

## Logistics Cooperation in the Far-East: Prioritizing Supply Chain Requirements to Strengthen Intra-Regional Integration of Maritime Transport Networks

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### ABSTRACT

Logistics cooperation among countries is an important policy tool with potential for strengthening the international competitiveness and economic growth of regions. In the Far-East region, joint efforts to increase the coordination of maritime logistics activities have undergone since 2006 between the governments of China, South Korea and Japan. This paper aims at finding a potential gap in past and current logistics cooperation requirements for the Far-east region to provide suitable logistics policies to be implemented in the region. In the first step of the study, past joint statements of China, Republic of Korea and Japan's ministerial conference on transport and logistics were examined. Thereafter, a text mining methodology was applied to highlight key areas of logistics and derive related network patterns by analyzing the degree centrality and the community betweenness of the most frequent terms. Secondly, a q-methodology was utilized to analyse whether new priorities areas should be discussed among governments to increase logistics cooperation in the region. A gap analysis between logistics trends derived from text mining and current trends derived from the Q-method led to suggest that there is a gap between past and current logistics requirements and particularly in the areas of environment, technology, standardization and adoption of best practices.

**Keywords:** logistics cooperation, far-east region, big data, text mining, q-method, policy recommendations.

### INTRODUCTION

Efficient logistics process and supply chain networks have been recognized as core enablers of competitiveness and economic growth long back (Arvis *et al.*, [1–3]; Ekici *et al.*, [4]). Logistics, in a broader sense, has emerged as a sector that greatly contributes into the economic development of regions. The configuration of complex logistics networks requires close cooperation across different functionalities and activities namely transportation, warehousing, inventory management, customs clearance, payment and information systems. Although many of these chains are majorly controlled by private operators, efficient logistics is also driven by the active involvement of national governments via direct and indirect investments, provisions of services and policies (Ekici *et al.*, [4]).

Policy makers and regulators are well aware that the successful implementation of policies on transport infrastructure, free trade areas, regulatory trade framework and governance (private–public partnership

in ports particularly) can lead to enhanced logistics performances (Arvis *et al.*, [5]). Along with the core operational requirements, various new logistical issues such as technological changes (Jo & D'agostini, [6]; Jo *et al.*, [7]; D'agostini, [8]), sustainability and requirement of green supply chains (Srivastava, [9]) and the effect of COVID19 pandemic on liners' chartering strategies (Jo *et al.*, [10]) and have been identified as segments that deserve attention for an increased coordination among governments.

Due to Covid-19 pandemic outbreak, it appears there is a rising need for cooperation in several logistics sectors. Governmental imposed restrictions such as border closures, quarantine requirements, crew changeover and repatriation of seafarers, have heavily affected maritime logistics and supply chain operations. In consideration to all these reasons, logistics has increasingly become a strategic concern with respect to several operational aspects.

This study intends to clarify whether there the gap in the logistics issues that have been discussed in the past joint statements issued by the national governments of China, Republic of Korea and Japan. It also aims at understanding the current important issues which need to be further discussed for future intra-governmental cooperation in the region. Whilst past literature investigated logistics cooperation in the Far-East, to the authors' knowledge this is the first study to attempt to develop a study which empirically shows results and provides ad-hoc policy recommendations considering joint ministerial logistics cooperation drafts of three countries as the starting point.

## THEORETICAL BACKGROUND ON REGIONAL LOGISTICS COOPERATION

In recent years, a broad range of research studies have been focusing on the concept of cooperation across firms to enhance the efficiency and competitiveness of supply chains. The importance of cooperation has been highlighted particularly in the field of logistics and supply chain management as this is referred to as the way for firms to enhance competitiveness, improve and integrate operational processes (Christopher, [11]; Barrat, [12]; Sandberg, [13]).

The term 'cooperation' in many cases has been used interchangeably with the terms such as 'coordination' and 'collaboration' (Castaner & Oliveira, [14]) which eventually leads to confusion. In general, the concept of cooperation differs depending upon the level of integration that the involved firms can achieve. A lower level of integration has been defined as 'collaboration' or the harmonization of the business processes of firms that are mutually adjusted to attain goals successfully (Göpfert, [15]). On the other hand, cooperation is defined as '*the practice of entities or people working together with common objectives*' (Kamis *et al.*, [16]) whilst (Gulati *et al.*, [17]) defined coordination as '*the deliberate and orderly alignment or adjustment of partners' actions to achieve jointly determined goals*'.

