November 2025
Volume 11

Sri Lanka Navy Journal

ISSN 2448 - 9409

Sri Lanka Navy Journal

November 2025
Volume 11, Issue 1

Naval Research Wing
Sri Lanka

SRI LANKA NAVY JOURNAL

Sri Lanka Navy Journal is an annual publication which provides the opportunity to discuss matters relevant to Maritime, Strategic and Global Affairs. It serves as a potent medium for all serving members of the Navy to present ideas, express opinions and share insights on subjects of national and global importance whilst enabling them to improve writing skills and broaden the horizon of knowledge.

The journal publishes papers and articles of professional interest to the Sri Lanka Navy.

Articles published in this journal reflect only the opinions of the authors and not necessarily those of the Sri Lanka Navy.

Sri Lanka Navy Journal is registered with the National Library and Documentation Services Board (NLDSB) under the International Standard Serial Number (ISSN) 2448-9409.

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ISSN 2448 - 9409

FOREWORD

The Sri Lanka Navy Journal marks our institutional commitment to professional development: its 14th Edition emerges at a juncture when transformative forces are reshaping the global maritime order, geopolitical competition, technological acceleration, climate imperatives and the redefinition of security across the seas. This publication represents an evolving dialogue that bridges experience with inquiry and practice with reflection.

I wish to extend my deepest appreciation to all contributors, the Editorial Board, reviewers and the staff of the Naval Research Wing whose dedication has resulted this publication as such efforts reaffirm the SLN commitment to continuous learning and intellectual excellence. May it continue to inspire a new generation of thinkers and practitioners who will chart the course amidst many dynamics.

BAKSP BANAGODA, RSP, USP, ndc, psc
Vice Admiral
Commander of the Navy

MESSAGE FROM THE EDITORIAL BOARD

It is with great pride and enthusiasm that we welcome you to the 14th Edition of the Sri Lanka Navy Journal (Volume 11, November 2025). This year's publication stands as a testament to our continuing commitment at advancing maritime scholarship, strategic thought and professional dialogue within and beyond the naval community.

The Sri Lanka Navy Journal has now matured into an annual publication of intellectual depth and institutional significance. This edition brings together ten insightful essays, including the two prize-winning submissions of the Admiral Clancy Fernando Memorial Essay Competition. Collectively, these works reflect not only academic rigor but also the evolving spirit of naval professionalism in an era defined by complex maritime and geopolitical dynamics.

As we navigate through an increasingly interconnected maritime frontier, where global realities, technological transformations and regional power shifts converge the role of knowledge and research has never been more critical. The essays featured herein address a diverse spectrum of themes, including NAVSTRAT 2030 and Beyond, the institutional framework for maritime casualty response and critical infrastructure protection, among others. Each contribution represents a meaningful stride toward enhancing maritime understanding and preparedness in the modern strategic environment.

Our unwavering commitment is to nurture a culture of inquiry, reflection and knowledge sharing across the Sri Lanka Navy and its extended academic and professional community. The Naval Research Wing (NRW) continues to serve as the intellectual hub of this endeavor, promoting research that informs policy, strengthens institutional resilience and contributes to the broader maritime discourse of our time.

We take this opportunity to convey our deepest appreciation to the Commander of the Navy for his steadfast guidance, vision and encouragement in steering this publication to greater heights. Our heartfelt thanks also go to the authors and reviewers whose expertise and dedication remain the pillars of this journal's success. Finally, to our readers and well-wishers, your engagement, feedback and critical reflections continue to enrich this scholarly pursuit.

As we move forward, let us reaffirm our shared purpose: to advance maritime thought, inspire innovation and strengthen the intellectual foundations of our naval service. We invite you to explore this volume with curiosity and reflection and to join us in shaping the maritime discourse of tomorrow. Thank you for your continued support and readership.

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PROPOSAL FOR SRI LANKA NAVY'S STRATEGY 2030 AND BEYOND (NAVSTRAT-2030) : SECURING THE MARITIME DOMAIN IN AN EVOLVING STRATEGIC LANDSCAPE

Rear Admiral Hasantha Dassanaike, USP, ndc, psc, BSc (DS) Mar Eng, MDS(UoK), MPA (PIM-USJ), CEng (SL), CEng (I), MIE (SL), MIE (I), MCPM

Abstract

A thorough and flexible framework for repositioning the Sri Lanka Navy (SLN) in response to the changing maritime security environment is provided by the Proposal for Sri Lanka Navy's Strategy 2030 and Beyond (NAVSTRAT-2030). This strategic vision aims to match naval capabilities with national security goals against the backdrop of changing power dynamics, unconventional threats and growing reliance on marine trade. Rightsizing, Maritime Domain Awareness, regional collaboration, naval diplomacy, technical innovation and environmental stewardship are all included into the approach. It aspires to promote multilateralism and uphold the rule of international maritime law, reflecting Sri Lanka's principled non-alignment. The strategic aim, guiding principles and regional placement of NAVSTRAT-2030 are examined in this article. It demonstrates the SLN's versatility as a marine force and its capacity to advance collective security, development and diplomacy by utilizing its key geostrategic location. Finally, the paper discusses how SLN can ensure that NAVSTRAT-2030 is not merely a strategic document but a living framework that drives transformation.

Keywords : ***Maritime Strategy, Sri Lanka Navy, Security Architecture, Naval Diplomacy, Indian Ocean Region, Maritime Domain Awareness, Sustainable Development.***

INTRODUCTION

Maritime areas have gained significant strategic importance in the twenty-first century and are now essential to international trade, geoeconomics and security frameworks. Sea routes carry more than 70% of the world's value and 80% of its volume of trade (UNCTAD, 2024). The Indian Ocean has existential relevance for Sri Lanka, which is situated along important East-West sea lines of communication (SLOCs). Sri Lanka's strategic importance is increased by its location, which also necessitates a strong and sophisticated maritime policy.

A forward-looking plan for repositioning the SLN in a complex and rapidly changing regional environment is NAVSTRAT-2030. The strategy is based on the knowledge that naval might must be used not only for defence but also for economic security, diplomatic influence and increased national resilience. It highlights how traditional naval thinking is giving way to a more expansive maritime viewpoint that incorporates sustainability, security and strategic maneuvering into a cohesive whole.

UNDERSTANDING THE MARITIME SECURITY LANDSCAPE

The contemporary maritime domain is shaped by an array of challenges geopolitical rivalries, piracy, terrorism, cyber threats, illegal, unreported and unregulated (IUU) fishing, and climate-induced hazards. The Indian Ocean Region (IOR) is now a strategic hotspot where major powers seek to project influence, secure sea lanes, and protect their trade and energy routes (Brewster, 2018). This increased power projection dynamics and competition for maritime resources demand that smaller littoral nations such as Sri Lanka craft nuanced strategies to safeguard sovereignty while engaging constructively.

NAVSTRAT-2030 identifies these realities and highlights the necessity for the SLN to operate as a versatile, forward-leaning force. It seeks to navigate competing interests while ensuring national security and facilitating the uninterrupted flow of maritime trade. It embraces a shift from reaction to anticipation, making the SLN a central actor in shaping regional maritime dynamics.

FROM NAVAL TO MARITIME: A BROADENED OUTLOOK

Historically, naval strategy was focused on warfighting at sea. However, as Corbett (2008) noted, control of the sea is often achieved through broader influence rather than direct confrontation. NAVSTRAT-2030 differentiates between 'naval' and 'maritime', recognising that maritime strategy encompasses economic, environmental, diplomatic and humanitarian roles.

The SLN's responsibilities now span fisheries protection, search and rescue, humanitarian assistance and disaster relief (HADR), maritime law enforcement, and support for scientific and environmental initiatives. This expanded scope reinforces the SLN's role as an enabler of national policy, development and diplomacy an instrument that can shape the outcome of national and regional maritime affairs.

POLICY, STRATEGY AND STRATEGIC INTENT

According to UK Defence Doctrine (2014), policy articulates a choice leading to a course of action proposed or adopted by a government. Policy is a statement of intent or a commitment to act. Strategy is creating and orchestrating the instruments of power in support of long-term policy objectives. Together, policy and strategy describe what we need to achieve (the ends), how we will do this (the ways) and the resources we need (the means). While policy and strategy are shaped by external factors, they are interdependent. Policy only works if there is a credible strategy to deliver it and strategy demands an achievable policy end-state. Advice to policy-makers is only effective when it comprises an honest, realistic appraisal of both current and future capabilities.

NAVSTRAT-2030 aligns closely with Sri Lanka's broader national policy imperatives territorial integrity, trade protection, environmental stewardship and regional peace. Its strategic intent is to develop a resilient, technologically capable and diplomatically agile Navy. It draws upon the Ends–Ways–Means framework to guide decisions and prioritise investments while accounting for resource limitations.

STRATEGIC DIRECTION AND POLICY INTEGRATION

NAVSTRAT-2030 is integrated with national maritime policy, serving as a maritime arm of statecraft. It perceives the Navy not as an isolated warfighting body, but as a strategic platform for advancing the nation's maritime agenda in multilateral and bilateral contexts. In an environment marked by a shift in the balance of power and increasing vulnerability of global supply chains, the SLN's role in safeguarding national interests is more critical than ever.

KEY STRATEGIC COMPONENTS

Rightsizing and Capability Alignment

The strategy proposes calibrating force structure based on operational requirements and budgetary realities. This includes prioritising modular platforms, versatile assets, and a sustainable logistics network enhancing agility and reducing redundancy.

Human Capital Development

Modern navies are built not only on hardware but on talent. NAVSTRAT-2030 emphasises investment in education, leadership, training and development to foster a technically proficient and globally competent cadre of officers and sailors.

Maritime Domain Awareness (MDA)

Real-time surveillance and situational awareness are critical to security and deterrence. The strategy advocates for a fused MDA architecture using coastal radars, UAVs, satellite tracking, AI-driven analytics and information-sharing partnerships across the region.

Modernisation and Technological Transformation

Future SLN platforms will reflect emerging technologies autonomous systems, green propulsion, cyber-resilience and modular adaptability. Indigenous development will be encouraged to strengthen self-reliance and strategic independence.

Naval Diplomacy and Non-Alignment

NAVSTRAT-2030 leverages naval diplomacy as a tool for soft power and strategic influence. Sri Lanka's non-aligned posture allows it to engage constructively across geopolitical divides. Participation in regional and extra-regional naval exercises, dialogues and conferences will enhance visibility and trust.

Maritime Cooperation and Regional Collaboration

Multilateralism is essential for regional security. Joint exercises, coordinated patrols, interoperability, and legal harmonisation will enable SLN to contribute to collective security, especially in counter-piracy, HADR and maritime law enforcement missions (IONS, 2024).

Economic Security and Trade Protection

Sri Lanka's economy depends heavily on secure and efficient maritime trade. NAVSTRAT-2030 reinforces the Navy's role in protecting critical maritime infrastructure, SLOCs, and offshore resources ensuring continuity in supply chains and trade flows.

Environmental Stewardship and Sustainability

Recognising increased competition for marine resources and the impact of climate change, NAVSTRAT-2030 promotes environmental responsibility. It calls for enhanced enforcement against IUU fishing, integration of sustainable technologies and support for marine research.

Strategic Monitoring and Flexibility

The strategy provides for periodic reviews and net assessments to maintain relevance. Flexibility and adaptability are key principles in ensuring that SLN remains capable of responding to emerging threats and evolving regional dynamics.

Centre of Gravity and Strategic Leverage

The centre of gravity of NAVSTRAT-2030 lies in SLN's ability to leverage maritime power for national and regional advantage. Whether in peacekeeping, deterrence, diplomacy, or disaster relief, the SLN is positioned as a multidimensional instrument of state policy. It combines presence, perception and partnership to achieve strategic outcomes in a contested and interconnected maritime domain.

STRATEGIC PLANNING AND DIRECTORATE-LEVEL INTEGRATION FOR NAVSTRAT-2030 IMPLEMENTATION

The effective implementation of NAVSTRAT-2030 hinges on the ability of the respective directorates of the Sri Lanka Navy to formulate well-conceived, integrated, and forward looking plans that translate strategic vision into operational reality. As this strategy aspires to shape a resilient, future-ready, and multidimensional naval force, it is essential that each directorate be it Operations, Engineering, Logistics, Personnel, Training, or Administration takes ownership of its role in realizing the overarching objectives. These directorates required to craft plans that are not only aligned with their core responsibilities but also responsive to the evolving maritime security environment, technological advancements, and national development priorities in line with the NAVSTRAT-2030.

Sound planning requires clarity of purpose, resource-conscious thinking, and an emphasis on innovation, sustainability, and interoperability. Equally important is the need for cross-functional coordination to ensure unity of effort and strategic coherence. Periodic review mechanisms, performance indicators, and feedback loops must be integrated to monitor progress and enable timely adjustments. By fostering a culture of strategic planning, collaboration, and accountability, the SLN can ensure that NAVSTRAT-2030 is not merely a policy document but a living framework that drives transformation. It is through these robust and purpose-driven plans that the Navy's strategic aspirations can be effectively manoeuvred into enduring maritime capability and influence.

CONCLUSION

NAVSTRAT-2030 is a comprehensive, forward-looking maritime strategy that recognises the importance of understanding maritime dynamics, manoeuvring strategically and leveraging Sri Lanka's geostrategic position. It highlights the Navy's role in promoting a cooperative and rules-based maritime order, links naval development with national policy and advances maritime diplomacy within a principled framework of non-alignment.

NAVSTRAT-2030 represents a bold and strategic commitment by the SLN to reshape its role in an increasingly complex and contested maritime environment. It is a comprehensive and forward-looking maritime strategy that recognises the critical importance of understanding the evolving dynamics of the Indian Ocean Region, manoeuvring strategically amidst shifting power equations and leveraging Sri Lanka's unique geostrategic position at the crossroads of global maritime trade. As the ocean becomes a theatre not only of geopolitical competition but also of opportunity, NAVSTRAT-2030 provides a timely and pragmatic framework to ensure that the SLN remains a credible,

resilient and multidimensional force. By aligning naval development with overarching national policy goals, the strategy bridges the gap between vision and capability. It integrates elements of rightsizing, technological modernisation, maritime domain awareness, human capital development, and environmental stewardship, offering a holistic blueprint for maritime transformation. At its core, NAVSTRAT-2030 champions a principled approach to maritime engagement grounded in non-alignment, regional cooperation and a firm commitment to multilateralism, the United Nations Convention on the Law of the Sea (UNCLOS), and international maritime law.

The significance of the SLN goes far beyond conventional naval boundaries in a time when marine space supports economic growth, environmental sustainability and strategic stability. The Navy will be prepared to inspire as well as defend with NAVSTRAT-2030. It gives the Navy the ability to protect national interests, negotiate new problems and influence positive regional results. In the end, NAVSTRAT-2030 is a call to action rather than just a strategy. It sets course for the SLN to become a proactive force in ensuring Sri Lanka's maritime safety and security in the Indian Ocean and beyond, as well as a crucial contributor to regional peace and the preservation of maritime order.

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ENHANCING THE INSTITUTIONAL FRAMEWORK FOR MARITIME CASUALTY RESPONSE IN SRI LANKAN WATERS

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Abstract

During the last five years, Sri Lanka has experienced two catastrophic maritime accidents (MV X-Press Pearl-2021 & MT New Diamond-2020); even though several local stakeholders worked together to face those maritime casualty incidents, it was a total failure to mitigate the damages in the Sri Lankan waters. Maritime casualty always causes detrimental effects on the social, economy, environment, and ecosystems of coastal states. This paper aims to study enhancing the existing Sri Lankan framework to respond to maritime casualties, ensuring a timely, measured, and effective response. Also, the project identifies the key stakeholders involved, the governance arrangements under which they should operate, and the broad responsibilities attached to each entity regarding maritime casualty handling.

Keywords : ***Maritime casualty, Maritime disaster, Institutional framework***

INTRODUCTION

The MV X Press Peral and MT New Diamond maritime casualty incidents provided eye-opening evidence for Sri Lanka to revamp the existing institutional framework for responding to maritime casualties within the Sri Lankan maritime zones. The MT New Diamond was a large crude carrier chartered by Indian Oil Cooperation Limited; the tanker caught fire on 3rd September 2020 within the Sri Lankan EEZ 40–50 nm southeast coast of Sri Lanka, while transferring crude oil from Port Meera Al Ahmadi in Kuwait to Indian Eastern coast Port Paradip oil refinery (Udara, 2021). This incident could have been the world's second-largest oil spill after Atlantic Empress in 1979, which spilled 287,000 tons in the Caribbean Sea (Andria, 2020). Despite Sri Lanka's existing maritime rescue mechanism, Maritime Rescue Coordinating Cantre (MRCC-Colombo) swiftly responded to the incident and rescued all crew members; the risk of the oil spill and onboard fire remained for six days until the ship got towed to an Indian Port, while several maritime agencies individually responded to the incident without knowing an established role to play (Ranil, 2020).

Notwithstanding, MV X-Press Pearl was another similar incident that happened within the Sri Lankan territorial waters; a Singapore-flagged container feeder ship caught fire on 20th May 2021 off Colombo harbour anchorage due to a nitric acid leak; later, the fire deteriorated with the nitric acid leak, resulting

in explosions. Subsequently, despite many attempts, the ship sank off Colombo harbour within the territorial sea after 12 days, causing the most devastating chemical and plastic nurdles maritime disaster in Sri Lankan and world history. This incident was not an exception to the MT New Diamond repeating poor response to the maritime casualty without taking any tangible action or timely decision by any responsible agency (Madushika, 2022).

These two incidents highlighted that no single agency has been designated to take a leading role in the maritime casualty response in Sri Lanka, and there is a significant policy gap in the country's existing maritime casualty handling framework (Udara, 2021). Therefore, paper will discuss revamping the existing institutional framework for effectively handling of pre-maritime casualties in the Sri Lankan maritime zone to prevent ship-based maritime disasters, emphasising the designated maritime agency or responsible person and amendments to the existing legislation for the maritime casualty response.

INTERNATIONAL GOVERNANCE FOR MARITIME CASUALTY MANAGEMENT

A risk of ship casualties was present since humans have interacted with the sea for transportation; therefore, over some time, treaties, conventions, safety standards, regulations and guidelines were introduced as international governance for the response to maritime casualty, primarily concentrating on the safety of life onboard ships (Dalziel, 2019). UNCLOS provides a comprehensive framework for the coastal state's maritime casualty response, especially concerning pollution activities due to casualties (LOSC 1982). However, most international maritime treaties and conventions cover post-maritime casualty effects such as marine environmental pollution and oil pollution, which are beyond my research question. Hence, I found minimum international maritime treaties and conventions directly relevant to the maritime casualty response during my research work. In contrast, I found most of the relevant regulations and standards provided by IMO as a primary competent authority for global shipping; IMO has continuously updated the non-binding regulations, guidelines, and standards for the coastal state to establish their institutional framework for maritime casualty response.

EXISTING SRI LANKAN INSTITUTIONAL FRAMEWORK FOR MARITIME CASUALTY RESPONSE

The existing legal framework of Sri Lanka has authorised multiple agencies for different elements of the maritime casualty response. Those governmental agencies are Sri Lanka Merchant Shipping Secretariate (MSS), Sri Lanka Port Authority (SLPA), Sri Lanka Disaster Management Centre (DMC), Sri Lanka Marine Pollution Authority (MEPA), Sri Lanka Navy (SLN) and Sri Lanka Coast Guard (SLCG). Nonetheless, collectively, these agencies have been empowered to

perform different elements of the maritime casualty, such as acting as a point of contact to the casualty ship, maritime safety, firefighting and emergency towing, salvage, and wreck operations, dealing with maritime disaster and preventing pollution by ship accidents. Hence, this decentralised legislation power has led to poor coordination and response. Following table will elaborate the existing legislation powers assigned to abovementioned agencies.

The Disaster Management Act of Sri Lanka has provided provisions to deal with maritime hazards while providing provisions to establish a national council for disaster management, appointing the president as the chairman while including different ministers as the council members, elevating into the highest-powered council in the country. Thus, the council can take any decision to protect the human life and property of the people and environment of Sri Lanka from the maritime hazard (Disaster Management Act 2005).

However, the Sri Lanka MSS being the prime agency to deal with shipping-related issues, the Merchant Shipping Act has empowered MSS with matters related to maritime safety, provisions to deal with wreck and ship salvage operations within the territorial waters and provisions to deal with distress ship at any place on or near the coasts of Sri Lanka or in any tidal water within Sri Lanka waters and legal proceeding of post maritime casualties (Merchant Shipping Act 1971). Nevertheless, the Act does not provide any legislation authority to deal with maritime casualty beyond the coastal waters of Sri Lankan maritime zones. Therefore, except coastal waters no agency has given the power to deal with maritime casualties which are in non-pollution nature up to EEZ.

SLPA Act has empowered to provide firefighting and emergency towing assistance for maritime casualty within the Sri Lankan maritime zones (Port Authority Act 1979) however, SLPA needs to coordinate with other agencies to provide this assistance. Nonetheless, the Sri Lanka Maritime Prevention Act has empowered MEPA as a designated authority to prevent pollution control and reduction within the Sri Lankan EEZ (MEPA Act 2008). However, the Act does not provide explicit provisions for maritime casualty handling other than actions to prevent maritime pollution. Further, the Act empowered a council to make decisions in maritime pollution events, consisting of the ministry's secretary. However, the council has not included a secretary from the Ministry of Defence, where SLN and SLCG come under and possess most of the capabilities to respond to such situations. Further, MEPA has established an Incident Management Team (IMT) to respond to maritime pollution incidents within the EEZ with limited expertise and resources.

Moreover, SLN (Sri Lanka Navy Act 1950) and SLCG (Sri Lanka Coast Guard Act 2009) have empowered to assist SAR Operations in maritime casualty situations within the Sri Lankan Search and Rescue Region (SRR). Furthermore,

the SLN is responsible for maintaining the Maritime Rescue Coordinating Centre (MRCC) where SAR operation is coordinated. Also, presently, MRCC act as a point of contact between casualty ship and authorities in the case of maritime casualty, which formally needs to be done by the MAS of the coastal state (IMO guideline MAS 2003). Therefore, considering all these decentralised and legislation gaps in the existing institutional framework for the maritime casualty response, it is a timely necessity to reinstate the existing framework and introduce a common centralised and established role framework with designated authority for the future maritime casualty response in the Sri Lankan maritime zones.

