Container throughput forecast in the ESCAP region

Workshop on Strengthening Integrated Intermodal Transport Connectivity for Southeast and South-Southwest Asia.

Vincent VAUDEL
Transport Facilitation and Logistics section
Transport Division
Contents

1. Necessity and objectives of research
2. Study methodology: Trade Module, Transport Network Module, Port Strategic Plan Module
3. Container throughput forecast in ESCAP region
   - GDP World and ESCAP
   - Container throughput trend
   - Container seaborne trade volume
   - Top ports
4. Container volume for selected countries
   - World and ESCAP: 2015 & 2020
   - Selected countries: 2010-2016
5. Future working plan
1. Necessity and objectives of research
1. Necessity and objectives of research*

- **Context:**
  - ESCAP: strong economic growth rate, emerging as growth engine and leading consumer market of the world.
  - Diverse countries, various economic development levels: gap in development phase of logistics facilities (port, road and rail).
  - Ports are a key driving force: more than 80% of international cargoes are transported by sea.
  - Increasing demand for port connectivity to respond to soaring freight volume

- **There is a need to prospect container cargoes in ESCAP area to accommodate ports and container fleets for consistent development**
  - Help in designing national logistics plan
  - Give an overview of future port activities
  - Allow to better prepare facilities, authorities and people

* "Facilitating the development and effective operation of ports and strengthening maritime connectivity in Asia and the Pacific" (project under discussion)
2. Study methodology: Trade Module, Transport Network Module, Port Strategic Plan Module
2. **Study methodology**: Trade Module, Transport Network Module, Port Strategic Plan Module

- **ITPM: Intermodal Transport Planning Model**, developed by ESCAP and KMI (Korea Maritime Institute) was applied to estimate container throughput and future demand
  - Variables: GDP and Container throughput data
  - Include data on infrastructure (ports, roads, railways) from literature and field research
  - ITPM model adopted in this study is forecasting container throughput in the future using simple regression analysis on economic growth rate of major countries and regions and container throughput volume
2. Study methodology: **Trade Module, Transport Network Module, Port Strategic Plan Module**

Trade Module is used for container flow forecast

**Data for Trade Module**

- Define
- Generation
- Distribution
- Zone (port)
- Containers

- Define: Country, Ex/Import, Port, Variables (GDP)
- Regression: Forecasting CNTR Volume Region to Region (country to country matrix)
- Port Sharing Port to Port Matrix
- Port Traffic Terminal Volume Full & Empty Ex/Im, T/S
- Full & Empty CNTR
- CNTR Trade Historical data Forecasting data CNTR Flow matrix
- Macro Eco. Var. GDP Trade Volume

Trade module provides export & import container volumes for each country

Transport Network Module (TNM) is used for port throughput.

**Data for TNM**

- Define Scenario & Data
- Run Assign
- Result
- Diagnostics

- Util
- Scenario
- Data
- Run
- Result
- Diagnostics

- Scenarios
- Cargo Route & Post
- CNTR at each Route & Post, Cost, Frequency, T/S, CNTR
- Ports Inland Terminal Route (Fleet, capacity, frequency, distance, cost)
- O-D Distance (Fleet Info)

TNM provides how many ships will be needed (fleet capacity) to carry the projected forecast containers and inform on port throughput (including transshipment volume)
2. Study methodology: Trade Module, Transport Network Module, Port Strategic Plan Module

- Port Strategic Planning Modules
  - Capacity and investment requirement
  - Work needed: input from national experts
  - Calculate berths requirements according to forecasting traffic volume
- Update is needed for database including port facilities (existing berths)
3. Container throughput forecast in ESCAP region
3. Container throughput forecast in ESCAP region – GDP growth & container trade volume

- World seaborne trade remains largely determined by world economy and trade growth.
- ITPM model adopted in this study is forecasting container throughput in the future using simple regression analysis on economic growth rate of major countries and regions and container throughput volume.

Global Growth Forecast to Reach 2.7 Percent in 2017.
Average annual GDP growth rate (percent %)

Over the past 30 years, sea borne container throughput continued to expand. Except for 2009, shortly after the economic crisis.

Container trade, which has shown relatively high growth rates over the past several decades, is expected to show a **8.3% growth rate until 2020**. It is a reflection of the prospect that economic growth in the near future should stay consistent.

Cargo flows are expected to be developed on all segments, with rapid growth anticipated on containerized and major dry bulk commodities.

---

### Container throughput forecast in ESCAP region

#### Container throughput trends

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>7.83</td>
</tr>
<tr>
<td>2000</td>
<td>9.12</td>
</tr>
<tr>
<td>2010</td>
<td>7.293</td>
</tr>
<tr>
<td>2015</td>
<td>8.38</td>
</tr>
<tr>
<td>2020</td>
<td>8.28</td>
</tr>
</tbody>
</table>

3. Container throughput forecast in ESCAP region

- Container seaborne trade volume

Container seaborne trade volume 2015 (East-West, North-South)

Unit: ‘MillionTeu
Source: Based on data from Drewry, Container Forecast & Annual Review 2016/2017

Container seaborne trade volume 2015 (Intra-Regional)

Unit: ‘MillionTeu
Source: Based on data from Drewry, Container Forecast & Annual Review 2016/2017
3. Container throughput forecast in ESCAP region – Container seaborne trade volume

Intra-regional container trade in 2016 (‘000 TEU)

Unit: ‘000Teu
3. Container throughput forecast in ESCAP region – Top Ports

Top 20 ESCAP ports in 2014-2015


* Estimated throughput; some transhipment percentages are estimated.

