

Future of Maritime Security

Navigating Complex Waters in the Indo-Pacific

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Abstract

In the dynamic realm of international relations, maritime security holds enduring significance, particularly within the ever-evolving Indo-Pacific sphere. This research article aims to assess the trajectory of maritime security in the Indo-Pacific region up to the year 2040, with a specific emphasis on the shifting geopolitical landscape. Given the escalating strategic significance of the Indo-Pacific, comprehending the diverse challenges affecting the area is of utmost importance. Accordingly, this article examines the roles of pivotal actors such as China and the United States in addressing both existing and potential traditional and nontraditional security concerns through the lens of Alfred Thayer Mahan's theory of sea power. It seeks to illuminate regional cooperation mechanisms and their efficacy in addressing security challenges, notably considering emerging technologies' impact on naval strategies, cybersecurity, and environmental concerns. Finally, by navigating the intricate waters of regional security challenges, this research endeavors to outline potential strategies and solutions to safeguard maritime interests.

The Indo-Pacific region constitutes a pivotal maritime crossroads of immense global significance, where crucial sea routes, strategic interests, and economic prowess converge, shaping the indispensable framework of international security and global trade.¹ While the term *Indo-Pacific* had primarily been utilized by foreign policy experts, particularly in India, Australia, and Indonesia, the vast expanse had long been denoted as the *Asia-Pacific* by most Western nations. More readily adopted in the 2000s, the term reflects the escalating strategic and economic significance of the region.²

Geographically vast, this area spans from the western coasts of the Americas to the eastern reaches of Africa, enveloping both the Pacific and Indian Oceans. In essence, it serves as a central hub for transnational commerce, connecting major economies through vital sea lanes.³

¹ Udayan Das, "What Is the Indo-Pacific?," *The Diplomat*, 13 July 2019, <https://thediplomat.com/>.

² Maria Siow, "What Is the Indo-Pacific Region and Why Does the US Keep Using This Term?," *South China Morning Post*, 26 August 2021, <https://www.scmp.com/>.

³ Rishav Kaundal, "Why Is Indo-Pacific Region Important for the World?," *Xamnation*, 17 February 2022, <https://www.xamnation.com/>.

Notably, the Indo-Pacific grapples with a myriad of complex security challenges. These encompass longstanding territorial disputes over sea and land boundaries, alongside contemporary concerns regarding resource utilization, as well as emerging threats such as cyberattacks, environmental degradation, and piracy.⁴

A thorough examination of regional history, geography, and stakeholder interactions is essential for grasping the intricacies of regional dynamics. Within this context, it is pertinent to consider the evolving currents of international relations to underscore the enduring importance of maritime security within the evolving global landscape, particularly in the vital Indo-Pacific region.

Furthermore, environmental challenges, including overfishing, pollution, and the impacts of climate change, have emerged as critical maritime security concerns. Extreme weather events, rising sea levels, and the degradation of marine ecosystems not only directly threaten coastal areas but also have broader implications for maritime activities and infrastructure.

Hence, this research aims to delve into the complex evolution of maritime security dynamics in the Indo-Pacific and project trends until the year 2040, with a focus on the region's shifting geopolitical terrain. The research will comprehensively examine the key roles played by primary stakeholders, primarily the United States and China, in addressing both existing and potential traditional and nontraditional security concerns. These concerns encompass cybersecurity, the transformative effects of emerging technologies on naval strategies, and the environmental landscape within the maritime domain. Accordingly, the objective is to highlight cooperation mechanisms and assess their effectiveness in managing diverse security challenges in the region. Ultimately, the research will offer future implications tailored for international actors, policy makers and military strategists engaged in navigating strategic complexities.

The significance of the Indo-Pacific extends beyond its geography; it holds strategic importance as well. Economic powerhouses like China, South Korea, India, and Japan consider it home. Furthermore, global heavyweights like the United States and Russia significantly influence the regional dynamics. It is crucial to note that within the ever-evolving dynamics, each stakeholder distinctly contributes to shaping the region's balance of power.⁵

In this regard, China's ascendancy is evident, demonstrated by ambitious economic endeavors such as the Belt and Road Initiative (BRI), aimed at fostering

⁴ Rajan Kochhar, "Indo Pacific Region: Challenges and Opportunities," *Taazakhabar News*, 25 November 2021, <https://taazakhabarnews.com/>.

⁵ Patrick Wintour, "Why Britain Is Tilting to the Indo-Pacific Region," *The Guardian*, 15 March 2021, <https://www.theguardian.com/>.

connectivity and showcasing economic strength. Conversely, the United States seeks to safeguard its interests in the region, as evidenced by its longstanding naval presence.⁶ Additionally, other significant players like Japan, India, Australia, and numerous Southeast Asian countries each contribute uniquely to shaping regional dynamics.⁷

Mahan's Theory of Sea Power

One of the key theories that significantly impacts the domain of maritime security and is relevant to the research is Mahan's theory of sea power. Developed by Alfred Thayer Mahan, a US naval officer and an influential theorist of sea power, the theory emphasizes the crucial role of maritime power in shaping a country's geopolitical and strategic influence and its global dominance.⁸

The theory underscores the importance of naval strength, arguing that a strong navy is paramount for a country's security, global influence, and economic prosperity. Mahan asserts that controlling sea routes, possessing a powerful fleet, and establishing naval bases are crucial to securing maritime interests and dominating international trade routes.⁹

Mahan distinctively listed six primary elements of sea power:

- Physical conformation;
- Geographical position;
- Extent of territory;
- The character of the people;
- Size of population; and
- The character of the government.

Concerning the Indo-Pacific, the sea power theory holds immense relevance due to the region's extensive coastline, vital sea lanes, and strategic waterways. Historically, regional countries have acknowledged the value of naval power and maritime dominance, aligning with Mahan's principles.

⁶ "Indo-Pacific Strategy of the United States" (fact sheet, The White House, 11 February 2022), <https://www.whitehouse.gov/>.

⁷ Mohd Akhter Ali and M. Kamraju, "Indo-Pacific Significance: A Study on Geopolitical Impact on India and China," ResearchGate, 20 June 2019, <https://www.researchgate.net/>.

⁸ Alfred Thayer Mahan, *The Influence of Sea Power upon History* (Boston: Little, Brown, and Co., 1890).

⁹ Thomas Jamison, "Alfred Thayer Mahan: 'The Influence of Sea Power upon History' as Strategy, Grand Strategy, and Polemic," *Classics of Strategy and Diplomacy* (blog), 23 August 2023, <https://classicsofstrategy.com/>.

Applied to the power struggle between China and the United States in the region, the theory provides insights into how the two have contested and projected their maritime interests in the Indo-Pacific.¹⁰ It illuminates their respective strategies for maintaining naval supremacy, projecting power, and establishing naval bases across the regional maritime arena.

Furthermore, Mahan's theory elucidates the significance of controlling key chokepoints like the Strait of Malacca, Strait of Hormuz, Lombok Strait, Bab el-Mandeb, Sunda Strait, and Taiwan Strait. This control ensures the security of trade routes and the strategic dominance of maintaining a formidable naval presence.¹¹

Historical Context of Maritime Security in the Indo-Pacific

Historically, maritime security in the Indo-Pacific region is deeply intertwined with the rich regional history of trade, geopolitical dynamics, and exploration. Traditionally, it served as a maritime hub, facilitating cultural exchanges and trade routes spanning expansive stretches across the Pacific and Indian Oceans.¹²

In antiquity, regional maritime activities were largely driven by the ancient trade networks of civilizations such as China, Mesopotamia, the Mediterranean, and the Indus Valley powers. These routes fostered the exchange of cultures, ideas, and goods, contributing to the region's cultural diversity and economic prosperity.¹³

During the colonial era, European powers like the British, Dutch, Portuguese, Spanish, and French exerted control over various parts of the Indo-Pacific, establishing trading outposts and exploiting resources. Colonization brought significant changes to regional maritime dynamics, including the establishment of naval bases, trading posts, and dominance over crucial maritime lanes.¹⁴

The Indo-Pacific gained strategic importance during the twentieth century, particularly during World War II, when intense military engagements and naval battles, especially in the Pacific theater, occurred.¹⁵ This resulted in a shift in power dynamics and shaped subsequent maritime security concerns.

