

# A Study on the Impact of the Panama Canal's Vulnerabilities on U.S.

## Economic Security

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### 1. Introduction

Since ancient times, humankind has used the sea as a pathway to move people and goods. As trade between nations became more prevalent, the utilization of ships capable of transporting large quantities of goods at once gained interest, leading to the formation of numerous maritime routes, or sea lanes, around the world.

With the advancement of the global economy, countries have become increasingly dependent on these sea lanes for their economic activities, resulting in a significant increase in maritime traffic. Consequently, these sea lanes have witnessed a rise in ship accidents and frequent pirate activity. Additionally, they have come to be recognized as areas susceptible to geopolitical influences, such as the imposition of transit fees or arbitrary passage restrictions by coastal states.

In recent years, the direct impact of security threats on sea lanes has become increasingly evident. These threats include China's assertions of maritime rights in the South and East China Seas, unilateral attempts to alter the status quo through the use of force, Russia's blockade of the Black Sea following its invasion of Ukraine, and attacks on civilian merchant ships by non-state actors during the 2023 Israel-Hamas conflict. As a result, nations that rely on sea lanes have increasingly recognized the importance of securing these routes as a crucial component of economic security and foreign policy, particularly in maintaining the stability of supply chains.

Moreover, in addition to the aforementioned traditional security threats, weather phenomena have a profound impact on sea lanes. Historical

examples illustrate this, such as the Isewan Typhoon of 1959, which led to the sinking of numerous ships and the destruction of port facilities, severely affecting maritime routes. Similarly, Cyclone Bhola in 1970 caused catastrophic damage in Bangladesh, resulting in a devastating impact on regional maritime transportation. The 2004 tsunami off the coast of Indonesia also dealt a severe blow to sea lanes across the Indian Ocean, causing extensive damage to ports and vessels.

A recent example is the 2023 El Niño phenomenon, which caused a significant drop in the water levels of Lake Gatun, leading to severe restrictions on the number of ships able to transit the Panama Canal. Despite its vast landmass, geographically isolated from the sea, the United States functions as a maritime nation, in line with Alfred Mahan's theory of sea power, with the majority of its imports and exports relying on maritime routes. Consequently, the restrictions on Panama Canal transits that year had a substantial impact on the U.S. economy.

For Japan, an undeniable sea power surrounded by ocean and dependent on maritime logistics for 99.6% of its trade, the Panama Canal is a crucial maritime route that directly affects its economic security. This paper will examine the recent developments concerning the Panama Canal and, drawing on insights that I've gained from working in Washington, will analyze the impact of sea lane vulnerabilities on U.S. economic security.

## 2. The Panama Canal

### 2.1 Construction of the Panama Canal

The Panama Canal is situated on the narrow Isthmus of Panama, connecting North and South America. It links the Pacific and Atlantic Oceans over a distance of approximately 41.5 nautical miles (77 km), making it a critical maritime route often referred to as the lifeline of global trade. The existence of the canal allows ships to bypass Cape Horn, the treacherous southernmost point of South America, enabling interoceanic navigation. This significantly enhances the safety of maritime transport and contributes to substantial cost savings.

Approximately 150 years ago, the area where the Panama Canal now exists was covered by jungle and wetlands. Due to the challenges faced by many ships navigating around Cape Horn—such as strong winds, high waves, and dense fog, which often led to shipwrecks—and the issues of maintaining the quality of goods during long voyages, a French company conceived the idea of constructing a safer and faster canal across the Isthmus of Panama. The construction of the canal began in 1881, led by Ferdinand de Lesseps, who had previously completed the Suez Canal, under the auspices of the French company Compagnie Universelle du Canal Interocéanique (hereafter referred to as Company C).