Increased competition across international supply chains has been converted into a collection of fragmented supply chains and high intensity concentration of logistics activities within limited spatial concentration (Bolumole *et al.*, [18]). Therefore, regional development is highly dependent upon the competitiveness of supply chain for economic development and regional cooperation has become a key element to strengthen logistics activities. Regional cooperation within neighbouring countries has the potential to generate several advantages from the logistics point of view and to strengthen international trade participation. With intensified cooperation in a region, there is a possibility of strengthened and more integrated supply chains that can lead to potential cost savings and increase in efficiency. This cooperation is specifically significant for those nations which do not have highly developed and productive transport networks individually (Bui & Duc, [19]).

Intra-regional logistics cooperation can lead to the creation of spatial concentration and a more integrated transport network (Van den Heuvel *et al.*, [20]) and consequent reduction of freight transport (Wagner, [21]). As defined by Porter [22], a regional cluster is a geographically proximate group of interconnected companies and associated institutions. This term further reinforces the idea that regional cooperation can

only be achieved through creation of synergistic relationships among all supply chain stakeholders by aligning individual action towards a common objective (Fugate *et al.*, [23]). Regional logistics clusters create opportunities to develop platforms which generate economic output. However, this is strictly dependent on the firms located within the spatial concentration (Snowdon & Stonehouse, [24]).

Van den Heuvel *et al.*, [25] studied the effects of spatial concentration about land allocation policies of municipalities in the south of the Netherlands. They found that logistics companies co-located within a spatial cluster are more likely to share transport capacity and decrease CO2 emissions as compared to non-co-located logistics companies. Xiu [26] explored regional logistics cooperation on the basis of industrial clusters and suggested that the advantages of co-located industries do not come from the aggregation of firms but rather from the series of internal and external regional interactions related to the cluster. Furthermore, the effects of regional logistics clusters are influential on the logistics labor market, for knowledge sharing among participating entities (Sheffi, [27]) and also act as a catalyst for investment attractions as well as infrastructure developments (Snowdon & Stonehouse, [24]). Nevertheless, successful promotion and implementation of an intra-regional logistics coordination is a complex exercise and requires several factors to be considered.

## RESEARCH DESIGN PROCEDURES

This section presents the research model as depicted in figure 1. This research model comprises a three-step process. In the first step, a text mining method is applied to extract, retrieve and process information from past ministerial resolutions drafted between China, Republic of Korea and Japan. In the second step, a Q-methodology is utilized to discover the current trends in logistics which are significant to be discussed in future transport cooperation policies among the three countries. In the last step, potential discrepancies between the results derived from the text mining analysis and those obtained from the Q-method are highlighted and policy recommendations are suggested for current and future discussion on regional logistics cooperation.

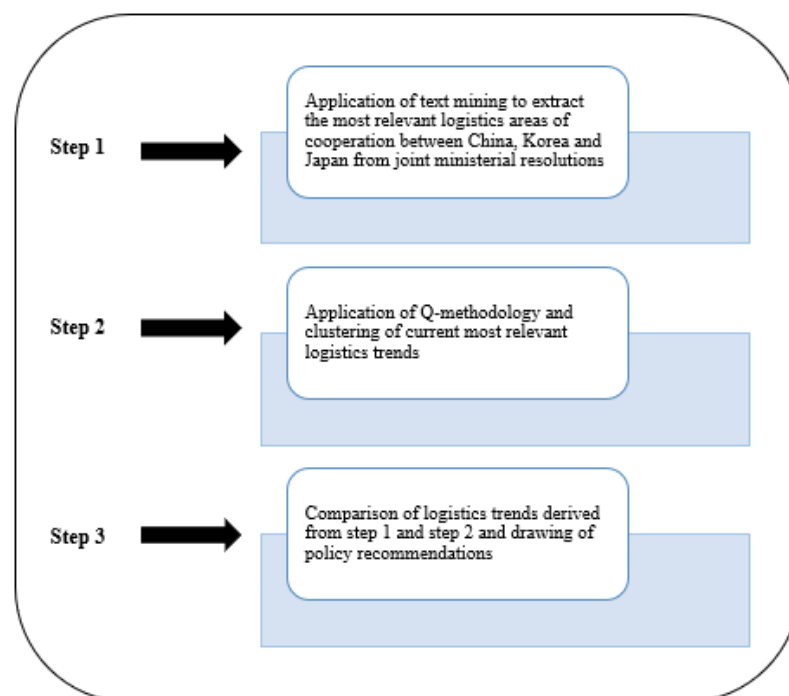


Figure 1: Three Steps Research Model.

