A Study On The Evaluation Of Inland Container Depot In The South Of Vietnam

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Abstract: Inland Container Depot is regarded as an important link in the multimodal transport, contributing to reduce transportation costs, reduce the time saved at the port, with the main function of clearing domestic goods, empty containers and refrigerated containers, super cargo. Inland Container Depot has just used in the South of Vietnam in recent years which are starting in the business. In this paper, I want to research on the potential of dry ports including the development and effective for economic of Vietnam.

Key word: ICD, Location, Potential, South of Vietnam, AHP Method.

1. Introduction

1.2 ICD

- Inland Container Depot is one of the types of infrastructure for logistics operations. It has been around for decades, but was only used properly in the early 1970s and then became more and more popular around the world.
- Main services include clearance of domestic cargo, containerized cargo yards, empty containers and refrigerated containers, container handling services, overweight cargo.

1.3 Situation of ICD

- Inland Container Depots the South of Vietnam were born in 1998 but from 2009 to present, the rate of development and expansion of ICD has increased rapidly.
- ICD born in recent years have large scale, modern technology, advanced management level. It is also possible to integrate a full range of logistics services, initially taking the form of logistics centers.

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Figure 1. The South of Vietnam

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1. Introduction

1.3 Situation of ICD

ICD Tan Cang - Long Binh (2009), is is not only the clearance point but also the type of warehouse outside the control of customs such as domestic warehouse, warehouse for distribution, cold storage, storage of dangerous goods, provision of logistics-related services, and supply chain management. The goal is to become a largest model center in Vietnam of logistics providing comprehensive business solutions, professional logistics management and supply chain quality.

2. AHP Methodology

- Calculating Priority vector (\( \mathbf{x} \))
- Calculate Adjusted weight
- Calculating Consistency index (CI) and Consistency ratio (CR)

\[
CI = \frac{\lambda_{max} - n}{n - 1}
\]

\( \lambda_{max} \) is Eigen value.

\( n \) is the number of evaluations

Table 2. Random Consistency Index

<table>
<thead>
<tr>
<th>n</th>
<th>1.00</th>
<th>1.02</th>
<th>1.03</th>
<th>1.04</th>
<th>1.05</th>
<th>1.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI</td>
<td>0.95</td>
<td>0.97</td>
<td>0.99</td>
<td>1.01</td>
<td>1.03</td>
<td>1.06</td>
</tr>
</tbody>
</table>

Consistency Ratio = \( \frac{CI}{Random\ Consistency\ Index} \)

3. Application of AHP method

Analytic Hierarchy Process (AHP) is one of Multi Criteria decision making method that was originally developed by Prof. Thomas L. Saaty. It is a method to derive ratio scales from paired comparisons. The input can be obtained from actual measurement.

Table 1. Number of comparisons

<table>
<thead>
<tr>
<th>Number of things</th>
<th>Number of comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>21</td>
</tr>
</tbody>
</table>

Steps of using AHP

- Survey collection
  \[ s = (a_1 + a_2 + \ldots + a_n)^{\frac{1}{n}} \]
  \( s \) is the sum of values for comparison pairs.
  \( a_i \) is the single evaluation of comparable couples,
  \( n \) is the number of evaluations.

- Making Comparison matrix

\[
\begin{bmatrix}
  1 & a_1 & a_2 & \ldots & a_n \\
  \frac{1}{a_1} & 1 & a_3 & \ldots & a_n \\
  \frac{1}{a_2} & \frac{1}{a_3} & 1 & \ldots & a_n \\
  \vdots & \vdots & \vdots & \ddots & \vdots \\
  \frac{1}{a_n} & \frac{1}{a_n} & \frac{1}{a_n} & \ldots & 1
\end{bmatrix}
\]

Figure 3. Comparison matrix

Information of ICD in the South of Vietnam

3. Application of AHP method

Figure 4. Location of ICD Tan Cang
3. Application of AHP method

<table>
<thead>
<tr>
<th>Investment and operating cost</th>
<th>Ability of multimodal transporation</th>
<th>Potential of area</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The cost of buying land</td>
<td>• The distance to the route</td>
<td>• Industrial area</td>
</tr>
<tr>
<td>• The cost of Building</td>
<td>• The distance to the railway</td>
<td>• Customer</td>
</tr>
<tr>
<td>• Transport costs</td>
<td>• the distance to the inland</td>
<td>• Regional</td>
</tr>
<tr>
<td></td>
<td>waterways</td>
<td>economic scale</td>
</tr>
</tbody>
</table>

138 questionnaires in the pairwise comparisons of the first and second level criteria were sent to 15 experts who were local government officials, maritime ports, logistics companies and customers.

\[
\begin{bmatrix}
1 & 10/13 & 1/2 \\
1.3 & 1 & 10/14 \\
2 & 1.4 & 1
\end{bmatrix}
\]

Figure 3. Level 1 comparison matrix.