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Figure 1: Construction of the Panama Canal by Company C<sup>2</sup>

In 1879, two years before the construction of the canal began, Company C signed a contract with the Panamanian local government (Departamento de Panamá), which was then an administrative division of Colombia, for the transfer of land necessary for the canal's construction.<sup>3,4</sup> The contract included several stringent economic conditions, such as:

- The division of toll revenue between Company C and the Panamanian local government upon the canal's completion
- Company C would be responsible for the construction and operation of the canal, while the Panamanian local government would oversee and regulate its use and the distribution of revenues
- Deadlines for the construction and operation were established, with penalties for non-compliance

Moreover, maintaining the relationship with the Panamanian local government, with whom Company C was negotiating, involved significant political risks. Specifically, frequent political upheavals and internal conflicts within the Colombian government often influenced the local government, leading to the potential annulment of agreements or forced policy changes. Additionally, corruption and administrative instability within the Panamanian local government posed significant obstacles to the canal's construction, particularly in terms of contracts and land transfers.<sup>5</sup>

The construction of the Panama Canal, which commenced under these challenging circumstances, faced numerous obstacles due to the harsh natural environment. The hot and humid tropical rainforest, rocky terrain, and marshy land made excavation work far more difficult than anticipated. The unstable geology led to equipment failures and landslides.<sup>6</sup> Moreover, the tropical diseases endemic to the region, such as malaria and yellow fever, along with unsanitary working conditions, claimed the lives of many workers, causing significant delays in the canal's construction.<sup>7</sup>

Furthermore, Company C faced difficulties in securing funds, as it had limited support from the French government and was heavily reliant on private investors. Ultimately, the project led to severe financial problems, forcing the company to declare bankruptcy in 1889, resulting in the suspension of construction.<sup>8</sup>

After the failure of Company C, the U.S. government became interested in taking over the construction of the Panama Canal, recognizing its strategic and economic importance. In 1902, the U.S. Congress passed the Hepburn Act, officially authorizing the construction of the Panama Canal. Under this law, the U.S. government purchased the canal rights and assets from Company C for \$40 million\* and formally took over the project in 1904.<sup>9</sup> In 1903, the Panamanian local government declared independence from Colombia, becoming the present-day Republic of Panama (República de Panamá).

Learning from the failure of Company C, the U.S. government designated the construction of the Panama Canal as a direct government project, placing it under the supervision of the U.S. Army Corps of Engineers.<sup>10</sup> Additionally, the U.S. government implemented a large-scale mosquito eradication campaign to control yellow fever and malaria, and improved sanitary conditions. These measures protected the health of the workers and significantly reduced construction delays.<sup>11</sup>

Technically, the canal adopted a lock system that utilized Lake Gatun, an artificial lake created by damming the Chagres River. Located at the center of the canal, Lake Gatun sits 26 meters above sea level, higher than both the Pacific and Atlantic Oceans. By using this elevation difference and massive locks, ships can safely and efficiently navigate the changes in elevation and pass through the Isthmus of Panama.<sup>12</sup> This technological innovation enhanced the structural stability and functionality of the canal, allowing construction to proceed as planned.

After ten years of work, the Panama Canal, overcoming geographical barriers to link the Pacific and Atlantic Oceans and revolutionizing global shipping routes, was completed in 1914.<sup>13</sup>

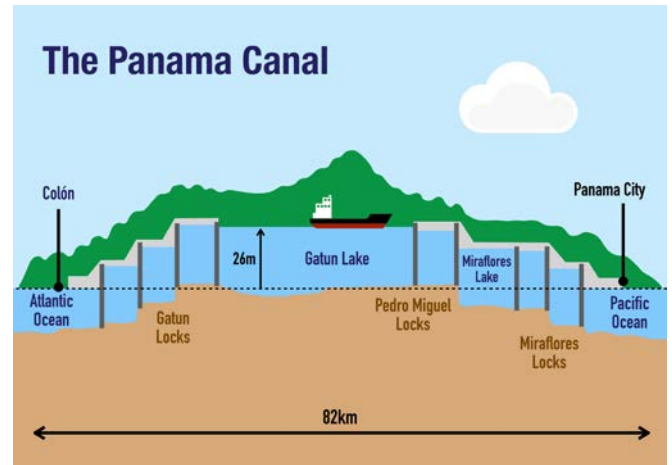


Figure 2: Lock System Utilizing Lake Gatun<sup>14</sup>

## 2.2 The Contemporary Importance of the Panama Canal

Since its construction, the Panama Canal has continued to play an indispensable role in international trade and maritime transport. Particularly after the September 11 attacks in 2001, as concerns over the energy policies dependent on the Middle East grew, the concept of economic security gained prominence in the United States. This, in turn, heightened the strategic importance of the Panama Canal, not only for the transportation of energy resources but also for various other goods critical to economic security.