¹⁰ Camilla Tenna Nørup Sørensen, "U.S.-China Strategic Rivalry in the Indo-Pacific," *DIIS Policy Brief*, 27 April 2020, <https://pure.diiis.dk/>.

¹¹ Benedetta Girardi, Paul van Hooff, and Giovanni Cisco, *What the Indo-Pacific Means to Europe: Trade Value, Chokepoints, and Security Risks* (The Hague: The Hague Centre for Strategic Studies, 20 November 2023), <https://hcsc.nl/>.

¹² Dhruva Jaishankar, "Maritime Connectivity and Security in the Indo-Pacific," Brookings, 25 September 2023, <https://www.brookings.edu/>.

¹³ Jaishankar, "Maritime Connectivity and Security in the Indo-Pacific."

¹⁴ Jaishankar, "Maritime Connectivity and Security in the Indo-Pacific."

¹⁵ Gurpreet S. Khurana, "The 'Indo-Pacific' Concept: Retrospect and Prospect," Center for International Maritime Security, 14 November 2017, <https://cimsec.org/>.

Following World War II, the region experienced decolonization, leading to the emergence of independent nations amid Cold War dynamics. Military alliances and strategic bases were established throughout the region, thrusting it into the center stage of global geopolitics, with the United States playing a dominant role in maintaining maritime security through naval presence and coalitions.

In the post–Cold War era, the US has pursued a comprehensive strategy aimed at containing China’s rise and influence in the Indo-Pacific region. Conversely, China’s approach to the Indo-Pacific has sparked much discussion and debate.¹⁶ Some Chinese scholars contend that the US *Indo-Pacific Strategy* aims to constrain China’s geopolitical ascent while safeguarding American leadership and interests in the region.

Hence, the historical evolution and contemporary power struggles related to maritime security in the Indo-Pacific reflect a complex tapestry of colonization, trade, conflicts, and power dynamics. Understanding this historical backdrop is imperative for comprehending the intricate interplay of geopolitical forces in the region and addressing contemporary maritime security challenges.

Regional Disputes and Territorial Claims

The Indo-Pacific region is characterized by numerous regional disputes and territorial claims with significant implications for security and stability.¹⁷ These disputes often revolve around strategic waterways, maritime boundaries, and natural resources. The lack of resolution poses serious challenges to freedom of navigation, regional stability, and adherence to international maritime laws, notably the United Nations Convention on the Law of the Sea (UNCLOS).

Efforts to resolve these disputes persist through diplomacy, legal frameworks, and multilateral dialogues, recognizing that any upheaval could have far-reaching consequences beyond the region.¹⁸ However, due to a myriad of reservations stemming from historical grievances, geopolitical rivalries, and national interests among the involved countries, finding mutually acceptable solutions has remained a complex and elusive challenge.

¹⁶ “Reinventing the Indo-Pacific,” *The Economist*, 4 January 2023, <https://www.economist.com/>.

¹⁷ Arzan Tarapore, “Three Dilemmas Facing the Indo-Pacific’s Regional Order,” *Asia Pacific Bulletin*, 29 June 2021, <https://www.eastwestcenter.org/>.

¹⁸ Tarapore, “Three Dilemmas Facing the Indo-Pacific’s Regional Order.”

South China Sea Dispute

The South China Sea is a critical area of contention, with overlapping territorial claims by China, the Philippines, Vietnam, Malaysia, and Brunei. Central to the dispute are China's expansive claims, notably its assertion of sovereignty over much of the region through the Nine-Dash Line, a claim that has been deemed illegal by international rulings, including the Permanent Court of Arbitration's landmark decision in 2016.

China's claim of control over the South China Sea has contributed to heightened regional tensions and prompted concerns among neighboring countries and the international community. The delineation of the Nine-Dash Line, overlapping the territorial waters and EEZs of other claimant states, has contributed to these concerns. This strategically vital area is rich in natural resources, including oil and gas reserves, and hosts critical sea lanes through which a significant portion of global trade passes. As such, the South China Sea has become a focal point for geopolitical competition, with countries vying for control over its resources and maritime routes.

In addition to disputes over sovereignty and maritime boundaries, incidents of maritime standoffs and confrontations have occurred, further exacerbating tensions in the region. China's construction of artificial islands and military installations in disputed waters has raised alarm bells among neighboring countries and the international community, as it undermines efforts to resolve the dispute through peaceful means and violates international law.

The South China Sea dispute underscores the importance of upholding the principles of international law, including the UNCLOS, in resolving maritime disputes and maintaining regional stability. The Permanent Court of Arbitration's ruling in 2016, which invalidated China's claims based on historical rights, serves as a legal precedent that should guide efforts to peacefully resolve the dispute and uphold the rights of all claimant states in accordance with international law.¹⁹

East China Sea Dispute

The conflict between China and Japan over the sovereignty of the Diaoyu/Senkaku Islands presents a significant challenge to regional stability and adherence to international law in the East China Sea. Both countries assert ownership of these uninhabited islands, which are strategically located and surrounded by rich fishing grounds and potential oil and gas reserves.

¹⁹ Center for Preventive Action, "Territorial Disputes in the South China Sea," *Global Conflict Tracker*, 28 February 2024, <https://www.cfr.org/>.

From an international law perspective, the legal status of the Diaoyu/Senkaku Islands remains ambiguous. While China claims historical sovereignty over the islands dating back centuries, Japan argues that it has maintained effective control over them since the late nineteenth century. The lack of a clear legal basis for either claim complicates efforts to resolve the dispute through established legal mechanisms, such as international arbitration or mediation.

The dispute has escalated tensions in the region, leading to intensified maritime patrols, occasional confrontations between naval vessels and coast guard ships, and violations of airspace. These actions not only heighten the risk of conflict but also undermine efforts to promote peaceful resolution through diplomatic channels and adherence to international law.

Both China and Japan have a responsibility to abide by international legal principles, including those outlined in the UN Charter, which emphasizes the peaceful settlement of disputes and respect for the sovereignty and territorial integrity of all states. Any attempts to unilaterally alter the status quo or assert control over disputed territories without legal justification are inconsistent with these principles and risk destabilizing the region.

Efforts to address the Diaoyu/Senkaku Islands dispute should be guided by a commitment to upholding international law and promoting peaceful resolution through dialogue and negotiation. The involvement of impartial third-party mediators and adherence to established legal frameworks, such as the UNCLOS, could help facilitate a resolution that respects the rights and interests of all parties involved while contributing to regional stability and cooperation.²⁰

India–China Border Dispute

The ongoing border dispute between China and India in the Himalayan regions, notably Arunachal Pradesh and Aksai Chin, presents a complex issue with differing perspectives. China maintains its claims over these areas, asserting historical and geographical grounds, despite India's sovereignty claims. Arunachal Pradesh is viewed by China as disputed territory, challenging India's assertion of it being an integral part of its territory. Similarly, Aksai Chin's occupation by China following the 1962 Sino-Indian War is perceived as legitimate by China, citing historical association. China's perspective emphasizes its commitment to safeguarding its territorial integrity and national security interests in the region. However, these disputes contribute to periodic standoffs and military tensions, affecting

²⁰ Sun-won Park, "The East China Sea Dispute: Short-Term Victory and Long-Term Loss for China?" *Brookings*, 28 July 2016, <https://www.brookings.edu/>.

regional stability. Additionally, China's support for Pakistan, including infrastructure projects in Pakistan-occupied Kashmir, adds complexity to the situation, influencing regional dynamics and exacerbating Indo-China border tensions.

