

Strategic Maritime-Air Defense in the Bay of Bengal: Bangladesh's Comprehensive Security Architecture

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Introduction

The Bay of Bengal represents a critical maritime crossroads, positioned strategically between South and Southeast Asia, connecting two major economic blocs - SAARC and ASEAN. For Bangladesh, this maritime domain is vital as over 90% of its trade is sea-borne, highlighting the nation's profound dependence on maritime routes. The Bay's strategic value is amplified by its role in global trade, with approximately 25% of the world's traded goods traversing these waters, including crucial energy resources from the Persian Gulf. Bangladesh's maritime interests encompass the protection of vital sea lines of communication (SLOCs), safeguarding offshore resources and blue economy potential, ensuring port security at Chittagong, Mongla, and Payra, and maintaining sovereignty over maritime zones.



Source: Observer Research Foundation

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The need for an integrated maritime-air defense architecture stems from emerging multi-domain threats and intensifying great power competition in the region. As China, India, and the United States vie for influence, Bangladesh must develop robust defensive capabilities to protect its maritime interests.

This commentary aims to analyze Bangladesh's current maritime-air defense posture and propose a comprehensive security framework that addresses both traditional and non-traditional threats while advancing national maritime interests.

Strategic Environment Assessment

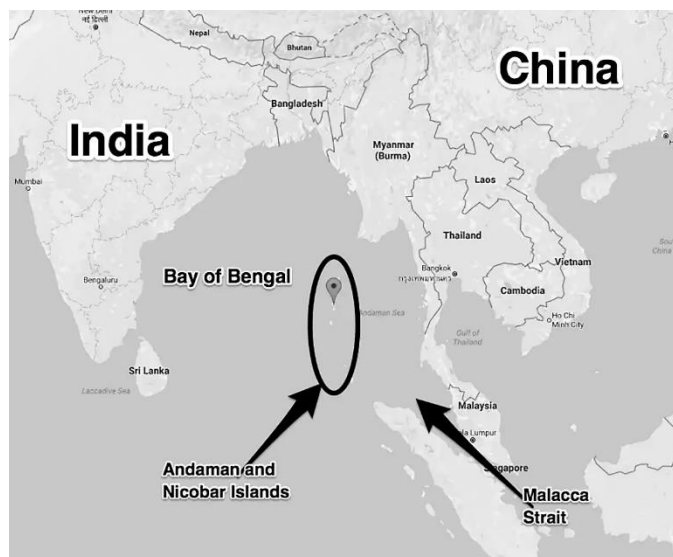
Maritime-Air Security Landscape

The Bay of Bengal has emerged as a critical theater for maritime security, where traditional and non-traditional threats converge. Two vital sea lines of communications (SLOCs) traverse the region - one connecting Eastern nations through the Malacca Strait, and another linking to the Middle East². The maritime landscape faces multiple challenges, including terrorism, piracy, unregulated fishing, and environmental threats³. Nearly 70% of China's petroleum imports pass through the Malacca Strait, making it a crucial chokepoint that shapes regional power dynamics⁴.

² India Foundation. "MARITIME SECURITY IN BAY OF BENGAL: POTENTIAL CHALLENGES AND OPPORTUNITIES," November 1, 2019. <https://indiafoundation.in/articles-and-commentaries/maritime-security-in-bay-of-bengal-potential-challenges-and-opportunities/>.

³ Prothom Alo English Desk, and Prothom Alo English Desk. "Bay of Bengal Is a Platform for Regional Cooperation and Competition." Prothom Alo, May 29, 2024. <https://en.prothomalo.com/bangladesh/0ffhg2qss4>.

⁴ Marine Corps University. "Neglected Maritime Terrain in the Bay of Bengal," n.d. <https://www.usmcu.edu/Outreach/Marine-Corps-University-Press/MCU-Journal/JAMS-vol-13-no-2/Neglected-Maritime-Terrain-in-the-Bay-of-Bengal/>.