The Panama Canal serves as a vital route connecting the Atlantic and Pacific Oceans, and is especially important for maritime transport between the United States, Asia, and Europe. It plays a crucial role in enhancing efficiency and reducing costs in international supply chains. Compared to the route that bypasses Cape Horn at the southernmost tip of South America, the canal allows ships to navigate more safely while significantly reducing the duration of voyages. On average, the shortened route saves

\* When adjusted for current value based on the Consumer Price Index (CPI), this amount is equivalent to approximately \$1.5 billion today.

approximately 8,000 nautical miles (14,800 km), reducing travel time by about 10 to 20 days.

Additionally, the cost-saving effect of transiting the Panama Canal is significant. On average, approximately 12,000 vessels pass through the canal each year, with an average deadweight tonnage (DWT) of around 33,000 tons.<sup>15</sup> This accounts for approximately 6% of global maritime trade.<sup>16</sup> According to Jones (2020), the fuel cost savings amount to approximately \$2 billion annually.<sup>17</sup> Furthermore, the reduction in voyage duration contributes to lower crew labor costs and improved operational efficiency, thereby reducing overall operating expenses.

From an environmental perspective, the Panama Canal plays a crucial role as well. By shortening shipping routes, it significantly reduces carbon dioxide emissions. According to calculations by the Panama Canal Authority, the canal helps reduce carbon dioxide emissions by approximately 13 million tons annually, which is equivalent to the amount emitted by around 3 million passenger cars in a year. This demonstrates that the Panama Canal contributes to the global reduction of greenhouse gas emissions.<sup>18</sup>

The Panama Canal also holds significant geopolitical importance. Many nations, including economic powerhouses like the United States, Japan, and China, rely on the canal, making its stability and security essential for global economic security.

As mentioned in the previous section, the United States recognized the strategic value of the Panama Canal early on and was deeply involved in its construction and operation. Notably, the U.S. managed the canal from 1904 until 1999, benefiting both militarily and economically by the nature of it connecting the mainland to the Pacific coast states.

After Panama regained full sovereignty over the canal in 1999, the Panama Canal Authority (ACP: Autoridad del Canal de Panamá) was established to manage and operate it. The ACP is responsible for a wide range of tasks, including water level

management and coordinating vessel transits, ensuring the efficient and sustainable operation of the Panama Canal.

Even with the transfer of canal operations to Panama, the Panama Canal remains indispensable for trade routes between the East and West coasts of the United States, and its stable operation is crucial to U.S. economic security.<sup>19</sup>

Japan and China are also significant users of the Panama Canal. For Japan, the canal is a key route for exporting goods quickly and efficiently from Asia to the U.S. East Coast, making it essential for the export of automobiles and electronic products. Similarly, China relies on the Panama Canal to secure access to the U.S. market, emphasizing its strategic importance as part of the Belt and Road Initiative.<sup>20</sup>

The Panama Canal also holds significant military importance. For the U.S. Navy, in particular, it facilitates rapid movement between the Pacific and Atlantic Oceans, enhancing military strategic flexibility and global deployment capabilities. As a result, the defense and stable operation of the Panama Canal are priorities for U.S. national security.

Another factor that underscores the contemporary importance of the Panama Canal is the completion of the Panama Canal Expansion Project in 2016. This project enabled the passage of larger vessels, known as Neo-Panamax ships, significantly enhancing the efficiency of logistics. As a result, the canal's annual transit capacity has increased approximately threefold, and about 6% of global trade now passes through the Panama Canal.<sup>21</sup> This expansion has increased the flexibility of logistics in trade between Asia, the Americas, and Europe, enabling companies to respond more quickly and efficiently to market fluctuations.<sup>22</sup>



Figure 3: 8th Anniversary of the Panama Canal Expansion

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Moreover, the economic impact of the expansion on the region has been significant. According to the Panama Canal Authority, the expansion project directly and indirectly created approximately 40,000 jobs, and it has contributed to the development of Panama's transportation and logistics sector, which accounts for about 8% of the country's GDP, enhancing its capacity and efficiency.