India consistently emphasizes the pursuit of a peaceful resolution to the border dispute through diplomatic channels, underscoring the importance of respecting established borders and international law. In contrast, China asserts a different stance, emphasizing its own considerations and positions in these negotiations. The challenges in achieving a lasting resolution stem from the complex dynamics and differing perspectives of the involved parties.

Considering these challenges, India remains committed to safeguarding its territorial integrity and sovereignty. The Indian government prioritizes strengthening border infrastructure, enhancing military capabilities, and fostering strategic partnerships with like-minded nations to address what it perceives as China's expansionist agenda and maintain regional stability. India emphasizes the importance of upholding principles such as sovereignty, territorial integrity, and respect for international law in seeking a peaceful resolution to the border dispute.

On the other hand, from the Chinese perspective, the country views its activities in the region as legitimate efforts to protect its territorial sovereignty and maintain stability along its borders. China asserts its rights to develop infrastructure and enhance security measures in areas it claims as its own, including those disputed with India. From China's viewpoint, these actions are consistent with its commitment to safeguarding its national interests and ensuring regional security. China also advocates for peaceful negotiations based on mutual respect and adherence to international law to resolve the border dispute with India.²¹

Maritime Boundaries in the Indian Ocean

Maritime boundary disagreements and territorial disputes in the Indian Ocean region highlight the complexities of maintaining stability and upholding international law. While disputes between neighboring countries are not uncommon, it is essential to address them through peaceful means and in accordance with established legal principles, rather than resorting to revanchism or irredentism.

The disputes between India and Sri Lanka, India and Pakistan, and unresolved maritime claims between Myanmar and Bangladesh are illustrative examples of the challenges faced in delineating maritime boundaries and resolving territorial disputes in the Indian Ocean. These disagreements often stem from historical

²¹ "India-China Dispute: The Border Row Explained in 400 Words," *BBC News*, 13 December 2022, <https://www.bbc.com/>.

grievances, competing territorial claims, and resource competition, further complicated by overlapping EEZs and continental shelf claims.

In addressing these disputes, it is imperative to adhere to the principles of international law, including the UNCLOS, which provides a comprehensive legal framework for resolving maritime disputes. UNCLOS establishes rules for the delimitation of maritime boundaries, the determination of EEZs and continental shelf rights, and the peaceful settlement of disputes through negotiation, mediation, or arbitration.

Resorting to revanchism or irredentism, which involve seeking to regain or assert control over territories based on historical claims or ethnic affiliations, only serves to exacerbate tensions and undermine efforts to promote peace and stability in the region. Instead, all parties involved should demonstrate a commitment to dialogue, cooperation, and respect for international law in addressing maritime boundary disputes.

By engaging in constructive dialogue and adhering to established legal mechanisms, countries in the Indian Ocean region can work toward mutually beneficial solutions that uphold the rights and interests of all parties involved while fostering trust, cooperation, and regional stability. This approach is essential for ensuring the peaceful and sustainable management of maritime resources and promoting the rule of law in the Indian Ocean.²²

Andaman and Nicobar Islands

The Andaman and Nicobar Islands hold immense strategic significance for India, serving as a vital outpost in its maritime defense posture and projecting its influence in the Indian Ocean region. However, China's increasing assertiveness in the region has raised concerns regarding its intentions and actions vis-à-vis these strategically located islands.

The border dispute between India and China concerning the Andaman and Nicobar Islands underscores India's sovereign rights and territorial integrity. They are considered integral to India, and any actions by China that challenge or undermine India's control over them are seen as contentious and may elicit strong opposition.

Given their strategic location at the entrance to the Malacca Strait, one of the world's busiest maritime chokepoints, the Andaman and Nicobar Islands are critical for controlling and monitoring maritime traffic in the Indian Ocean. Indian

²² Harshit Bhimrajka, "Maritime Boundaries and Disputes in the Indian Ocean Region," *iPleaders* (blog), 7 December 2020, <https://blog.ipleaders.in/>.

warships and aircraft routinely patrol the waters around these islands to safeguard India's maritime interests and ensure the security of vital sea lanes.

China's interest in the Andaman and Nicobar Islands raises concerns about its intentions in the Indian Ocean region. China's ambitious BRI includes plans for infrastructure projects in the Indian Ocean, raising suspicions about its strategic objectives and potential encroachment on India's sphere of influence.

The Andaman and Nicobar Islands hold significance in India's maritime defense strategy and regional security framework. Potential challenges from China to India's control over these islands are expected to be met with a determined response, potentially serving as a point of concern in the ongoing maritime dynamics between the two nations in the Indian Ocean region.²³

Geopolitical Dynamics in the Indo-Pacific

The shifting power dynamics among key players in the Indo-Pacific have significantly shaped the regional geopolitical landscape. China's rapid economic growth and military modernization have profoundly altered the balance of power in the region. The evolution of China's naval capabilities and the construction of artificial islands in the South China Sea, coupled with initiatives like the BRI, exemplify its aspirations to assert regional influence. This ascent has raised considerable concerns among other stakeholders, particularly the United States and other regional powers, regarding China's intentions and their ramifications for regional stability.

As a longstanding power in the region, the United States has pursued a strategy of rebalancing, pivoting its focus toward the Indo-Pacific. This strategic realignment aims to enhance its presence, reinforce alliances, and counterbalance China's expanding influence. Initiatives such as the Indo-Pacific Command (INDOPACOM) and increased military engagements and partnerships in the region underscore the US commitment to maintaining its role as a major actor.²⁴

Furthermore, alongside China and the US, other regional powers like Japan and India have been asserting their influence. Japan's Free and Open Indo-Pacific (FOIP) vision and India's Act East Policy reflect their endeavors to foster connectivity, ensure regional stability, and enhance strategic partnerships.²⁵ It is worth

²³ Abhinav Singh, "EXPLAINED: How India Developing a Naval Base at Andamans Chokes China in the Region," *WION*, 15 March 2023, <https://www.wionews.com/>.

²⁴ "Reinventing the Indo-Pacific," *The Economist*.

²⁵ "Japan's Foreign Policy by Region," in *Diplomatic Bluebook 2021* (Tokyo: Ministry of Foreign Affairs [Japan], 2021), <https://www.mofa.go.jp/>.

noting that these regional powers are increasingly assuming pivotal roles in shaping the geopolitical dynamics of the Indo-Pacific.

Correspondingly, territorial disputes among countries in the East China Sea, South China Sea, and Indian Ocean have spurred the formation of coalitions and strategic alignments. As a result, regional countries such as the Philippines, Japan, Vietnam, and Australia have sought closer ties with the United States and other regional powers to counterbalance China's expanding influence in response to perceived threats.

Along these lines, countries in the Indo-Pacific have expanded their alliances to navigate the evolving geopolitical landscape.²⁶ This includes engaging with nontraditional partners like European countries and pursuing multilateral collaboration to address common challenges such as maritime trade, security, and infrastructure development.

This signifies the intricate web of strategic interactions and power dynamics among key stakeholders in the Indo-Pacific, which continually experiences a complex interplay of alliances, interests, and competition, profoundly influencing the regional security architecture and carrying far-reaching implications for cooperation and stability.