OTHER COUNTRY'S INSTITUTIONAL FRAMEWORK FOR MARITIME CASUALTY MANAGEMENT

As per the European Maritime Safety Agency (EMSA) reports, global maritime casualty incidents from 2014-2021 are 21,173, with a yearly average of 2,647, including cargo ships, passenger ships, service ships and fishing vessels (Annual overview of maritime casualty & incident 2022). These statistics highlight that maritime casualty is a significant global issue, and coastal states have established frameworks to respond to maritime casualties within their maritime zones. However, none of the coastal states developed their response mechanisms in the first instance due to its dynamic nature; therefore, it was an evolving process with new challenges. Hence, coastal states have established their response framework with their experience of facing catastrophic maritime casualty incidents. While researching similar literature, I selected the most appropriate two maritime casualty response frameworks from the UK and Australia, considering their previous experience on maritime casualties and world-leading maritime safety concern nations. Further, it is understood that studying different institutional frameworks provides fundamental elements to consider while determining a compelling new framework for the coastal states.

UNITED KINGDOM FRAMEWORK FOR MARITIME CASUALTY RESPONSE

The UK government provided legal provisions to respond to maritime casualties within UK maritime zones by the 1995 Merchant Shipping Act (United Kingdom Merchant Shipping Act 1995), under that maritime casualty response power was given to the 'salvage committee', followed by experience from the Torrey Canyon disaster in 1967 and the Brear disaster 1993. However, after the Sea Empress casualty incident 1996, the UK government appointed a committee to review the existing Act and introduced an amended Merchant Shipping Act in 1997. The committee realized that the emergency response to maritime casualties must have one voice empowered to decide on the government's behalf and override public interest and, if necessary, all other interest parties (United Kingdom Merchant Shipping and Maritime Security Act 1997). This created the new appointment called Secretary of State Representative (SOSREP), nominating a single responsible person for the maritime casualty response decisions (United Kingdom Marine Safety Act 2003) under the power of Secretary of State.

SOSREP is a civil servant and independent body directly responsible to the secretary of the state without any political influences. Hence, he can make timely decisions in maritime casualty based on facts, logic, and reasons rather than political and emotional considerations. Since SOSREP is the final decisive voice, he is responsible for his decision, and the government must either 'back him or sack him' (Louise, 2010). Further, SOSREP can have advisers from different fields of expertise to advise him in making decisions for maritime casualty situations. Thus, the Chief executive of the Maritime Coast Guard agency must support him to make decisions and facilitate him to secure the services of an appropriately qualified person (Louise, 2010). The authority and responsibility of SOSREP are set out on the Maritime and Coast Guard Agency (MCA), and he is physically located in the MCA.

Nevertheless, SOSREP authority extends up to 200 nm (EEZ) to prevent or reduce maritime pollution by maritime casualty. His authority extends only within the country's territorial waters for safety issues (The National Contingency Plan UK). Moreover, after identifying some gap areas, SOSREP was further empowered to give direct orders to the ship owner, Harbour Master, and Master of salvor regarding any safety and avoid maritime pollution. Also, he is empowered by Maritime Safety Act 2003 to make decisions on requests for places of refuge by casualty ships and give orders to the harbour master to provide facilities (UK Marine safety Act 2003).

AUSTRALIA FRAMEWORK FOR MARITIME CASUALTY RESPONSE

Australia's institutional framework for the maritime casualty response mechanism is quite different from the UK system; despite the single voice, Australia adopts a combined and corporative approach, having three elements in the framework. Those are Maritime Casualty Incident Management Team (MCIMT), Maritime Emergency Response Commander (MERCOM) and Maritime Casualty Control Unit (MCCU) (Australia National Maritime Casualty Management Guideline 2018). However, MERCOM has been empowered under the Protection of the Sea (powers of intervention) Act 1981 to handle the maritime casualty situation by coordinating the other two elements and communicating with relevant stakeholder groups (Australian Protection of the Sea Act 1981). As per the National plan for maritime environmental emergency policies, the incident management system for maritime casualties is based on some basic principles. The commercial sector must handle the operational management of maritime casualties, such as towage and salvage; the system must be flexible enough to meet the demand for casualties. The government must oversee the action of the shipowner/shipmaster and towage and facilitate communication among stakeholders on the action and situational information.

As per the IMO guidelines, Australia has established MAS within the Joint Rescue Coordination Centre (JRCC Australia) under the Australian Maritime Safety Authority (AMSA) as a contact point between casualty ships and government maritime authority (Australia National Maritime Casualty Management Guideline 2018). Since Australia's maritime casualty response framework works with three elements, they have designated roles. The role of MCIMT is coordinating the maritime casualty incident among other responding agencies and strategic stakeholders, developing effective communication and collaboration. Further, evaluate the situation, share a common operating picture between agencies, and communicate to the public and key stakeholders what is happening, why, and what can be done (Australia National Maritime Casualty Management Guideline 2018).

The AMSA appoints MERCOM to manage emergency intervention issues with maritime casualty incidents when maritime pollution has significant potential. However, MERCOM stands on his decisions to the authority since they directly affect the country's economy, marine environment, community, and social interest. Further, MERCOM needs to expeditiously communicate his decisions to relevant stakeholders and fully document them (Australia National Maritime Casualty Management Guideline 2018). The role of MCCU is to provide multiple management teams to mitigate the impact of the maritime hazard associated with maritime casualty. MCCU will form a special sub-unit and work with MERCOM or the incident controller. Further, MCCU will take actions to oversee and monitor actions taken in response to maritime casualty, provide a platform for key stakeholders to discuss situation information and coordinate government intervention as required (Australia National Maritime Casualty Management Guideline 2018).

PROPOSALS TO ENHANCE EXITING FRAMEWORK, TO REACT MARITIME CASUALTY IN SRI LANKA

Sri Lankan existing institutional framework for maritime casualty handling is more decentralised and overlapping. During previous maritime casualty responses, it was evident that multiple government agencies worked individually to respond to the situations without considering coordinated effort. The coordination was constrained mainly due to no single responsible agency was designated to take the lead in the situation, shared legislative powers among different agencies and no established role for the related agencies (Udara, 2021).

ESTABLISHING OF MARITIME ASSISTANCE SERVICE (MAS)

As per the IMO guideline, establishing MAS in a coastal state is a mandatory element of the maritime casualty response mechanism, whereas Sri Lanka does not possess, hence MRCC is performing the same duty, which is not designed

for the same purpose. Therefore, considering the nonexistence of such a facility in Sri Lanka, it is proposed to initiate action to establish such a facility under a competent authority on a priority basis. Thus, Sri Lanka needs to establish a new MAS, preferably with the Coast Guard operation centre. However, the intended service of a MAS will not be feasible through the MRCC since the facility is being manned by Sri Lanka Navy personnel, and they are qualified only in discharging MRCC duties, which contradicts expectations of IMO guideline having specially trained personnel for the MAS. Also, it is essential to demarcate the level of engagements of MRCC and MAS during the maritime casualty separately.

SRI LANKA MERCHANT SHIPPING ACT AND MARINE POLLUTION PREVENTION ACT

Notwithstanding, the legislative power given to the MSS in the case of a vessel in distress in any place on or near the coasts of Sri Lanka or in any tidal water within Sri Lanka waters by Art 227-229 of the Sri Lanka Merchant Shipping Act 1971, it does not mention anything about maritime casualty incidents within the territorial sea or beyond it. Moreover, it does not give the MSS any power to make decisions or use the other relevant maritime agencies' coordinated efforts. In contrast to the MSS powers to handle the distress ship in any place on or near the coasts of Sri Lanka or in any tidal water within Sri Lanka waters, MEPA has also been empowered to deal with maritime casualties up to the EEZ as per the Art 24 of the Marine pollution prevention Act 2008 while creating overlap with the MSS Act.

Moreover, the MEPA Act has provided provisions only to act if the maritime casualty ship is an imminent threat of pollution to the territorial waters or any other maritime zone of Sri Lanka. Besides, MEPA has empowered to undertake operations of the ship by force if the casualty ship responds inadequately for prevention or mitigating pollution, other than the general power to issue directions to move the ship to a specified place, remove from a specific area or location, towed away from the maritime zones, loaded or unloaded oil or other cargo and salvage measures are to be or not to be taken.

However, being the competent authority for shipping affairs in Sri Lanka, MSS has not given legislation power to deal with maritime casualties beyond the coastal waters. Despite, overarching powers have been given to the MEPA to deal with maritime casualties threatening maritime pollution up to the EEZ of Sri Lanka, even without having knowledge of ship operations. Therefore, it is proposing to delegate powers for operational and maritime safety concerns of the maritime casualty to the MSS up to the limits of EEZ and authorize MEPA to provide advice to MSS on maritime casualty cause imminent or likely threat of pollution within any maritime zone of Sri Lanka. However, taking the lead from the Australian MCCU concept, Sri Lanka can upgrade the IMT of MEPA at

the national level to respond to maritime pollution situations due to maritime casualty within all maritime zones, having more authority, expertise, personnel, and resources to mitigate adverse effects. Further, IMT can continuously function under MEPA, and MSS can access it during casualty management when required.

INTRODUCING COMMITTEE OF EXPERTS FOR MARITIME CASUALTY RESPONSE

The DGMS from MSS must empowered with decision-making powers without much influence of the political authority, and he should be directly responsible for the Minister of Port and Shipping as a responsible minister for shipping affairs; as per the concept of Australia he can empowered similar to the MERCOM powers while introducing 'Committee of Experts' which is responsible for the management of emergency intervention issues in response to maritime casualty incidents and maritime assistance requests. The committee must be headed by the DGMS and comprised of members from maritime related state agencies and supported by each agency's statutory powers, preferably those agencies need to be represent by head of the agencies to take prompt decisions. However, DGMS must consult other committee members before making the decisions. Moreover, the Director General of the Coast Guard (DGCG) must be delegated with powers to interfere with maritime safety issues up to EEZ, and GDMS must especially consult DGCG for the event of maritime casualty and places of refuge, like the MERCOM consult AMSA and head of Coast Guard for the decision of maritime casualties and especially places of refuge in the Australian system. Therefore, the SLCG Act must change accordingly by delegating powers to involve maritime safety issues within EEZ.

However, considering all above gaps and existing delegation of domestic legislative powers into different maritime agencies to response maritime casualty within the Sri Lankan maritime zones are needed to be amend. Nevertheless, allocation of exact time frame for these amendments will be not feasible considering lengthy administrative process and political will of the country. Furthermore, 'Committee of Experts' has to coordinate with resourceful agencies to deal with maritime casualties and if required regional assistance, considering existing financial situation of the country.

CONCLUSION

Since Sri Lanka is prone to response maritime casualties within its maritime zones due to its geographical location near the world, one of the busiest shipping routes, Sri Lanka needs to take adequate measures to establish a formidable institutional framework for the maritime casualty response. However, lapses of the existing institutional framework were significant during previous maritime casualty incidents such as MT New Diamond and MV X-Press

Pearl. Even though Sri Lanka has obligations to comply with international governance related to maritime casualty response, Sri Lanka still needs to amend and introduce new provisions for domestic legislation to comply with those obligations. Furthermore, Sri Lanka's existing legislative framework for the maritime casualty response needs to introduce some amendments to minimise the decentralised legislative power and find a designated agency to respond collectively to such incidents with other responsible agencies. Notwithstanding, Sri Lanka must study other countries' models for similar incidents to adopt best practices into the Sri Lankan institutional framework. Therefore, Sri Lanka can adopt a combined approach as a 'Committee of Experts' while designating a single agency to coordinate the maritime casualty incident, introducing appropriate amendments to the existing legal framework.

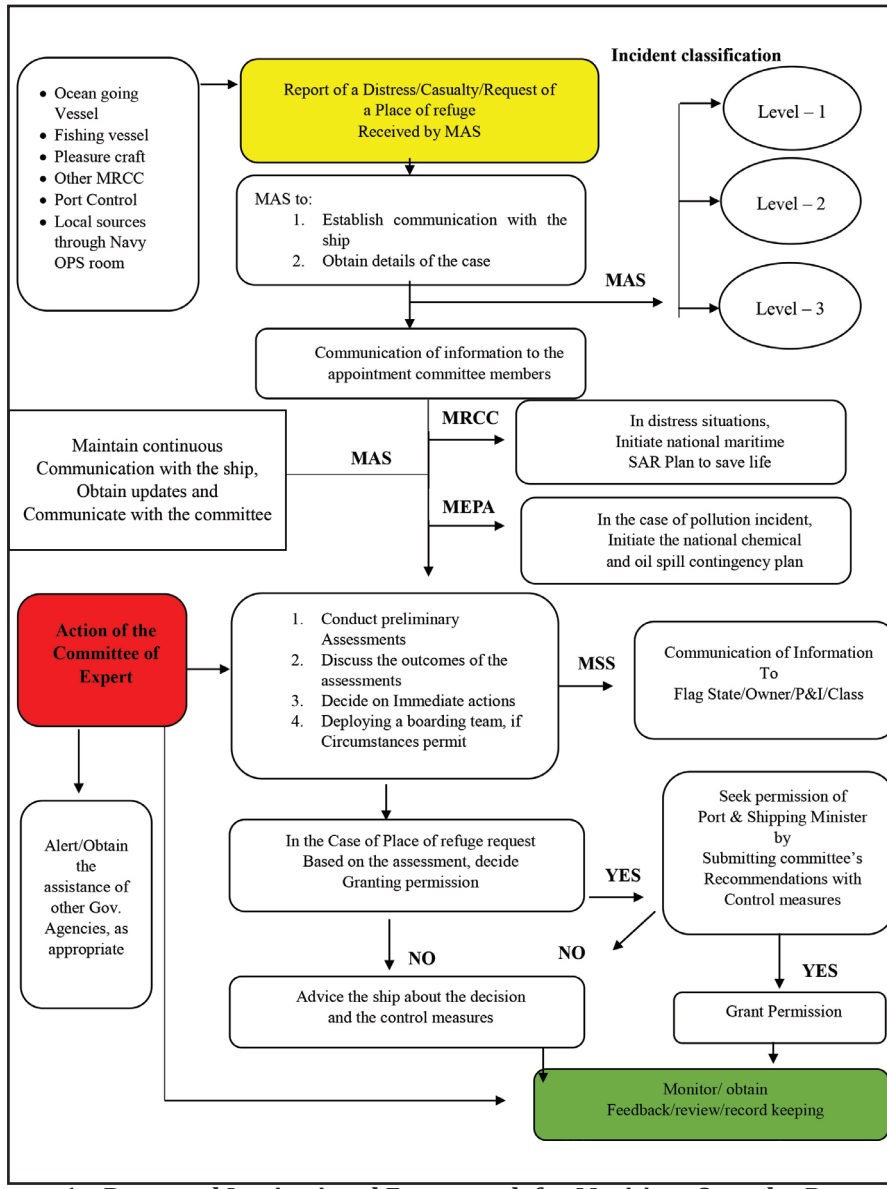

Figure 1 : Proposed Institutional Framework for Maritime Casualty Response

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MARITIME CRITICAL INFRASTRUCTURE PROTECTION IN SRI LANKA : A PROPOSED MULTI-AGENCY COMMAND AND CONTROL FRAMEWORK

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Abstract

Sri Lanka, an island nation strategically positioned in the Indian Ocean, relies heavily on its maritime sector for both economic prosperity and national security. This paper adapts maritime critical infrastructure protection and multi-agency command and control strategies to propose a framework specifically tailored for Sri Lanka's unique context. It comprehensively assesses the vulnerabilities of Sri Lankan ports to asymmetric threats, the evolving dynamics of maritime warfare, and the potential economic and strategic repercussions of port disruptions. Furthermore, the paper advocates for the establishment of Joint Operations Centers across Sri Lanka, designed to foster collaboration among various national agencies. These centers aim to enhance intelligence gathering capabilities, promote coordinated strategic planning, and improve tactical command and control, thereby ensuring effective port security and defense in an asymmetric environment. Such integration is crucial for safeguarding Sri Lanka's maritime infrastructure against emerging threats and ensuring its continued stability and economic viability.

Keywords : ***Maritime Critical Infrastructure Protection, Joint Operations Centers, Command and Control, Multi-Agency Collaboration, Sri Lanka Navy***

INTRODUCTION

Strategic Importance of Sri Lanka's Maritime Domain and Ports

Sri Lanka, as an island nation, is deeply reliant on its maritime domain, particularly its ports, for economic prosperity and national security (DOĞAN et al., 2023; Kavirathna et al., 2020). Country's ports, including Colombo, Hambantota, and Trincomalee, are strategically positioned at the crossroads of major shipping lanes, serving as critical nodes in global trade networks (Kandaudahewa, 2023). These facilities are not only commercially significant but also function as strategic assets that underpin the nation's economic stability and regional influence (Fernando, 2018). Consequently, any substantial disruption to this maritime critical infrastructure could precipitate significant economic repercussions, such as widespread supply chain interruptions and increased insurance costs, potentially affecting other ports globally due to heightened security measures (DOĞAN et al., 2023; Pandey & Bhushan, 2023).

Given Sri Lanka's central location in the Indian Ocean, the geopolitical landscape significantly influences its strategic considerations, especially with major naval powers vying for influence in the region (Attanayake & Atmakuri, 2021). This heightened maritime activity increases the potential for both state and non-state actors to pose threats to maritime infrastructure. Criticality of Sri Lanka's maritime infrastructure necessitates a comprehensive security framework that can adeptly manage both traditional and non-traditional threats, ensuring the nation's continued stability and economic vitality (Bueger, 2023). Therefore; addressing these challenges effectively requires a robust multi-agency framework that integrates military, law enforcement, and civilian entities to ensure comprehensive maritime security .(Bueger, 2022; Herzinger, 2021; Liebetrau & Bueger, 2024; Maternová et al., 2023)

Modern economies and societies are fundamentally dependent on maritime infrastructures, which include energy platforms and subsea data cables (Bueger & Liebetrau, 2023). Despite the maritime domain's vital role in facilitating a substantial proportion of global trade and telecommunications, these issues often receive insufficient attention from the public and policymakers (Bueger et al., 2024). This oversight may inadvertently foster an environment conducive to illicit activities and result in fragmented policy responses, as well as underinvestment in essential security measures. Consequently, a comprehensive maritime critical infrastructure protection framework is needed to proactively enhance awareness of the domain's multifaceted criticality, addressing trade volumes and its vulnerabilities as a conduit for various threats.

Evolving Global Security Landscape and Asymmetric Threats to Maritime Critical Infrastructure

Historically, maritime defense strategies primarily concentrated on countering traditional naval threats (Enoch et al., 2021). However, the contemporary global security landscape, characterized by the rise of asymmetric warfare, has fundamentally altered this focus (Kumar, 2010). Non-military targets, particularly critical infrastructures like ports, have emerged as attractive objectives, susceptible to exploitation for economic or psychological impact (Farrell & Newman, 2019). This expanded threat spectrum now includes not only terrorism and crime but also sophisticated challenges from state adversaries employing hybrid tactics or operating in grey zones (Gonçalves, 2019).

Modern advancements in containerization and the increasing size and technical complexity of vessels have inadvertently transformed ports into highly valuable and vulnerable targets for adversaries (O'Kelly, 2025). According to (Tam et al., 2021) the interconnected and networked nature of port operations means that disruption can be achieved with relative simplicity by a determined attacker, simultaneously elevating the economic and strategic importance

of major Sri Lankan ports while amplifying their susceptibility to various threats. The maritime environment itself often provides inherent advantages to attackers, particularly those employing asymmetric tactics or aiming to deliver substantial explosive forces (McCabe & Flynn, 2023). The sheer volume of legitimate commercial and recreational traffic in Sri Lankan waters presents a significant challenge, as it can be exploited to mask hostile movements, complicating effective defense efforts (Dossier on LTTE Weapons, 2022). Furthermore, the proximity of many port facilities to urban centers and other volatile infrastructure significantly increases the potential for mass casualties and large-scale conflagration in the event of a successful attack (Adler & Fuller, 2009). Moreover, in the 2010s, attention shifted toward addressing cyber threats, and recent discussions emphasize hybrid threats, potentially involving intentional actions by hostile states (Bueger & Liebetrau, 2023).

Adding another layer of complexity, the vulnerability of maritime critical infrastructure is not confined to physical attacks alone. Critical infrastructure systems are increasingly managed through automation and interconnected network systems, relying heavily on Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) (Roshanaei, 2021). This digital reliance means that cyber-attacks can directly disrupt port operations, navigation, and vital financial and communication systems.(Kolosok & Korkina, 2018). A successful cyber intrusion into these operational technology (OT) systems can have devastating physical consequences, demonstrating the critical interdependence of physical and digital security.(O'Kelly, 2025). Therefore, this necessitates a holistic protection strategy that seamlessly integrates physical security measures with robust cybersecurity protocols.

Purpose and Scope of the Paper

This paper is aimed to analyze the specific challenges and opportunities inherent in enhancing port security and defense in Sri Lanka. It achieves this by adapting established models of multi-agency command and control, recognizing a significant gap in the existing literature concerning the development of a grounded theory that comprehensively identifies the constructs and relationships of maritime safety, security, and environment.

The core purpose of this study is to propose a multi-agency command and control framework, specifically the Joint Operations Centers (JOCs) model, tailored for Sri Lanka's maritime critical infrastructure protection. This framework will draw upon valuable lessons learned from past models, including the experimental Joint Harbor Operations Centers (JHOCs) implemented in the United States (Watts, 2005). The scope of the paper encompasses a thorough analysis of Sri Lanka's current maritime security environment, a detailed examination of the proposed JOC model, and the formulation of actionable recommendations for its effective implementation, giving due consideration to the unique challenges faced by developing island nations.