In conclusion, even more than a century after its completion, the Panama Canal continues to play a crucial role in international trade, geopolitical stability, environmental protection, and regional economic development.

### 3. The Vulnerabilities of the Panama Canal

#### 3.1 Transit Restrictions Due to Political Factors

Many maritime routes around the world are highly significant due to their lack of alternatives, making them susceptible to geopolitical influences. Examples of this include the imposition of transit fees or arbitrary passage restrictions by coastal states. This characteristic also applies to the Panama Canal, and as dependence on the canal increases, transit restrictions have the potential to easily disrupt the economies of various nations.

Looking back at the history of the Panama Canal from the perspective of transit restrictions due to political factors, one notable event is the anti-American riots of 1964. After gaining independence

from Colombia in 1903, the Panamanian government signed the Hay–Bunau-Varilla Treaty with the United States. In exchange for supporting Panama's independence, this treaty granted the United States autonomous control over the Panama Canal Zone, including maintaining security and infrastructure development. This treaty significantly limited Panama's sovereignty and was a source of long-standing friction between the two countries. In particular, tensions escalated in the 1960s over the issue of whether American ships transiting the Panama Canal Zone should fly the Panamanian flag.

On January 9, 1964, amidst these tensions, a confrontation between students over the raising of the American flag at Balboa High School in the Panama Canal Zone escalated into a large-scale riot that spread throughout Panama City. This eventually led to a temporary severance of diplomatic relations between the two countries.<sup>24</sup> As a result of the riots, transit through the canal was temporarily restricted, affecting numerous vessels and disrupting international logistics. This was particularly problematic for shipments from Asia to the U.S. East Coast, where dependence on the Panama Canal is high, forcing the use of alternative routes and leading to significant economic losses.<sup>25</sup>

These riots symbolized the growing discontent among Panamanians regarding U.S. control over the Panama Canal and served as a critical turning point in redefining the relationship between the two countries. This eventually led to the signing of the Torrijos-Carter Treaties in 1977, which guaranteed the canal's neutrality and set the stage for the full transfer of control to Panama by 1999.

Additionally, on December 20, 1989, the U.S. invasion of Panama, known as Operation Just Cause, aimed at ousting the dictator General Manuel Noriega, restoring democratic governance in Panama, and securing the safety of the canal, led to a temporary halt in canal transit, affecting numerous commercial vessels.

While detailed data on the economic losses from these two incidents is limited, it is estimated that the impact of the canal's closure or delays in transit due to such disruptions resulted in millions of dollars in losses, including costs associated with cargo delays and the need to use alternative routes.

### 3.2 Transit Restrictions Due to Natural Phenomena

The Panama Canal is subject to transit restrictions not only due to political factors but also as a result of natural phenomena. These natural phenomena, primarily driven by climate change and extreme weather events, have a significant impact on the operation of the canal.

For example, the impact of the El Niño phenomenon is particularly notable. El Niño is characterized by the warming of sea surface temperatures in the equatorial Pacific, which triggers global climate variations.<sup>26</sup> During the 1998 El Niño event, the water level of Lake Gatun, the primary water source for the Panama Canal, dropped significantly, necessitating restrictions on the maximum cargo load of transiting vessels.<sup>27</sup> As a result, vessels were required to reduce their cargo loads, leading to decreased logistical efficiency. This restriction reduced the number of ships able to transit the canal, impacting international trade.<sup>28</sup>

Heavy rainfall and flooding also have a significant impact on the Panama Canal. In December 2010, the canal region experienced unusually heavy rainfall, causing a rapid rise in the water levels of Lake Gatun and Lake Alajuela. This placed immense pressure on the canal's water management system.<sup>29</sup> As a result, the canal was temporarily closed, marking the first time since its opening that transit was halted due to weather conditions. This closure affected numerous commercial vessels and caused significant delays in logistics.<sup>30</sup> The flooding caused by heavy rainfall highlighted the need for swift response in the management of the canal.

