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A Comparative Study on the Current Situation of Logistics Development Among Countries Under the RCEP Framework: From the Perspective of the World Bank Logistics Performance Index (LPI)

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Abstract: As the world's largest free trade agreement, the effective implementation of the Regional Comprehensive Economic Partnership (RCEP) relies heavily on an efficient and smooth logistics system among member states. The Logistics Performance Index (LPI) released by the World Bank is the first global indicator to evaluate the level of national logistics development. Multi-dimensional analysis using the LPI helps explore new paths for high-level logistics development. This study takes the latest 2023 Logistics Performance Index (LPI) released by the World Bank as the core analytical tool, conducts a systematic comparison of the current logistics development status of 15 RCEP member states, and studies countermeasures to promote the development of regional trade logistics under RCEP.

Keywords: RCEP; Logistics Performance Index (LPI); Comparative study

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1. Introduction

The Regional Comprehensive Economic Partnership (RCEP) was officially signed on November 15, 2020, and came into effect on January 1, 2022, establishing the world's largest free trade area in terms of population and economic scale [1]. By 2025, the total GDP of RCEP member states has accounted for 32.6% of the global total, contributing 42.5% to global GDP growth over the past decade (2015–2025) [2].

In RCEP's grand blueprint for promoting regional trade and investment liberalization, logistics plays a crucial role as the "blood vessels" [3]. An efficient logistics system is the core foundation for reducing trade costs, ensuring supply chain stability, and enhancing overall regional competitiveness. The RCEP agreement itself includes special chapters such as "Customs Procedures and Trade Facilitation," aiming to improve logistics efficiency by simplifying customs clearance processes and promoting the application of information technology [4]. However,

there are significant differences in economic development levels among RCEP member states, which are directly reflected in the quality of logistics infrastructure, service quality, and management efficiency of each country [5].

Therefore, scientifically evaluating the current logistics development status of RCEP member states, identifying their advantages and shortcomings, is of important theoretical and practical significance for promoting the process of trade facilitation under the RCEP framework and achieving coordinated regional economic development.

2. Literature review

Academic research on RCEP mainly focuses on its economic effects, rule characteristics, and impact on the global trade pattern [6]. Most studies believe that by reducing tariffs and unifying rules of origin, RCEP will significantly promote intra-regional trade and investment growth, reshaping the industrial and supply chains in the Asia-Pacific region and even the world. In particular, RCEP's regional accumulation rule, regarded as the "gold standard," allows member states to use raw materials from other member states in the production process, making it easier to obtain origin qualifications and enjoy preferential tariffs, which greatly enhances the stickiness of regional supply chains [7]. However, some scholars point out that the successful implementation of RCEP depends on subsequent implementation mechanisms and domestic reforms of member states, especially the improvement of trade facilitation levels.

Regarding logistics performance, the LPI released by the World Bank is an internationally recognized authoritative indicator for measuring a country's logistics efficiency. The LPI report regularly released by the World Bank since 2007 has become the cornerstone of research in this field [8]. Released every two years since 2010, this indicator evaluates the logistics performance of various countries from six dimensions: customs efficiency, logistics infrastructure, international shipments, logistics service quality and competence, tracking and tracing, and timeliness, through surveys of global logistics professionals, providing a benchmark for horizontal comparison [9]. The LPI uses a 5-point scale, with higher scores indicating higher logistics performance. Some scholars have used the LPI to analyze the impact of the logistics industry on international trade, achieving significant results, and proving that improved logistics performance is conducive to the development of international trade imports and exports [10]. Other scholars have proposed countermeasures for logistics development through comparative studies of the LPI [11]. Some studies have selected partner countries of a specific trade agreement as research objects, such as "Belt and Road" countries and the "G20." In recent years, research has begun to focus on logistics development in the RCEP region, but most are based on pre-RCEP entry-into-force data or focus on comparisons among some countries (such as China, Japan, South Korea, or China and ASEAN) [12].

In summary, existing research provides a solid foundation for understanding RCEP's economic potential and the importance of logistics performance [13]. However, with the full implementation of RCEP and the release of the 2023 LPI report, there is currently a lack of a comprehensive comparative study on logistics performance covering all RCEP member states based on the latest authoritative data [14]. This study aims to fill this gap, systematically evaluate the logistics development level of each member state under the RCEP framework through in-depth analysis of the 2023 LPI data, and provide empirical basis for the subsequent deepening of cooperation under the agreement.