Furthermore, the multifaceted roles of the United States, China, and other key players significantly impact the geopolitical landscape. Historically, the United States has been a linchpin in the Indo-Pacific in terms of regional security, economic development, and stability, as evidenced by its presence characterized by alliances, military partnerships, and a purported commitment to ensuring a rules-based order in the Indo-Pacific.²⁷

However, US involvement has been viewed cautiously by some nations, primarily considering its strategic interests and military presence. Some perceive US policies as contributing to regional tensions, particularly in its responses to China's growing influence. Moreover, shifts in US foreign policy priorities and occasional inconsistencies have raised concerns among regional partners regarding the credibility of its commitments.²⁸

On the other hand, China's ascension as a global powerhouse has been accompanied by rapid economic growth and a determination to pursue its strategic interests, as evidenced by its economic initiatives like the BRI and the construction

²⁶ Siow, "What is the Indo-Pacific region?"

²⁷ Sanjay Pulipaka and Mohit Musaddi, "In Defence of the 'Indo-Pacific' Concept," *Observer Research Foundation*, Issue Brief no. 493, 21 September 2021, <https://www.orfonline.org/>.

²⁸ "Indo-Pacific Strategy of the United States" (fact sheet, The White House).

of artificial islands in the South China Sea, demonstrating its ambition to expand influence and enhance connectivity across the region.²⁹

While China's economic engagement has offered opportunities for infrastructure development and trade, its assertive actions in regional territorial disputes, notably in the South China Sea, have sparked concerns among neighboring countries and major stakeholders. Some critics highlight China's increasing military presence in the region as a potential threat to adherence to international norms and regional stability.³⁰

In addition, other regional players such as Australia, Japan, India, and South-east Asian nations also play significant roles in shaping the Indo-Pacific. They promote economic cooperation, forge strategic alliances, and enhance defense capabilities through nuanced approaches aimed at maintaining a delicate balance for regional stability.

Policy Initiatives and Regional Cooperation Mechanisms

Significant policy initiatives and regional cooperation mechanisms have been instrumental in shaping maritime security dynamics in the Indo-Pacific. Major stakeholders in the region have established cooperation frameworks and initiatives to address joint maritime security concerns:

ASEAN-led Mechanisms

The Association of Southeast Asian Nations (ASEAN) has taken proactive steps to address maritime security concerns in the Indo-Pacific region by establishing important platforms such as the ASEAN Regional Forum (ARF) and the East Asia Summit (EAS). These fora serve as crucial avenues for promoting confidence-building measures, fostering cooperation, and facilitating dialogue among major stakeholders and member states.

The ARF and the EAS play pivotal roles in enhancing regional security architecture by providing opportunities for open discussions and collaboration on maritime security issues. Through these platforms, participating countries can share information, exchange best practices, and coordinate responses to common challenges, thereby contributing to the maintenance of peace and stability in the region.

One notable aspect of ASEAN's efforts in promoting maritime security is the conduct of joint naval exercises among Indo-Pacific countries. These exercises serve

²⁹ Associated Press, "China Has Fully Militarized Three Islands in South China Sea, US Admiral Says," *The Guardian*, 21 March 2022, <https://www.theguardian.com/>.

³⁰ Associated Press, "China Has Fully Militarized Three Islands."

as practical demonstrations of cooperation and interoperability among regional navies, enhancing their collective capacity to address maritime threats and challenges. By participating in joint exercises, countries not only strengthen their military capabilities but also build trust and confidence among themselves, laying the groundwork for future collaboration in ensuring maritime security.

Overall, the initiatives spearheaded by ASEAN, including the ARF and joint naval exercises, underscore the importance of multilateral cooperation in addressing maritime security challenges in the Indo-Pacific. Through sustained efforts and engagement, ASEAN and its partners can continue to build a robust framework for regional security that promotes peace, stability, and prosperity for all stakeholders in the Indo-Pacific region.³¹

Shangri-La Dialogue

The Shangri-La Dialogue, organized annually by the International Institute for Strategic Studies (IISS), holds significant importance as a premier platform for fostering dialogue and cooperation among military chiefs, policy makers, and defense ministers from major stakeholders in the Indo-Pacific region. Representatives from countries such as the United States, China, Japan, and others gather at this forum to deliberate on pressing regional security issues, exchange perspectives, and build mutual understanding.

As a high-level security forum, the Shangri-La Dialogue provides a valuable opportunity for key decision-makers to engage in open and frank discussions on a wide range of security challenges facing the Indo-Pacific region. These discussions cover various topics, including maritime security, territorial disputes, military modernization, counterterrorism, and nontraditional security threats such as cybersecurity and climate change.

One of the primary objectives of the Shangri-La Dialogue is to promote transparency and confidence-building measures among regional stakeholders. By facilitating face-to-face interactions and dialogues, the forum helps to reduce misunderstandings, manage tensions, and foster trust among participants. This, in turn, contributes to the maintenance of peace and stability in the region.

Moreover, the Shangri-La Dialogue serves as a platform for the exchange of views and perspectives on strategic developments and security challenges. Partici-

³¹ John Bradford, "Evolving Conceptualizations of Maritime Security in Southeast Asia," Asia Maritime Transparency Initiative, 4 November 2021, <https://amti.csis.org/>; and Adriana Elisabeth, "ASEAN Maritime Security and Power Interaction in the Region," in *ASEAN Maritime Security*, ed. Faudzan Farhana Khanisa (Singapore: Springer, 2022), 93–110, <https://doi.org/>.

pants can articulate their respective countries' policies, priorities, and concerns, allowing for a better understanding of each other's perspectives and interests.

In addition to formal discussions, the Shangri-La Dialogue also provides valuable opportunities for informal networking and bilateral meetings on the sidelines of the main event. These interactions enable participants to deepen their relationships, explore areas of cooperation, and build personal rapport, which can be instrumental in addressing security challenges and advancing regional cooperation.

Overall, the Shangri-La Dialogue plays a vital role in promoting dialogue, enhancing trust, and fostering cooperation among major stakeholders in the Indo-Pacific region. By facilitating constructive engagement and exchange, the forum contributes to the development of pragmatic solutions and strategies for maintaining peace, stability, and prosperity in the region.³²

The Quadrilateral Security Dialogue's Initiatives

The Quadrilateral Security Dialogue, commonly known as the Quad, is a strategic partnership comprising the United States, Japan, India, and Australia. Originating from informal discussions in the aftermath of the 2004 Indian Ocean tsunami, the Quad has evolved into a significant forum for like-minded Indo-Pacific powers to address regional security challenges and promote shared interests.

At its core, the Quad seeks to uphold a FOIP vision, which emphasizes the promotion of a rules-based international order, respect for international law, and the preservation of freedom of navigation and overflight in the Indo-Pacific region. By championing these principles, the Quad aims to counterbalance any attempts by authoritarian powers to assert unilateral dominance and undermine the established norms and institutions that underpin regional stability and prosperity.

One of the primary areas of focus for the Quad is maritime security. Given the strategic importance of maritime trade routes and the increasing militarization of the Indo-Pacific region, the Quad members recognize the imperative of safeguarding maritime domains against various security threats, including piracy, terrorism, illegal fishing, and maritime coercion. Through coordinated naval exercises, intelligence-sharing mechanisms, and capacity-building initiatives, the Quad seeks to enhance interoperability among their respective naval forces and

³² Lalit Kapur, "Tensions at the Shangri-La Dialogue," *Delhi Policy Group Policy Brief* 8, no. 20 (18 June 2023), <https://www.delhipolicygroup.org/>; Joseph Clark, "Austin Underscores Importance of Partnerships in Securing a Shared Vision for Indo-Pacific," *DOD News*, 2 June 2023, <https://www.defense.gov/>; and Hunter Marston, "Eyes on Asia: Shangri-La Security Dialogue's Role in Managing Great Power Rivalry," *9DASH-LINE*, 7 June 2023, <https://www.9dashline.com/>.

strengthen maritime domain awareness to ensure the safety and security of sea lanes of communication.