Based on this research model, the study aims to answer the following research questions:

1. What are the most important logistics areas of cooperation of China, Republic of Korea and Japan based on past joint ministerial resolutions?
2. Compared to the past, are there new logistics priorities which should be properly addressed and discussed to enhance and improve cooperation between China, Republic of Korea and Japan?
3. What are the potential policy recommendations based on new logistics trends?

### ***Application of Text Mining***

This section presents the application of a text mining methodology through which information about past joint ministerial resolutions between the Governments of China, Republic of Korea and Japan is detected. Information is extracted automatically via 'Netminer' software from eight full-text documents drafted by the ministries of the three countries from 2006 to 2020. Text mining is a useful method to extract metadata and patterns via the application of various algorithms. The main strength of this method is that it solves the problem of identifying useful information from a large amount of text-based data. Therefore, the applicability of this method to extract information from eight joint ministerial drafts on logistics cooperation appears to be justified.

In the next step, all individual draft resolutions were combined into a single file to perform a comprehensive and integrated text mining analysis. After this step, calculation of the plugs in and frequency of the words from the documents was obtained. In total, 2556 words which ranged from 594 (most frequent) to 1 (least frequent) were obtained. However, all non-logistics related words and those terms with a frequency of less than thirteen were eliminated from the list as they may have distorted the analysis. All the remaining terms were high-frequency and logistics-related terms and amounted to 62 words.

In the next step, pair networks were calculated and an analysis of 'Degree Centrality' was performed to analyse those terms that were the most central to the network based on degree of connections. Degree centrality is computed by the portion of nodes that are adjacent to each node as shown below:

$$\text{Degree Centrality of Node} = \frac{\text{sum [weight of incident links]}}{\text{\#nodes}-1} \quad (1)$$

In a directed network, in-degree centrality is the portion of nodes that are adjacent to each node, and out-degree centrality is the portion of nodes that are adjacent from each node.

In the last step of text mining processing, 'Community Betweenness' is calculated to draw a hierarchical structure. Several insights from a logistics cooperation perspective which can be summarized as follows:

1. The existence of six unique but interconnected clusters. The first cluster shown can be summarized as an environmental trend. 'Greenhouse', 'Gas', 'Emission', 'Market', 'Transportation', 'Management': are all connected with each other towards the central node of 'Logistics'. The second cluster includes words such as 'program', 'exchange', 'Policy', 'Research', 'Sharing', 'Information', 'Port', 'Cooperation'. The third cluster emerges with some common traits as the previous one where the word 'shipping' is connected with 'technology', 'research', 'Sharing', 'Information: and 'Port', 'Cooperation' and 'Logistics'. The fourth cluster which emerges from the network is relevant to the field of standardization and regulations in logistics

within the region. It particularly highlights that there is a connection of peers among 'Standardization', 'Possibility', 'Region', 'Regulation', 'Safety', 'Standard', 'Network', 'System', 'Logistics'. The fifth cluster involves the trading patterns between 'Korea', 'China' and 'Japan'. 'ASEAN', 'Transport', 'Intermodal', 'Port' are elements which directly or indirectly connect with the central node 'Logistics'. The final cluster shows the need for development of energy efficient transportation chains. This group includes words such as 'Energy', 'Efficiency', 'Cost', 'Chain', 'Transport', 'management', 'Equipment'.

2. Further, China, Republic of Korea and Japan as nations are central to the transport value chain in ASEAN countries and are particularly connected with the area of trading, transportation and logistics but not directly connected with the most peripheral nodes such as emissions, energy, technology, and standardization.