CONCEPTUAL FRAMEWORK: MARITIME CRITICAL INFRASTRUCTURE PROTECTION AND MULTI-AGENCY COMMAND AND CONTROL

Defining Maritime Critical Infrastructure (MCI) and its Vulnerabilities

Critical infrastructure (CI) broadly encompasses systems that perform essential functions for a country or region, directly impacting the life of its community. This ranges from fundamental urban water networks to vast underwater communication cables (Eldosouky et al., 2017). Within the North Atlantic Treaty Organization (NATO) context, CI is understood as a general term describing a nation's infrastructure assets, facilities, systems, networks, and processes that support military, economic, political, and/or social life, upon which the nation or NATO depends for the preservation of essential security, societal functions, health, safety, economic viability, and the effective functioning of government (Liebetrau & Bueger, 2024).

Maritime Critical Infrastructure (MCI) specifically refers to assets such as ports, shipping lanes, oil and gas platforms, and communication cables, all of which are vital to the global economy and the security of nations (Felice et al., 2022). This infrastructure, whether physical or cyber, has become a prime target for a diverse array of threats, each possessing the potential to severely disrupt daily life and economic activity (Liebetrau & Bueger, 2024). For example, numerous maritime infrastructures are now owned and operated by private companies because of the wave of privatization in the 1980s and 1990s. Therefore, CMIP frameworks necessitate close collaboration between governments and industries.

The protection of CI is fundamentally a multidimensional risk management practice, with its primary objective being the reduction of risk to an acceptable level (Sharma, 2021). This necessitates a comprehensive approach that integrates robust cybersecurity, physical security, emergency preparedness, and recovery planning (Flaus, 2019). Recent increases in geopolitical tensions and regional conflicts, exemplified by incidents such as the Nord Stream pipeline attacks, have starkly highlighted the inherent vulnerability of maritime infrastructures to an evolving spectrum of threats (Liebetrau & Bueger, 2024). These threats range from conventional attacks, terrorism, and piracy to more sophisticated forms of sabotage and cyber warfare (DOĞAN et al., 2023; Mraković & Vojinović, 2019).

A critical understanding of MCI must extend beyond traditional port facilities to include vital undersea infrastructure. The broad definition of CI explicitly includes "huge underwater communication cables" ,(Eldosouky et al., 2017) and MCI specifically lists "communications cables" and "subsea data and electricity cables" as vulnerable assets (Osei–Kyei et al., 2021). This broader

perspective implies that protection strategies for Sri Lanka must extend beyond the immediate vicinity of its ports to encompass these often-overlooked, yet highly critical, assets. Damage to such infrastructure can have profound national and global economic repercussions, necessitating specialized surveillance, response capabilities, and international cooperation for their comprehensive protection.

Understanding Asymmetric Threats in the Maritime Domain

Asymmetric threats in the maritime domain represent a persistent and often unpredictable danger, capable of unleashing significant destruction and loss of life and property (Smith & Doe, 2023). These threats encompass a wide range of non-traditional security challenges, including piracy, armed robberies at sea, terrorism, human trafficking, irregular movement of persons, drug trafficking, illicit trafficking in wildlife, trafficking of weapons, and Illegal, Unreported, and Unregulated (IUU) fishing (Pandey & Prashanthi, 2023). Maritime terrorism has been a notable concern in the Indian Ocean region, particularly since the mid-1980s, partly due to the historical absence of effective maritime security mechanisms (Chatterjee, 2014). South Asia, being a nexus of terrorist activity with increasing connectivity among various groups, contributes to this regional vulnerability (Fenton, 2024).

Illicit trafficking, particularly of drugs and arms, constitutes a significant aspect of maritime security challenges. The immense profits generated from drug trafficking often serve to finance terror networks and arms smuggling (Rosnani et al., 2022). Sri Lanka's strategic geographical location and its proximity to major drug-producing regions, such as the 'Golden Triangle' and 'Golden Crescent,' position it as a convenient transit point for drug traffickers. Large consignments, notably of heroin and cannabis, are frequently transferred mid-sea from larger boats like Iranian trawler to multi day fishing trawlers and fiberglass boats (Boviatsis & Vlachos, 2022). Furthermore, human trafficking networks exploit economic vulnerabilities, coercing individuals to undertake illegal departures by boat from less-patrolled areas. Further; Illegal, Unreported, and Unregulated (IUU) fishing also remains a persistent challenge, not only depleting marine resources but also contributing to and facilitating other illicit activities such as illegal migration, maritime terrorism, and human trafficking at sea (Belhabib et al., 2020).

The interconnectedness of these illicit maritime activities is a crucial observation. Activities like drug trafficking, human trafficking, arms trafficking, and IUU fishing are not isolated criminal acts; they are frequently part of larger, sophisticated organized criminal networks (Sosnowski et al., 2024). For instance, drug trafficking networks in Sri Lanka are described as "complex, interconnected and extend beyond national boundaries," involved in smuggling a wide array of

illicit goods (Kleemans & Koppen, 2020). This interconnectedness implies that a multi-agency framework for MCIP cannot address these threats in isolation. Effective protection necessitates a holistic approach that acknowledges these linkages, enabling agencies to share intelligence and coordinate operations across different crime types, thereby disrupting entire illicit supply chains rather than merely individual acts.

Beyond physical threats, cyber vulnerabilities pose a growing concern. The maritime sector is particularly susceptible to cyberattacks due to its heavy reliance on digital technology for remote control, navigation, communication, and logistics (Mraković & Vojinović, 2019). Malicious cyber activity is increasingly observed targeting the maritime industry, aiming to disrupt port operations (Li et al., 2024). Recent reports highlight a surge in AI-driven cyber threats targeting the global maritime industry, with cybercriminals adopting more efficient, structured, and business-like approaches, leveraging generative AI tools to create malware and automate attacks (Li et al., 2024). These attacks can specifically target supply chains, 5G infrastructure, Internet of Things (IoT) devices, and critically, Operational Technology (OT) systems (Achuthan et al., 2024). The reliance on digital technology for remote control and logistics means that cyber resilience must be a core component of MCIP, extending beyond traditional IT security to encompass critical OT systems. This escalating cyber threat, with its direct implications for the physical operation and safety of ports (e.g., disrupting cranes or navigation systems), demands specialized expertise, training, and significant investment, which can be a substantial challenge for developing nations like Sri Lanka (Li et al., 2024). The convergence of physical and cyber threats introduces another layer of complexity, demanding an integrated approach to security.

Sri Lanka possesses direct historical experience with asymmetric naval warfare, particularly through the Sri Lanka Navy's (SLN) prolonged battle against the Liberation Tigers of Tamil Eelam (LTTE) Sea Tigers The(Povlock, 2011). LTTE employed unconventional tactics, including swarm attacks by small, fast boats equipped with machine guns and explosives, suicide boats targeting SLN assets, stealthy low-profile crafts designed to blend into fishing fleets, and submersibles for covert transportation of weapons and personnel (Gunaratna, 2020). While these historical examples primarily involved naval engagements, demonstrate Sri Lanka's deep-seated experience with unconventional maritime threats. This institutional memory and operational experience, shaped by a long civil war, while valuable, could inadvertently lead to a bias towards kinetic, physical responses, potentially under-prioritizing less visible threats such as sophisticated cyberattacks or illicit trafficking networks that exploit digital vulnerabilities or blend seamlessly into legitimate trade (Leventopoulos et al., 2024). The proposed JOC framework must leverage this hard-won experience while actively fostering a broader understanding and response capability for the evolving forms of asymmetric threats.

Principles of Effective Multi-Agency Command and Control

The efficacy of multi-agency cooperation in maritime security is not a new concept. During the Cold War, port defense strategies, notably in the United States, already emphasized joint communications, multi-service planning, and a comprehensive multi-agency approach (Watts, 2005). Although the specific military threats of that era differ from today's asymmetric challenges, the fundamental principles of inter-agency cooperation remain highly pertinent (Rațiu, 2016). The post-9/11 security environment necessitated a significant reorganization in many countries, leading to a merging of responsibilities to ensure a unified approach to maritime security across all missions within a given geographic area (Fenton, 2024). This reorganization involved the integration of traditional regulatory functions with law enforcement capabilities to directly address the expanded threat spectrum within ports.

Multi-agency models, such as the Joint Harbor Operations Centers (JHOCs) implemented experimentally in the United States, offer distinct advantages for merging effective port operations and critical infrastructure protection (Tam et al., 2021). These advantages are particularly evident in the areas of intelligence fusion, coordinated planning, and tactical command and control (Spall, 2019). JHOCs serve as critical fusion centers, explicitly addressing the challenges associated with intelligence sharing and creating a comprehensive tactical picture (Catano & Gauger, 2016). The co-location of personnel from various agencies within these centers fosters a shared understanding of procedures, practices, and critical infrastructure priorities, thereby facilitating both rapid and long-term cooperation (Spall, 2019). Ultimately, these centers can function as operational hubs for the tactical coordination of diverse assets in the field.

It is important to recognize that simply establishing a physical JOC or co-locating personnel, while a necessary initial step, is insufficient for achieving optimal effectiveness. True operational effectiveness hinges on building deep interpersonal trust, harmonizing diverse organizational cultures and mandates, and developing common standard operating procedures (SOPs) that effectively overcome historical silos and potential conflicts of interest (Kusnianto, 2022). Experiences from other developing nations, such as Kenya, highlight challenges in multi-agency cooperation, including issues of trust, overlapping roles, conflicts of interest, and poor integration of policies (Muok & Onyango, 2020). These challenges underscore that effective multi-agency command and control requires more than just structural changes; it demands a concerted effort to cultivate a shared culture of collaboration and mutual understanding through regular joint training, exercises, and shared accountability mechanisms.

Challenges in Inter-Agency Coordination and Information Sharing in Sri Lanka

Despite the shared responsibility among various stakeholders, including the Ministry of Defence, Ministry of Foreign Affairs, and Ministry of Ports, Shipping, and Aviation, along with numerous military and civilian agencies, Sri Lanka's maritime security efforts are often characterized by limited coordination, resulting in fragmented and reactive responses to threats (Shivamurthy, 2024). This situation is exacerbated by the absence of a clearly articulated national defense strategy, which hinders the ability to define and prioritize maritime security interests comprehensively. The urgent need for a "Comprehensive Maritime Security Strategy" is therefore paramount (Enoch et al., 2021). Sri Lanka has not yet formalized its maritime security interests in an official government policy document, nor has it developed a unified comprehensive strategy. This indicates a critical disconnect between the recognized need for comprehensive maritime security and the practical implementation of a coordinated national strategy. The absence of a top-down, integrated policy document means that individual agencies, while fulfilling their specific mandates, may not be working towards a shared, prioritized objective, leading to inefficiencies, duplication of effort, and vulnerabilities that fall between jurisdictional cracks (Trein et al., 2020).

Challenges in intelligence sharing between various Sri Lankan agencies have been identified (Abdeen et al., 2021). While the Information Fusion Centre (IFC) Colombo exists and plays a crucial role in collecting, analyzing, and sharing maritime information, and actively facilitates cooperation with local and international stakeholders (Kuruwita, 2023), explicit details on the specific mechanisms for internal inter-agency information sharing remain limited. The Central Intelligence Directorate of Sri Lanka Customs does analyze and disseminate intelligence and connects with other agencies (Jayaratne, 2014; Wignaraja et al., 2020), but a systemic, integrated approach across all relevant bodies is still developing.

Furthermore, constraints stemming from limited capabilities, a struggling economy, and inherent institutional weaknesses pose significant challenges for small states like Sri Lanka in enhancing their maritime capabilities (Attanayake & Atmakuri, 2021). The ongoing economic crisis, for instance, has rendered some naval modernization plans impractical (Sosale et al., 2023). These challenges are not unique to Sri Lanka; observations from other developing nations highlight similar obstacles in multi-agency collaboration, including a lack of effective surveillance, uncoordinated sectoral methods, overlapping roles and conflicts of interest, poor integration of maritime policies, ad-hoc participation, an absence of long-term nationwide blueprints, inadequate training facilities, and issues related to trust in information sharing (Mihailović et al., 2021). These factors

underscore that even the most well-designed Joint Operations Center (JOC) framework will struggle to achieve its full potential without an overarching national strategy that provides strategic direction, allocates resources, clarifies mandates, and establishes the legal and institutional framework necessary for sustained multi-agency cooperation. Without such a strategy, individual initiatives, no matter how well-intentioned, risk remaining ad-hoc and vulnerable to shifts in political will or economic conditions.

PROPOSED MULTI-AGENCY COMMAND AND CONTROL FRAMEWORK FOR SRI LANKA : THE JOINT OPERATIONS CENTERS (JOCS) MODEL

Rationale for Adopting the JOC Model

The adoption of the Joint Operations Centers (JOCs) model for Sri Lanka's maritime critical infrastructure protection is supported by compelling rationale, drawing from both international experience and the specific demands of the contemporary security environment. The concept of Joint Harbor Operations Centers (JHOCs), as experimentally implemented in the United States, has demonstrated its robustness and effectiveness (Watts, 2005). These centers have proven successful in facilitating multi-agency intelligence fusion and coordinating tactical port operations, which are essential for comprehensive maritime critical infrastructure protection (Canyon et al., 2021).

The evolving nature of modern asymmetric threats necessitates a fundamentally multi-agency approach to effective command and control for port defense (Kozaczka & Grelowska, 2019). The traditional model, relying solely on distinct military intelligence, is no longer sufficient. The current threat landscape demands an expansion of this model to incorporate all agencies vital for total protection (Pöyhönen & Lehto, 2023). The JOC model directly supports this need by fostering a merging of responsibilities, thereby ensuring a unified approach to maritime security across all missions within a given geographic area. This mirrors the post-9/11 reorganizations observed in other nations, where traditional regulatory functions were integrated with law enforcement capabilities to directly address the expanded spectrum of threats within ports (Watts, 2005). Ultimately, JOCs function as force multipliers, significantly enhancing capabilities by enabling the collective collection and utilization of multi-agency intelligence within a cohesive command and control structure.

While the JOC model offers a sound framework, its implementation in Sri Lanka must be carefully adapted to the nation's specific context. Sri Lanka faces inherent limitations in capabilities, a struggling economy, and institutional weaknesses. The Sri Lanka Navy's historical experience against the LTTE, where it developed innovative and cost-effective countermeasures due to resource constraints (Povlock, 2011), underscores the importance of pragmatic solutions.

Therefore, a direct replication of a U.S. model may not be feasible or optimal. Instead, the JOC implementation should prioritize adaptability and scalability, emphasizing cost-effectiveness and leveraging existing resources (Jimerson et al., 2020). This might involve a phased approach, an initial focus on the most critical ports, and a strong emphasis on low-cost, high-impact strategies such as enhanced intelligence sharing and human capacity building, rather than immediate heavy investment in new infrastructure. The JOC framework must be resilient to potential economic fluctuations and designed for sustainable operation within Sri Lanka's resource-constrained environment.

Operationalizing JOCs in Sri Lanka : Structure and Core Functions

To effectively operationalize the JOC model in Sri Lanka, these centers would integrate key national agencies, including the Sri Lanka Navy, Sri Lanka Coast Guard, Sri Lanka Ports Authority, Sri Lanka Customs, and other relevant law enforcement and intelligence bodies. This integration is designed to significantly enhance tactical coordination, intelligence fusion, and overall port security and defense capabilities (Dolbow, 2019). At their core, JOCs are operational centers, possessing substantial command and control capabilities that can be utilized by diverse multi-agency assets. They would provide a unique and comprehensive tactical picture to all users, facilitating coordinated actions not only during crises but also in routine day-to-day operations and training exercises.

Enhanced Tactical Intelligence Fusion

A primary function of JOCs would be to serve as critical intelligence fusion centers, directly addressing the existing challenges of intelligence sharing among various Sri Lankan agencies (Spall, 2019). By integrating databases from maritime intelligence, law enforcement, and national security agencies, JOCs would generate a comprehensive tactical picture, thereby significantly improving surveillance and anomaly detection capabilities(Guarascio et al., 2022). This multi-agency approach to intelligence collection and dissemination is paramount for effective Maritime Critical Infrastructure Protection (MCIP). This increased multi-agency awareness would lead to streamlined operations and a tremendously enhanced capacity for surveillance and anomaly detection, a crucial element in safeguarding maritime critical infrastructure. The existing Information Fusion Centre (IFC) Colombo, which already plays a vital role in collecting, analyzing, and sharing maritime information to enhance Maritime Domain Awareness (MDA), could be seamlessly integrated into the JOC structure, serving as a foundational component for its intelligence fusion efforts.

The effectiveness of intelligence fusion within JOCs is not solely dependent on the willingness of agencies to share information; it also relies heavily on the underlying technological infrastructure and data interoperability. MDA systems, for instance, involve the collection of information through reconnaissance,

surveillance, and reporting, followed by the aggregation and analysis of data in a central location.(Étienne et al., 2014). Challenges observed in other developing nations, such as "limited digital integration" and a "lack of major investment in information sharing infrastructure" (Yeganegi et al., 2020), highlight potential impediments. Therefore, Sri Lanka needs to invest in compatible systems, establish common data standards, and ensure secure communication channels. Without these foundational technological elements, the "fusion" aspect of JOCs will be hampered, resulting in fragmented data rather than a truly comprehensive tactical picture. This underscores the need for technical capacity building to complement organizational restructuring.

Coordinated Multi-Agency Planning

The joint personnel structure within JOCs would be instrumental in facilitating both rapid and long-term multi-agency cooperation (Watts, 2005). By co-locating personnel from the Sri Lanka Navy, Sri Lanka Coast Guard, Sri Lanka Ports Authority, Sri Lanka Customs, and other relevant entities, JOCs would cultivate a shared understanding of procedures, operational practices, and critical infrastructure priorities. This collaborative environment is essential for effective tactical multi-agency planning, ensuring that all participating agencies are aligned in their efforts to protect critical maritime infrastructure (Tomasulo, 2010). Furthermore, effective maritime security models incorporate dimensions such as security risk assessment and the development of risk-based security mitigation strategies and plans. JOCs would provide the necessary platform to facilitate this joint risk assessment and collaborative planning, ensuring a proactive and unified approach to potential threats.

Integrated Tactical Command and Control

Ultimately, JOCs would serve as the operational nerve centers for the tactical coordination of multi-agency assets involved in port security and defense (Watts, 2005). They would offer a unique, consolidated tactical picture to all users, enabling synchronized and coordinated actions not only during immediate crises but also in day-to-day operations and planned exercises aimed at improving multi-agency coordination (Jaskowska et al., 2024). This integrated command and control apparatus would significantly enhance the efficient management of diverse forces in the field. Regular drills and exercises, facilitated by the JOC structure, are crucial for refining procedures and building the necessary muscle memory for effective crisis response, ensuring that the theoretical framework translates into practical, coordinated action.

RECOMMENDATIONS FOR IMPLEMENTATION AND FUTURE RESILIENCE

Overcoming Challenges in Multi-Agency Cooperation

The effectiveness of the proposed JOC model hinges on addressing the systemic challenges that currently impede multi-agency cooperation in Sri Lanka. The existing "limited coordination" and "fragmented and reactive responses" necessitate the formalization of cooperation protocols that extend beyond mere physical co-location. This includes actively addressing "overlap roles and conflict of interest" and the "poor integration of maritime policies" that have historically hindered unified efforts.

Building trust and fostering a shared organizational culture among agencies is paramount. This can be achieved through deliberate mechanisms such as mandatory joint training programs, personnel exchange initiatives, and the development of shared career development paths. Such measures can help overcome historical bureaucratic barriers and cultivate a sense of collective responsibility. Furthermore, a critical step involves reviewing and harmonizing existing legal frameworks and policies that may contribute to uncoordinated sectoral methods or contradictory mandates. This legislative and policy coherence is essential for establishing a truly coherent national approach to maritime security. Finally, the establishment of clear, unified Standard Operating Procedures (SOPs) for all facets of MCIP, from intelligence gathering to incident response, will ensure seamless operations and reduce ambiguity during critical moments.

Table 1: Challenges and Success Factors for Multi-Agency Cooperation in Developing Nations: Implications for Sri Lanka

Category	Specific Challenge/Factor	Implication for Sri Lanka
Challenges	Lack of effective surveillance at sea	Creates a complex environment for monitoring activities and identifying threats, particularly illicit activities blending into legitimate traffic.
	Uncoordinated sectoral methods / Overlap roles and conflict of interest	Agencies operate with limited coordination, resulting in fragmented and reactive responses; absence of a national defense strategy hinders prioritization.
	Poor integration of maritime policies / Absence of comprehensive strategy	No official national level government policy document articulates maritime security interests, leading to unaligned efforts.
	Ad-hoc participation	Leads to inefficiency in responding to maritime incidents, as agencies may not be consistently integrated into a unified framework.
	Inadequacy of training facilities / Staff competence	Limits the ability to adopt advanced technologies and best practices for maritime security.
	Trust issues with information sharing	Hinders effective intelligence fusion, a critical component of the proposed JOC model.
	Limited digital integration / Lack of IT investment	Impedes seamless data exchange and the development of a comprehensive tactical picture within JOCs.
Success Factors	Enhanced data sharing	Critical for creating a comprehensive tactical picture and improving anomaly detection.
	Effective organizational structure	JOCs provide a structured platform for merging responsibilities and fostering unified operations.
	Staff competence and capacity building	Essential for adopting new technologies and effectively implementing complex security protocols.
	Information Technology (IT) adoption	Revolutionizes data management, decision-making, and information sharing, especially for MDA.
	Clear communication protocols	Ensures efficient response and coordination during daily operations and crises.
	Regional and international collaboration	Provides expertise exchange, capacity building, and influence on maritime security.

Strengthening Maritime Domain Awareness (MDA) and Intelligence Sharing

Maritime Domain Awareness (MDA) is not merely a function but a foundational prerequisite for all Maritime Critical Infrastructure Protection (MCIP) efforts. Without robust MDA capabilities, the intelligence fusion, coordinated planning, and tactical command and control functions within JOCs would be severely hampered. Therefore, investment in MDA technologies, such as advanced sensors, data analytics, and artificial intelligence for anomaly detection, along with comprehensive training for personnel to effectively utilize these tools, should be prioritized as a critical enabler for the entire proposed framework.