3. Research methods and data sources

3.1. Research methods

This study adopts a comparative analysis method, based on data from the World Bank's 2023 Logistics

Performance Index Report: Connecting to Compete. The LPI is a comprehensive benchmarking tool that assesses the performance of countries in six key dimensions through surveys of freight forwarders and express carriers worldwide [15]. These six dimensions are as follows:

(1) Customs efficiency: Refers to the efficiency of customs and border management clearance, an important indicator reflecting the efficiency of a country's customs management and the quality of government services;
(2) Logistics infrastructure: Refers to the quality of infrastructure related to overall supply chain services;
(3) International shipments: Refers to the ease and affordability of arranging international cargo transportation;
(4) Logistics competence: Refers to the ability to conduct international cargo circulation;
(5) Tracking & tracing: Refers to the ability to track and trace international cargo shipments;
(6) Timeliness: Refers to the on-time delivery rate of goods within the scheduled or expected delivery time and the punctuality of goods arriving at their destination.

This study will first conduct a macro comparison of the overall LPI scores and rankings of RCEP member states, dividing them into different tiers. Subsequently, it will conduct an in-depth analysis of the scores of each member state in the six sub-indicators to identify their specific advantages and disadvantages. Through this "overall-sub-indicator" comparative framework, this study strives to comprehensively and objectively reveal the current situation and differences of logistics development in the RCEP region.

3.2. Data sources

All data in this study are sourced from the official 2023 LPI database released by the World Bank. This version of the LPI covers 139 countries and regions worldwide and introduces a new indicator for tracking freight speed based on big data for the first time, enhancing data objectivity. It should be noted that among the 15 RCEP member states, data for Brunei and Myanmar are missing in the 2023 LPI report, so this comparative analysis mainly focuses on the remaining 13 member states.

4. Comparative analysis of logistics performance among RCEP member states

Based on the 2023 LPI data, the logistics performance of RCEP member states shows an obvious differentiated pattern, which can be roughly divided into four tiers (**Table 1**).

Table 1. 2023 logistics performance rankings and sub-indicator scores of RCEP countries

Tier	Country	Global ranking	LPI total score (1–5)	Customs efficiency	Logistics infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
1	Singapore	1	4.3	4.2	4.6	4.0	4.4	4.4	4.3
2	Japan	13	3.9	3.9	4.2	3.3	4.1	4.0	4.0
	South Korea	17	3.8	3.9	4.1	3.4	3.8	3.8	3.8
	Australia	19	3.7	3.7	4.1	3.1	3.9	4.1	3.6
	China	19	3.7	3.3	4.0	3.6	3.8	3.8	3.7
	New Zealand	26	3.6	3.4	3.8	3.2	3.7	3.8	3.8
	Malaysia	26	3.6	3.3	3.6	3.7	3.7	3.7	3.7

Table 1 (Continued)

Tier	Country	Global ranking	LPI total score (1–5)	Customs efficiency	Logistics infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
3	Thailand	34	3.5	3.3	3.7	3.5	3.5	3.6	3.5
	Philippines	43	3.3	2.8	3.2	3.1	3.3	3.3	3.9
	Vietnam	43	3.3	3.1	3.2	3.3	3.2	3.4	3.3
	Indonesia	61	3.0	2.8	2.9	3.0	2.9	3.0	3.3
	Cambodia	66	2.9	2.5	2.9	3.0	3.1	3.1	3.2
4	Laos	115	2.4	2.3	2.3	2.3	2.4	2.4	2.8

Data source: World Bank Open Database. Note: Data for Brunei and Myanmar are missing in 2023.

4.1. Tier 1: Countries with high-level logistics

Singapore ranks first globally with an overall LPI score of 4.3, making it an undisputed logistics leader in the RCEP region. It scores particularly prominently in two dimensions: "Logistics Infrastructure" (4.6 points) and "Logistics Competence" (4.4 points), reflecting its world-class ports, airports, and efficient logistics service system. As a key node connecting the East and the West, Singapore's successful experience provides important reference for other member states, especially those aiming to become regional transit hubs.

4.2. Tier 2: Countries with medium-to-high-level logistics

This tier includes Japan (3.9 points), South Korea (3.8 points), Australia (3.7 points), China (3.7 points), New Zealand (3.6 points), and Malaysia (3.6 points). These countries have relatively mature logistics systems. Japan, South Korea, Australia, New Zealand: These developed economies perform excellently in "Customs Efficiency," "Logistics Infrastructure," and "Logistics Competence." For example, Japan and Australia score as high as 4.2 and 4.1 points in logistics infrastructure respectively. South Korea ties with Japan in customs clearance (3.9 points), showing a highly facilitation-oriented customs environment.

China and Malaysia, as representatives of developing countries, China and Malaysia have impressive logistics performance. China has obvious advantages in "Logistics Infrastructure" (4.0 points) and "International Shipments" (3.6 points), benefiting from its large market scale and continuous infrastructure investment. Malaysia shows balanced performance across all sub-indicators, demonstrating its strength as an important logistics node in ASEAN.