### ***Application of Q-Methodology and Research Procedure***

Q-methodology has been considered as a useful methodology while evaluating the subjectivity of opinions and viewpoints of a selected group of respondents (Simons, [28]). The methodology was developed by Stephenson in 1936 as a tool to study human subjectivity (Stephenson, [29]). It is unique as it is a combination of qualitative and quantitative analysis and enables researchers to obtain a holistic view on the issue rather than focusing on a single aspect (Watts & Stenner, [30]). For a correct application of Q-method, six steps must be followed in a rigorous way as shown in figure 2. The first stage is known as the concourse or a collection of statements about the research topic from prior studies relevant to logistics cooperation. For the present study, about 160 statements were collected which were duly reviewed by three experts having wider knowledge and professional experience in logistics. In this stage, it was ensured that the topic is well covered by the selected statements and the holistic view of the subject is satisfactory. It also included the most frequent and central logistics areas previously extracted by text mining. Then, similar or overlapping statements were removed. Under the supervision as well as advice of three professors from a leading logistics university in the Republic of Korea, 35 statements were obtained and were commonly considered as a suitable number for study (Brown, [31]).

In the next step, the Q-set was submitted for responses' collection from a group of participants or P-sample. The process strictly followed the recommendations set by Brown [31] and a diverse group of 31 respondents based out of the Republic of Korea were selected. The selected participants had different logistics expertise and work experience ranging from two major national port authorities, freight forwarders, shipping companies and research institutes. The Q-methodology does not require a large sample of respondents therefore, 31 participants was a sufficient and reasonable sample for representing the beliefs and opinions of the larger groups. In total, there were eleven females (35%) and 20 males (65%) as participants. In terms of age, nineteen respondents (61%) were in the range of 30–39 years old, ten respondents (32%) between 40–49 years old and two respondents were (7%) older than 50 years old. The participants of the study were selected from different sectors of logistics. Seventeen respondents (55%) were working for shipping companies, eight respondents (26%) as freight forwarders, four respondents in port authorities (13%) and two respondents (6%) in research institutes.

In the next stage, known as Q-sorting, the participants were guided on the correct way to respond. Each participant was given 35 statement cards and a paper-format grid with exactly 35 cells. Respondents were asked to place each statement card in one available cell according to the extent to which he or she agreed or disagreed with it. The grid ranges from +5 (most strongly agree) to -5 (most strongly disagree). The grid followed a normal distribution because each respondent could place a limited number of cards under each column.

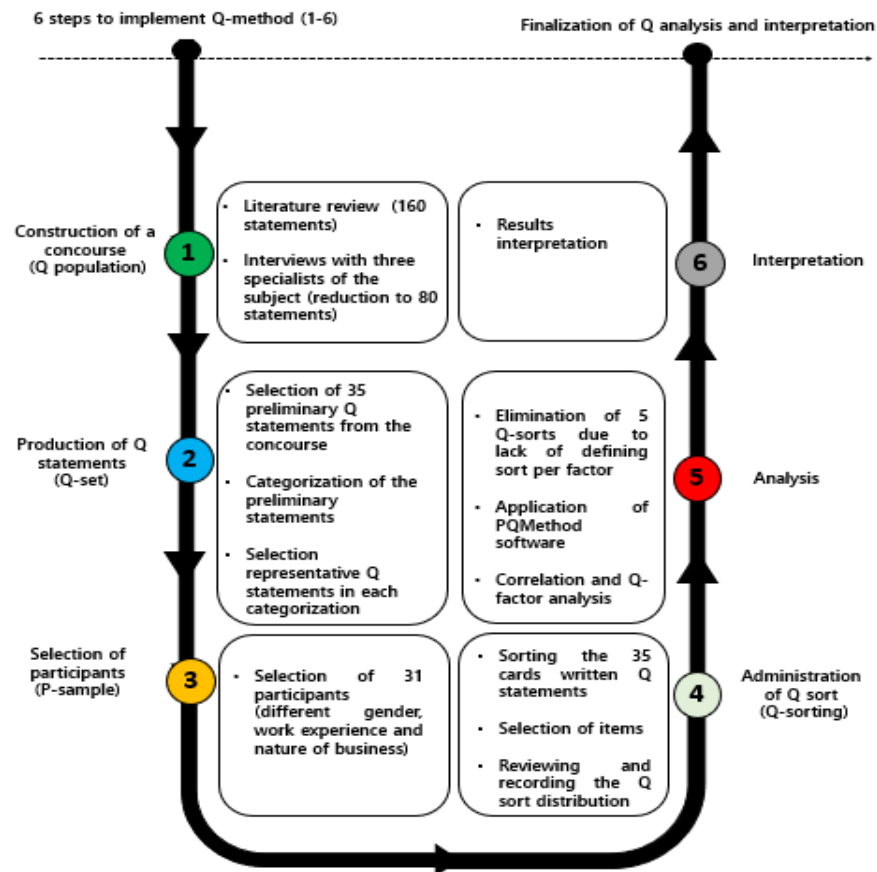


Figure 2: Six Steps Q-Method Implementation.