Source: Marine Corps University

Geopolitical Dimensions

The geopolitical environment is characterized by intensifying great power competition. China's String of Pearls strategy, evidenced by port developments in Pakistan and Myanmar, directly challenges India's traditional influence⁵. India maintains robust presence through its Andaman and Nicobar Islands command, actively monitoring Chinese submarine activities in the region⁶. BIMSTEC serves as a primary platform for regional cooperation, comprising Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand⁷. However, the organization remains underutilized, with habits of cooperation largely absent and institutional mechanisms underdeveloped⁸. The Indo-Pacific framework has heightened the Bay's strategic significance, particularly given its proximity to the Malacca Strait⁹. This evolving security architecture requires

⁵ ibid

⁶ ibid

⁷ ibid

⁸ Admin. "Introduction: Fostering Cooperation to Connect the Bay of Bengal Region - CSEP." CSEP - Centre for Social and Economic Progress, February 17, 2023. <https://csep.org/reports/introduction-fostering-cooperation-to-connect-the-bay-of-bengal-region/>.

⁹ Friedrich Naumann Foundation. "Call for Paper: Global Security Implications of the Bay of Bengal," n.d. <https://www.freiheit.org/south-asia/global-security-implications-bay-bengal>.

balanced engagement among regional stakeholders while addressing both traditional and non-traditional security challenges.

Current Security Challenges

Traditional Security Threats

Bangladesh faces an array of conventional security challenges in the Bay of Bengal. Maritime terrorism remains a persistent threat, with groups potentially targeting shipping lanes and port facilities. Naval force projection by regional powers, particularly China and India, has intensified, with increased submarine activities in Bangladesh's maritime zones. In 2023 alone, there were multiple reports of unauthorized submarine movements near the Bangladesh coast. The country recorded 47 airspace violations in 2022-23, highlighting vulnerabilities in maritime-air defense coordination. These incidents underscore the need for enhanced surveillance capabilities and rapid response mechanisms.



Non-Traditional Security Threats

Illegal, Unreported and Unregulated (IUU) fishing costs Bangladesh approximately \$119 million annually, threatening both economic security and marine biodiversity¹⁰. The country's maritime zones have become transit routes for transnational criminal networks:

- **Drug trafficking:** Increased seizures along the maritime route (32% rise in 2023)¹¹
- **Human trafficking:** Over 500 cases reported in coastal areas (2022-23)
- **Arms smuggling:** Multiple interdictions reported by Coast Guard

¹⁰ Paul, Shourav Kumar. "Maritime Non-Traditional Security Threats Against the Blue Economy: Collaborative Approach of Maritime Agencies in Bangladesh." *Journals.Bpatc.Gov.Bd*, 2023. <https://doi.org/10.36609/bjpa.v31i1.892>.

¹¹ United Nations: United Nations Office on Drugs and Crime in Brazil. "GMCP – Global Maritime Crime Programme," n.d. <https://www.unodc.org/cofrb/en/projetos/crime-organizado-e-mercados-ilicitos/gmcp.html>.

- **Environmental challenges:** Rising sea levels, coastal erosion, and marine pollution

Existing Defense Architecture

Naval Components

Bangladesh Navy operates a diverse fleet including 2 submarines, 5 guided missile frigates, 2 patrol frigates, and 6 guided missile corvettes. The newly commissioned BNS Sheikh Hasina submarine base at Pekua, Cox's Bazar, represents South Asia's largest submarine facility. The coastal surveillance infrastructure includes radar stations capable of detecting small vessels and integrating data from multiple sources including:

(i) Vessel Traffic Management Systems (ii) Automatic Identification System (AIS)

(iii) Electronic warfare support measures

Air Defense Elements

Bangladesh Air Force maintains maritime patrol capabilities with 4 Dornier 228 NG aircraft and 2 AgustaWestland AW109 helicopters for maritime surveillance¹². The air surveillance network operates across six major bases including strategic locations at Chittagong and Cox's Bazar. Current vulnerabilities include limited integration between naval and air assets, gaps in continuous coastal radar coverage, need for enhanced maritime domain awareness systems¹³ etc.



