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"MARLOG 13"

Towards Smart Green Blue Infrastructure

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Presented by

Islam Abdallah

The Role of Improving the Infrastructure of multimodal transport to enhance the Efficiency of seaports using Interpretive Structural Modelling. (Case study Damietta port)

Authors: Islam Abdallah, Ahmed Ismail, Ahmed Mansor, Ahmed Omar, Ahmed Mostafa

1.Introduction

Damietta Port, is a vital trade hub and a prime example of a port embracing multimodal transport.

It's a gateway connecting Egypt to the world through a seamless blend of maritime, land, and river transportation.

Its proximity to major trade routes further enhances its significance as a regional logistics center.

According to the following:

1- The great economic problem is how to arrange our limited resources to satisfy as many of our wants as possible.

2- Much previous research has examined the relationship between multimodal transport and port efficiency, especially Damietta Port.

2. Objective

The basic objective of this study, through the analysis of Damietta Port as a case study, this research aims to provide valuable insights into the critical barriers and their hierarchical relationships within the multimodal transport infrastructure that influence port efficiency.

3. Method

The methodology employed is Interpretive Structural Modeling (ISM), which enables a comprehensive understanding of the interrelationships among different elements within the multimodal transport system and their impact on port efficiency.

3. Method

3.1 Data collection

In this regard, data collection was used through previous research and interviews to identify the problem, which revealed that there is a problem , which is the Lack of optimal exploitation Infrastructure of multimodal transport.

3. Method

3.2 Interpretive Structural Modelling (ISM)

Numerous Barriers to were listed , these barriers will be analysed using the ISM methodology in this part to visualize the interrelationships and different levels of the identified barriers.

In addition, a classification of those barriers will be provided based on their driving and dependence power on one another.

In this regard, the primary goals of the analysis to identify and rank the Barriers facing the development of infrastructure for multimodal transport to increase the efficiency of Damietta Sea port.

4.Analysis

Based on an extensive literature review and expert opinions, nine salient barriers were identified that significantly influence the implementation of multimodal infrastructure upgrades at seaports.

4. Analysis

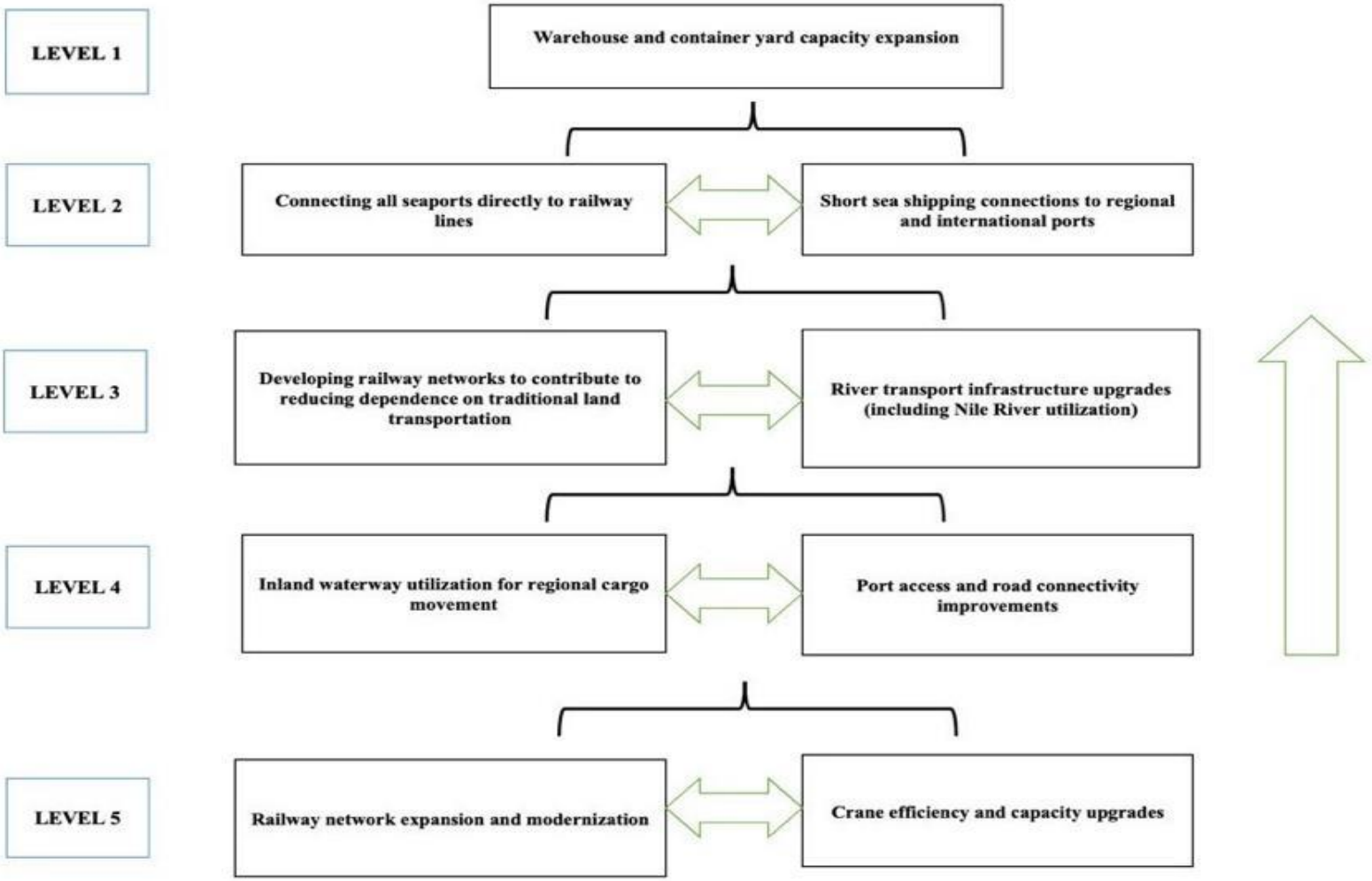
#	Identification Barriers facing the development of infrastructure for multimodal transport in Damietta port.
1	Railway network expansion and modernization
2	Connecting all seaports directly to railway lines
3	Warehouse and container yard capacity expansion
4	Developing railway networks to contribute to reducing dependence on traditional land transportation
5	River transport infrastructure upgrades (including Nile River utilization)
6	Inland waterway utilization for regional cargo movement
7	Port access and road connectivity improvements
8	Crane efficiency and capacity upgrades
9	Short sea shipping connections to regional and international ports