Sri Lanka can leverage its existing infrastructure, such as the Information Fusion Centre (IFC) Colombo, which is already integral to MDA, collecting, analyzing, and sharing maritime information 24/7. This center should be a core component of the JOC's intelligence fusion efforts. Effective MDA involves integrating diverse data sources, including information gathered through reconnaissance, surveillance, reporting, and aggregating data from various origins. This also extends to commercial shipping and financial information, which can be crucial for identifying and classifying vessels by risk.

Ensuring efficient and timely cross-agency information flow is vital. Reviewing existing information sharing mechanisms between agencies like the Sri Lanka Air Force and Sri Lanka Navy (e.g., IFC and Maritime Rescue Coordination Centre) is crucial. Furthermore, integrating non-traditional intelligence sources, such as information from coastal communities gathered through Coastal Observation Posts (COPs) staffed by the SLN, can provide valuable, localized intelligence for decision-makers. International partnerships are also essential for strengthening MDA. Collaborative initiatives, including joint naval exercises, real-time information sharing, and enhanced capacity-building efforts with regional and international partners (such as UNODC, IMO, IORA and the India, United States, China, Japan, Australia), are fundamental.

Addressing Cybersecurity Vulnerabilities in Port Operational Technology (OT)

The escalating cyber threat to maritime infrastructure, particularly to port operations and logistics chains, necessitates a proactive and comprehensive approach. Without significant enhancements to existing cyber defenses, critical infrastructure will become progressively more exposed. The Colombo Plan's initiative to provide essential training on port cybersecurity and assist the Sri Lanka Ports Authority (SLPA) in developing a strategic policy is a commendable

step (Mandra, 2023). This training is vital for ensuring compliance with national and international cybersecurity regulations and for enhancing the overall resilience of port operations.

The rise of AI-driven cyber threats means that malicious actors are becoming increasingly efficient and structured, leveraging generative AI to create sophisticated malware and automate attacks. To counter this, stronger software policy enforcement, tighter endpoint control, and heightened cybersecurity awareness among all maritime personnel are crucial. A particularly vulnerable area is Operational Technology (OT) systems, which are specifically targeted to disrupt operations and extract financial gains. Protecting these systems requires specialized cybersecurity measures that extend beyond traditional IT security, acknowledging that critical infrastructure systems are managed by automation through interconnected networks.

This implies the need for a "whole-of-port" cybersecurity strategy. Port cybersecurity cannot be treated as an isolated IT problem; it requires an integrated approach that encompasses both IT and OT security, involves all stakeholders from port authorities to shipping companies and logistics providers, and addresses vulnerabilities across the entire digital and physical ecosystem. This includes not only technical defenses but also human factors (e.g., training, awareness campaigns) and robust supply chain security, as a compromise anywhere in the chain can significantly impact the port's integrity and operational continuity.

Developing a Comprehensive National Maritime Security Strategy

A critical "missing link" in Sri Lanka's current maritime security architecture is the absence of a comprehensive national maritime security strategy. This deficiency leads to fragmented responses and hinders the clear prioritization of national maritime interests. Even the most well-designed JOC framework will struggle to achieve its full potential without an overarching national strategy. A comprehensive policy document provides the strategic direction, allocates resources, clarifies mandates, and establishes the legal and institutional framework necessary for sustained multi-agency cooperation. Without it, individual initiatives, no matter how well-intentioned, risk remaining ad-hoc and vulnerable to shifts in political will or economic conditions. The development of such a strategy is therefore a critical pre-condition for long-term MCIP success.

A truly comprehensive strategy must integrate inputs from all relevant stakeholders, recognizing that the Sri Lanka Navy cannot bear this responsibility alone. This strategy must be forward-looking and coherent, clearly outlining roles and responsibilities, ensuring effective coordination, and promoting

the timely and efficient allocation of resources to effectively address complex non-traditional threats. Furthermore, the strategy needs to realistically assess current and emerging threats, meticulously evaluate existing capacities, and identify necessary resources, all while remaining mindful of Sri Lanka's economic constraints. The Sri Lanka Navy's "Maritime Strategy 2030 and Beyond"(Sri Lanka Navy, 2024) represents a positive step in this direction, but it requires broader integration with the perspectives and capabilities of all other maritime agencies and stakeholders to become a truly national, comprehensive document.

Capacity Building, Training, and Resource Allocation

The human element is paramount in ensuring effective port security. Emphasizing safety and security awareness, coupled with continuous training and skill development, is a fundamental principle of robust port security. It is crucial to develop security training programs specifically tailored to the region's unique needs, foster a pervasive culture of security awareness, and ensure that all employees are thoroughly familiar with established procedures and emergency protocols. Sri Lanka already offers specialized courses, such as "Proficiency as Ship Security Officer," which can serve as a foundation for broader capacity-building initiatives.

International support plays a significant role in enhancing Sri Lanka's maritime security capabilities. The nation has benefited from assistance and expertise from partners like the United States in developing its defense strategy and enhancing maritime doctrine. Collaborative initiatives with organizations such as the United Nations Office on Drugs and Crime also contribute significantly to improving understanding and operational effectiveness in maritime security.

Sustainable funding is a critical factor for long-term success. The impact of economic crises on naval modernization plans in Sri Lanka underscores the necessity of securing stable financial commitment and long-term strategic planning for both naval modernization and overall maritime security. Partnerships, such as the substantial support extended by India, including training programs and the provision of defense equipment, are vital for bridging resource gaps. Furthermore, leveraging cutting-edge technology, including the deployment of Unmanned Aerial Vehicles (UAVs) and Unmanned Underwater Vehicles (UUVs), can significantly improve surveillance and reconnaissance capabilities, offering a force multiplier effect in a resource-constrained environment.

Fostering Regional and International Partnerships

The Indian Ocean Region faces common non-traditional maritime safety and security challenges, particularly illicit trafficking, which inherently

necessitates robust regional cooperation. Collaborative initiatives such as joint naval exercises, real-time information sharing, and enhanced capacity-building are essential for fostering innovation and facilitating the exchange of expertise among regional partners.

Several international models offer valuable insights for Sri Lanka's approach to cooperation:

a. **ReCAAP Information Sharing Centre (ISC):** This government-to-government agreement, focused on combating piracy and armed robbery in Asia, facilitates swift information exchange, conducts critical analysis, and supports capacity-building among 16 regional countries. Its secure web-based Information Network System (IFN) links focal points 24/7, enabling timely response to incidents.

b. **Combined Maritime Forces (CMF):** A multinational maritime partnership comprising 46 nations, CMF promotes security, stability, and prosperity by countering illicit non-state actors, suppressing piracy, and encouraging regional cooperation. Operating as a "coalition of the willing," CMF has five Combined Task Forces (CTFs) with specific focuses, and Sri Lanka has already participated in CMF Vessel Boarding, Search and Seizure (VBSS) training.

c. **Pacific Fusion Centre:** Established through the Pacific Islands Forum, this center conducts strategic assessments, information sharing, and capacity building for domain awareness across the Pacific.

Bilateral engagements are also crucial. India and Sri Lanka are actively deepening their defense and security cooperation, with a focus on maritime security, counter-terrorism, defense training, and intelligence sharing. Similarly, the United States, China, Japan, Australia actively supports Sri Lanka's maritime security initiatives.

For a developing island nation like Sri Lanka, while international partnerships and shared intelligence are undeniably crucial for MCIP, they also present a delicate balancing act with national sovereignty. Small Island Developing States (SIDS) are inherently dependent and vulnerable. Discussions around foreign research vessels and delays in implementing Standard Operating Procedures (SOPs) for them highlight a tension between asserting sovereignty and engaging in international cooperation. Concerns about "loss of sovereign control over maritime chokepoints" due to foreign influence are also present. The JOC framework must therefore be designed to enhance national capabilities and decision-making autonomy, while effectively integrating international support and information. This requires clear national policies and SOPs that meticulously define the terms of engagement, ensuring that foreign assistance genuinely strengthens Sri Lanka's security posture without compromising its strategic independence.

CONCLUSION

Sri Lanka's maritime critical infrastructure stands as a cornerstone of its economic prosperity and national security, rendering its ports particularly attractive targets in the contemporary asymmetric threat environment. The proposed adaptation and implementation of a multi-agency command and control framework, specifically the Joint Operations Centers (JOCs) model, offers a robust pathway for Sri Lanka to significantly bolster its port security and defense capabilities. This approach, fundamentally rooted in intelligence fusion, coordinated planning, and integrated tactical command, will empower Sri Lanka to effectively counter diverse threats, ensure the resilience of its vital maritime assets, and maintain its strategic position within the Indian Ocean.

The successful realization of the JOC model necessitates a concerted effort to overcome existing challenges in inter-agency cooperation, address the pervasive "invisibility" of the maritime domain, and bridge the policy-practice disconnect in maritime security governance. It demands a significant strengthening of MDA capabilities, recognizing MDA as a foundational enabler for all MCIP efforts, which in turn requires investment in compatible technologies and data standards for effective intelligence fusion. Simultaneously, a dedicated focus on addressing the escalating cybersecurity vulnerabilities in port Operational Technology (OT) is critical, advocating for a holistic "whole-of-port" cybersecurity strategy that integrates IT and OT security across all stakeholders.

Furthermore, the establishment of a comprehensive national maritime security strategy is an imperative, serving as the strategic blueprint that clarifies roles, allocates resources, and ensures sustained multi-agency cooperation. This must be complemented by continuous capacity building, targeted training programs, and the securing of sustainable resource allocation. Finally, fostering robust regional and international partnerships, while carefully navigating the delicate balance between collective security and national sovereignty, will be essential for sharing expertise, leveraging support, and addressing transnational maritime threats effectively. This holistic and integrated approach is not merely an option but a crucial necessity for Sri Lanka to navigate the complex and evolving maritime security landscape of the 21st century and safeguard its future prosperity.

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MARITIME CULTURE AND STRATEGIC IDENTITY: REIMAGINING SRI LANKA'S OCEANIC HERITAGE FOR CONTEMPORARY SECURITY POLICY

Lieutenant Lahiru Cooray

Abstract

Maritime culture has often been treated as a secondary factor in national security and strategic planning. However, for island nations like Sri Lanka, which have a long and rich seafaring heritage, the cultural relationship with the sea can play a meaningful role in shaping strategic thought. This article explores how Sri Lanka's maritime traditions and historical experiences with the ocean can influence its national identity, civil-military relations, and foreign policy. Drawing on historical accounts, cultural studies, and regional geopolitical developments, it argues that understanding and embracing maritime culture can help develop a more balanced and locally rooted security strategy. Rather than relying solely on conventional military thinking, this approach highlights the value of cultural awareness and soft power in enhancing Sri Lanka's presence and influence in the Indian Ocean region. By reconnecting with its oceanic past, Sri Lanka can shape a more distinctive and effective role in regional maritime affairs.

Keywords : ***Maritime Culture, Strategic Identity, Naval Heritage, Maritime Strategy***

INTRODUCTION

For many years, strategic studies have mostly focused on clear and measurable areas of national power—things like armies, weapons, economic strength, or a country's location. But the world is changing, and today, ideas and culture are becoming just as important. One area that is often ignored, but can offer real value, is maritime culture—the traditions, beliefs, and practices shaped by people's long relationship with the sea. In many parts of the world, especially in the Indo-Pacific region, the sea has shaped how people live, trade, travel, and relate to others. It's not just a route for ships or a space to guard with navies. It also affects how countries see themselves and how they act. As some scholars point out, maritime security is not only about protecting coastlines, it's also about how societies think about the ocean and their role in it.

Sri Lanka, as an island in a key location in the Indian Ocean, has a deep maritime history. For centuries, it was a hub for sea trade, culture, and exchange between East and West. But in recent decades, Sri Lanka has become more focused on land-based issues—especially due to the long civil war and internal political concerns. This has led to a situation where the country's strategic thinking has moved away from the sea.Now, with regional tensions growing and

new security challenges emerging at sea—from illegal fishing to outside powers competing for influence, it is time for Sri Lanka to reconnect with its maritime roots. Doing so can bring many benefits. For one, it can help strengthen the country's identity on the global stage. A strong and proud maritime culture can boost soft power and open doors in regional diplomacy. It can also help build stronger links between the navy and the wider public, by rooting naval priorities in national history and shared values.

Some scholars have shown how island nations often develop unique views of the world shaped by the sea. These views can help them act independently and wisely in international matters. For Sri Lanka, its long history of seafaring and ocean-based trade with countries like India, China, and the Middle East offers a rich source of cultural capital. By embracing this, Sri Lanka could strengthen its regional role while avoiding being pulled into the power struggles of larger countries.In today's world, where influence is shaped not just by military strength but also by ideas and image, culture matters more than ever. Sri Lanka has the chance to turn its maritime culture into a real strategic asset—one that supports peace, regional cooperation, and smart defence planning.This article argues that maritime culture should not be seen as something soft or secondary. Instead, it should be part of the country's core national strategy. By reconnecting with its past, Sri Lanka can better face the future, with a strategy that reflects its geography, its history, and its people.

MARITIME CULTURE

Maritime culture refers to the shared customs, knowledge, and ways of life shaped by communities living by the sea. It includes fishing traditions, sea myths, boat-making, naval practices, and the diverse cultural life of port cities. These elements influence how people view the ocean, how governments make maritime decisions, and how societies support naval and coastal policies (Till, 2009).This culture is dynamic. Over time, colonisation, trade, migration, and technology have transformed coastal traditions. Some practices survive, while others evolve. As Horden and Purcell (2000) suggest, maritime history is shaped by many voices and shifting influences. It also includes the spiritual and emotional bonds people have with the sea. In Sri Lanka, rituals like the Kara-vela show how coastal communities honour and spiritually connect with the ocean (de Silva, 1981).

Sri Lanka's ports—Galle, Trincomalee, and Colombo have long been meeting points for global cultures. Traders and sailors from Arabia, China, Portugal, the Netherlands, and Britain helped form a rich maritime identity, visible in local languages, architecture, and customs.

Today, digital tools like documentaries, online exhibits, and social media can keep maritime culture alive. As Appadurai (1996) notes, global information flows allow old traditions to take on new meanings and stay relevant.Recognising the value of maritime culture goes beyond preserving history. It should be integrated into education, policy making, and community development. A strong maritime identity can improve public engagement, shape better marine policies, and boost Sri Lanka's soft power and global standing.In short, maritime culture can be a foundation for inclusive growth, stronger diplomacy, and a more strategic future.

THE HISTORICAL MARITIME IDENTITY OF SRI LANKA

Sri Lanka has a deep and rich maritime history. Ancient ports like Mantai, Galle, and Trincomalee played vital roles in Indian Ocean trade, linking the island with regions across Asia and beyond (Carswell et al., 2013). Texts like the Mahavamsa show that seaborne trade brought not just goods, but also new religions, ideas, and technologies that helped shape early kingdoms.

A powerful example of maritime vision was King Parakramabahu I in the 12th century, who launched naval expeditions to South India and Southeast Asia (de Silva, 1981). From the 8th century, Arab traders settled along the coast, boosting Sri Lanka's global trade links. The Chinese, including Admiral Zheng He's fleet, visited during the Ming Dynasty. Later, European powers—Portuguese, Dutch, and British—seized control of key ports for trade and military purposes (Pearson, 2003).Colonial rule disrupted this tradition. The British shifted focus to inland economic goals, sidelining local maritime knowledge and replacing it with colonial systems (Samaraweera, 1997). After independence, civil conflict further drew attention away from the sea. The Navy was limited to coastal defence and counter-smuggling, while broader maritime strategy was largely forgotten.

This disconnect weakened Sri Lanka's cultural bond with the ocean. The sea, once a source of pride and exchange, became associated mainly with security risks.To rebuild this connection, Sri Lanka must invest in maritime education, heritage projects, and coastal development. It should also engage more actively with regional bodies like Indian Ocean Rim Association (IORA) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC). By understanding its maritime past, Sri Lanka can shape a more confident and balanced future—where national strategy includes both its geographic realities and cultural heritage.

STRATEGIC CULTURE AND MARITIME IDENTITY

a. Strategic Culture Theory. Strategic culture is the idea that a country's approach to national security is shaped not just by its military power or economic strength, but also by its history, traditions, and the way its people think about the world. Scholars like Snyder (1977) and Gray (1999) argue that over time, countries develop their own way of thinking about defence and security based on their past experiences and cultural values.

For example, Britain in the 1800s became a global naval power partly because people believed strongly in the idea that controlling the seas was key to national strength. In the United States, its military strategy of having a strong presence overseas can be linked to its early history of expanding westward, which created a mindset of pushing boundaries (Booth and Trood, 1999).

In Sri Lanka, this kind of thinking—strategic culture—hasn't been explored much. Most national security decisions have focused on immediate threats, especially during and after the civil war. But looking back at Sri Lanka's long seafaring history, there is a chance to build a stronger strategic identity based on its past. By including stories and lessons from maritime history in government policy documents, naval training, and public discussions, Sri Lanka can shape a smarter and more culturally aware approach to security.

b. Civil-Military Maritime Identity. A country's military earns more respect and trust when it reflects the culture and values of its people. For navies in particular, connecting with a nation's maritime heritage can boost public support, help attract new recruits, and create stronger ties between civilians and the military.

In Sri Lanka's case, this could include using traditional maritime symbols in naval uniforms and ceremonies, or highlighting stories of ancient seafarers in museums and public events. Celebrating Sri Lanka's proud maritime past can help people feel more connected to the Navy and the country's role at sea (Hobson, 2002).

Naval training schools should also teach the local history of the sea and how past generations used maritime knowledge. This would help future naval officers understand and respect the cultural meaning of their work. Events like maritime festivals, coastal clean-up projects, or Navy open days where people can visit ships and talk to sailors can build trust and awareness in local communities.

Countries like the UK and India already do this. Britain has its White Ensign Day, and India celebrates Navy Week, both of which connect the public with naval traditions. Sri Lanka can follow similar models to create a stronger, shared maritime identity between its people and its Navy.

STRATEGIC BENEFITS OF MARITIME CULTURAL INTEGRATION

a. Soft Power Projection. Joseph Nye's idea of soft power highlights how a country can influence others not through force, but through culture, values, and appeal. For Sri Lanka, using its maritime heritage—such as historic ports, ocean-related arts, and seafaring traditions—can help build a positive image internationally.

Events like the Galle Literary Festival, traditional sailing events, or naval parades could showcase Sri Lanka's rich maritime past while strengthening its cultural presence in the region. These activities go beyond celebration—they send a message about Sri Lanka's identity and history. By presenting itself as a centre of maritime culture, Sri Lanka can connect more effectively with regional groups like IORA, BIMSTEC, and ASEAN (Nye, 2004).

b. Policy Legitimacy and Public Support. Policies are more likely to succeed when they reflect people's values and identity. If Sri Lanka includes maritime culture in school education, national celebrations, and public campaigns, people will begin to see the ocean as a key part of their national life.

This public connection helps build support for important efforts like ocean-based economic projects (blue economy), protecting the coastline, or upgrading the Navy. For instance, in Japan, schools teach ocean studies to build awareness about maritime issues, helping foster a strong sea-based national identity—even under a pacifist constitution (Yoshihara and Holmes, 2008).

c. Strategic Narratives in Diplomacy. In today's Indo-Pacific region, countries often use strategic storytelling—or narratives—to shape how others see them and to build international trust. Sri Lanka has a strong story to tell: it has been part of maritime trade and cultural exchange for centuries.

By promoting this story through international exhibitions, cultural festivals, films, and diplomatic missions, Sri Lanka can position itself as a peaceful and historic bridge between nations. Highlighting ancient

ports like Galle, Mantai, or Trincomalee, and the country's long-standing seafaring communities, adds depth to its non-aligned foreign policy and strengthens its voice in regional maritime affairs.

INSTITUTIONAL AND EDUCATIONAL PATHWAYS

a. Reforming Maritime Education. To bring maritime culture into national strategy, education is the starting point. Universities and naval academies should offer courses that mix subjects like maritime history, coastal traditions, and strategic studies. These interdisciplinary programs can help future leaders understand the broader role of the ocean in Sri Lanka's identity and security.

Partnering with international bodies like the Indian Ocean Rim Academic Group (IORAG) or UNESCO's Ocean Literacy Initiative can give students and professionals valuable global exposure. Also, short-term training for diplomats, policymakers, and journalists can build an informed group of decision-makers who understand the importance of the sea.

b. Cultural Mapping of Coastal Communities. Research into the everyday lives and traditions of fishing communities is vital. Many of these communities still follow customs passed down for generations. Projects like oral history recordings, community-led mapping, and documentation of rituals can help preserve this living knowledge.

Such research also helps create better policies—for example, in areas like disaster management, marine conservation, or sustainable fishing. Working with local universities, NGOs, and coastal groups ensures that these projects are ethical, inclusive, and respectful of community ownership (Senanayake, 2006).

c. Protecting Naval and Maritime Heritage. Historical maritime sites—like old forts, lighthouses, and sunken ships—are more than tourist attractions. They are part of Sri Lanka's national memory and can play a role in education, diplomacy, and local development.

Projects such as the Maritime Archaeology Project in Galle show how conservation can support tourism and revive interest in naval history. International organisations like the World Monuments Fund or ICOMOS can offer funding and expertise for preserving these sites.

d. Engaging Through Media and Digital Platforms. In today's digital world, storytelling through media can bring maritime culture to life. Short films, podcasts, virtual tours of ports and heritage sites, and social media content can all help share Sri Lanka's ocean story with a wider audience.

These modern tools make maritime culture more appealing to younger generations and global audiences. They also support cultural diplomacy by showing the world a more vibrant and connected image of Sri Lanka rooted in its oceanic past.