Photo: Dornier 228 NG Aircraft



Photo: AgustaWestland AW109 Helicopter

¹² “Bangladesh Military - Air Force,” n.d. <https://www.bangladeshmilitary.com/air-force>.

¹³ “Case Study - Coastal Surveillance - Bangladesh | Forward Slope,” n.d.

<https://www.forwardslope.com/solutions/border-and-coastal-surveillance/case-study/case-study-coastal-surveillance-bangladesh>.

Capability Enhancement Framework

Naval Modernization

Bangladesh's naval modernization efforts under 'Forces Goal 2030' have significantly expanded its fleet and capabilities:

- Acquisition of 2 Ming-class submarines from China, enhancing undersea warfare capabilities¹⁴¹⁵
- Procurement of Type 053H3 frigates and Type 056 stealth corvettes, bolstering surface fleet strength
- Plans to build 6 multi-role stealth guided missile frigates domestically
- Development of BNS Sheikh Hasina submarine base, South Asia's largest submarine facility

Air Power Integration

The Bangladesh Air Force has made strides in maritime domain awareness:

- Acquisition of 4 Dornier 228 Maritime Patrol Aircraft and 2 AgustaWestland helicopters for maritime surveillance¹⁶
- Introduction of Yak-130 and K-8 fighter trainers to enhance air defense capabilities¹⁷
- Deployment of FM-90 SHORAD SAMs and Selex RAT-31DL 3D surveillance radar for improved air defense coverage¹⁸

¹⁴ Author, Guest. "Bangladesh's Submarines From China: Implications for Bay of Bengal Security | Center for International Maritime Security," February 16, 2017. <https://cimsec.org/bangladeshs-submarines-china-implications-bay-bengal-security/>.

¹⁵ Pasandideh, Shahryar. "Bangladesh's Naval Modernization." NAOC, June 15, 2015. <https://natoassociation.ca/bangladeshs-naval-modernization/>.

¹⁶ ibid

¹⁷ Rejwan, Khandakar Tahmid. "Revisiting 'Forces Goal 2030': Bangladesh's Military Modernization Plan Under the New Government." *The Diplomat*, December 6, 2024. <https://thediplomat.com/2024/12/revisiting-forces-goal-2030-bangladeshs-military-modernization-plan-under-the-new-government/>.

¹⁸ ibid

Additionally, future focus areas include UAV/drone integration for enhanced maritime surveillance, strengthening joint air-naval operations capabilities and further optimization of air defense coverage over maritime zones.



Photo: FM-90 SHORAD SAM (L), Selex RAT-31DL 3D surveillance radar (R),

Type 053H3 frigates (D)

Multi-Domain Operations Architecture

Integration Mechanisms

Bangladesh's multi-domain operations require seamless integration across land, sea, air, space, and cyber domains. The current architecture emphasizes the development of joint command and control systems that enable real-time information sharing and coordinated response capabilities¹⁹. A comprehensive Maritime Domain Awareness (MDA) network integrates coastal radar stations, aerial surveillance platforms, and naval assets into a unified operational picture. This integration extends to cyber-maritime security through dedicated operations centers that monitor and protect critical maritime infrastructure and communications networks.

Space-based maritime awareness capabilities are being enhanced through partnerships with regional space-faring nations, providing crucial satellite surveillance and communication support. These systems complement existing ground-based and aerial surveillance networks, creating a comprehensive maritime picture that enhances decision-making capabilities.



Source: ESCI-UPF News

¹⁹ Retd, Maj Gen Harvijay Singh. "Multi-domain Operations Are the Future - the Tribune." *The Tribune*, November 30, 2024. <https://www.tribuneindia.com/news/defence/multi-domain-operations-are-the-future/>.

Technology Integration

The evolution of modern warfare necessitates sophisticated technology integration across all operational domains²⁰. Artificial Intelligence and machine learning systems are being implemented to process vast amounts of surveillance data, enabling faster and more accurate threat assessment. Electronic warfare capabilities have been strengthened to ensure spectrum dominance in contested environments, while smart maritime surveillance systems utilize advanced sensors and high-bandwidth connectivity to maintain persistent awareness of maritime activities.