In addition to maritime security, the Quad also places significant emphasis on infrastructure development to promote connectivity, economic growth, and resilience in the Indo-Pacific region. Recognizing the critical role of infrastructure in shaping geopolitical dynamics and fostering regional integration, the Quad members have pledged to collaborate on high-quality, transparent, and sustainable infrastructure projects that adhere to international standards and best practices. By investing in infrastructure development, the Quad aims to address infrastructure gaps, promote economic development, and enhance the resilience of Indo-Pacific nations against external pressures and coercion.

Overall, the Quad represents a strategic alignment of like-minded democracies committed to advancing a rules-based order and promoting peace, stability, and prosperity in the Indo-Pacific region. Through their collective efforts in maritime security cooperation and infrastructure development, the Quad members seek to shape the regional security architecture and contribute to the long-term peace and prosperity of the Indo-Pacific.³³

Bilateral and Multilateral Agreements

Repeatedly, many Indo-Pacific nations have engaged in bilateral agreements to strengthen maritime security. For example, the US has security alliances with South Korea, Australia, the Philippines, and Japan for the sake of regional stability. Aside from that, trilateral agreements between countries like Japan, the US, and India have also emerged to address shared security concerns.

Maritime Domain Awareness Initiatives

In the Indo-Pacific region, many nations have recognized the importance of bilateral agreements to strengthen maritime security and promote regional stability. These agreements serve as frameworks for cooperation, intelligence-sharing, joint exercises, and capacity-building initiatives aimed at addressing common security challenges and threats in the maritime domain.

One prominent example of such bilateral agreements is the network of security alliances established by the United States with key partners in the region. These

³³ Jagannath P. Panda and Ernest Gunasekara-Rockwell, eds., *Quad Plus and Indo-Pacific: The Changing Profile of International Relations* (New York: Routledge, 2022); Kyoko Hatakeyama et al., “The Quad’s Growing Focus on Maritime Security,” *Domino Theory*, 29 February 2024, <https://dominotheory.com/>; and Yui Nishimura and Atsushi Tago, “Are Shared Values Valuable?: Liberal Democracy and Human Rights among AUKUS and its Future Membership,” *International Journal* 78, no. 3 (September 2023): 394–416, <https://doi.org/>.

alliances, forged through bilateral treaties and agreements, play a crucial role in enhancing maritime security and deterring potential threats. For instance, the United States maintains security alliances with countries such as South Korea, Australia, the Philippines, and Japan, which serve as linchpins for regional stability. Through these alliances, the US provides security assurances to its partners, conducts joint military exercises, and coordinates efforts to address shared security concerns, including maritime threats, territorial disputes, and regional instability.

In addition to bilateral alliances, trilateral agreements have also emerged as a mechanism for enhancing maritime security cooperation in the Indo-Pacific. These agreements involve three countries coming together to address shared security challenges and promote regional stability. For example, trilateral agreements between Japan, the United States, and India have gained prominence in recent years, reflecting the growing strategic convergence among these countries. These trilateral partnerships aim to deepen defense cooperation, enhance interoperability among their respective armed forces, and address common security concerns, including maritime security, counterterrorism, and regional stability.

Furthermore, bilateral and trilateral agreements often complement multilateral frameworks and initiatives aimed at promoting maritime security in the Indo-Pacific. By leveraging existing partnerships and networks of cooperation, countries in the region can pool their resources, expertise, and capabilities to effectively address complex security challenges and uphold the rules-based order in the maritime domain.

Overall, bilateral and trilateral agreements play a vital role in strengthening maritime security cooperation and promoting regional stability in the Indo-Pacific. By fostering closer ties and collaboration among key stakeholders, these agreements contribute to the maintenance of peace and security in one of the world's most strategically significant regions.

Despite the importance of these initiatives, challenges persist in their effective implementation. Historical disputes, geopolitical tensions, and differing strategic interests present complexities that hinder seamless cooperation among participating nations.³⁴

While regional collaboration platforms have facilitated dialogue and confidence-building measures among key actors, challenges remain due to varying threat perceptions, divergent strategic interests, and historical disputes among member states. These factors continue to impede efforts toward achieving seamless cooperation in addressing maritime security challenges.³⁵

³⁴ Jasmin Alsaied, "How to Make the Indo-Pacific Partnership for Maritime Domain Awareness Work," *The Diplomat*, 12 October 2022, <https://thediplomat.com/>.

³⁵ Alsaied, "How to Make the Indo-Pacific Partnership."

Evolution of Regional Maritime Security Concerns

The regional maritime security concerns in the Indo-Pacific have undergone significant transformations, reflecting emerging challenges and a changing geopolitical landscape. Initially, the focus was on protecting merchant vessels from raiders and piracy, as well as safeguarding trade routes. However, over time, the scope expanded to encompass broader security issues, including geopolitical rivalries, the proliferation of nonstate actors engaged in maritime criminal activities, the impact of climate change, and territorial disputes.³⁶

One ongoing challenge in the Indo-Pacific is territorial disputes over maritime boundaries, EEZs, and islands. For example, the South China Sea has been a focal point of contention involving regional countries like China, the Philippines, Vietnam, and others, along with the involvement of the United States. These disputes have led to heightened tensions and conflicting claims, posing implications for regional stability and security.

The comprehensive US *Indo-Pacific Strategy* aims to address various challenges and promote US interests in the region. Under the Biden administration, efforts have been made to assert US leadership in the region and adapt its role for the twenty-first century.³⁷ Consequently, since 2022, the United States has strengthened emerging partnerships, forged innovative links, and modernized its longstanding alliances to address urgent challenges, including competition with China, the COVID-19 pandemic, and climate change. Notably, the United States has undertaken these endeavors at a time when its partners and allies throughout the world are increasingly engaging in the region.

Beijing contends that the US *Indo-Pacific Strategy* aims to constrain China's rise geopolitically while safeguarding US leadership and interests in the region. Moreover, China asserts that its expanding influence through initiatives like the BRI, ostensibly aimed at infrastructure development and connectivity across Asia, Europe, and Africa, is intended to promote shared prosperity through peaceful means. However, China's growing military presence in the region, particularly in the South China Sea, has led to tensions with other regional countries.³⁸

Against the backdrop of the Indo-Pacific's evolving geopolitics, the contemporary relationship between the United States and China is undergoing a critical juncture. The two countries are engaged in a new great-power competition, leading to uncertainties surrounding various geopolitical flashpoints across the region,

³⁶ Alsaied, "How to Make the Indo-Pacific Partnership."

³⁷ "Indo-Pacific Strategy of the United States" (fact sheet, The White House).

³⁸ Dingding Chen, "What China Thinks of the Indo-Pacific Strategy," *The Diplomat*, 27 April 2018, <https://thediplomat.com/>.

including the Taiwan Strait. Despite efforts by both sides' political leadership to de-escalate tensions and prevent inadvertent crises, there is a heightened risk of potential kinetic exchanges between the United States and China.³⁹

Moreover, nontraditional security threats such as maritime piracy, illegal fishing, human trafficking, and the smuggling of drugs and arms have emerged as significant challenges to maritime security.⁴⁰ These activities not only undermine the stability of coastal communities and regional economies but also pose risks to the safety of vessels and crew. Additionally, the rise of asymmetric threats, such as insurgency and terrorism, further complicates the security landscape as extremist groups exploit the maritime domain for illegal activities and target maritime infrastructure.⁴¹

Furthermore, the rapid advancement of technology has introduced new dimensions to maritime security concerns, particularly in the form of cyberthreats targeting maritime infrastructure, communication networks, and navigation systems. These cyberthreats pose substantial risks to the security and safety of maritime operations, adding to the complexity of maritime security challenges in the Indo-Pacific region.⁴²

Regional Environmental Maritime Security

In addition to traditional threats, climate change has emerged as one of the most significant nontraditional challenges globally.⁴³ The Indo-Pacific region has also experienced alterations in average weather patterns due to climate change, including changes in precipitation, temperature, and other atmospheric conditions. Carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) are the primary

³⁹ Chen, "What China Thinks of the Indo-Pacific Strategy."