## RESULTS

After the collection of a satisfactory number of responses, the statistical analysis was performed with PQM method software. The analysis included twenty-six sorts (from the total of thirty-one, five were eliminated due to a lack of defining sort per factor) which were correlated with Varimax rotation and a five and six unrotated factors were performed. The most significant results were achieved by performing six unrotated factors and from which three factors (typology) were obtained with each of them showing an Eigenvalue  $>1.0$ . Each of the factors had a specific number of respondents featured onto it. This shows that each factor showed a specific statistical pattern on the way a group of participants sorted the statements in the grid. Eleven respondents ( $n=11$ ) were clustered in Factor I, twelve respondents ( $n=12$ ) in factor II and three respondents ( $n=3$ ) in factor III. For five out of the thirty-one participants, the loading factors (number 4, 10, 14, 15, 17) did not show any defining sort to any of the types and were discarded from further analysis.

The next step examines each Z-score assigned to a specific statement to discern the peculiarities and characteristics of each factor. Table 1 depicts the statements and Z-score for each factor. The interpretation of each factor needs a holistic approach as a process because patterns can be extracted by comparing pairs of each factor within the same array factor. Statements showing a Z-score above 1.0 were considered significant and were interpreted as strong agreements within a factor. However, statements with Z-values below 0 indicated a disagreement. At the end, three factors emerged, and each factor was characterised by the viewpoints of the participants clustered in the respective factors.



*Table 1. Q-Statements and Z-scores for Each Factor*

Q Statement		Factor I	Factor II	Factor III
Q1	Hold joint discussions and meeting on the impact of COVID19 on maritime logistics and transportation	1.461	1.627	-1.252
Q2	Stronger cooperation between North-East Asian countries in the field of seafarers' embarkation and disembarkation is important	1.355	1.626	1.132
Q3	Coordination in the creation of temporary medical facilities for seafarers in the region	1.628	1.653	0.954
Q4	Ensuring berth availability and quicker medical check by governments of the region on seafarers	1.427	1.496	-0.115
Q5	Joint creation of 'Green Lanes' or supply chain corridors which enables the exchange of necessity goods during pandemics and other emergency situations in the region	0.933	0.716	-0.212
Q6	Enabling fast customs procedures (paperwork included) at a regional level for specific types of necessity goods	1.042	2.089	0.256
Q7	Simplifying or waiving import-export procedures in the region to ensure smooth logistics and trade operations	0.969	0.334	-2.184
Q8	Temporary tariff suspension during COVID10 to facilitate the flow of goods	-0.345	-0.781	-0.682
Q9	Measure to improve transport business liquidity by extending or postponing payment of customs duties	-0.287	-0.410	-1.950
Q10	Joint workshops to plan joint emergency responses and risk management in the field of logistics during pandemics	-1.188	-0.169	-0.056
Q11	Discussion of a 'broader' concept of 'Port Community System' can be beneficial to the region	-1.186	0.414	-0.897
Q12	Standardization of specific technologies in regional' ports can contribute improving overall transport efficiency	-0.623	0.630	1.132
Q13	Standardization of specific technologies in regional' ports and transport-related companies can contribute improving congestion	-0.892	0.020	0.682
Q14	Improving trade transparency in the region through block-chain should be a priority	-0.770	0.277	-0.271