Future technology adoption focuses on autonomous systems for enhanced maritime awareness, including unmanned surface and underwater vehicles. These systems will augment existing capabilities while reducing risk to personnel and improving operational efficiency. The success of this multi-domain architecture depends on robust, secure communications infrastructure and seamless integration between different service branches.

Strategic Partnerships

Regional Cooperation

Bangladesh has established robust maritime security cooperation frameworks with regional partners, particularly through BIMSTEC and IORA mechanisms. The nation regularly participates in multilateral naval exercises like MILAN and CARAT, strengthening interoperability with regional navies. Information sharing has been enhanced through the establishment of White Shipping Agreements with India and other Bay of Bengal littoral states, facilitating real-time maritime domain awareness.

²⁰ “Publication,” n.d. <https://www.usiofindia.org/publication-journal/Multi-Domain-Warfare:-Are-we-Geared-for-it.html>.



Photo: CARAT Naval Exercise of Bangladesh, 2019

International Engagement

Beyond regional partnerships, Bangladesh has diversified its international defense cooperation through strategic agreements with China, Turkey, and South Korea. Technology transfer arrangements have enabled domestic shipbuilding capabilities, while capacity-building programs with the US and European partners have enhanced operational expertise. The nation actively participates in the UN Convention on the Law of the Sea (UNCLOS) framework, ensuring compliance with international maritime regulations while protecting national interests.

Economic Implications

Bangladesh's blue economy potential is significant, with over 90% of external trade relying on sea routes. The development of Bay Terminal and modernization of port infrastructure represents a \$650 million investment to improve trade competitiveness and reduce import-export costs²¹. Maritime trade security has become paramount as the Chittagong Port handles 98% of container traffic²². The defense industrial base is expanding through domestic shipbuilding capabilities and technology transfer agreements, creating opportunities for indigenous production and economic growth.

²¹ World Bank Group. "World Bank Helps Bangladesh Develop Bay Terminal." *World Bank*, June 28, 2024. <https://www.worldbank.org/en/news/press-release/2024/06/28/world-bank-helps-bangladesh-develop-bay-terminal>.

²² *ibid*

Institutional Framework

Bangladesh lacks a comprehensive national maritime security strategy that would provide a clear framework for interagency cooperation. Current challenges include jurisdictional overlap between agencies like Coast Guard and River Police. The Blue Economy Cell, currently under the Ministry of Power, Energy and Mineral Resources, requires repositioning to the Prime Minister's Office for better coordination. Emergency response mechanisms are being enhanced through multi-agency collaboration and joint maritime security operations²³.

Future Considerations

The maritime sector is embracing technological transformation through smart port initiatives and IT-enabled multimodal logistics systems. Green defense initiatives align with climate-resilient port development plans, particularly at Chittagong Port. Smart port security systems are being implemented through port automation and ICT enhancement to improve productivity and data sharing among regional ports. The capability development roadmap focuses on establishing climate-resilient infrastructure and implementing advanced surveillance systems²⁴.

Recommendations and Conclusion

The development of Bangladesh's maritime-air defense architecture requires a balanced approach between capability enhancement and resource optimization. Strategic priorities must focus on creating a resilient, multi-domain security framework that protects national interests while contributing to regional stability.