⁴⁰ Erin Zimmerman, "Security Cooperation in the Indo-Pacific: Non-Traditional Security as a Catalyst," *Journal of the Indian Ocean Region* 10, no. 2 (2014): 150–65, <https://doi.org/>; and Brandon Prins et al., "Tackling Maritime Security Requires a Revised Indo-Pacific Strategy," *War on the Rocks*, 22 June 2023, <https://warontherocks.com/>.

⁴¹ Sreeparna Banerjee and Pratinashree Basu, "Countering Nontraditional Security Threats," *Indo-Pacific Defense Forum*, 16 December 2022, <https://ipdefenseforum.com/>.

⁴² Chan Yan Jau, "Cyber-Attacks as an Evolving Threat to Southeast Asia's Maritime Security," *Asia Maritime Transparency Initiative*, 7 December 2022, <https://amti.csis.org/>.

⁴³ "Climate Change 'Biggest Threat Modern Humans Have Ever Faced', World-Renowned Naturalist Tells Security Council, Calls for Greater Global Cooperation" (press release, UN Security Council, 23 February 2021), <https://press.un.org/>.

drivers of contemporary climate change, influenced by various natural and human-induced factors.⁴⁴

Climate change affects both marine and terrestrial ecosystems in the Indo-Pacific region, making it a significant factor in contemporary global security with specific implications for regional maritime security. The intersection of environmental changes, such as rising sea levels and extreme weather events, with geopolitical complexities has resulted in numerous challenges.⁴⁵

The Indo-Pacific region is particularly vulnerable to the impacts of climate change. The rise in sea levels threatens coastal regions, including critical maritime infrastructure and naval installations. Littoral states such as Myanmar, Indonesia, the Philippines, Vietnam, Sri Lanka, Pacific island nations, and Bangladesh face displacement, while critical infrastructure may encounter logistical obstacles due to encroaching waters.

Moreover, the region is susceptible to severe cyclones, storms, and unpredictable weather patterns, which can disrupt maritime operations, endanger shipping and ports, and affect vital coastal facilities. This disruption poses a threat to maritime trade and rescue operations, ultimately impacting regional stability.⁴⁶

Touching briefly on environmental challenges in each Indo-Pacific country, Bangladesh faces riverbank erosion exacerbated by climate change, which impacts agriculture and displaces communities. Water pollution and deforestation further threaten the country's ecosystems.

The Maldives confronts an existential threat from rising sea levels, critically impacting the nation. As coral reefs degrade due to climate change, fisheries and tourism suffer significant setbacks.⁴⁷

Indonesia grapples with environmental security issues, including deforestation driven by agricultural expansion and illegal logging, leading to biodiversity decline

⁴⁴ Melanie Pill, "Understanding 'lost and damage' from climate change across the Indo-Pacific," *The Interpreter*, 24 July 2023, <https://www.lowyinstitute.org/>; and Piers Forster et al., "Changes in Atmospheric Constituents and in Radiative Forcing," in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the 4th Assessment Report of the Intergovernmental Panel on Climate Change*, ed. Susan Solomon et al. (New York: Cambridge University Press, 2017): 131–234, <https://www.ipcc.ch/>.

⁴⁵ Robert Glasser, Cathy Johnstone, and Anastasia Kapetas, eds., *The geopolitics of climate and security in the Indo-Pacific* (Barton: Australian Strategic Policy Institute, 24 February 2022), <https://www.aspi.org.au/>.

⁴⁶ Glasser, Johnstone, and Kapetas, eds., *The geopolitics of climate and security*.

⁴⁷ Amit Ranjan, "Rising Sea Levels: Threat for the Maldives," *ISAS Briefs*, 8 December 2021, <https://www.isas.nus.edu.sg/>.

and habitat loss. Additionally, forest fires, exacerbated by climate change, worsen air quality concerns.⁴⁸

Similarly, Vietnam, Myanmar, Sri Lanka, and Thailand face challenges from climate change–induced rising sea levels in the Mekong Delta, posing significant risks to livelihoods and agriculture.⁴⁹ Industrial pollution and deforestation also threaten environmental sustainability in these countries, while Myanmar additionally contends with water pollution and climate-change effects.

The Philippines faces environmental challenges, including frequent typhoons and storms resulting in landslides, flooding, and coral reef degradation. Overfishing and improper waste disposal further impact marine ecosystems.

Sri Lanka and Thailand also grapple with issues such as illegal fishing, coral reef degradation, and water pollution. East Timor or Timor Leste struggles with sustainable economic development and natural resource management challenges.

Pacific island nations like Kiribati, Tuvalu, and the Marshall Islands are particularly vulnerable to climate change, experiencing rising sea levels, extreme weather events, and ocean acidification. Preservation of freshwater resources is crucial for their sustainability.

India, China, Japan, South Korea, Singapore, Malaysia, Brunei, and Cambodia are other regional stakeholders facing significant maritime environmental challenges. Coastal pollution, habitat degradation, and unsustainable resource exploitation affect marine ecosystems. Rising sea levels and extreme weather events, exacerbated by climate change, pose substantial threats, increasing the vulnerability of coastal regions and impacting infrastructure, communities, and fisheries.

Deforestation and urbanization contribute to soil erosion and sedimentation, further impacting water quality. Additionally, maritime traffic and industrial activities can lead to oil spills and chemical pollution, jeopardizing marine ecosystems' health. The Indo-Pacific's heavy reliance on maritime trade heightens the risk of accidental spills and introduces invasive species.

Collaborative efforts are essential to address these challenges, emphasizing sustainable resource management, climate adaptation, and pollution control. Such

⁴⁸ Kathryn Hansen, "Indonesian Fires Return in 2023," Earth Observatory, 2 October 2023, <https://earthobservatory.nasa.gov/>.

⁴⁹ To Quang Toan, "Climate Change and Sea Level Rise in the Mekong Delta: Flood, Tidal Inundation, Salinity Intrusion, and Irrigation Adaptation Methods," in *Coastal Disasters and Climate Change in Vietnam*, ed., Nguyen Danh Thao, Hiroshi Takagi, and Miguel Esteban (New York: Elsevier, 2014): 199 – 218, <https://doi.org/>; and Anamitra Anurag Danda, "Climate Change and Sea-Level Rise in the BIMSTEC Region: Towards a Suitable Response," *ORF Issue Brief*, October 2022, <https://www.orfonline.org/>.

measures are crucial for ensuring the long-term security and health of maritime environments across the region.⁵⁰

Evolving Maritime Technologies

Analyzing technological advancements in the Indo-Pacific region through the lens of Mahan's theory of sea power entails examining several key aspects.⁵¹ The development and deployment of autonomous vessels, equipped with advanced sensors and artificial intelligence (AI) to perform tasks independently, are revolutionizing maritime operations by enhancing patrolling, surveillance, and data collection capabilities. Similarly, the utilization of underwater drones or unmanned underwater vehicles (UUV) for reconnaissance, monitoring undersea activities, and mapping ocean floors is increasingly common, thereby improving underwater surveillance and data gathering capabilities.⁵²

The integration of such advanced technologies is reshaping naval strategies, with a growing emphasis on leveraging autonomous vessels and UUVs expected to further transform traditional maritime tactics.⁵³ Currently, rapid advancements in maritime technologies have significantly enhanced situational awareness by providing real-time data on maritime activities, aligning with Mahan's emphasis on understanding and controlling critical maritime spaces to exert influence.