Q15	Increase digital coordination between regional shipping lines and ports can strengthen logistics efficiency	-0.671	0.294	-0.021
Q16	Standardization of data collected can improve the regional transport efficiency	-1.247	0.997	-0.349
Q17	Joint research on autonomous ships to improve technological advancements in the region	-1.674	-0.185	-0.078
Q18	Acceleration of documents' digitization within the region can help boosting trade volumes	-0.869	0.277	1.074
Q19	Cooperation in the framework of port-related associations (creation of logistics association in North-East Asian countries) in the region	-0.568	-0.434	0.293
Q20	Cooperation and joint communication and exchanges on environmental topics with a broad range of stakeholders (environmental groups, community groups, the press, government, port user)	-0.050	0.040	1.657
Q21	Joint promotion of ports' network in the region as recycling hubs within the region. Within these hubs, recycling flows are delivered, transformed into new products, and re-exported around the world	0.093	-0.334	-0.704
Q22	Jointly promote industrial ecology within the region (ecology attempts to optimize waste management by making interactions between stakeholders within the same geographical area stronger (e.g., exchanging materials, water, and by-products))	-0.560	-0.630	-0.994
Q23	Implementation of common regulation on maritime emission standards (creation of ECA/SECA areas)	-0.227	0.629	0.078
Q24	Production of joint environmental performance indicators for the transport and port business sectors	-0.337	-0.265	-0.157
Q25	Sharing of logistic best practices can help improving the competitive position of the region	-0.351	0.531	1.544
Q26	Creation of joint yearly sustainable reports for transport-related companies and ports in the region following international standards	-0.243	-0.793	-0.547
Q27	Create appointment systems and increased coordination between national shipping line/national ports as a way to ease congestion on peak time and reduce emissions	0.414	-1.162	-0.173
Q28	Production of joint reports/publications on logistics indicators for the region	-1.251	-0.797	0.271



Q29	Increased cooperation in the field of education and training for Government officers working in logistics	-0.285	-1.503	2.206
Q30	Implement of smart planning in ports and logistics operators to ensure maximization of backhaul cargo	-0.054	0.096	-0.314
Q31	Cooperation in recycling by joint planning	-0.596	-0.775	-1.188
Q32	Joint marketing initiatives to strengthen the logistics position within a specific industry	0.475	-0.782	-1.345
Q33	Organization of specific logistics conferences to improve the regional network and knowledge	0.402	-1.680	0.696
Q34	Discussion on the creation on a level playing field (no public incentives) in logistics in the region	1.695	-2.265	0.427
Q35	In the case of the spread of infectious diseases such as COVID19, there is a need for exceptions to check the status of the ship and the status of compliance with various standards without face-to-face inspection and inspection of ships and ports	2.380	-0.781	1.088

## DISCUSSIONS (ANALYSIS OF TYPOLOGY)

The three factors which emerged from the analysis were renamed according to the specific pattern that most strongly emerged by analysing the Z-score for each statement. Factor I was labelled 'Reliability and flexibility of service achiever', factor II, 'Long-term shipper-carrier relationship builder', and factor III, 'Customer service and cost-saving seeker type'.

### **Factor I: 'COVID19 solution seeker and technological denier' (N=11)**

Respondents belonging to this group were labelled as 'COVID19 solution seeker and technological denier' because the statements that yielded higher were mainly COVID19 pandemic-related and the statements that yielded negative scores focused on technological cooperation. In particular, the participants of this group strongly agreed on the need to take joint initiatives aimed at helping seafarers in terms of non-face-to-face inspections at ports (Q.35, Z=2.380), medical facilities installations (Q. 3, Z= 1.1628), and embarkation and disembarkation (Q.2, Z= 1.355). This group of participants strongly agreed more generally in the field of logistics and transport as shown, in statement 4 (Z=1.427), in statement 34 regarding the creation of level playing field (Z=1. 695), and faster customs procedures in statement 6 (Z=1.042).

### **Factor II: 'COVID19 cooperation builder and trade cooperation rejecter' (N=12)**

Factor II was referred to as the 'COVID19 cooperation builder and trade cooperation rejecter'. Participants showed very similar views with the respondents of factor I and identified COVID19 pandemic as the top priority to be discussed by the Governments of the region. The highest loaded statement in this factor was statement number 6 'Enabling fast customs procedures (paperwork included) at a regional level for specific types of necessity goods' (Z= 2.089). The rest of high-yielding z-score statements

showed that respondents agreed on actions aimed at easing seafarers' conditions during the COVID19 pandemic as indicated by statements Q3 ( $Z = 1.653$ ), Q2 ( $Z = 1.1626$ ) and Q4 ( $Z = 1.496$ ).