4. Container volume for selected countries
In 2020, the global port traffic volume is estimated at 728 million TEU and ESCAP estimated at 594 million TEU. During the same period, the average annual growth rate of ESCAP ports is estimated to be 8.2%, which is higher than the global growth rate of 4.3%.
5. Container volume for selected countries

- Container port throughput

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1,468,914</td>
<td>1,343,408</td>
<td>1,468,713</td>
<td>1,625,509</td>
<td>1,642,951</td>
<td>2,044,651</td>
<td>2,366,651</td>
</tr>
<tr>
<td>Cambodia</td>
<td>224,206</td>
<td>237,941</td>
<td>255,378</td>
<td>286,450</td>
<td>424,000</td>
<td>474,000</td>
<td>482,000</td>
</tr>
<tr>
<td>India</td>
<td>9,112,108</td>
<td>9,557,424</td>
<td>9,576,716</td>
<td>9,685,160</td>
<td>11,319,000</td>
<td>11,883,003</td>
<td>12,083,010</td>
</tr>
<tr>
<td>Indonesia</td>
<td>8,089,047</td>
<td>9,674,437</td>
<td>10,428,434</td>
<td>10,811,007</td>
<td>11,636,900</td>
<td>12,031,700</td>
<td>12,431,700</td>
</tr>
<tr>
<td>Iran (Islamic Republic of)</td>
<td>2,592,522</td>
<td>2,952,233</td>
<td>2,317,647</td>
<td>1,910,717</td>
<td>2,371,000</td>
<td>2,174,000</td>
<td>2,452,000</td>
</tr>
<tr>
<td>Malaysia</td>
<td>18,203,567</td>
<td>20,010,545</td>
<td>20,588,224</td>
<td>20,910,265</td>
<td>22,367,904</td>
<td>24,012,700</td>
<td>24,570,000</td>
</tr>
<tr>
<td>Myanmar</td>
<td>335,346</td>
<td>380,675</td>
<td>474,300</td>
<td>567,156</td>
<td>716,926</td>
<td>827,249</td>
<td>1,026,216</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2,149,000</td>
<td>2,132,000</td>
<td>2,244,000</td>
<td>2,445,000</td>
<td>2,534,600</td>
<td>2,755,600</td>
<td>2,645,100</td>
</tr>
<tr>
<td>Philippines</td>
<td>5,087,499</td>
<td>5,314,702</td>
<td>5,641,594</td>
<td>5,825,634</td>
<td>6,176,041</td>
<td>7,210,441</td>
<td>7,421,441</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4,080,000</td>
<td>4,262,887</td>
<td>4,187,120</td>
<td>4,306,206</td>
<td>4,907,915</td>
<td>5,185,467</td>
<td>5,550,000</td>
</tr>
<tr>
<td>Thailand</td>
<td>6,520,905</td>
<td>7,036,492</td>
<td>7,323,881</td>
<td>7,546,523</td>
<td>8,119,271</td>
<td>8,359,455</td>
<td>8,239,363</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>5,886,249</td>
<td>6,924,430</td>
<td>7,372,468</td>
<td>8,254,299</td>
<td>8,149,626</td>
<td>8,841,833</td>
<td>8,495,730</td>
</tr>
</tbody>
</table>

5. Future working plan
Future is strongly linked with market economy trends: volatility factors concerning commodities

Liner Market: volatility factors including the sizing up of vessels, fleet adjustment, rearrangement of alliances.

Considering the gap between volume estimated and actual port capacity, it is likely to see inefficiency in ports in several countries. Looking at the region, building infrastructure is essential but absence of holistic approach could lead to redundant facilities in the same region and port competition

To prevent overlapping investment, reasonable role sharing and distribution across neighboring countries is essential to increase efficiency with co-operation of facilities.
5. Future working plan

- **Update Data Base** (for ITPM model)
  - Global container trade volume (export and import)
  - GDP data
  - Ship routes
  - Port facilities (berths, terminals)
  - To make more reliable output, ESCAP/KMI will collect trade and transport related data & update DB
  - Carefully look for SIDC, archipelagic countries & other Land-lock countries

- **Model run and Joint Study**
  - Development scenarios: 2020, 2025
  - Joint study: ESCAP/KMI and regional experts
  - Future cooperation and knowledge sharing with member countries for reliable data

- **Advisory services for countries**
  - Application of ITPM to transport planning and policy formulation
  - Subregional/Regional meetings (including EGM)
Thank you

Vincent VAUDEL
vincent.vaudel@un.org