CHALLENGES AND CONSIDERATIONS

a. Risk of Politicising Culture. Using culture in national strategy can be powerful, but it must be done carefully. There's a risk that some groups might use maritime heritage to push narrow, ethnic, or religious agendas. To avoid this, Sri Lanka's maritime identity should be built on inclusion. It should celebrate the many communities that shaped our ocean history—like Tamil traders in Jaffna or Moor merchants in Beruwala. Policies must reflect this diversity and guard against turning heritage into a tool for division.

b. Balancing Tradition and Modern Needs. Preserving old maritime customs, like traditional fishing and coastal rituals, is important. But modern maritime policy also needs to deal with today's issues—such as climate change, illegal fishing, and regional security. Finding the right balance means respecting traditional knowledge while also using modern science, technology, and international law. The goal should be a smart mix of old and new.

c. Limited Institutional Capacity. Bringing maritime culture into national strategy is not easy. It needs strong coordination between different government agencies, from education to defence. But in reality, bureaucratic delays, lack of funding, and poor coordination can slow things down. To make real progress, high-level leadership is essential. A national maritime council or even a presidential task force could help bring different sectors together and make sure everyone is working toward the same goals.

CONCLUSION

Maritime culture is not just a part of Sri Lanka's past—it can be a powerful part of its future. By reconnecting with its ocean heritage, Sri Lanka has the chance to build a stronger national identity, earn greater public support for maritime policies, and stand out as a key player in the Indo-Pacific region. When culture is used alongside modern naval strength and smart international partnerships, it can shape a well-rounded approach to maritime security.

At a time when global and regional tensions are rising, looking back to our seafaring roots can help us move forward with confidence. The sea should no longer be seen only as a path for trade or conflict—it must be central to how we see ourselves, how we govern, and how we protect our interests. By doing this, Sri Lanka can turn its maritime legacy into a real strategic advantage, helping to build a safer, more connected, and culturally rich future.

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IMPACT OF MARITIME TRANSPORTATION ON MARINE BIODIVERSITY AND SUPPLY CHAIN RESILIENCE : STUDY IN THE INDIAN OCEAN

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Abstract

The resilience of the global supply chain and the integrity of the environment are both seriously threatened by maritime accidents in the Indian Ocean. Accidents and disasters caused by nature are more likely in this crucial area as shipping traffic increases. This study focuses on the main causes of marine vulnerabilities and investigates how sustainable behaviors, legal frameworks, and technology developments might improve maritime safety. The results highlight urgently better risk management techniques, stakeholder cooperation, and ongoing innovation are needed. Maintaining the stability of maritime trade routes that rely on the Indian Ocean and the health of ocean ecosystems depend on addressing these issues.

Keywords : Supply Chain Resilience, Marine Biodiversity, Maritime Transportation, Marine Safety

INTRODUCTION

Overview of Maritime Transportation and Its Importance

With developments in shipbuilding, navigation, communication technology, and the exploitation of marine resources, the maritime industry experienced tremendous expansion in the 20th century (Duda & Wawruch, 2017). During this time, the offshore industry emerged and a variety of ship types were introduced, including tankers, heavy lift carriers, and container ships. However, the frequency of marine accidents has not decreased in spite of technical advancements (Duda & Wawruch, 2017). The effects of maritime accidents on the environment and the economy have been worse as ships have grown in size and hazardous cargo have been transported. Global economic and environmental issues are putting increasing strain on the distinctive marine culture, which is defined by globality, autonomy, complexity, and challenging working circumstances.

The industry's vulnerability was further revealed by the COVID-19 pandemic, which resulted in a notable economic slump in 2020. UNCTAD (2022) reports that there are 98,140 commercial ships above 100 gross tons in the world's fleet, with significant expansion in bulk carriers, oil tankers, gas carriers, and container ships. However, 193 vessels above 100 GT were lost between 2017 and 2020, mostly as a result of sinking (62%), grounding (15%), and fire or explosion (10%) (SSR, 2021). Furthermore, the modular and hierarchical structure of the marine commerce network and port connection highlight how strategically significant a country's geographic location is (Guo et al., 2025).

Table 01: World seaborne trade by types of cargo in metric tons in millions as of 18th July 2023

Cargo Type	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Crude oil loaded	1,751	1,785	1,738	1,712	1,761	1,832	1,875	1,881	1,860	1,715	1,700
Other tanker trade loaded	1,028	1,055	1,091	1,121	1,178	1,238	1,279	1,320	1,303	1,203	1,252
Dry cargo loaded	5,959	6,357	6,625	6,983	7,074	7,176	7,560	7,818	7,908	7,727	8,033
Total goods loaded	**8,739**	**9,197**	**9,453**	**9,816**	**10,013**	**10,247**	**10,714**	**11,019**	**11,071**	**10,645**	**10,985**
Crude oil discharged	1,897	1,930	1,882	1,850	1,910	1,985	2,033	2,049	2,023	1,864	1,846
Other tanker trade discharged	1,039	1,056	1,091	1,088	1,175	1,235	1,288	1,339	1,320	1,224	1,273
Dry cargo discharged	5,766	6,129	6,511	6,782	6,879	7,083	7,366	7,629	7,712	7,546	7,856
Total goods discharged	**8,702**	**9,115**	**9,483**	**9,720**	**9,965**	**10,303**	**10,687**	**11,017**	**11,055**	**10,634**	**10,975**

Source: UNCTAD, 2024.

Significance of the Indian Ocean as a vital corridor for international shipping.

Due to its well-positioned ports, South Asia has long been a major hub in the Indian Ocean trade network, facilitating the flow of valuable commodities including textiles, precious stones, and spices (Prakasch, 1998). In addition to connecting South and Southeast Asia, these routes promoted cultural and technological contacts throughout the Indian Ocean region (Raj Somadeva, 2009; UNESCO.org, 2025). Through ports like Kedah, Mabar, Ceylon (Sri Lanka), and Seylac, the western Indian Ocean once linked South Asian staple-producing regions with important economic hubs in Arabia, East Africa, and the Mediterranean (Margariti, 2008).

Nearly two-thirds of world marine trade is supported by the Indian Ocean, which is still essential for moving gas and oil from resource-rich areas to industrialized countries (The Lakshman Kadirgamar Institute, 2019). Three principal and four minor sea routes and chokepoints that are vital to international trade and geopolitics increase its strategic significance (Gunathilake, 2021). Transshipment Incidence (TI), a measure of logistical performance, is used to quantify port efficiency close to these chokepoints (Notteboom, Pallis, & Rodrigue, 2022).

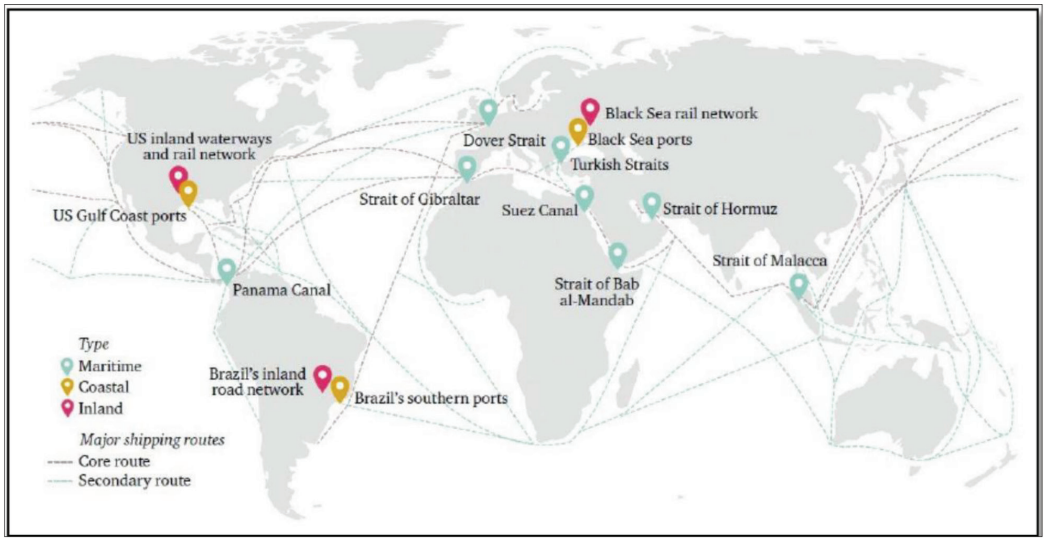

Figure 01: Main Maritime Shipping Routes and Chokepoints

Source: Chulantha Gunathilake, 2021

For the majority of traffic is moving between the Atlantic and Pacific Oceans, and the Indian Ocean serves as a natural "transit lounge." There are two main ways that it is different from the Atlantic and Pacific Oceans. First, the countries in the Indian Ocean region only engage in around one-fifth of the region's trade (Weitz, 2018). Crude oil shipments to the United States, Japan, and Europe account for the remaining 80% of commerce. The Atlantic and Pacific Oceans, on the other hand, are where the majority of international trade takes place. Second, there are just a few crucial chokepoints in the Indian Ocean, whereas the Atlantic and Pacific Oceans are "open" oceans with numerous entry points (Lartey, 2024). These include the Straits of Malacca, Sunda and Lombok Straits, and the Ombai-Water Straits from the east; the Cape of Good Hope and the Straits of Madagascar from the west; the Bab el-Mandeb at the end of the Red Sea and the Straits of Hormuz in the Persian Gulf from the north (Thrift and Kitchin, 2009).

Table 02: The Canals and Straits that connects the Indian Ocean

Feature	Suez Canal	Strait of Hormuz	Strait of Malacca
Length	193 km (120 miles)	~39 km (21 nautical miles) wide	800 km (500 miles)
Minimum Width	Varies; dredging channels allow large ships	~33 km (18 nautical miles) at narrowest point	65 km (40 miles) in south; 250 km (155 miles) north
Connection	Mediterranean Sea ^ Red Sea	Persian Gulf ^ Gulf of Oman	Indian Ocean ^ South China Sea (Pacific Ocean)
Annual Ship Traffic	~20,000 ships (~12% of global trade)	~21,000 ships	~94,000 ships (one-third of global trade)
Key Countries	Egypt	Iran, Oman, UAE	Indonesia, Malaysia, Singapore, Thailand
Main Cargo	Oil, LNG, containers, dry bulk	Crude oil, LNG	Oil, LNG, container goods, electronics
Strategic Importance	Cuts travel time between Europe & Asia	Key for global oil supply (~20% of world oil)	Vital link between Pacific & Indian Oceans; handles >50% of oil trade in Asia

Source: Author

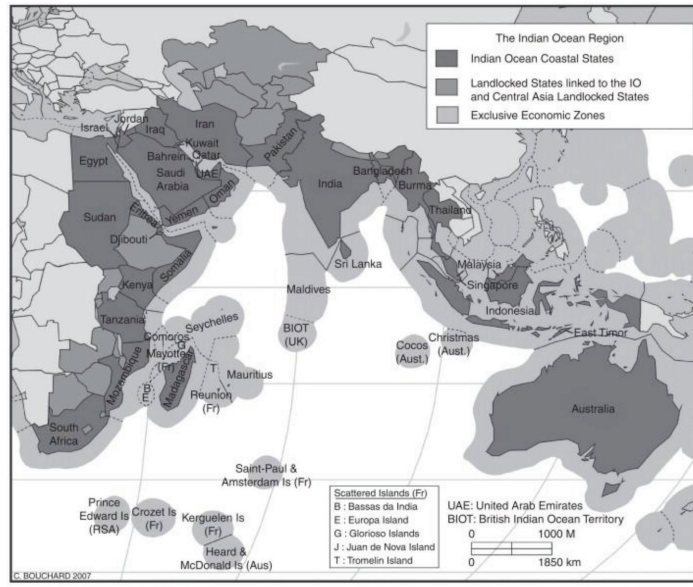

Figure 02: The Indian Ocean Region (IOR)

Source: Thrift and Kitchin (2009)

Research Question

Based on the opportunities, threats, and challenges of SLN based on the Red Sea deployment, this discussion paper presents the following recommendations for the strategic level of the SLN hierarchy. Hence, by addressing these recommendations, SLN would effectively steer the opportunities, threats, and challenges posed by its involvement in the Red Sea conflict.

RQ1: How does maritime transportation impact marine biodiversity in the Indian Ocean, particularly in relation to pollution, habitat damage, and species endangerment?

RQ2: What are the effects of major maritime incidents (e.g., oil spills, shipwrecks) on the resilienceof the supply chain in the Indian Ocean region?

RQ3: What sustainable shipping practices and technological advance ments can improve maritimesafety and ecosystem protection in the Indi an Ocean?

Research Objectives

Using a case study methodology, this research attempts to investigate the ecological and economic effects of maritime transportation and disasters in the Indian Ocean. It is methodically filtered pertinent literature using keywords

like “Indian Ocean,” “marine pollution,” “shipping tragedy,” and “sustainable maritime practices” using the PRISMA approach. Analyzing significant maritime disasters (MOLComfort, MV X-Press Pearl, MT New Diamond, and MV Wakashio), evaluating the impact of maritimeactivities on marine biodiversity, and suggesting sustainable shipping methods are some of the main goals. The project also intends to create strategic policy suggestions to improve supply chain resilience in the area, safeguard ecosystems, and improve maritime safety.

BACKGROUND AND CONTEXT

Key Ports and the their role in international trade

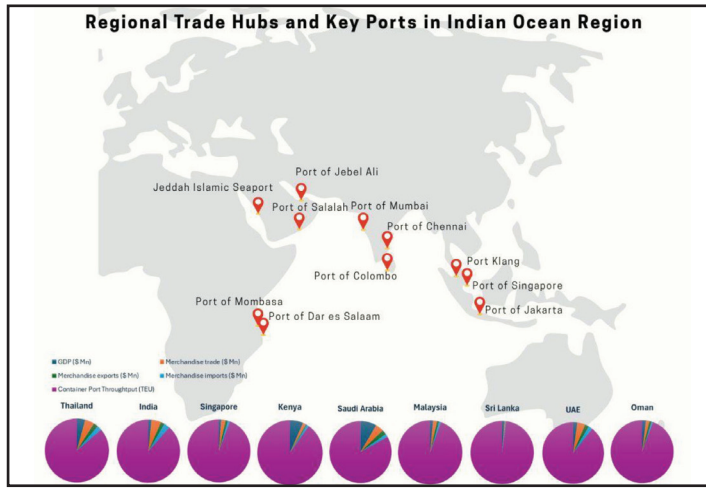

Figure 03: Regional Trade Hubs and Key Ports in IOR

Source: Author.

Table 03: Key Ports and Hubs in IOR

Port	Type	TEUs Handled (2024)	Estimated Revenue	Key Shipping Lanes
Port of Colombo (Sri Lanka)	Transshipment & Gateway	7.78 million	Not publicly disclosed	Europe–Asia via Suez Canal; East Africa–South Asia
Port of Mumbai (India)	Gateway	Data not available	Data not available	Arabian Sea–Europe; Persian Gulf–India
Port of Singapore	Global Transshipment Hub	39.01 million	S$4.8 billion business spending	Pacific–Indian Ocean; Global East–West trade
Port of Salalah (Oman)	Transshipment & Bulk	3.3 million	Not publicly disclosed	Europe–Asia via Suez Canal; East Africa–Middle East
Port of Mombasa (Kenya)	Gateway	2.0 million	Not publicly disclosed	East Africa–Asia; Indian Ocean–Europe
Jeddah Islamic Port (Saudi Arabia)	Gateway & Transshipment	Capacity up to 19,800 TEU vessels	Not publicly disclosed	Red Sea–Suez Canal; Middle East–Europe
Port Klang (Malaysia)	Transshipment & Gateway	Data not available	Data not available	Pacific–Indian Ocean; Southeast Asia–Global trade routes

Source: Author

Types of Maritime Incidents

Case Studies of Ship Incidents

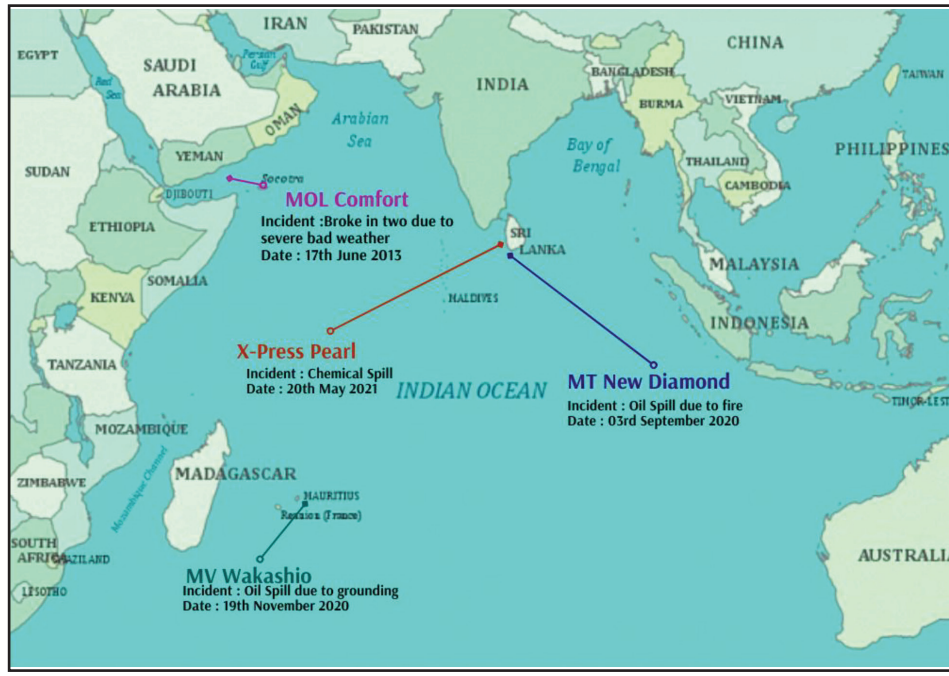

Figure 04: Maritime Incidents Occurred in IOR 2010-2025

Source: Author

Table 04: Case Studies of Ship Incidents 200-2025

Incident	Impacted Country	Location	Overview	Environmental Impact	Supply Chain Disruption	Economic Loss	Company Loss	Sources
MOL Comfort (2013)	Global (cargo from various countries)	Arabian Sea, near Yemen	On June 17, 2013, a massive container ship the MOL Comfort experienced a catastrophic structural failure in the Indian Ocean, causing the ship to split in two and ultimately sink.	Significant maritime contamination ensued from the sinking, which claimed about 4,382 containers, many of which contained plastics and other contaminants.	The event caused delays and financial losses by interfering with important commerce routes between Asia and Europe. Significant insurance claims resulted from the loss, which also forced changes to ship safety regulations and design..	Due to supply chain interruptions and cargo loss, the total economic damage is anticipated to be between $300 and $400 million.	Mitsui O.S.K. Lines was the owner of the vessel. The value of the ship as well as possible liability claims were included in the loss.	Mitsui O.S.K. Lines, Ltd., (2025),
MV X-Press Pearl (2021)	Sri Lanka	Off the coast of Colombo, Sri Lanka	The MV X-Press Pearl and her cargo, which included plastic pellets and dangerous chemicals, were destroyed after it caught fire off the coast of	The catastrophe severely damaged coastal regions and marine ecosystems by releasing large amounts of dangerous chemicals and	Colombo's port operations were seriously disrupted by the incident, which had an impact on regional trade. Coastal communities	Substantial effect on the tourism and fishing sectors; precise financial losses are not given.	X-Press Feeders, the ship's operator, suffered significant losses as a result of the vessel's devastation	Environment, (2021), Vithanage et al., (2023)

			Colombo, Sri Lanka, on May 20, 2021.	microplastics into the ocean. It is regarded as Sri Lanka's biggest marine catastrophe.	suffered financial losses as a result of the contamination's effects on local fishing.		and environmental damage liability.	
MT New Diamond (2020)	Sri Lanka	Approximately 65 km off the coast of Sangaman Kanda Point, Sri Lanka	About 270,000 metric tons of crude oil were being transported when the MT New Diamond, a very large crude carrier, caught fire on September 3, 2020, about 65 kilometers off the coast of Sri Lanka.	There was a serious chance that the fire would result in a large oil spill, which could have seriously harmed marine life. A major environmental catastrophe was averted because too quick response actions.	The tragedy sparked conversations about enhancing oil tanker safety protocols and prompted questions about how resilient maritime transportation is. It also brought attention to weak points in the system that supplies oil.	Possible financial losses as a result of the possibility of an oil leak impacting marine resources; precise amounts are not given.	New Shipping Ltd., the owner of the vessel, suffered damages, as a result of firefighting operations, possible environmental liability, and ship damage.	Reports and news coverage from Sri Lankan officials.
MV Wakashio (2020)	Mauritius	Pointe d'Esny, off the coast of Mauritius	When the bulk carrier MV Wakashio grounded on a coral reef off the coast of Mauritius on July 25, 2020, around 1,000 metric tons of petroleum spilled into the water, causing a massive oil disaster.	The ecological impact was significant, with long-term implications for the biodiversity of the area, and the spill severely damaged coral reefs, mangroves, and marine life, impacting local fisheries and tourism.	Local industries that depend on fishing and tourism were impacted by the grounding and the spill that followed. The disaster increased awareness of environmental preservation and maritime safety and sparked a worldwide emergency reaction.	Severe effects on the fishing and tourism sectors; precise financial losses are not given.	The ship's owner, Nagashiki Shipping, was liable for environmental damages and lost the ship's worth.	Reports from international environmental organizations and the Mauritius government.

Source: Author

ENVIRONMENTAL IMPACT ASSESSMENT

Marine biodiversity is seriously threatened by maritime transportation, especially when it comes to accidents like chemical and oil spills. According to Bacchiocchi et al. (2022), the 2020 MV Wakashio disaster near Mauritius spilled over 1,000 tons of fuel oil, destroying mangroves and coral reefs. The 2021 MV X-Press Pearl fire off Colombo, Sri Lanka, released nurdles (plastic pellets) and nitric acid, posing a long-term pollution risk (Wijesekera et al., 2023). These incidents demonstrate how vulnerable biodiverse areas are when they lack the necessary infrastructure for environmental response. The physiology, reproductive cycles, and feeding chains of marine animals are disrupted by spill contaminants such chemicals and hydrocarbons (Almeda et al., 2014).

For instance, microplastics from X-Press Pearl were discovered in fish and seabirds, raising concerns about bioaccumulation, and polycyclic aromatic hydrocarbons (PAHs) can damage fish endocrine systems (De Costa et al., 2016). Particularly vulnerable are species like corals, olive ridley turtles, and hump head wrasses. Despite their endurance, ecosystems like mangroves and coral reefs frequently need human assistance to recover. However, because of ongoing pollution, habitat fragmentation, inadequate finance, and a lack of regional coordination, initiatives like coral replanting have had minimal success (Rocliffe & Harris, 2021).