4. Analysis

#	1	2	3	4	5	6	7	8	9	Driving Power
1	1*	1	1	1	1	0	0	0	1	6
2	1	1	1	0	1	1	1	1	1	8
3	1*	0	1*	1	1	1	1	1	1*	8
4	1	1	1	1	1	1	0	0	1	7
5	1	1	1	1	1	0	0	0	1	6
6	0	0	1	1	0	1	1	0	1	5
7	0	1	1	0	0	1	1	1	1	6
8	1*	1	1	1	0	0	0	1	0	5
9	1	1	0	0	1	1*	1	1	1	7
Dependence power	7	7	8	6	6	6	5	5	8	58/58

5. results

The results indicate that railway network expansion and modernization along with crane efficiency and capacity upgrades exhibit the highest driving power among the identified barriers.


LEVEL 1
Warehouse and container yard capacity expansion
LEVEL 2
Connecting all seaports directly to railway lines
Short sea shipping connections to regional and international ports
LEVEL 3
Developing railway networks to contribute to reducing dependence on traditional land transportation
River transport infrastructure upgrades (including Nile River utilization)
LEVEL 4
Inland waterway utilization for regional cargo movement
Port access and road connectivity improvements
LEVEL 5
Railway network expansion and modernization
Crane efficiency and capacity upgrades

5. Conclusion

These two barriers display significant dependence that hinders the application of multimodal infrastructure improvements at seaports.

From the methodical structural analysis, railway and crane infrastructure limitations surface as prime candidates for priority interventions by port authorities to unlock substantial efficiency gains.

The research framework and empirical analysis provides crucial insights to guide policies and development initiatives focused on seaport infrastructure upgrading for long-term viability amid intensifying maritime trade competition.

6. Recommendation

For practical recommendations:

1- Prioritize Railway and Crane Upgrades: Focus on expanding and modernizing the railway network and improving crane efficiency at Damietta Port.

2 - Strategic Investment : Allocate resources to areas identified as having high driving power for efficiency improvements.

3 - Policy Development : Formulate policies targeting the key barriers to infrastructure improvement, based on the study's findings.

6. Recommendation

For academic recommendations:

1- ISM application: Encourage the use of Interpretive Structural Modeling in other areas of transportation and logistics research.

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Thank You