Climate change presents serious challenges to the operation of the Panama Canal.<sup>31</sup> Rising

temperatures and changing precipitation patterns could have long-term effects on the canal's water resources, and maintaining stable water levels is crucial for smooth operations.<sup>32</sup> Since water shortages or excessive rainfall directly impact the canal's transit capacity, the Panama Canal Authority is working to enhance its water management system and improve predictive models. These efforts aim to minimize the effects of natural phenomena and maintain the smooth flow of international trade.<sup>33</sup>

As discussed above, considering the Panama Canal's susceptibility to natural phenomena, the 2023 El Niño event, like previous instances, had a significant impact on its operations. This is an important case study from the perspective of contemporary economic security, which will be examined in detail in the next section.

## 4. The Impact of the 2023 El Niño Phenomenon

### 4.1 Water Level Decline and Its Impact

The El Niño phenomenon is a natural occurrence triggered by the interaction between the ocean and atmosphere in the equatorial Pacific, influencing global weather patterns. The 2023 El Niño event was caused by the release of energy accumulated during a roughly three-year La Niña period, coupled with the weakening of trade winds. This led to an abnormal rise in sea surface temperatures in the eastern Pacific, which altered the Walker Circulation—a pattern of atmospheric circulation—resulting in the El Niño–Southern Oscillation (ENSO) climate cycle.<sup>34</sup> This shift in circulation disrupted normal climate patterns, leading to extreme weather events in various parts of the world, particularly in North and South America, India, and Asia.<sup>35</sup>

At the Panama Canal, the impact of this El Niño event led to a significant drop in the water level of Lake Gatun, its primary water source.

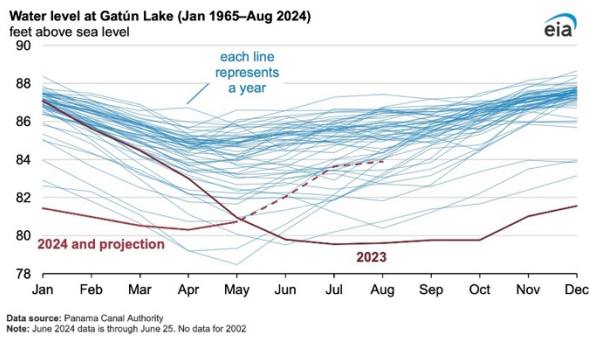


Figure 4: Water Level Changes in Lake Gatun<sup>36</sup>

As a result, the draft of vessels passing through the canal was restricted, forcing many ships to reduce their cargo loads to comply with the draft limitations.<sup>37</sup> Furthermore, the number of vessels that could transit the Panama Canal, typically ranging from 36 to 38 per day, was restricted to a maximum of 18 ships, forcing many to opt for alternative routes.<sup>38</sup> These constraints had a significant impact on global trade and logistics, particularly leading to increased transportation costs and delays in supply chains.<sup>39</sup>

In the same year, the Japan Coast Guard Academy's training vessel *Kojima*, during its around-the-world training voyage, had to abandon its planned transit through the Panama Canal and instead shift to training within the Pacific Ocean. This change was a direct result of the transit restrictions imposed on the Panama Canal due to the El Niño phenomenon, significantly impacting the training plans of the Japan Coast Guard Academy. Although this perspective differs from that of economic security, it is worth mentioning due to the considerable impact it had on the author's home organization.