MARITIME SUPPLY CHAIN RESILIENCE

The Maritime Supply Chain (MSC), which facilitates the extensive movement of commodities across continents via integrated land and sea networks, has become crucial to international trade in the context of economic globalization. Trade efficiency is increased by this interconnection, but disruption susceptibility is also raised (Wan et al., 2019). Events like port explosions, the COVID-19 pandemic, and geopolitical conflicts have demonstrated how disruptions in the MSC can have a domino impact on the world economy (Chowdhury & Quaddus, 2017). The dangers of relying too much on vital marine chokepoints are best shown by the 2021 closure of the Suez Canal, which stopped $10 billion in daily trade) (Lloyd's List, 2023).

Operational uncertainty, insurance premiums, and inventory prices are increased by disruptions such as port congestion, natural disasters, and conflicts. Maritime mishaps like the MOL Comfort sinking (2013), the MV X-Press Pearl fire (2021), and the MT New Diamond oil spill (2020) resulted in significant financial losses and environmental harm (Swiss Re Institute, 2022; Mitsui O.S.K. Lines, 2025). The response to the MV Wakashio spill in Mauritius served as a reminder of the value of international collaboration between governments, shipping companies, non-governmental organizations, and international organizations such as the IMO and UNCTAD (UNCTAD, 2022).

Proactive risk mitigation is necessary to build long-term MSC resilience. Maritime logistics is changing as a result of technological advancements like blockchain for secure documentation, AI for predictive analytics, digital twins for simulation, and real-time vessel tracking (Gereffi & Fernandez-Stark, 2018). But in order to handle climate change and new technology, legal frameworks like SOLAS (International Convention for the Safety of Life at Sea) and MARPOL (International Convention for the Prevention of Pollution from Ships) need to shift. In accordance with international norms, national authorities must also improve infrastructure, safety, and training. In order to protect international trade, the Ever Given incident highlights the critical need for strong contingency planning, varied trade routes, and durable maritime infrastructure (Rodrigue, 2020).

PREVENTION AND MITIGATION MEASURES

A comprehensive approach combining international legislation, technical innovation, and robust environmental governance is needed to prevent environmental disasters from maritime transportation. Due to differing state commitments and inadequate coast guard capabilities, international standards such as SOLAS and MARPOL that regulate emissions, garbage, and ship safety are not consistently enforced in the Indian Ocean region (Rahman et al., 2021).

Double-hulled tankers greatly lower the chance of an oil spill, while technological tools like satellite-based AIS (Automatic Identification System) and AI-powered analytics are enhancing vessel tracking and avoiding collision. However, widespread implementation in mid¬sized ports in South Asia is hampered by a lack of funding and technical capability (Nababan et al., 2022).

Capabilities for responding to the environment are changing. The nature of the chemical fire limited the efficiency of Sri Lanka's response to the X-Press Pearl tragedy, despite international assistance. Promising substitutes include novel techniques like in-situ burning and biodegradable sorbents. Marine plastic pollution is also being addressed by initiatives like the UN's GloLitter Project, which uses port infrastructure and onboard waste management systems (Zhang et al., 2020).

It is imperative that regional cooperation be strengthened. In emergency exercises, data exchange, and policy coordination, the Indian Ocean Rim Association (IORA) is becoming more and more involved. Investments in technology transfer and training throughout the area are essential to fostering equitable resilience.

CASE STUDY COMPARISON

Comparative Analysis of Incidents

Table 05: Comparative Analysis of Incidents

Incident	Cause	Environmental Impact	Supply Chain Disruption
MOL Comfort (2013)	Structural failure of the hull mid-voyage due to design flaw and heavy sea conditions.	Minimal direct pollution: however, the ship broke into two and eventually sank, releasing over 4,000 containers at sea.	Major cargo loss (4,382 containers), delays for shippers, and increased scrutiny on post-Panamax vessel design.
MV X-Press Pearl (2021)	Fire onboard was caused by improper stowage of nitric acid and other chemicals; explosion followed.	Severe chemical and plastic pellet pollution off the coast of Sri Lanka; one of the worst marine pollution events in Asia.	Disrupted port operations in Colombo, impacted regional feeder routes and caused delays in cargo movement.
MT New Diamond (2020)	Engine room explosion and subsequent fire during transit of crude oil off Sri Lanka's coast.	Minor oil spill (approx. 1,000 MT crude oil saved from a major leak); significant air pollution due to smoke.	Limited supply chain impact; however, raised alarms over oil transportation safety near key shipping routes.
MV Wakashio (2020)	Ran aground on a coral reef due to navigational negligence during near-coast passage.	Major oil spill (over 1,000 tons of fuel oil) near Mauritius; ecological damage to coral reefs, mangroves, and fisheries.	Caused increased marine traffic, regulations around Mauritius; delays in rerouted vessels avoiding the area.

Source: Author

Lessons Learned

Important lessons for the marine sector and global supply networks can be learned from the examination of significant maritime disasters like the MOL Comfort (2013), MV X-Press Pearl (2021), MT New Diamond (2020), and MV Wakashio (2020). First and foremost, stronger maritime safety laws are desperately needed to stop structural collapses, improper cargo handling, and careless sailing. These occurrences highlight how crucial it is to uphold the IMO's SOLAS and MARPOL conventions while advocating for improved cargo documentation procedures and vessel design requirements (Knapp & Franses, 2007).

Furthermore, the environmental disasters associated with X-Press Pearl and MV Wakashio highlight the need for effective reaction plans in the event of chemical and oil leaks. Investing in quick-response marine cleanup technologies and strengthening global collaboration for spill control are two examples of this (Lehmann et al., 2022). Strengthening supply chain resilience through shipping route diversification, predictive risk analytics, and improved digital infrastructure to track cargo safety and vessel conditions is equally crucial (Fan & Stevenson, 2018). These incidents have raised awareness and caused policy to be reevaluated, emphasizing that long-term resilience involves not only efficiency but also global marine stewardship, flexibility, and foresight (Rodrigue, 2020).

RECOMMENDATIONS FOR IMPROVING MARITIME SAFETY AND ECOSYSTEM PROTECTION

Strong law enforcement, cutting-edge technology, and strong regional cooperation are all necessary components of a multifaceted plan to protect marine biodiversity and improve maritime security in the Indian Ocean. Despite international accords like CBD (Convention on Biological Diversity) and MARPOL, the 2021 MV X-Press Pearl tragedy off Sri Lanka brought to light differences in law enforcement between governments. If properly executed, the UN's 2023 BBNJ (Marine Biological Diversity of Areas beyond National Jurisdiction) Agreement has the potential to save biodiversity hotspots like the Mozambique Channel and the Chagos Archipelago.

Marine spatial planning is supported by regional frameworks like IORA and the Nairobi Convention, although they lack proper finance and supervision. Initiatives like the 2023 Indian Ocean Marine Pollution Exercise and the use of indigenous knowledge support conservation efforts. In order to mitigate dangers, technological tools such as drones, AIS, green fuels, low- emission ships, and AI-driven analytics are essential. Long-term sustainability can be ensured by strengthening regional logistics, data infrastructure, and search and rescue (SAR) capabilities through platforms such as BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation) and SAGAR (Security and Growth for All in the Region).

CONCLUSION

The ecology and maritime safety in the Indian Ocean are being threatened by aging fleets, heavy commercial traffic, and poor safety regulation. As demonstrated by the MV Wan Hai 503 fire in June 2025, marine accidents have long-lasting effects on the environment and the economy. Even while technology like artificial intelligence (AI), satellite surveillance, and autonomous navigation have promise, more stringent laws, regional collaboration, and environmentally friendly inventions are needed for sustainable advancement. Proactive risk assessments, robust supply networks, and disaster preparedness must be given top priority in future marine regulations. More research on the environmental and social impacts of marine disasters, particularly on vulnerable coastal communities, is also recommended by the study.

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MARITIME DRUG TRAFFICKING AND STRATEGIC CHALLENGES FOR SRI LANKA NAVY

Lieutenant Aloka Wijayalath

Abstract

The increasing prevalence of maritime drug trafficking poses a significant threat to Sri Lanka's national security and regional stability Sri Lanka is located strategically on major shipping routes in the Indian Ocean and thus is a critical transit point for narcotics smuggling, primarily via sea routes. This paper explains the strategic challenges faced by the Sri Lanka Navy (SLN) in combating maritime drug trafficking, including limited resources and evolving smuggling tactics. It also explains the broader implications for maritime security and regional cooperation. Furthermore, the paper proposes actionable proposal for the SLN like enhanced intelligence sharing, technological upgrades and regional naval collaboration to effectively address and reduce this transnational threat in the future.

Keywords : National Security, Strategic Challenges, Maritime Drug Trafficking and Technological Upgrade

INTRODUCTION

Sri Lanka strategically located in the heart of the Indian Ocean occupies a pivotal position along major international maritime trade routes. This geographical advantage is good for business and trade, but it also puts the country at risk of major maritime security threats, most notably drug trafficking through the sea. In the last ten years, maritime drug trafficking has emerged as a significant transnational crime affecting the South Asian region with increasing volumes of heroin, cannabis and synthetic drugs being smuggled through maritime channels (UNODC,2023). Pathfinder Indian Ocean Security Conference (2022) states the Indian Ocean has become a best route for traffickers due to its large and loosely monitored maritime spaces between producer and consumer regions across Asia, Africa and Europe.

Sri Lanka faces security challenges, both internal and external related to maritime drug trafficking. Internally, the smuggling of narcotics contributes to rising drug abuse, organized crime and social instability. Externally, it harms the country's reputation as a safe place for maritime activities and raises the chance of getting involved in global criminal networks.

According to Pathfinder Indian Ocean Security Conference (PIOSC) and Samaranayake (2022) indicate SLN plays a key role in this area. As the main force responsible for enforcing maritime law, it watches over and protects the country's territorial waters and Exclusive Economic Zone (EEZ). Although it faces many challenges like limited resources, old equipment and legal complexities. SLN has become more alert and effective in stopping drug shipments and preventing smuggling. Its role has also grown through working with other countries and taking part in regional naval exercises like Naval exercise between India and Sri Lanka (SLINEX) to fight drug trafficking.

This paper aims to explain the strategic challenges posed by maritime drug trafficking to the SLN, assess the operational and policy level gaps and propose comprehensive strategies to address this evolving threat. Furthermore, aims to add to the current conversation on maritime security and transnational crime in the Indian Ocean region by focusing on regional patterns, Navy activities and new threats.

OVERVIEW OF MARITIME DRUG TRAFFICKING IN THE INDIAN OCEAN

The Indian Ocean has rising become a critical pathway for maritime drug trafficking. Acting as a transit zone between major drug producing regions in South and Southwest Asia and consumer markets in Africa, Europe and Southeast Asia. Due to its Large, limited naval presence and complex jurisdictional environments traffickers exploit the region's maritime domain to transport large quantities of narcotics, particularly heroin, cannabis and synthetic drugs like Crystal methamphetamine (ICE), Tramadol (UNODC,2023).

One of the most dominant routes involves the called "Southern Route" which originates from Afghanistan through Pakistan and Iran's Makram Coast and extends across the Arabian Sea and Indian Ocean toward East Africa, Sri Lanka, the Maldives and ultimately to Europe and Southeast Asia. These routes often make use of multimodal transport methods including dhows, fishing vessels and sometimes even commercial shipping containers.

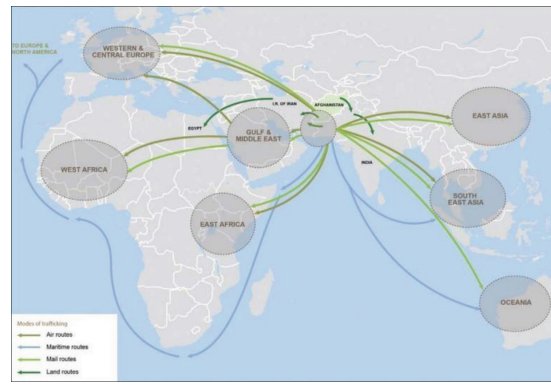

Figure 1: Drug trafficking routes along the Southern Route
Source: Afghan Opiate Trafficking Through the Southern Route – UNODC (2015)

Sri Lanka's location at the center of major sea routes makes it a target for drug traffickers. It is close to important points like the Strait of Hormuz and the Malacca Strait and along both east-west and north-south shipping paths. Because of this, Sri Lanka has become a transit point for international drug cartels, who take advantage of its good access to shipping and limited sea patrols. Often, drugs are dropped off in international waters and then brought to shore using local fishing boats or small vessels run by nearby smuggling groups (Chalk,2019).

There have been several notable drug seizures in Sri Lankan waters in recent years, reflecting the growing scale of the problem. For example, in April of 2024 the SLN intercepted a vessel off the southern coast carrying over 200 kilograms of heroin with an estimated street value exceeding LKR 2 billion (Sr i Lanka Navy, 2024). Similar operations have led to the confiscation of ICE and cannabis shipments with links to networks in Pakistan, India and Iran. These seizures highlight not only the limits of narcotics trafficking but also the increasing ability of the participants involved.

STRATEGIC IMPORTANCE OF SRI LANKA IN REGIONAL MARITIME SECURITY

Sri Lanka holds an important position in regional maritime security due to its strategic location in the Indian Ocean. Situated near the main East-West shipping route that connects the Strait of Malacca to the Suez Canal. Sri Lanka acts as a strategic maritime hub through which a significant portion of global trade. Its proximity to this large Sea Line of Communication (SLOC) enhances its relevance for both regional and extra regional powers seeking to ensure the free and secure movement of goods (Stratfor, 2013).

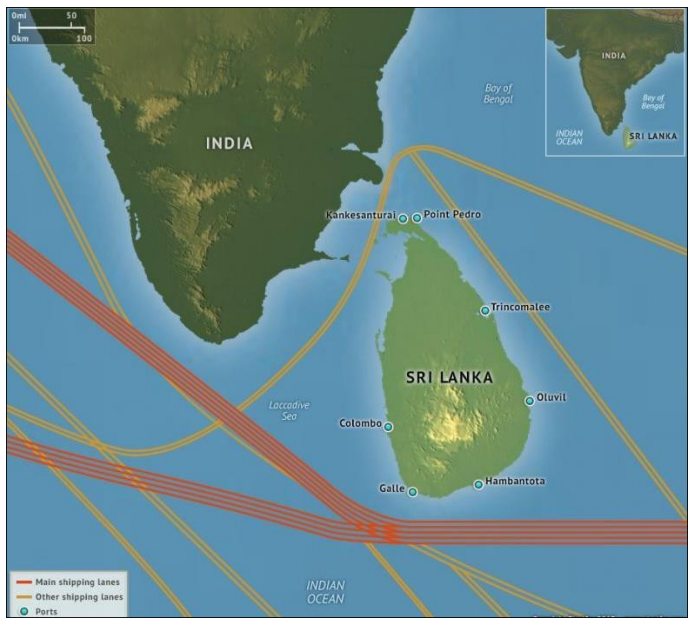

Figure 2: Shipping Lanes Near Sri Lanka
Source: Stratfor (2013)

Liyanagamage (2022) and Dissanayake (2022) indicate the island's geographic advantage enables it to play a crucial role in Maritime Domain Awareness (MDA). With its location south of India and at the center of the Indian Ocean. Sri Lanka can monitor maritime traffic and potential threats such as piracy, smuggling and illegal fishing. Through enhanced surveillance and information sharing mechanisms. Sri Lanka contributes to a more secure and transparent maritime environment which is essential to regional commerce and stability.

Recognizing its strategic value, Sri Lanka has developed and strengthened maritime partnerships with powerful countries in the region. India has longstanding maritime ties with Sri Lanka, cooperating on naval exercises, coast guard operations and capacity building. The United States has also engaged with Sri Lanka to boost maritime security, infrastructure development, military assistance and joint training programs. Similarly, Australia has collaborated with Sri Lanka to counter human trafficking and enhance border security through maritime patrol support and training initiatives. These partnerships not only enhance Sri Lanka's maritime capabilities but also integrate it into a broader regional security architecture. In summary, Sri Lanka's location along critical sea lanes, its capacity for maritime monitoring and its growing network of international partnerships make it a key player in regional maritime security (PIOSC,2022).

CHALLENGES FACED BY SLN

a. Limitation in Maritime Surveillance

(1) Insufficient Aerial Surveillance. The SLN currently operates with the Sri Lanka Air Force's (SLAF) limited fleet of maritime reconnaissance aircraft and surveillance drones, which significantly hampers its ability to maintain continuous oversight of large ocean areas. The few aircraft in operation are often outdated, with limited endurance, sensor range, and operational availability. Furthermore, drone capability remains underdeveloped and is rarely deployed for maritime tasks. These deficiencies lead to blind spots in Sri Lanka's MDA making it difficult to detect illegal activities like unauthorized fishing vessels, human trafficking and drug trafficking operations.

(2) Limited Capabilities of Available Platforms. The SLN operates several Advance Offshore Patrol Vessels (AOPVs) enhancing endurance, however the capabilities in terms of surveillance and reconnaissance found to be limited and limitedly

differ from smaller platform like Fast Attack Crafts (FAC) and Fast Gun Boats (FGB). In addition, the limitation in data usage on board prevent the larger platform to use Maritime Domain Awarenen (MDA), Vessel monitoring tools during its deployment, restricting unit to develop near real time understanding of the maritime environment, creating high dependency on shore base Maritime Operation Center (MOC) to make tactical decisions. Without enough capable platforms, the SLN struggles to establish a sustained presence in the Sri Lankan waters and the international waters, which are increasingly becoming transit routes for transnational crime and potential zones of strategic interest to global powers.

b. Budgetary Restriction. Maintaining a naval fleet is an expensive task which further exaggerated with the range and duration of the deployment. Limited allocation from the national budget against the sharing price of spare and technologically advanced systems continually preventing the SLN to improve sensors and weaponry in par with current military advancements.

(1) Aging Fleet. Greater portion SLN fleet have been in service for the past 20 to 30 years. Some acquired second-hand or refitted from older platforms. Which is liable to encounter mechanical snags of outdating technical systems, weaponry and sensors. As a result, mission readiness is low and the ability of the vessels to remain operational became difficult and uncertain day by day. Such environment develops a colossal pressure on the SLN's logistics system as well as the technical departments to keep the fleet operational and deployment ready to tackle emerging security threats in the responsible waters.

c. Legal Challenges in Interdiction and Prosecution. Sri Lanka's maritime jurisdiction spans multiple zones like territorial waters, contiguous zones, and the EEZ each with different legal rules. However, the limited and unclear provisions extended through international conventions against drug trafficking allow limited windows for navies to intervene with drug smugglers at sea. Such limitations considerably delay the board, search and diplomatic tensions if violated. Additionally, outdated domestic legal frameworks, along with poor coordination between enforcement agencies and the judicial system, hinder effective prosecution of maritime crimes like allowing drug trafficking. Criminals escape punishment by disheartening the law enforcement agencies.

d. Intelligence Gaps and Lack of near Real-Time Data

(1) Limited Intelligence Sharing. Even though several national security agencies like States Intelligence Service (SIS), Sri Lanka Army (SLA), SLN.SLAF, Customs, and Sri Lanka Police (SLP) intelligence services surveillance on drug smuggling centering the country, the absence of formal integration of these agencies found leading to isolated operations, duplication of task resulting missed opportunities to intercept illegal activities or respond promptly to maritime threats.

(2) Selection of Technology. Global maritime powers are increasingly deploying technologies to monitor maritime traffic, AI-driven detection prediction system and geospatial analytics. Apart from the acquisitions of MDA tools, the SLN is continually investing on the RADAR network, once to counter the insurgents. However, the malfunctioning of High Frequency Surface Wave RADAR (HFSWR) fitted at Nilaweli coast suggests SLN's less consideration on shore based long range surveillance options. In addition, SLN is critically lacking with the system integration solutions which expedite operational analysis and making processes. This technological gap makes SLN rely heavily on human interference and manual surveillance, weakening the decision-making process. As an example, a common tactic of drug traffickers is to bring drugs and narcotics to the island with using several large fishing trawlers changing trawler timely, load it's on to smaller size Fiberglass Dinghy (FGB) and quickly smuggle it's into the country.

IMPACT OF DRUG TRAFFICKING ON NATIONAL SECURITY AND SOCIETY

As the country lies along major Indian Ocean trade routes, it is at growing risk of becoming both a transit point and a consumer market of illegal drugs. This leads to rising drug use, especially among the young generation, causing health problems and more pressure on the public health system. Drug addiction also fuels crimes like theft and gang violence which weaken public safety and overburden the police, especially in cities.

Drug trafficking takes away government funds that could be used for development and lowers worker productivity due to addiction. It can scare foreign investors and harm legal businesses by spreading illegal money and unregulated deals. Worse, drug money can corrupt police, courts and politics. Furthermore, making it harder to fight crime and weakening trust in government. To keep the country safe in the future, everyone in society needs to work together.

CURRENT MEASURES AND OPERATIONS BY THE SRI LANKA NAVY

The Sri Lanka Navy (SLN) plays an important role in protecting the country's maritime interests especially by fighting illegal activities like drug trafficking, illegal fishing and environmental crimes. According to SLN official website in 2024, SLN carried out several major operations. In January, they worked with the SLP Narcotic Bureau to stop a fishing boat near Hikkaduwa and seized over 245 kg of heroin and ICE, worth around Rs. 3.19 billion. In November, they teamed up with the Indian Navy (IN) and caught two Sri Lankan fishing boats in the Arabian Sea with 355.8 kg of ICE. In August, the SLN also stopped an Indian dhow near the northwest coast and seized 2,689 kg of Tendu leaves. To improve cooperation and security, the SLN also joined international naval exercises. In February, SLNS Sayurala took part in MILAN 2024 in India, which included joint missions which focused on rescue missions, piracy response and medical evacuations.