²³ *ibid*

²⁴ *ibid*

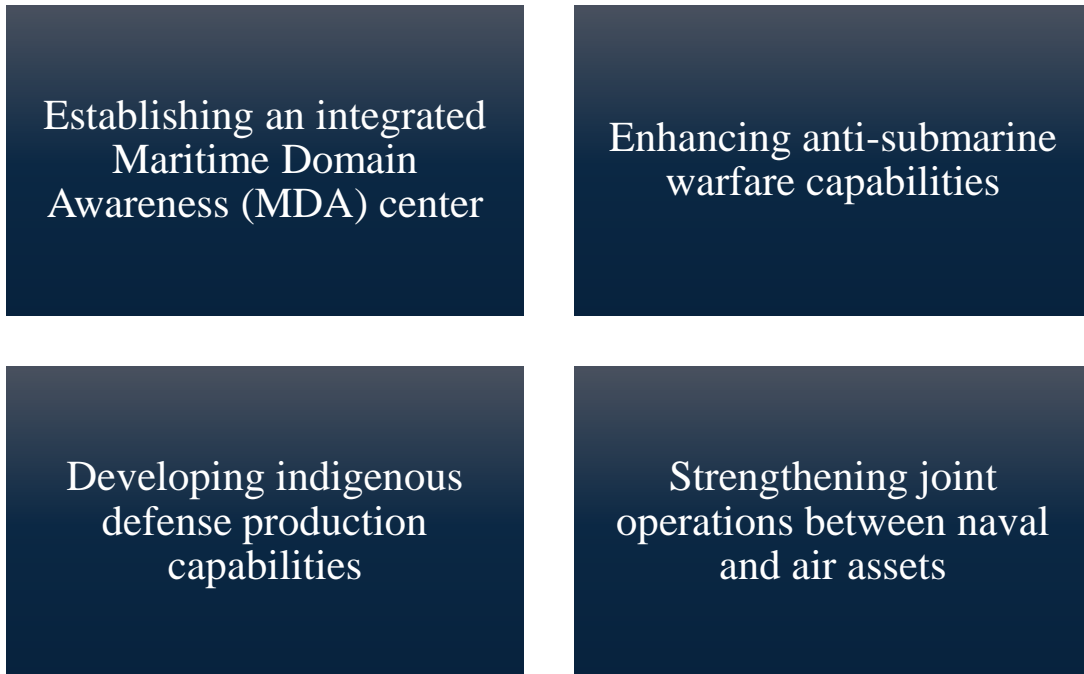


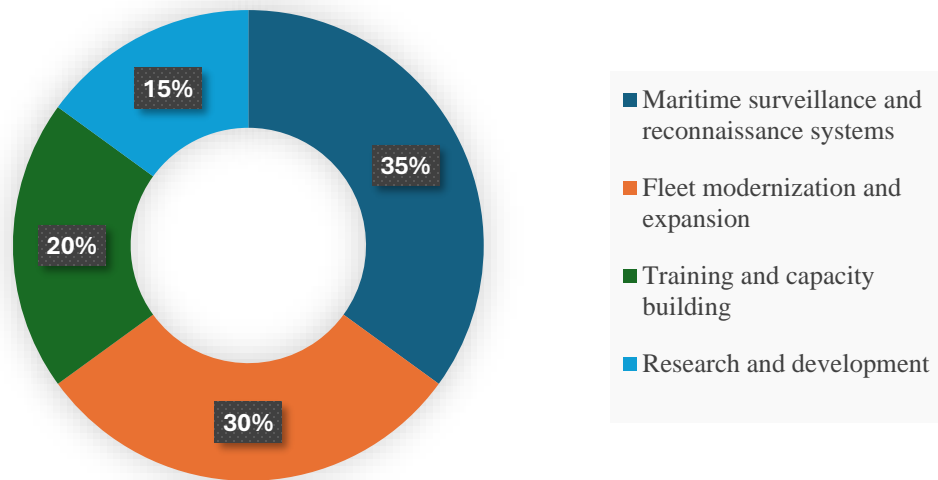
Figure: Key Strategic Priorities

Implementation Framework

The execution should follow a phased approach:

- ✓ **Phase 1 (2024-2026):** Infrastructure development and capability enhancement
- ✓ **Phase 2 (2026-2028):** Technology integration and force modernization
- ✓ **Phase 3 (2028-2030):** Advanced systems implementation and regional integration

Proposed Resource Allocation



The way forward demands a comprehensive approach incorporating technological advancement, human resource development, and regional cooperation. Bangladesh must leverage its strategic partnerships while maintaining strategic autonomy in the evolving Indo-Pacific security architecture.