4.3. Tier 3: Countries with medium-to-low-level logistics

Thailand (3.5 points), the Philippines (3.3 points), Vietnam (3.3 points), Indonesia (3.0 points), and Cambodia (2.9 points) form the third tier. These countries are important manufacturing bases in Southeast Asia with rapid economic growth in recent years, but there is still significant room for improvement in logistics performance. Thailand and Vietnam, as emerging manufacturing hubs, the governments of both countries have launched large-scale infrastructure development plans, such as Thailand's Eastern Economic Corridor (EEC) plan, aiming to improve logistics efficiency to attract foreign direct investment (FDI).

Philippines and Indonesia, as archipelagic countries, both face special challenges in "Logistics Infrastructure" (3.2 and 2.9 points respectively) and "Customs Efficiency" (both 2.8 points). Improving inter-port connectivity and simplifying administrative procedures for cross-island transportation are key to enhancing their logistics

performance. Notably, the Philippines scores relatively high in "Timeliness" (3.9 points), which may reflect its efficiency in specific trade corridors.

4.4. Tier 4: Countries with low-level logistics

Laos ranks 115th globally with an overall score of 2.4, at the bottom of the RCEP region. This least developed country (LDC) scores low in all six LPI dimensions, especially in "Customs Efficiency," "Logistics Infrastructure," and "International Shipments" (all 2.3 points), which constitute major obstacles to its integration into regional supply chains. In addition, data for Brunei and Myanmar are missing in the 2023 LPI report, but based on historical LPI data released by the World Bank, these two countries also belong to the fourth tier with low logistics levels. The RCEP agreement pays special attention to the participation of less developed member states and includes a chapter on economic and technical cooperation, aiming to help these countries improve their trade capacity, including logistics, through capacity building and technical assistance.

5. Conclusions and recommendations

In summary, the logistics development level of RCEP member states in 2023 presents several characteristics. There is a significant gradient difference in logistics performance within the RCEP region, forming a distinct "multi-tier" pattern from Singapore (world-class) to Laos (needing urgent development). The gap in logistics performance is mainly reflected in two "hardware" and "software" aspects, logistics infrastructure quality and customs efficiency, especially among member states with lower development levels. Moreover, the trade facilitation provisions and rules of origin accumulation under the RCEP agreement provide an institutional framework for reducing regional logistics costs and promoting supply chain integration, but their effectiveness is constrained by the huge logistics capacity gap among member states.

Efficient logistics is the key to unlocking RCEP's enormous economic potential. To promote the coordinated development and overall improvement of the regional logistics system, this study puts forward the following recommendations:

(1) Strengthen the "hard connectivity" of infrastructure to narrow development gaps. RCEP member states, especially logistics powers such as China, Japan, and South Korea, should increase investment and construction assistance to less developed ASEAN member states in fields such as ports, railways, highways, and cold chain logistics through multilateral cooperation frameworks such as the "Belt and Road" Initiative and the Asian Development Bank. Focus on supporting cross-border infrastructure projects such as the China-Laos Railway to enhance the breadth and depth of regional physical connectivity and reduce transportation costs;

(2) Deepen the "soft connectivity" of rules and standards to improve customs clearance efficiency. All member states should fully implement the commitments in the RCEP chapter "Customs Procedures and Trade Facilitation," promote the connection of "single window" systems, and realize the widespread application of measures such as customs pre-determination and pre-arrival processing. Encourage member states to coordinate and recognize customs supervision and inspection and quarantine standards, reduce non-tariff barriers, and achieve rapid customs clearance of goods, especially shortening port delays for perishable goods;

(3) Embrace digital transformation to build a smart and green logistics system. Digitalization is an important

way to improve logistics efficiency. The World Bank report points out that end-to-end supply chain digitalization can reduce port delays by up to 70%. RCEP member states should jointly promote the construction of a regional logistics information platform, use technologies such as the Internet of Things, big data, and artificial intelligence to improve cargo tracking capabilities and optimize transportation routes. At the same time, in response to global sustainable development trends, promote new energy logistics vehicles and green packaging materials, and jointly build a low-carbon and efficient regional green logistics system;

(4) Activate the economic and technical cooperation mechanism to precisely support weak links. RCEP includes special Economic and Technical Cooperation (ECOTECH) provisions. This mechanism should be fully utilized, with countries leading in logistics performance (such as Singapore, Japan, and China) providing targeted capacity-building support and technical training to countries with backward performance (such as Laos). Cooperation can focus on customs modernization management, logistics talent training, and supply chain risk management, helping less developed member states address shortcomings and ensuring they can truly benefit from RCEP, thereby promoting balanced and sustainable development of the entire region.

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Disclosure statement

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