FUTURE STRATEGIES AND RECOMMENDATIONS FOR THE SLN

SLN is tasked with maintaining the security of Sri Lanka's large maritime domain which stretches across hundreds of thousands of square kilometers of the Indian Ocean. As the threats to maritime security evolve the SLN needs to adapt to new challenges by implementing forward thinking strategies. Below are actionable, realistic and strategic recommendations that can enhance the SLN's operational capabilities, regional standing and overall effectiveness in ensuring national security.

a. Enhancing MDA and Surveillance. MDA is a cornerstone of modern naval operations. To enhance the SLN's MDA, the following strategies are essential:

(1) Invest in surveillance mechanism. Since, near real time information/surveillance is essential in understanding the responsible waters SLN should consider filling the technological gaps by introducing shore based long range sensors like HFSWR capable of intergrading with available MDA tools and sensors. In addition, it is recommended to seek cooperative agreements to secure on-demand satellite images from likeminded agencies like UNODC to have optical confirmation to be relayed to tactical units.

(2) Improve SLN aerial reconnaissance. Since unmanned platforms have become common use in maritime environments in the present day. It is recommended to integrate shipborne drone with adequate capacity (range and surveillance) to gain

speed detection, continue monitoring and evidence gathering over the wrong dues preserving the secrecy and operational cast. Unmanned aerial vehicles (UAVs) equipped with surveillance technologies can extend the SLN's reach especially over distant waters where manned patrols are limited. Drones can be employed for reconnaissance and monitoring of illegal activities.

(3) Information Fusion. Considering the effectiveness of isolation, and effectiveness of jointness/cooperation exposed through anti narcotic operations 2024 it is recommended to expedite the process to formally integrated maritime related agencies with Information Fusion Centre (IFC) Colombo and formally established information sharing agreements.

b. Capacity Building - Training, Modernization, and Fleet Enhancement. For the SLN to remain competitive in an increasingly complex security environment, it must prioritize capacity building in various aspects:

(1) Modernization of Fleet and Infrastructure. In terms of modernization, the SLN shall consider acquiring ships with the latest sensors and machinery with affordable maintenance costs, once a favorable option could be acquiring multirole vessels which enable different tasking with the expense of single platform. Additionally, SLN may invest in autonomous platforms to enhance operational flexibility, human security and extended operations whilst reducing operational costs.

(2) Fleet Maintenance and Infrastructure Upgrades. The capacity to repair and maintain larger, more modern vessels should be improved. Expanding and modernizing shipyards, dry docks, and repair facilities will enable the Navy to conduct more complex repairs and maintenance, improving fleet readiness.

(3) Training and Skill Enhancement. A well-trained workforce is critical. SLN must increase investment in both specialized and general training for its personnel. This includes regular participation in international naval training programs, simulated warfare exercises, conducting individual or group wise naval personal awareness programs and cross-training with regional and international allies to adopt best practices in maritime security and naval warfare.

c. Legal and Institutional Reforms. SLN's total success in combating narcotic drug smuggling is limited by outdated legal and institutional frameworks. Therefore, it is recommended to,

(1) Reform Maritime Law. Sri Lanka should update and strengthen its maritime legislation to address emerging Threats of narcotic smugglers. In addition, the SLN highlights it's observation and legal Impediments at international forces, making it a discussion point aiming to strengthen intentional legal for vision against narcotic drug smuggling.

(2) Strengthening Judicial processes. Strengthening legal frameworks and Judicial processes is crucial to ensure that offenders brought to justice are appropriately prosecuted. Streamlining judicial processes related to maritime crimes will deter illegal activities and contribute to a more robust deterrence strategy.

d. Sharing Intelligence with International Organization. Effective intelligence sharing is a critical component in addressing transnational maritime threats.

(1) Leverage Global Networks. By collaborating with organizations such as the United Nations Office on Drugs and Crime (UNODC) and the International Criminal Police Organization (INTERPOL), Sri Lanka can gain access to critical intelligence on drug trafficking, piracy and other maritime security threats. Formalizing intelligence, sharing agreements with regional and international partners will enable faster more effective responses to threats.

(2) Cyber security and Information Warfare. As maritime security threats become increasingly digital, Sri Lanka must invest in cyber intelligence capabilities to protect its maritime infrastructure. Cooperation with partners in the field of cyber security particularly the United States, Europe and India can help safeguard against cyber-attacks targeting port facilities and navigation systems.

CONCLUSION

Sri Lanka's strategic location in the Indian Ocean has placed significant responsibility on the SLN to safeguard maritime sovereignty and ensure regional stability. As indicated above, the SLN faces critical challenges like limited maritime surveillance capacity, aging fleet infrastructure, and legal constraints in maritime enforcement and coordination issues among domestic and international stakeholders. Drug trafficking poses a multidimensional threat fueling internal crime, destabilizing the economy and corroding governance structures.

Looking forward, a series of strategic measures must be implemented to enhance the SLN's operational readiness. These include investing in satellite-based surveillance, modernizing the naval fleet, strengthening inter agency coordination, reforming legal frameworks and expanding intelligence sharing with organizations like INTERPOL and UNODC. Strengthening skills through training and joint exercises will be essential for creating a flexible and well-prepared SLN for the future.

In conclusion, the evolving role of the SLN is not just about protecting territorial waters but about securing national interests, economic stability and regional cooperation in an increasingly interconnected maritime environment. Developing the SLN today will determine Sri Lanka's long-term strength in national security.

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BOOK REVIEW

Antony Beevor's 'Stalingrad' (1998)

Lieutenant Deepal Appuhamy

A BRIEF SYNOPSIS

Antony Beevor's "Stalingrad" (1998) is a definitive historical account of the pivotal World War II battle between Nazi Germany and the Soviet Union in 1942-1943. Drawing from newly available Soviet archives and eyewitness accounts, Beevor masterfully interweaves strategic military analysis with deeply human stories from both sides of the conflict.

The book chronicles the battle chronologically, from Hitler's fateful decision to capture the city through the brutal urban warfare that followed, and concludes with the Soviet counteroffensive (Operation Uranus) that encircled and ultimately defeated the German Sixth Army. What distinguishes Beevor's work is his balanced perspective, unflinching portrayal of the human dimension of warfare, and his analysis of how ideology influenced military decision-making.

Through meticulous research and vivid prose, Beevor illuminates the importance of logistics in modern warfare while documenting the psychological toll of combat under extreme conditions. "Stalingrad" stands as a landmark work that transformed Western understanding of the Eastern Front's significance in World War II and serves as both a military history classic and a powerful testament to human endurance under unimaginable circumstances.

RECOMMENDATIONS

Beevor's detailed accounts of house-to-house fighting provide insights into the unique challenges of combat in an urban environment. How both Soviet and German forces adapted their method of combat to suit the devastated city environment is a hands-on learning exercise that can be directly applied to modern urban warfare.

The book illustrates the calamitous consequences of political interference in strategic decisions, particularly Hitler's opposition to the withdrawal of the Sixth Army. Command officers will be taught from the lessons on how ideology overwhelmed sound military sense, leading to unnecessary casualties.

Beevor's emphasis on how logistics actually determined the battle is a strong case study. The German failure to keep supply lines open and the impossibility of Göring's promised airlift demonstrate that combat effectiveness depends on realistic logistics planning, not fantasy.

The book documents how morale collapsed under bad conditions and how propaganda was employed on both sides to maintain combat spirit. These psych aspects are relevant to today's PSYOPS considerations.

Study the small-unit tactics employed at Stalingrad to appreciate how initiative at the platoon and squad levels can be decisive in fluid environments. Note how doctrine had to be adapted to fit the specific context of urban fighting.

Examine the strategic failures on both sides and the tension between political imperatives and military realities. Consider how you would balance these competing pressures in your own command decisions.

Focus on how both armies-maintained unit cohesion (or failed to) under extreme stress. The accounts of small unit leadership provide examples of both effective and ineffective approaches to maintaining discipline in catastrophic conditions.

Note the Soviet achievement in concealing their build-up for Operation Uranus and the attendant German intelligence failure. This example illustrates the supreme importance of objective, sound intelligence estimation uninfluenced by confirmation bias.

CONTEXTUAL VALUE

This book is a stern reminder that war is more a matter of human sacrifice and stamina than it is about doctrinal or technical considerations. Commanders at all ranks would be wiser after reading Beevor's unflinching account of the human cost of strategic decisions.

With increasing contemporary military operations being conducted within city environments, the lessons of Stalingrad are as relevant today as ever with the developments of technology. The root issues of urban combat restricted visibility, exposed armor, three-dimensional battlefield continue in contemporary warfare.

"Stalingrad" is a book that every military expert seeking to learn the realities of warfare today and the ageless principles governing victory and defeat on the battlefield should read.

"STALINGRAD" BY ANTONY BEEVOR

Introduction

Antony Beevor's "Stalingrad" is one of the most authoritative historical accounts of what most people regard as the turning point of World War II. First published in 1998, this painstakingly researched book describes the brutal battle for the Soviet city of Stalingrad (now Volgograd) between Nazi Germany and the Soviet Union during 1942-1943. Drawn from newly available Soviet archives and numerous eyewitness accounts from both sides, Beevor constructs a narrative that is both sweeping in its strategic coverage and intimate to human in its evocation of individual suffering. The result is a military history classic that not only brings back to life the strategic maneuvers of the two opposing forces but also the grim sight of city fighting in its most desperate and ruinous form.

Historical significance of "Stalingrad" cannot be overstated. Western accounts of the Eastern Front so far were apt to be superficial and wanting in insight, which otherwise may have been supplied by access to Soviet archives. What distinguishes this book is Beevor's talent for interlinking the broad strategic elements with the deeply human experiences of the people sucked into the maelstrom of one of history's most catastrophic battles. This review will analyze the historical context, narrative approach, main themes, strengths and weaknesses, and lasting impact on our understanding of World War II.

Historical Context and Background

"Stalingrad" does not begin with the battle itself but rather sets the stage by viewing Operation Barbarossa, Hitler's disastrous June 1941 invasion of the Soviet Union. Beevor masterfully recounts how early German successes were followed by the grinding stalemate outside Moscow in December 1941, prompting the fateful decision to begin Case Blue—the 1942 summer offensive to capture the Caucasus oil fields and the industrial city of Stalingrad on the Volga River.

Beevor locates the battle within the framework of Hitler's more and more demented strategic vision and Stalin's brutal determination to hold the city named after him at all costs. He outlines the political imperatives driving both dictators and describes how Stalingrad became as much a war of the mind as of the terrain. The author also carefully outlines the military context of the battle, describing the state of both armies after twelve months of brutally contested combat on the Eastern Front.

How Beevor's setting is so effective is his ability to explain such intricate military and political realities in plain, simple terms. He avoids getting bogged down in too much technical detail but also provides readers with sufficient background to grasp the strategic significance of the battles he describes. This middle-ground strategy allows even uninitiated readers of World War II to follow the titanic amounts at stake in the battle of Stalingrad.

Narrative Structure and Style

Beevor employs a chronological structure, beginning with the German advance towards Stalingrad in the summer of 1942 and concluding with the surrender of Field Marshal Friedrich Paulus's Sixth Army in February 1943. In this structure, he alternates between various points of view: the high commands of the two armies, the front-line soldier's experience, and the dilemma of civilians trapped in the war zone.

The storytelling is perhaps Beevor's finest asset. His prose is direct, uncomplicated, and really vivid without ever becoming melodramatic. Consider his description of the city at the beginning of the battle:

"As the battle raged, the city came to resemble a vision of hell itself. The buildings were blown to smithereens, roads choked with rubble, and air thick with dust and stench of death. Tanks zigzagged through the wreckage of buildings while the snipers picked their victims from within the rubble."

Beevor possesses a special flair for breaking down intricate military operations into comprehensible steps without sacrificing accuracy. His descriptions of tactics are correct but never dull, and he possesses an appreciation for the anecdote which is used to make points illuminatingly large. The book unfolds at a steady pace, building tension as the German army forces their way into the city, peaking with the historic Soviet counterattack (Operation Uranus) that encircled the Sixth Army, and then revealing the grim last act as the trapped German soldiers died of starvation, disease, and Soviet fire.

What makes Beevor's narrative style stand out is its unflinching candor. He does not whitewash the atrocities of the battle or avoid describing atrocities perpetrated by both sides. But neither does he sensationalize the brutality. Rather, he reports the raw reality of Stalingrad with a measured gravity that honors the vast human tragedy while making it comprehensible to readers as a matter of historical importance.

KEY THEMES AND INSIGHTS

The Human Dimension of Warfare

The most persuasive aspect of "Stalingrad" is Beevor's determination to show the human condition in the midst of industrial-scale slaughter. Through letters, diaries, and interviews, he listens to the voices of individual soldiers and civilians whose lives were dominated by the battle. We learn of German soldiers writing their final letters to loved ones because they realized that they would never escape the Soviet encirclement, of Russian snipers following their prey through the rubble, and of civilians attempting to survive in sewers and basements while their city was reduced to rubble around them.

Beevor is particularly fascinated by the psychological toll of the combat. He documents the way the conditions of brutishness—temperatures below -30°C, starvation, unremitting shelling—overcame civilized human inhibitions and drove many to desperate or inhumane actions they would have considered unimaginable at other times. But he also reveals instances of surprising humanity: Soviet doctors treating wounded German prisoners, German officers

Distributing their last rations to starved Russian children, troops on both sides intermittently observing unofficial ceasefires to retrieve their dead.

Ideology and Its Consequences

Stalingrad's fighting was not merely a war of position but a war of ideologies. Beevor examines how Nazi racial ideology and Soviet communist ideology shaped the war and had a tendency to increase its brutality. Beevor documents German killing of Jewish civilians as they moved forward and Soviet killing of people deemed defeatist or deserts. The ideological dimension is perhaps best illustrated in Beevor's account of the Nazi leadership's refusal to allow the Sixth Army to retreat when it could still do so—a decision taken on the basis of Hitler's ideological commitment to "holding fast" rather than good military judgment.

Through painstaking research, Beevor depicts how ideology destroyed sensible decision-making on both sides but particularly within the German high command. Hitler's interference with tactical decisions through his ideological preoccupations and refusal to consider withdrawal came at a calamitous expense to German forces. Stalin's early refusal to allow civilians to be evacuated from Stalingrad on grounds of his doctrine that withdrawal was defeatism sentence thousands to unnecessary agony and death.

Beevor provides evocative portraiture of the leading battlefield commanders involved. Field Marshal Paulus is an operationally excellent but finally disastrous commander, unable to defy Hitler even when following the Führer's orders meant sending his Sixth Army marching into its fate. Soviet General Vasily Chuikov, who commanded the Soviet 62nd Army defending Stalingrad proper, is described as ruthless but effective in leadership; he understood it was necessary to match German brutality with Soviet determination in order to survive.

At a strategic level, Beevor refers to the great Soviet cover-up plan to conceal the magnitude of mobilization of troops for Operation Uranus. Beevor attributes Soviet Generals Georgy Zhukov and Aleksandr Vasilevsky with conceiving the counteroffensive in which the Germans' Sixth Army was trapped, observing how German intelligence failure contributed to their own exposure. The book throughout, Beevor explains how personality traits, institutional environments, and command arrangements influenced battlefield outcomes.

Logistics and the Reality of Modern Warfare

One of the book's strongest assets is its emphasis on the critical importance of logistics in determining victory or defeat in war. Beevor explains how the German transportation network collapsed under the strain of winter weather and Soviet bombing, making Hermann Göring's promise to airlift the besieged Sixth Army an impossibility. The resulting hunger and lack of equipment doomed German soldiers' months before the final Soviet push.

This focus on logistics leads readers to understand that modern war is not waged by acts of courage or tactical prowess but by the mundane exercise of ensuring troops are equipped with ammunition, rations, medicine, and spare parts. Beevor's history demystifies war by showing how death arrived as much from disease, exposure, and starvation as in heroic battles.

Historical Methodology and Sources

What sets "Stalingrad" apart from other histories of the battle is Beevor's exclusive access to Soviet files opened with the fall of the USSR. He draws intensively on operational accounts of the Red Army, NKVD documents, and eyewitness testimonies of Soviet soldiers unavailable hitherto to Western historians. This book allows him to debunk much myth and provide a more even-handed view of Soviet military performance than was possible under the Cold War.

Beevor supplements these Soviet sources with vast German documentation, such as units' war diaries, interrogation reports of captured officers, and private letters. He also interviewed survivors on both sides, adding crucial personal testimony to the official record. This multi-perspectival approach provides an astonishingly complete and subtle account.

The handling of sources by the author is flawless. He acknowledges the risk of deficiencies and bias in various documents, particularly those produced under totalitarian regimes where truth at times yielded to ideology or self-interest. In situations where there are conflicting sources, Beevor duly weighs their credibility and provides explanation for his choice between them. Such methodological transparency adds credibility to his findings.

STRENGTHS OF THE WORK

Balanced Perspective

Unlike earlier histories that were prone to Cold War biases, Beevor presents both German and Soviet perspectives with breathtaking even-handedness. He does not demonize the regular German soldiers nor idealize the Soviet regime. While acknowledging the criminality of the Nazi invasion, he also documents Soviet brutality against their own people, including the shooting of retreating soldiers and the brutal treatment of civilians accused of collaboration.

This even-handed treatment is continued in his assessment of military performance. Beevor explains German tactical ability as well as acknowledging growing Soviet competence through learning from earlier mistakes. He avoids the standard Western presupposition that accredited Soviet triumph to sheer numbers alone and instead focuses on Soviet command, tactics, and equipment improvements that made them successful.

Vivid Description of Urban Warfare

Beevor does a fine job of outlining the unique character of street fighting in Stalingrad. He explains how the battle descended into thousands of small-unit battles for individual buildings, sewers, and factory floors. The author illustrates how traditional German doctrine based on mobile warfare and combined-arms maneuvering did not play as well in the shattered city where visibility was limited and armor vulnerable.

His descriptions of the fighting for possession of sites such as the grain silo, Mamayev Kurgan hill, and the Tractor Factory are paragons of clarity that enable readers to visualize the three-dimensional character of combat in a city. Beevor employs veterans' testimony to explain

How troops adapted to fighting in this setting, developing specialized techniques for clearing buildings, occupying firing positions in rubble, and moving along sewers and basements to outflank enemy positions.

Integration of Strategic and Personal Narratives

One of the most compelling aspects of "Stalingrad" is Beevor's ability to switch smoothly between grand strategy and personal experience. Within the confines of a single chapter, he can shift from Hitler's deliberations at the Wolf's Lair command post to a Soviet nurse caring for wounded soldiers in a basement hospital. Such an approach facilitates readers' understanding of how choices made at the highest level found their way into human impact at the lowest level.

The personal vignettes Beevor employs are well-suited to stand as illustrations of issues of wider import. He recounts, for example, how severely injured German officer Lieutenant Wiener was treated with kindness by Soviet medical staff—a situation that discredited Nazi claims of Soviet brutality. The personal vignettes add emotional depth to the overall historical coverage and act as a reminder to readers that figures of casualties are illustrations of actual human suffering.

WEAKNESSES AND LIMITATIONS

Limited Coverage of Home Fronts

Although Beevor is scrupulous in his discussion of the military face of the battle, his description of the German and Soviet home fronts is somewhat short. More extended discussion of the way the battle was presented in propaganda, the reaction of civilians in each country to news from Stalingrad, and the impact of the battle on morale and production efforts would enhance the book. This broader context would provide readers with a better sense of why Stalingrad became such a vital symbol in both German and Soviet society.

Technological and Doctrinal Analysis

While Beevor does refer to the weapons and equipment used on either side, he provides relatively little examination of the technological and doctrinal developments that characterized the battle. A more detailed examination of the transformation of Soviet armor, artillery, and air assets during this period would explain why the Red Army's performance so greatly improved relative to past campaigns. Similarly, greater emphasis on transformations in German equipment and tactical doctrine as they adapted to Soviet conditions would enhance the military analysis.

Cultural and Social Context

The book is primarily interested in political and military matters and pays less attention to the cultural and social context of the battle. More information on how Soviet and German cultural perspectives, social structures, and their previous experiences shaped the behavior of their soldiers would be beneficial. For example, Beevor could have discussed to a larger extent how the Soviet view of the "Great Patriotic War" or Nazi racial Weltanschauung affected soldiers' morale and conduct.

Influence and Legacy

"Stalingrad" is a turning point for English-language scholarship on the Eastern Front. Its bestseller status and critical reception helped create renewed interest in this key theatre of World War II, which had largely been overshadowed in Western popular accounts to the D-Day landings or the Battle of Britain. Beevor's book demonstrated that a broad readership existed for serious, thorough examinations of Eastern Front battles that had otherwise been covered only in specialist scholarly works.

The book's impact extends beyond the academic community. Its close analysis of urban warfare has entered military training manuals, with Beevor's account of fighting from house to house in Stalingrad being employed by officers training to fight in cities like Fallujah or Mosul. The book has also helped shape popular understanding of World War II through its use in documentaries and through its influence on fictionalized accounts of the Eastern Front in films and video games.

Perhaps above all, "Stalingrad" assisted in changing Western views of the Soviet role in the victory in World War II. By recording the massive sacrifice and ultimate military success of Soviet troops, Beevor countered the Cold War bias toward downplaying the USSR's role in the defeat of Nazi Germany. The book adds to a better understanding of how the Allied victory was won and at what price.

Comparison with Other Works

Beevor's "Stalingrad" succeeds earlier books like William Craig's "Enemy at the Gates" (1973) but is more scholarly in style and vividly descriptive in approach. While Craig's is more of a journalist's work, Beevor's is based on enormous archival research and is more perceptive in its analysis of the military campaigns. More accessible than John Erickson's superb but very scholarly "The Road to Stalingrad" (1975), Beevor's book is no less exacting of a scholar's level.

The book also compares favorably with other German accounts like Heinz Schröter's "Stalingrad" (1958), which was written before many of the Soviet sources became available and exhibits some of the bias characteristic of early post-war German military memoirs. Beevor's multilateral perspective provides a more balanced account than memoirs drawn from German or Soviet perspectives alone.

Among more recent works, David Glantz and Jonathan House's "To the Gates of Stalingrad" (2009) is more detailed in its operations but less narrative flair and human interest than Beevor. Jochen Hellbeck's "Stalingrad: The City that Defeated the Third Reich" (2015) offers interesting Soviet testimony but is more narrowly focused on the Soviet experience than Beevor's overall picture.