However, this reliance on corresponding systems and digitized platforms in the maritime domain has also increased cybersecurity risks in the region, particularly through cyberattacks targeting communication networks, navigation systems, and data breaches. Therefore, safeguarding essential maritime infrastructure from cyberthreats through robust cybersecurity mechanisms is imperative.⁵⁴

The incorporation of evolving maritime technologies not only enhances domain awareness and reshapes naval strategies but also underscores the importance of securing technological infrastructure for sustained sea power, in line with Mahan's theory. Addressing future cybersecurity challenges is essential to leverage these advancements while ensuring a resilient and secure maritime domain in the Indo-Pacific.

⁵⁰ *ASEAN Maritime Outlook* (Jakarta: ASEAN Secretariat, August 2023), <https://asean.org/>.

⁵¹ Daniel F. Runde, Conor M. Savoy, and Owen Murphy "Post-Pandemic Infrastructure and Digital Connectivity in the Indo-Pacific," *CSIS Briefs*, November 2020, <https://csis-website-prod.s3.amazonaws.com/>.

⁵² Tate Nurkin, *The Five Revolutions: Examining Defense Innovation in the Indo-Pacific Region* (Washington, DC: Atlantic Council, December 2020), <https://www.atlanticcouncil.org/>.

⁵³ Nurkin, *The Five Revolutions*.

⁵⁴ Ash Rossiter and Brendon J. Cannon, *Conflict and Cooperation in the Indo-Pacific: New Geopolitical Realities* (New York: Routledge, 2020).

Implications for Maritime Security in 2040

Anticipating the implications for regional maritime security by 2040 through the lens of Mahan's theory of sea power provides a framework to forecast potential scenarios and their ramifications.⁵⁵ If territorial disputes persist, it is foreseeable that intensified naval competition among major actors such as the United States and China, vying for maritime supremacy through increased military build-ups and enhanced naval capabilities, will escalate the regional power struggle, in accordance with Mahan's emphasis on the significance of naval might in securing sea routes and controlling strategic points.

The prevalence of unresolved disputes may pose challenges related to the freedom of navigation, a central tenet in Mahan's theory. Additionally, tensions in vital maritime chokepoints could lead to heightened disruption of maritime trade and economic activities, underscoring the importance of controlling crucial sea lanes.

Mahan also advocated for harnessing emerging technologies for naval supremacy. However, looking ahead, the maritime domain may face increased cyberthreats due to AI-driven cyberwarfare and vulnerabilities in maritime technology.

Considering the naval strategist's emphasis on the primacy of diplomacy in securing sea power, concerted diplomatic efforts and adherence to international law could potentially pave the way for peaceful resolutions. Consequently, confidence-building measures and cooperative initiatives may aid in fostering alliances to bolster maritime security and mitigate tensions.

In this context, the significance of alliances cannot be overstated, and persistent disputes may prompt realignments in partnerships among regional powers to uphold maritime influence and counterbalance rising powers.

Environmental Challenges Seen through the Lens of Mahan's Theory

Against the backdrop of the complex regional maritime landscape, environmental challenges emerge as pivotal factors shaping the region's trajectory. Assessing these challenges through the lens of Mahan's theory unveils the significance and ramifications of rising sea levels, resource competitions, and climate adaptation strategies. It is crucial to recognize that the mounting threats posed by rising sea levels in climate-vulnerable coastal areas, coupled with intensified competition for maritime resources, compound the complexities encountered in ensuring naval dominance. Additionally, echoing Mahan's advocacy for adaptable maritime strat-

⁵⁵ Jamison. "Alfred Thayer Mahan."

egies, the imperative for climate adaptation strategies underscores the need to safeguard naval assets and infrastructure amid evolving environmental conditions.⁵⁶

Hence, understanding and mitigating environmental challenges are imperative for fostering resilient maritime forces and safeguarding the region's strategic interests effectively. In this regard, evaluating environmental challenges in the Indo-Pacific entails considering several key aspects:

- Rising sea levels resulting from climate change present a significant threat to low-lying coastal regions across the Indo-Pacific. These areas encompass the small island nations of Tuvalu, Kiribati, Tokelau, and the Marshall Islands, as well as the coastal zones of China and Indonesia. It is crucial to recognize that densely populated and highly productive agricultural river deltas, such as the Mekong, Irrawaddy, and Ganges-Brahmaputra, confront increased risks of flooding, erosion, and salinity intrusion. Consequently, coastal erosion, land inundation, and the loss of critical infrastructure emerge as urgent concerns.
- Similarly, coastal communities, vital maritime infrastructure, and naval installations face heightened vulnerabilities due to greater exposure to extreme weather events and rising sea levels. It is essential to acknowledge that such susceptibility undermines Mahan's emphasis on securing strategic coastal regions for maritime dominance.
- Moreover, the Indo-Pacific region has a history of competition for maritime resources, including fisheries, energy reserves, and minerals. The potential overexploitation and competition for limited resources may lead to conflicts among states, thereby affecting regional stability.
- In this context, climate adaptation strategies are indispensable for naval and maritime forces to mitigate the impacts of climate change. Therefore, the implementation of coastal defenses, the advancement of climate-resilient technologies, and infrastructure enhancements are imperative measures.⁵⁷

Furthermore, Mahan's theory underscores the importance of developing strategies to adapt to changing environmental conditions to maintain maritime supremacy. Climate adaptation measures are in accordance with this principle to secure control over maritime domains and naval assets.

⁵⁶ Jamison. "Alfred Thayer Mahan."

⁵⁷ *Ocean Climate Action Plan: A Report by the Ocean Policy Committee* (Washington, DC: The White House, March 2023), <https://www.whitehouse.gov/>; and "Building Resilience: Indo-Pacific Militaries Adapt, Fortify against Climate Impacts," *Indo-Pacific Defense Forum*, 18 December 2023, <https://ipdefenseforum.com/>.

Addressing rising sea levels, resource competition, and implementing climate adaptation strategies are imperative for the Indo-Pacific region. To uphold maritime superiority amid evolving environmental challenges, aligning Mahan's emphasis on coastal control, resource management, and adaptive strategies with these endeavors is essential.⁵⁸

Environmental Degradation's Impact on Maritime Security in the Indo-Pacific

The environmental challenges facing countries in the Indo-Pacific region significantly impact both conventional security and maritime security.⁵⁹ These impacts are multifaceted and affect various aspects of regional security.

Extreme weather events, rising sea levels, and coastal erosion have the potential to hinder the operational capability of naval forces. Damage to naval bases, ports, and vital infrastructure can hamper the readiness and deployment of maritime assets.

Climate change-induced frequent and severe natural disasters necessitate an increase in humanitarian assistance and disaster response missions for naval forces. Consequently, this affects the ability to respond to traditional security threats, diverting resources from conventional security activities.

Rivalry over maritime resources, such as oil reserves and fisheries, due to environmental degradation, can potentially escalate into security challenges. Disputes over these resources may cause tensions and conflicts between neighboring countries.

Extreme weather events and changes in sea currents can disrupt established maritime trade routes. Securing these routes is crucial for maintaining economic stability and national security, as well as addressing navigational challenges and potential disruptions in the flow of goods.

Environmental challenges can exacerbate socio-economic issues, leading to social unrest and instability, fostering piracy, smuggling, and other illicit maritime activities.

Disputes over environmental resources can heighten geopolitical tensions, as competing claims over EEZs and strategic sea lanes may threaten regional security and overall stability in the Indo-Pacific.

Climate-induced migration and displacement can result in demographic shifts and increased competition over limited resources due to environmental changes. This may lead to border disputes and security challenges.

⁵⁸ "Warming of the Indo-Pacific Ocean Is Changing Global Rainfall Patterns," Climate Program Office, 27 November 2019, <https://cpo.noaa.gov/>.

⁵⁹ Conor M. Savoy and Thomas Bryja, "Challenges and Opportunities in the Indo-Pacific Water Sector," CSIS, April 2023, <https://csis-website-prod.s3.amazonaws.com/>.

