bitung</td>
<td>Philippines, Indonesia</td>
<td>B</td>
<td>B (Gensan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B (Bitung)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (Davao)</td>
</tr>
<tr>
<td>4</td>
<td>Tawau – Tarakan – Pantoloan</td>
<td>Malaysia, Indonesia</td>
<td>B</td>
<td>C (Tawau)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B (Tarakan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B (Pantoloan)</td>
</tr>
<tr>
<td>5</td>
<td>Muara – Zamboanga</td>
<td>Brunei Darussalam, Philippines</td>
<td>B</td>
<td>A (Muara)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (Zamboanga)</td>
</tr>
<tr>
<td></td>
<td>Muara – Labuan – Brooke’s Point</td>
<td>Brunei Darussalam, Malaysia, Philippines</td>
<td>B</td>
<td>A (Muara)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A (Labuan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D (Brooke’s Point)</td>
</tr>
<tr>
<td></td>
<td>Belawan – Phuket</td>
<td>Indonesia, Thailand</td>
<td>C</td>
<td>B (Belawan)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B (Phuket)</td>
</tr>
<tr>
<td></td>
<td>Johor – Sintete</td>
<td>Malaysia, Indonesia</td>
<td>C</td>
<td>A (Tj. Belungkor)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D (Sintete)</td>
</tr>
</tbody>
</table>

(Source: JICA, 2013)
DETERMINANTS FOR THE SUCCESS OF INTERSTATE RO-RO SSS IN ARCHIPELAGIC SOUTHEAST ASIA

- F1: Adequate port facilities and equipment
- F2: Balance payload or shipment volume
- F3: Coordinated administrative and CIQS formalities
- F4: Good intermodal links
- F5: Good Port Access
- F6: Government assistance at initial period
- F7: Harmonisation of administrative procedures among ports
- F8: Large payload or shipment volume
- F9: Promotion of SSS
- F10: Port efficiency
- F11: Regional agreements to relax shipping restriction
- F12: SSS service quality
- F13: Suitable ship’s type in relation to payload, distance & speed
- F14: Weather & meteorological conditions
- F15: Security perception and safety of surrounding waters
- F16: Efficient and transparent government bureaucracy

(Source: Arof & Nair, 2017)
KEY DETERMINANTS

- Adequate port facilities and equipment (1)
- Government assistance at initial period (1)
- Suitable ship’s type in relation to payload, distance & speed (3)
- Good port access (4)
- Coordinated administrative and CIQS formalities (5)
- Security perception and safety of surrounding waters (5)
- Good intermodal link (7)
- Port efficiency (7)

(Source: Arof & Nair, 2017)
AHP Decision Making Model

GOAL: TO DETERMINE THE POTENTIAL OF INTERSTATE RO-RO SSS ROUTE IN BIMP-EAGA

REGULATORY (0.428)
- COORDINATED ADMINISTRATIVE & CIQS FORMALITIES (0.108)
- GOVERNMENT ASSISTANCE AT INITIAL PERIOD (0.150)
- REGIONAL AGREEMENTS TO RELAX SHIPPING RESTRICTIONS (0.086)
- SECURITY PERCEPTION & SAFETY OF SURROUNDING WATERS (0.084)

PHYSICAL & ADMINISTRATIVE INFRASTRUCTURE (0.284)
- ADEQUATE PORT FACILITIES & EQUIPMENT (0.136)
- GOOD INTERMODAL LINKS (0.068)
- GOOD PORT ACCESS (0.077)

COMMERCIAL (0.288)
- PORT EFFICIENCY (0.096)
- SSS SERVICE QUALITY (0.090)
- SUITABLE SHIP'S TYPE IN RELATION TO PAYLOAD, DISTANCE & SPEED (0.103)
## TESTING THE AHP MODEL

<table>
<thead>
<tr>
<th>Weight Route</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>P5</th>
<th>P6</th>
<th>P7</th>
<th>C8</th>
<th>C9</th>
<th>C10</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Muara to Menumbok</td>
<td>0.086</td>
<td>0.084</td>
<td>0.041</td>
<td>0.064</td>
<td>0.098</td>
<td>0.052</td>
<td>0.052</td>
<td>0.069</td>
<td>0.061</td>
<td>0.066</td>
<td>0.674</td>
</tr>
<tr>
<td>2- Muara to Labuan</td>
<td>0.099</td>
<td>0.09</td>
<td>0.045</td>
<td>0.064</td>
<td>0.109</td>
<td>0.057</td>
<td>0.062</td>
<td>0.077</td>
<td>0.065</td>
<td>0.078</td>
<td>0.745</td>
</tr>
<tr>
<td>3- Kudat to Brooke’s Point</td>
<td>0.048</td>
<td>0.072</td>
<td>0.041</td>
<td>0.037</td>
<td>0.054</td>
<td>0.049</td>
<td>0.025</td>
<td>0.031</td>
<td>0.054</td>
<td>0.049</td>
<td>0.460</td>
</tr>
</tbody>
</table>
Opportunity for Sabah Ports

• Vessels arrival (foreign trade):
  • 4772 (14.3 million NRT) in 2015 vs 4159 (11 million NRT) in 2011.

• Total trade:
  • RM71.1b (2015) vs 59.4b (2007)

• GDP Per Capita:

• Visitors arrival:
  • 3.18 m (2015) vs 2.39 m (2011)

• Import of motorcars (CBU):
  • 33,871 units (2015) vs 26,300 units (2012)

(Source: DSM, 2016)
CONCLUSION

• Intra-ASEAN Ro-Ro connections are beginning to take place, albeit at a slow pace.
• As earlier studies discovered that time spent by SSS in port is crucial as compared to deep sea shipping, RoRo vessels are assets to connect between the various ports in east ASEAN sub-region.
• Since the ASEAN Nautical Highway is an extension of the highways on land, many experts have argued that RoRo vessels must be treated as an infrastructure that should be made available on a regular basis to enable them to attract the cargo volume. Hence, government assistance is imperative at the initial period of operations.
• Its strategic location and the improved trade statistics augur well for Sabah and with the support of regular intra-ASEAN RoRo connections, the trans-Borneo highway and the industrialisation of Sabah’s economy there is a strong possibly for Sapangar Bay to become the load centre for the east ASEAN sub-region in the near future.
MAIN REFERENCES

• Association of Southeast Asian Nations (2011). Master Plan on ASEAN Connectivity, Jakarta: ASEAN Secretariat.
• Association of Southeast Asian Nations (2016). Master Plan on ASEAN Connectivity 2025, Jakarta: ASEAN Secretariat.
• Department Statistics Malaysia (2016). Statistics Year Book Sabah 2015, DSM.
• Japan International Cooperation Agency (2013). The Master Plan and Feasibility Study on the Establishment of an ASEAN Ro-Ro Shipping Network and Short Sea Shipping, ASEAN/JICA.
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