#### 4.2 Impact on the Global Economy and U.S. Economic Security

The climate changes caused by the El Niño phenomenon have significantly impacted the operation of the Panama Canal, which, in turn, has had widespread effects on the global economy. The Panama Canal serves as a critical hub for global

maritime trade, particularly as a major sea route connecting the Pacific and Atlantic Oceans across the Americas. Consequently, operational restrictions on the canal have directly affected international trade logistics, leading to increased transportation costs and disruptions in supply chains. This has resulted in cargo delays and the need for rerouting, imposing additional costs on businesses. Specifically, the restrictions on the Panama Canal in 2023 are estimated to have caused economic losses exceeding \$2 billion globally.<sup>40</sup>

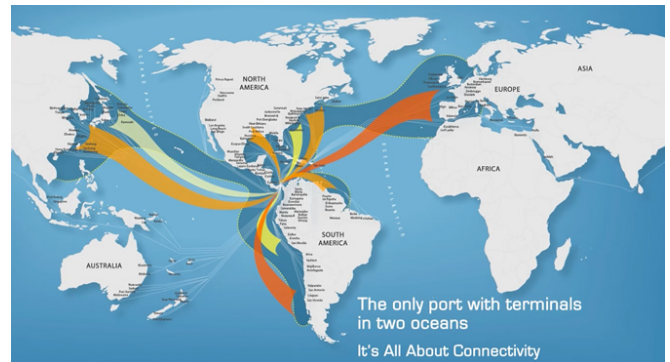


Figure 5: The Panama Canal Connecting Two Oceans<sup>41</sup>

The transit restrictions on the Panama Canal are particularly hindering the movement of goods between the United States and Asian countries. For nations east of India, which benefit from the trade efficiency and cost savings provided by the canal, these restrictions pose a significant challenge. Major exports from the U.S. to Asia include soybeans, corn, petroleum products, chemicals, and electronics. Conversely, imports from Asia to the U.S. consist of automobiles, electronic components, clothing, and machinery.

Major ports on the U.S. East Coast include the Port of New York and New Jersey, the Port of Savannah, the Port of Charleston, the Port of Virginia, and the Port of Miami. These ports serve as key entry points for imports from Asia, and the restrictions on the Panama Canal have a direct impact on logistics to these ports. The transit restrictions have led to longer shipping times and increased transportation costs, causing disruptions across the entire supply chain.<sup>42</sup>

Additionally, the Port of New York and New Jersey is known for its role in importing pharmaceuticals, batteries, and critical minerals, which are considered essential products for U.S. economic security.<sup>43</sup> Similarly, the Port of Savannah plays a crucial role in the importation of pharmaceuticals and critical minerals.<sup>44</sup>

Particularly, the United States is heavily reliant on Asia for many critical minerals, and the transit restrictions on the Panama Canal have significant implications from an economic security perspective. The U.S. is 100% dependent on imports for 12 out of the 50 designated critical minerals, and for more than 50% of its supply for an additional 31 minerals.<sup>45</sup> As a result, American industries face the risk of supply disruptions for these critical products, necessitating the exploration of alternative transportation routes and the strengthening of inventory management.

The United States is particularly dependent on China for mineral supplies, with China accounting for 63% of rare earth mining, 85% of processing, and 92% of magnet production.<sup>46</sup> This level of dependency creates vulnerabilities to supply disruptions and political risks, prompting the United States to diversify its mineral supplies and strengthen cooperation with Latin American and South American countries. However, much of this supply is transported through the Panama Canal, making the stability of the canal directly linked to U.S. economic security.

From the perspective of Japan's economic security, energy and other critical products are typically transported via the Indian Ocean and the Straits of Malacca and Singapore, while trade with Europe generally follows a route through the Suez Canal. Therefore, the transit restrictions on the Panama Canal did not pose direct economic security concerns for Japan.

However, the Panama Canal is a crucial route for trade with the U.S. East Coast, particularly for the transport of Japan's major exports, such as automobiles and electronic equipment, which rely on

the canal's efficiency. The canal's transit restrictions could lead to delays in Japanese companies' supply chains and increase transportation costs. This could make it more challenging for Japanese companies to access the U.S. market, potentially affecting their competitiveness. As a result, it is necessary for Japanese companies to secure alternative transportation routes and strengthen inventory management to mitigate these impacts.

### **4.3 Responses from Governments and Relevant Agencies**

In response to the impact of the Panama Canal transit restrictions on international trade, various governments and relevant agencies have implemented swift countermeasures.