Furthermore, regional environmental degradation can facilitate illegal activities such as poaching, trafficking, and illegal fishing, escalating security threats.⁶⁰

Security Challenges in the Indo-Pacific Region in 2040

Projecting the regional security challenges by 2040 necessitates a comprehensive assessment of various factors. The current issues confronting the Indo-Pacific region are poised to exacerbate by 2040 if not addressed through mutual consensus among all stakeholders, potentially leading to heightened tensions between the United States and China if their aggressive behaviors persist.⁶¹ However, the predominant challenges for the region's prosperity and security will revolve around regulating the proliferation of digitized and technology-driven systems amid pervasive geopolitical tensions, combating climate change and its resultant rising sea levels and intensified natural disasters, and managing resources alongside economic development while ensuring security.

Traditionally, the ongoing escalation of naval capabilities by key stakeholders, including China, India, Japan, the United States, and others, may escalate conventional security threats, resulting in the proliferation of advanced naval technologies such as aircraft carriers, submarines, and long-range (hypersonic) missiles, along with sophisticated weaponry including cyberwarfare capabilities and unmanned systems. Additionally, the adoption of innovative military strategies such as anti-access/area-denial (A2/AD) measures could exacerbate strategic competition among prominent naval powers.⁶² Submarine-based activities, particularly in contested regions like the South China Sea, are likely to increase the risk of inadvertent incidents or miscalculations, amplifying security challenges with global implications.⁶³

Furthermore, due to the vast expanse of maritime routes, maritime crimes are expected to persist despite concerted efforts to combat piracy. Contemporary tactics employed by evolving criminal networks could pose significant challenges to maritime security, particularly in vulnerable areas. These tactics may include piracy and armed robbery, involving cargo theft, vessel hijackings, and crew kidnappings

⁶⁰ Savoy and Bryja, "Challenges and Opportunities in the Indo-Pacific Water Sector."

⁶¹ Julian Ryall, "Can US and Japan Push Back against China in Indo-Pacific?," *Deutsche Welle*, 16 March 2021, <https://www.dw.com/>.

⁶² Hassan M. Kamara, "Countering A2/AD in the Indo-Pacific: A Potential Change for the Army and Joint Force," *Joint Forces Quarterly* 97, no. 2 (April 2020): 97–102, <https://ndupress.ndu.edu/>.

⁶³ Seth Robson, "More undersea activity in South China Sea increases risks, experts say after submarine crash," *Stars and Stripes*, 8 October 2021, <https://www.stripes.com/>.

for ransom. The South China Sea and the Malacca Strait are particularly susceptible to such activities.⁶⁴

Illegal, unreported, and unregulated (IUU) fishing activities by criminal networks using technologically advanced fishing vessels to evade detection through the exploitation of weak enforcement and governance in certain maritime zones will continue to pose a threat in the future. Criminal networks have expanded their operations to include cyberattacks targeting maritime infrastructure, including port facilities, vessels, and shipping companies. Cyberthreats are a significant concern as they can compromise sensitive data, pose safety risks, and disrupt operations.

Furthermore, other crimes such as contraband smuggling and the use of unmanned systems like drones and UUVs for smuggling operations, surveillance, or even deploying explosives or other illicit payloads, as well as collusion between criminal elements and officials or corrupt practices within local maritime authorities, will remain persistent threats in the future.

In the realm of cybersecurity, the growing reliance on interconnected systems in maritime security may expose vulnerabilities to widespread cyberattacks, including state-sponsored cyberattacks aimed at disrupting critical infrastructure or military networks, navigation systems, data breaches, and disinformation campaigns, posing significant challenges to both national and regional security by undermining maritime operations and communications.

Similarly, the increased integration of AI into naval technologies and warfare systems has the potential to revolutionize maritime operations. AI-enabled decision-making, autonomous vessels, and UUVs may introduce uncertainties and complexities in naval strategies, revolutionizing the dynamics of surveillance and conflicts in the maritime domain.

Prospects for Enhanced Cooperation by 2040

Potential enhanced cooperation by 2040 hinges on bolstered collaboration among regional players to strengthen existing mechanisms and establish new frameworks that foster greater trust and dialogue. In this regard, the inclusion of nontraditional global entities, such as European nations, along with expanded participation from emerging maritime powers, could deepen collaboration to promote collective responses to evolving security challenges.

Given the convoluted security dynamics of the Indo-Pacific, addressing challenges to cooperation, fostering inclusive engagement, and leveraging existing

⁶⁴ Claire Gute, "South China Sea: Where Piracy Impedes Smooth Sailing," *Asia Media*, 6 August 2021, <https://asiamedia.lmu.edu/>.

mechanisms are pivotal to enhancing regional partnerships for fostering a long-lasting maritime environment and addressing emerging security threats by 2040.⁶⁵

Historical crises, like the Taiwan Strait confrontations between China and Taiwan, highlight the risk of military escalation and underscore the importance of diplomatic de-escalation strategies.⁶⁶ Similarly, historical maritime conflicts like piracy in the Malacca Strait and naval battles such as the First Sino-Japanese War (1894-1895), the Second Sino-Japanese War (1937-1945), and the World War II Pacific Theater, including battles like Midway, the Coral Sea, and naval clashes around Guadalcanal, emphasize the need for collaboration between stakeholders for regional peace. Moreover, post-World War II, sporadic maritime altercations and disputes involving many countries in the Indo-Pacific region have occurred.⁶⁷

The highly intricate maritime security landscape of the Indo-Pacific calls for collaborative endeavors and innovative approaches. Military strategists, policy makers, and international actors, including China and the United States, must prioritize cooperative frameworks and technological advancements while acknowledging historical lessons.

Synthesizing the extensive evaluation of maritime security in the Indo-Pacific yields vital results and implications. Based on Mahan's theoretical framework of sea power, it efficiently demonstrates multi-dimensional challenges in the region. Traditional threats like naval capabilities will persist alongside evolving nontraditional threats, environmental vulnerabilities, and technological advancements. Fostering cooperation mechanisms that transcend geopolitical tensions is imperative, particularly in policy making, by emphasizing dialogue, leveraging technological advancements, and building trust.

Future research should deeply analyze technological innovations like AI-driven warfare for enhanced cybersecurity resilience. Understanding the implications of regional conflicts on maritime security is crucial for fortifying cooperation initiatives.

Looking toward 2040, there are encouraging possibilities for improved collaboration in the realm of environmental security within the Indo-Pacific. Countries in the region are increasingly inclined to collaborate for sustainable solutions, acknowledging the shared challenges and susceptibilities imposed by climate change, ecosystem degradation, and rising sea levels. Cooperation can encompass joint

⁶⁵ Cleo Paskal, "Indo-Pacific Strategies, Perceptions and Partnerships," Chatham House, 23 March 2021, <https://www.chathamhouse.org/>.

⁶⁶ Scott L. Kastner, "Is the Taiwan Strait Still a Flash Point?: Rethinking the Prospects for Armed Conflict between China and Taiwan," *International Security* 40, no. 3 (2016): 54 – 92, <https://doi.org/>.

⁶⁷ Paul Hardman, "Maritime Trade Is Essential to the Indo-Pacific," *Proceedings* 149, no. 5 (May 2023): <https://www.usni.org/>.

efforts in climate resilience, resource management, and the mitigation of environmental risks affecting security. This collaborative approach may foster a collective commitment to protecting maritime environments and coastal areas, with a shared understanding that environmental issues transcend national boundaries. Moreover, nations in the region may build a resilient and ecologically sustainable future through joint research initiatives, technology exchange, and coordinated policy frameworks, safeguarding both regional security and environmental integrity. This approach not only addresses pressing environmental challenges through collaborative efforts but also lays the foundation for strengthened regional ties and a shared commitment to the well-being of Indo-Pacific nations. 🌐

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