### **Factor III: 'The digital technology and best practices adapter' (N=3)**

Factor III was titled 'The digital technology and best practices adapter' and it showed a more unique viewpoint about logistics cooperation in the Far-East region in comparison to factor I and II. Whilst respondents in factor III showed agreement on cooperation for easing embarkation and disembarkation of seafarers, they did not find COVID19 pandemic as a main priority for cooperation but rather expressed their common opinion in the field of education, information exchange and digitalization of logistics. For instance, education and training (Q29,  $Z = 2.206$ ), information exchange on environmental issues (Q20,  $Z = 1.657$ ), sharing of best practices (Q25,  $Z = 1.544$ ) and digitalization in logistics (Q12,  $Z = 1.132$ ; Q18,  $Z = 1.074$ ) were all seen as important areas for intra-Governmental cooperation. Figure 3 shows the consensus, defined as the similarities in views amongst the three factors. Unlike the two previous factors, factor III followed a more peculiar and distinct pattern on the most disagreed statements. Respondents stressed their disagreement on statement 7 'simplifying or waving import-export procedures in the region to ensure smooth logistics operations' ( $Z = -2.184$ ). They also believed that improving business liquidity by extending the payment of customs duties (Q9,  $Z = -1.950$ ), and holding joint initiatives for cooperation in the fields of logistics marketing (Q32,  $Z = -1.345$ ) and the impact of COVID19 pandemic (Q1,  $Z = -1.252$ ) were not pivotal elements.

### **Consensus Statement**

The consensus statements provide an overview of statements which did not show distinguishing patterns between pairs of factors. Consensus shows similarities in view among factors and eight different statements were extracted. There is a consensus, with a significant agreement load across the three factors, concerning seafarers' status during the pandemic as shown by Q2 'Stronger cooperation between North-East Asian countries in the field of seafarers' embarkation and disembarkation is important' and Q3 'Coordination in the creation of temporary medical facilities for seafarers in the region'. Furthermore, there is a consensus for the 'Temporary tariff suspension during COVID 19 to facilitate the flow of goods' (Q8) and for 'Implementing smart planning in ports and logistics operators to ensure maximization of backhaul cargo' (Q30). A common area of understanding was found in green logistics, and this is also indicated by 'Joint promotion of ports' network in the region as recycling hubs within the region. Within these hubs, recycling flows are delivered, transformed into new products, and re-exported around the world' (Q21), 'Jointly promote industrial ecology within the region (ecology attempts to optimize waste management by making interactions between stakeholders within the same geographical area stronger (e.g., exchanging materials, water, and by-products) (Q22), 'Production of joint environmental performance indicators for the transport and port business sectors' (Q24) and 'Cooperation in recycling by joint planning' (Q31). Consensus statements are depicted in figure 3.

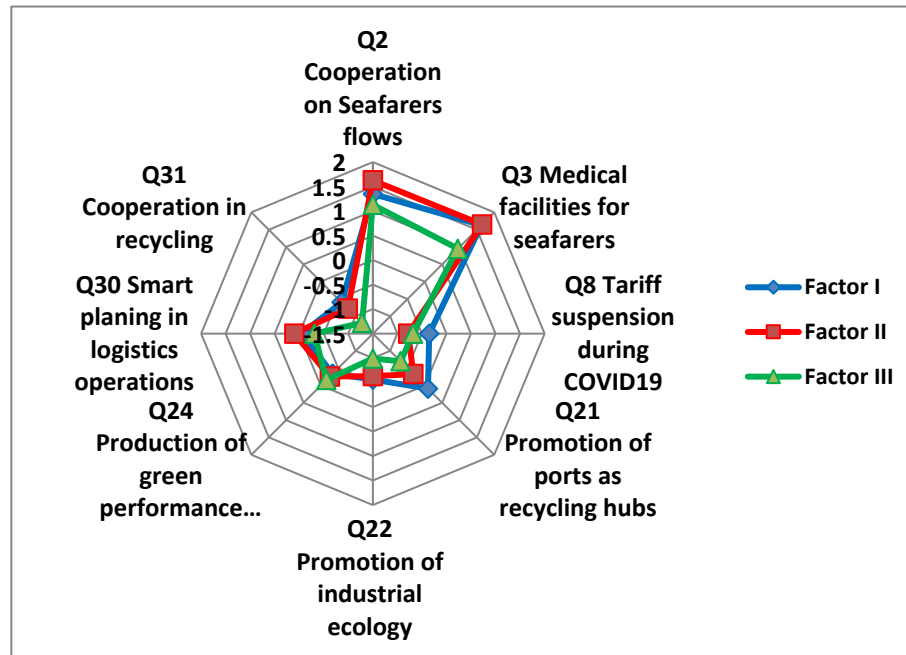


Figure 3: Consensus Statements.