To address the situation of declining water levels in the Panama Canal, the Panama Canal Authority introduced an auction system for transiting vessels in 2006. This system optimizes the number of vessels that can pass through the canal and promotes efficient water usage, thereby striving to maximize both the canal's operation and revenue.<sup>47</sup> Additionally, to effectively manage the canal's capacity, the Panama Canal Authority has adjusted the number of transits and revised the maximum draft levels. They are also planning to implement water conservation technologies and construct new reservoirs.<sup>48</sup>

Meanwhile, the U.S. government is working to strengthen supply chains and improve logistics infrastructure. The Biden administration has established the Office of Multimodal Freight Infrastructure and Policy to build a more resilient and adaptable supply network, focusing on maintaining and enhancing logistics networks. This office, through the Freight Logistics Optimization Works (FLOW) program under the U.S. Department of Transportation, is increasing the transparency of logistics data and supporting the efficient distribution of goods. The FLOW program collaborates with partners, including major container



ports and large retailers, to share information and optimize planning, making the supply network more reliable. This initiative includes efforts to bolster the nation's logistics infrastructure and improve the efficiency and transparency of supply chains, which indirectly helps mitigate the impacts of the constraints on the Panama Canal.<sup>49</sup>

Additionally, companies are being encouraged to optimize inventory management and develop diverse sources of supply, as part of efforts to reduce economic vulnerabilities.<sup>50</sup>

These responses underscore the importance of maintaining a flexible and robust supply chain network while addressing environmental and logistical challenges. The efforts of governments and relevant agencies are expected to contribute to the stability of international trade and the enhancement of economic security in the future.

Regarding the Japanese government, it pointed out that the preferential treatment for container ships in transit reservations, implemented by the Panama Canal Authority since last year, was unfair to other types of vessels. In response, a letter of request for improvement was issued in September of the same year. As a result, during the meeting of maritime authorities from advanced shipping nations, held in Washington, D.C., on Monday, April 29, and Tuesday, April 30, 2024, it was announced that the preferential measures at the Panamax locks had been withdrawn.<sup>51</sup>

However, since the same preferential treatment continues to be applied at the Neo-Panamax locks, the Japanese government is continuing to coordinate with the Panamanian authorities and is strengthening information dissemination to shipping companies to minimize logistical disruptions.

Moreover, in this context, diversifying transport routes across the Pacific and strengthening procurement networks within the Asia region are considered crucial. Japanese companies will need to focus on enhancing inventory management and

increasing the flexibility of production bases to mitigate uncertainties in international logistics.

## 5. Conclusion

This paper has examined the impact of the 2023 El Niño phenomenon on the Panama Canal, related international trade, and the economic security of the United States and Japan. The El Niño event of that year not only triggered various extreme weather conditions globally but also led to a significant drop in the water level of Lake Gatun, the primary water source for the Panama Canal, resulting in transit restrictions. These restrictions disrupted international supply chains, causing substantial economic losses, particularly in trade between the United States and Asian countries.

The Panama Canal is a strategically important sea lane for U.S. economic security. However, as discussed in this paper, this sea lane is vulnerable to both political and natural factors, and its stable operation is crucial for the U.S., particularly in importing essential products, including many mineral resources, from Asia. Similarly, Japan relies on the Panama Canal for efficient exports to the U.S. East Coast, and any transit restrictions could potentially impact the competitiveness of Japanese companies.

Governments and relevant agencies have introduced policies to respond swiftly to such situations, focusing on strengthening supply chains and securing alternative routes. The U.S. government is enhancing efforts to improve logistics infrastructure and establish new policy offices to increase the reliability and efficiency of supply networks. In Japan, there is a need to diversify transportation routes via the Pacific and strengthen procurement networks within the Asia region. The Japanese government has issued a request to the Panamanian government to address the preferential treatment for container ship reservations and is providing support to minimize logistical disruptions.

The stable operation of the Panama Canal is a critical factor in global trade and economic security. To ensure the safety of sea lanes, countries must collaborate to seek sustainable solutions, taking into account the impacts of climate change, such as El Niño. Moving forward, it is essential to continue

addressing the vulnerabilities of the Panama Canal and other sea lanes through international cooperation and policy coordination, to ensure the stability of global trade and the economy.

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