## CONCLUSION

With the emergence of new global challenges, public and private organizations are required to increase their operational efficiency, flexibility and resilience in a similar manner. The COVID19 pandemic, new regulations, environmental pressure and new technologies have all proven to be elements of potential disruption across supply chains. The challenges for private corporations in the logistics sector is to quickly adapt to such changes and implement new operating business models. It is equally important for Governments to recognize such shifts and implement suitable policies aimed at supporting the national logistics sector to facilitate import and export of cargoes.

The Governments of China, Republic of Korea and Japan have recognized the importance of cooperation in the logistics industry and have produced biennial joint statements to address new challenges. However, it has been widely recognized that the COVID19 pandemic has further accelerated certain trends namely digitalization and new environmental regulations.

Based on the proposed analysis, several managerial implications and policy recommendations can be suggested. Firstly, it was revealed that COVID19 pandemic was the most agreed and novel issue for cooperation among the three governments. More specifically, the most urgent area of discussion according to the analysis was found to be relevant to seafarers' conditions. Most of participants indicated that it is important to cooperate for facilitating embarkation and disembarkation of seafarers, to create medical facilities in ports to ensure faster medical checks and enabling faster customs' procedures. On the other hand, the creation of special chain corridors for specific goods, waving import and export procedures and tariff suspension during pandemics were not considered important. Therefore, the governments of China, Republic of Korea and Japan should initiate the discussion for the joint promotion of new procedures to ensure fast medical checks and installation of medical facilities, waive visa requirements and ensure the availability of commercial flights for seafarers' repatriation.

Secondly, the acceleration towards the adoption of digital technologies and best business practices was another paramount area extracted from the analysis. Implementing new technologies and data exchange

was believed to be an important area of cooperation for improving overall transport efficiency in the region. The standardization of the data collected and technology implemented can contribute to higher efficiency in the region. Reliable information exchange of international cargo flows among different stakeholders can substantially decrease congestion and waiting times in ports and airports. In this sense, the joint adoption of specific software and EDI (Electronic Data Interchange) technologies via digitalized services and documents in public organizations involved in logistics (port authorities, customs, VTS operators) and the involvement of several stakeholders could be beneficial for the region as a whole in terms of cargo flows. Similarly, an area of mutual cooperation could be in the exchange of best practices to foster the safe, secure and sustainable role that logistics operators and port authorities play. This can raise the awareness of specific cooperation in logistics operations within the Far-East region with citizens, media and private organizations.

Thirdly, environmental pressure is rising in logistics and the policy makers in the region should take measures to tackle new challenges. Although both China and the Republic of Korea have recently implemented emission control areas, an area of cooperation can be established regarding the creation of new ECAs in international waters between China and the Republic of Korea and the Republic of Korea and Japan. Examples from the North-Sea and the discussed ECA (Emission Control Areas) in the Mediterranean Sea can be considered as a pragmatic example. Furthermore, from the academic viewpoint, areas for stricter cooperation can lead to ad-hoc research groups to produce joint exchange and communication on specific environmental indicators with the aim to raise the awareness on green governance for operators, users, and consumers across value chains.

In conclusion, there are several areas of potential discussion among the three Governments and, even though all are important, few elements should be prioritized as shown in the analysis. Fresh challenges and the rapid development of new business models adopted by logistics enterprises increasingly require governments to play an active role as regulatory and trade facilitator bodies. The huge importance of the Far-East region in international trade and the vast number of economic exchanges among China, the Republic of Korea and Japan indicates that cooperation is the key to strengthen relations and also to enhance operational matters in the logistics industry.

However, it is also important to note that the study's findings may have a local bias as all respondents were from the Republic of Korea, hence, considering respondents from China and Japan and different logistics sectors other than purely maritime networks, could enhance the study's applicability.

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