CONCLUSION

Antony Beevor's "Stalingrad" represents military history at its finest—meticulously researched, elegantly written, and morally serious. By integrating strategic analysis with human experience, Beevor creates a work that is simultaneously informative and deeply moving. He helps readers understand not just how the battle unfolded but why it mattered, both to the outcome of World War II and to the individuals whose lives were forever altered by their experiences in that ruined city on the Volga.

The book's greatest success is maybe its raw honesty. Beevor writes about heroism where it exists and won't sugarcoat atrocities, defeats, and the often less than glamorous reality of soldiers brought to extremes by terror, starvation, and exhaustion. This commitment to truth makes "Stalingrad" not only great history but a powerful analysis of human nature under pressure.

For serious students of military history, for general readers interested in World War II, or for anyone who wants to grasp one of the turning points of the twentieth century, "Stalingrad" is still indispensable reading more than twenty years after publication. It is at once a definitive history of a critical battle and a tribute to the permanent value of historical writing that marries scholarly discipline with literary art.

HUMAN SECURITY AT SEA: EVALUATING SRI LANKA'S MARITIME PRACTICES THROUGH A HUMAN RIGHTS LENS

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Abstract

Sri Lanka's strategic location in the Indian Ocean creates vital opportunities and challenges for maritime security and sustainable development. This article argues that Sri Lanka's maritime governance, while focusing on state sovereignty and economic security, inadequately addresses the human security of coastal communities, seafarers, and the marine environment. Through qualitative analysis of international conventions, national policies, and the 2021 MV X-Press Pearl disaster, this study highlights legal and institutional gaps and advocates for a human rights centered approach to maritime security. The article concludes with policy recommendations for integrating human security principles into Sri Lanka's maritime governance framework, promoting inclusive, sustainable, and rights-respecting maritime practices.

Keywords : Human Security, Maritime Governance, Human Rights at Sea, Coastal Communities

INTRODUCTION

While Sri Lanka's maritime governance has traditionally prioritized national sovereignty, economic development, and strategic interests, this state-centric orientation often overlooks the lived experiences and rights of those most affected by maritime policies, coastal communities, fisherfolk, and seafarers. These human dimensions of security are crucial, especially in a nation whose economy, food security, and cultural identity are closely intertwined with the ocean.

The concept of human security, introduced by the United Nations Development Programme (UNDP) in 1994, represents a fundamental shift in how we understand safety and well-being. It moves beyond the conventional understanding of national defense and focuses instead on safeguarding individuals from persistent threats such as poverty, environmental degradation, exploitative labor conditions, and political exclusion. In the context of maritime governance, applying a human security lens means recognizing that maritime policies should not only protect borders and stimulate the economy, but also ensure that people who live and work around the sea are safe, empowered, and treated with dignity.

A stark reminder of the consequences of neglecting human security in maritime affairs was the MV X-Press Pearl disaster in 2021. The chemical-laden cargo ship caught fire and sank off the coast of Colombo, releasing hazardous substances into the marine environment. This incident severely impacted local fisheries, endangered biodiversity, and disrupted livelihoods. The state's response revealed gaps in disaster preparedness, environmental monitoring, compensation frameworks, and public accountability, all of which are key components of human security. Communities affected by the disaster reported delays in aid, lack of transparent communication, and minimal engagement in recovery planning.

Moreover, international legal instruments such as the United Nations Convention on the Law of the Sea (UNCLOS)and the Maritime Labour Convention (MLC, 2006) set out comprehensive guidelines for environmental protection and seafarers' rights. However, these global standards have yet to be fully incorporated into Sri Lanka's domestic maritime policies. There remains a disconnect between the ratification of international conventions and their practical enforcement on the ground, especially for informal or unregistered maritime workers who lack representation and legal safeguards.

This paper, therefore, undertakes a critical evaluation of Sri Lanka's maritime governance by applying a human rights and human security framework. It seeks to propose policy reforms that move beyond top-down state control and instead promote participatory, inclusive, and sustainable practices. By embedding human security principles into maritime governance, Sri Lanka can better align with international norms, strengthen community resilience, and responsibly harness its maritime resources for future generations.

Problem Statement

Sri Lanka's maritime governance is characterized by a predominant state-centric framework that overlooks the rights and welfare of vulnerable groups including fisherfolk, informal seafarers, and coastal communities (Jayawardena, 2022). Environmental disasters, labor rights violations, and gender exclusion persist as systemic challenges.

The 2021 MV X-Press Pearl chemical spill caused significant ecological damage and socio-economic hardship, revealing shortcomings in disaster response and community support (Fernando, 2022). Additionally, despite ratifying key international maritime labor and human rights conventions, Sri Lanka's enforcement and monitoring remain inadequate (ILO, 2020).

This disconnect between policy and practice raises urgent questions about the extent to which human rights are integrated into maritime governance frameworks and how human security can be prioritized.

Research Questions

This study addresses:

a. How effectively does Sri Lanka integrate human security and human rights principles into maritime governance?
b. What are the vulnerabilities faced by maritime-dependent populations?
c. To what extent do international legal norms inform Sri Lankan maritime policy and enforcement?
d. What reforms can promote a human rights-based maritime secu rity framework?

Research Objectives

a. Analyze Sri Lanka's maritime policies from a human security per spective.
b. Identify risks faced by maritime communities.
c. Evaluate compliance with international maritime human rights standards.
d. Recommend policy reforms fostering inclusive and rights-respecting maritime governance.

LITERATURE REVIEW

The concept of human security, as established by the United Nations Development Programme (UNDP) in 1994, represents a transformative approach in the discourse of security, emphasizing the protection of individuals rather than states alone. This paradigm shift calls for policies that address the multifaceted threats to human dignity, including economic deprivation, environmental hazards, and social marginalization (UNDP, 1994). In the maritime domain, this translates to recognizing the ocean not just as a geopolitical space but as a vital ecosystem supporting livelihoods and cultures that must be protected.

Maritime governance frameworks globally have traditionally prioritized sovereignty, economic development, and naval defense, often at the expense of environmental conservation and human rights (Grote & Warner, 2021). However, an increasing body of scholarship argues for a more holistic governance approach that incorporates the human security lens to better address complex maritime challenges. For example, Grote and Warner (2021) emphasize the critical need to integrate social justice and environmental sustainability into maritime policies, especially as global fisheries face overexploitation and climate change pressures.

The Maritime Labour Convention (MLC, 2006), often described as the "Seafarers' Bill of Rights," sets international standards to safeguard seafarers' working and living conditions. Despite its significance, enforcement remains uneven, especially in developing countries where resources and institutional capacity are limited (ILO, 2020). Sri Lanka, as a significant maritime labor hub with a large seafaring workforce, struggles with implementing these standards fully, particularly among informal seafarers and fishers who operate beyond formal regulatory frameworks (Gunawardena, 2021).

Gender inclusion in maritime sectors remains an under-researched and under-prioritized issue in Sri Lanka. Women's participation in fisheries and maritime-related livelihoods is often informal, unrecognized, and unsupported by policy (Gunawardena, 2021). Feminist critiques in maritime studies highlight how exclusionary governance practices marginalize women, reducing their access to resources, decision-making, and social protections. Addressing these gaps is essential to achieving equitable human security.

Sri Lankan academic literature on maritime issues predominantly focuses on geopolitical strategy and environmental management, frequently overlooking the human rights dimension (Wijegunaratne, 2019; Jayawardena, 2022). The 2021 MV X-Press Pearl disaster has catalyzed more attention towards environmental justice and community impacts, revealing the urgent need to bridge this scholarly gap (Fernando, 2022). Studies analyzing this disaster underscore the systemic vulnerabilities of coastal populations and the insufficiency of current disaster response mechanisms.

Moreover, the Sustainable Development Goals (SDGs), particularly SDG 14 (Life Below Water) and SDG 8 (Decent Work and Economic Growth), provide a global normative framework for integrating human security principles into maritime governance (UN, 2015). Sri Lanka's maritime policies must therefore align with these goals to ensure sustainable and rights-respecting use of marine resources. This alignment requires not only policy reform but also robust implementation and community engagement strategies (de Silva, 2023).

FINDINGS

This study finds that Sri Lanka's maritime governance is strongly influenced by a state-centric security model that prioritizes national sovereignty and economic interests, often at the expense of human security considerations. The analysis of policy documents and international treaties ratified by Sri Lanka reveals a commitment in principle to global standards, yet a significant gap persists in translating these commitments into practice.

State-Centric Priorities vs. Human Security: The dominant focus on protecting territorial waters, securing maritime trade routes, and promoting economic development through ports and fisheries creates a narrow agenda that sidelines the welfare of coastal communities and maritime workers. This approach often neglects the social dimensions of maritime security, such as ensuring labor rights, environmental health, and community resilience.

Enforcement Gaps and Informality: Despite Sri Lanka's ratification of conventions such as UNCLOS and the Maritime Labour Convention, enforcement on the ground remains weak. Informal seafarers and artisanal fishers, who constitute a significant portion of the maritime workforce, lack formal recognition, legal protections, and access to grievance mechanisms. This informality exacerbates vulnerabilities to unsafe working conditions, exploitation, and social marginalization.

Environmental and Disaster Management Deficiencies.

The MV X-Press Pearl disaster illuminated critical weaknesses in environmental risk management, emergency response, and victim compensation. The release of hazardous chemicals severely damaged coastal ecosystems and disrupted fisheries-dependent livelihoods. Local communities reported delayed government assistance, lack of transparent communication, and insufficient involvement in recovery efforts, underscoring a failure to operationalize human security principles in disaster governance.

a. Gender Exclusion. Women in coastal and maritime sectors remain largely invisible in policy frameworks. Their roles, ranging from fish processing to community support are often undervalued and unsupported by legal protections or targeted social programs. This exclusion contributes to gender disparities in access to resources, decision-making, and social security benefits, limiting the overall resilience of maritime communities.

b. **Weak Localization of International Norms.** Although Sri Lanka has formally committed to numerous international maritime and labor conventions, these frameworks are inadequately localized through enforceable laws, institutional mechanisms, and community outreach programs. The disconnect between international commitments and local realities undermines the effectiveness of human rights protections at sea.

DISCUSSION

The findings highlight a crucial need for Sri Lanka to recalibrate its maritime governance towards a more inclusive and human-centered model. The state-centric approach, while important for national security, is insufficient to address the layered and intersecting vulnerabilities faced by coastal communities, seafarers, and ecosystems.

a. **Integrating Human Rights and Environmental Justice.** A human security approach calls for recognizing maritime governance as an ecosystem of rights and responsibilities that includes environmental stewardship, labor protections, and social equity. This entails strengthening environmental laws to prevent disasters and mitigate impacts, alongside enhancing labor regulations to protect vulnerable maritime workers. The MV X-Press Pearl disaster serves as a case study in how neglecting such integration results in compounded human and environmental harm.

b. Inclusive and Participatory Governance. Effective maritime governance must go beyond centralized decision-making to include the voices of marginalized groups,coastal communities, informal workers, women, and indigenous populations in policy formulation and implementation. Participatory mechanisms can enhance transparency, build trust, and ensure that policies reflect the lived realities and needs of those directly affected.

c. **Gender-Responsive Policies.** Incorporating gender perspectives into maritime governance is essential to redressing historical exclusion and promoting equitable development. This includes recognizing women's economic contributions, addressing their specific vulnerabilities, and enabling their leadership in maritime policymaking and community resilience programs.

d. **Aligning with Sustainable Development Goals.** Sri Lanka's maritime policies should explicitly align with SDG 14 (Sustainable Use of Oceans) and SDG 8 (Decent Work), among others, to foster sustainable blue economy practices that respect human rights and ecological limits. This alignment offers both normative guidance and practical benchmarks for monitoring progress.

d. **Capacity Building and Legal Reforms.** Strengthening institutional capacities for enforcement, monitoring, and community engagement is necessary to bridge the gap between policy and practice. Legal reforms should codify human rights protections explicitly, ensuring

that international conventions are domesticated effectively. Training for maritime officials, community leaders, and civil society actors can support this transition.

CONCLUSION

Sri Lanka's maritime governance currently reflects a traditional security paradigm that emphasizes sovereignty and economic interests, often sidelining the human rights and security of coastal populations, seafarers, and the marine environment. This approach leaves critical gaps in disaster preparedness, labor protections, environmental justice, and gender inclusivity, weakening the resilience and well-being of those most reliant on the sea.

The 2021 MV X-Press Pearl disaster dramatically exposed the vulnerabilities within Sri Lanka's maritime governance framework, underscoring the urgent need for a human security-centered approach. Addressing these challenges requires a fundamental shift towards policies and practices that integrate human rights, environmental sustainability, and social inclusion.

To realize this vision, Sri Lanka must undertake comprehensive legal reforms that explicitly embed human rights in maritime laws and policies. Strengthening enforcement mechanisms to protect informal maritime workers and improving disaster response frameworks with community participation are critical steps. Additionally, enhancing gender inclusion through targeted policies and promoting participatory governance will help build a more equitable and resilient maritime sector.

Aligning maritime governance with the Sustainable Development Goals offers a strategic pathway for Sri Lanka to balance economic growth with social justice and environmental stewardship. Such alignment will not only enhance the country's maritime security but also position it as a regional leader in adopting human-centered, rights-based maritime practices.

Ultimately, safeguarding human security at sea is an ethical and strategic imperative that demands ongoing collaboration among government agencies, civil society, communities, and international partners. By embracing a holistic human rights approach, Sri Lanka can secure the health and prosperity of its blue economy for current and future generations.

RECOMMENDATIONS

a. Legal Reforms. Embed human rights explicitly in maritime laws.

b. Enforcement. Strengthen monitoring and protection for informalmaritime workers.

c. Disaster Response. Develop inclusive plans prioritizing affected communities.

d. **Gender Inclusion.** Promote women's participation in maritime sectors and policymaking.

e. Participatory Governance. Involve diverse stakeholders in decision-making.

f. Awareness. Increase public education on maritime human rights.

g. SDG Alignment. Integrate maritime governance with global sustainable development goals.

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ADMIRAL CLANCY FERNANDO ESSAY COMPETITION 2025

1ST PLACE OF EACH CATEGORY

'GENERATION MULTIPLICITY AND TECHNOLOGICAL ADVANCEMENTS: A CHALLENGING IN PERSONNEL RETENTION AND ATTRACTION IN SLN'

Commander (C) Damith Dissanayake, RSP***

INTRODUCTION

A navy is a legitimate force capable of fighting on, under or over the seas (Tikkanen, no date), which primarily defending its nation from threats emerging from and at sea. Even though it is country's maritime fighting force, worldwide navies are expected to perform Constabulary and Diplomatic roles in addition to the prime Military role; offering it a unique position among the sister services. In this backdrop, the Sri Lanka Navy (SLN) envisages to "develop into a naval force capable of countering Brown, Green and Blue water challenges with a formidable force structure to achieve National Security Objectives and safeguard Sri Lanka's Maritime Interests" (Sri Lanka Navy, no date). In par with its' vision, the SLN maintains nearly 43,000 cadre at present and its' latest strategy highlight the desire to maintain a 40,000 human capital by year 2030 (proposal for sri lanka navy's strategy 2030 and beyond, 2024). In addition to the welcoming of latest technology, such ambition necessitates a human capital with physical strength, talent and experience.

A generation is a group of individuals with common social attributes shaped through their experiences in the time of existence. According to Jones et al. (2012), common social identity of a generation is developed through the historical events taken place during their time. However, the improved worldwide connectivity in the recent past has shaped 'generation' a globally common feature, which sociologists recognises as a period of 15 years at present. In accordance with the regulations, the SLN cadre will be ranging between 18-55 years where two to three generations will always serve cohesively in achieving organizational goals. As an example, present day navy is a mixture of Generation X (born in 1965-1979), Generation Y (born in 1980-1994) and Generation Z (born in 1995-2012).

Human capital is the drive shaft of an organization; a deciding factor of overall organizational performance in the competitive and technologically evolving world. Therefore, the attraction of new talent and retention of experience remain top priorities of the managers across the world. Even though, the hierarchical organizational structure creates more opportunities to the youth to join in and enjoy an adventurous trade, the recent SLN experiences highlight a considerable recruitment deficit and an alarming low retention rate, challenging the health of the organizational structure.

Therefore, this essay intends to analyse the facts affecting recruitment and retention in SLN with special emphasis to the impacts from generation multiplicity and technological advancements.

IDENTIFY SPECIFIC GENERATIONS : IMPACTS ON ENLISTMENT AND RETENTION

Impacts on Enlistment According to Rajyalaxmi (2023), recruitment is the process of attracting qualified personnel who agreed with the organizational ethics and Kyndt et al. (2009) define retention as the mechanism to keep potential employees according to the organizational desire. During the last phase (2006-2009) of Counter Insurgency Operations against the Liberation Tigers of Tamil Eelam (LTTE), SLN's recruitment drive has been highly successful to attract Generation Y (Gen Y) population in large numbers, allowing a rapid force expansion from 35000 to 52000 during a short span of time. Thus, the Navy's limited success to fascinate Generation Z (Gen Z) population during the peace time suggests the presence of strong factors preventing Gen X joining the organization. Therefore, identifying Gen Z's expectations from the working life will shed light to understand the real reasons behind their reluctance to join this widely recognised and much secured government service (job).

Gen Z. Born in an era of rapid technological transformation and raised in growing consumer society with easy access to information, the individuals of this generation are technical savvy, information seeking, idiosyncratic, open minded and better agile to changes than its' predecessors. Berkup (2014) identified that the Gen Z expects flexible working hours, work life balance, organic structure, clear career progression opportunities, technology involved innovative tasks, individual office space, quality-based assessment from an organization.

a. Career Prospects. Across the globe, military services are recognised as one of the best carrier options for youth seeking financial prospects, exposure and development. Thus, the organization's public image matters in large to stimulate the job seeking young generation to make their decision in favour of the navy. In general, navy's operational successes, special employments (response to natural disasters/ public disorders, etc…) and nation building endeavours (cleaning waterways/ constructions, etc…) are largely exposed to the general public and widely publicise in many media formats. Most of such reporting lead to label the navy as an exhausting, highly committed, largely controlled and less innovative environment, contradicting the

expectations of job seeking youth. In contrast, avenues found to be limited in highlighting the typical SLN routine which allows great balance in work with adequate time for individual's personal life and recreational activities, more ashore employment opportunities, merit-based promotion criterions, higher education opportunities and welfare measures; creating a hindrance to counter the negative appraisals of targeted generation.

b. Organizational Structure. According to Bresman and Rao (2017), Gen Z population expects higher leadership responsibilities and freedom in their workplace, whereas Boson Project by BNP Paribas, (2015) highlight Gen Z's attraction for more democratic, less discriminatory and flattened hierarchical organizations. Ensuring the warfighting capabilities, military organizations are hierarchical in structure through which, the authority is delegated to its' members for command (Feld, 1959). Therefore, the authority and freedom of junior cadre is kept limited and the enlisted men receive considerably limited authority compared to the commissioned officers. further, one's enlistment category and seniority in the navy will decide his leadership opportunities, whilst the corporate world allow far better competition between the individual skills and experience. Thus, the navy's organizational ethics and structure found unappealing to the Gen Z population, making it a less preferable choice.

c. Job Preference. The majority of Gen Z population is motivated to work for an international company whilst 25% of them prefer starting their own business (Bresman and Rao, 2017). In the present Sri Lankan context, countrymen continue to seek overseas employment opportunities aftermath of economic downturn in post pandemic. During 2022 and 2024, Sri Lankans leaving for overseas job opportunities has exceeded 300,000 (Sri Lanka Bureau of Foreign Employment, 2024) and nearly 40% of migrating Sri Lankans in 2023 found to be between 18-35 of age (Annual statistics of foreign employment 2023, 2023), complementing the Gen Z's popular occupational motive. Further, the strongly recovered tourism industry is creating more flexible and independent job opportunities in the country. The industry has marked 106.5% growth and generated 204,591 direct and 225,050 indirect job opportunities in 2023 (annual statistical report 2023- Sri Lanka Tourism Development Authority, 2023). Such opportunities easily attract the Gen Z population who are fond of flexible employment opportunities and entrepreneurship. Therefore, in the presence of the job options of their kind, naval service found to have low priority in the Gen Z's expected list.

d. Declining Eligibility. Apart from the academic qualifications, the military enlistment criterion carries considerable weightage on one's physical and medical standards and recent SLN statistics express notable struggle of candidates to meet these necessities. Expressing the commonality among the generations worldwide, majority of recent military candidates in the United States of America (USA) reported to have sought some kind of waiver to overcome their disqualifications at the entry (Olay, 2024). Whilst highlighting a grave social issue underneath, such observation leading to a doubt whether naval service or rather military services have become the last resort of job seeking young Sri Lankans. Most interestingly, similar social phenomenon may drastically reduce the candidature, since all generations found to have high concerns about the fitment between their personality and the intended work.

Retention

SLN enlistment criterion accept entrants up to 23 years of age and the candidates could enlist as officers or sailors in the regular navy for 20 and 12 years of mandatory service period respectively. Whilst officers are eligible to serve up to 55 years of age, the service of a sailor limited up to 22 reckonable years. In that context, the general schedule of retirement in terms of generation and enlisted category are as follows:

According to the facts tabled above, the SLN retention attempts should address the officers of all three generations and sailors of Gen Y and Z. However, since the majority of Gen X officers have already reached the rank of Captain and the hierarchical structure naturally shape the higher leadership opportunities, the SLN retention focus could be directed towards the 'Y' and 'Z' generations. Therefore, analysis between the critical factors affecting military retention and its affiliation to the attitudes of identified generations will expose the critical areas which require SLN attention to improve the retention rate.

Table 1: General Retirement Schedule in SLN

Generation	Upper Ceiling of Enlistment	Upper Ceiling of Retirement	
		Officers	Sailors
X (1965- 1979)	2002	2020- 2034	2010- 2024
Y (1980-1994)	2017	2035- 2049	2025- 2039
Z (1995- 2012)	2035	2050- 2067	2040- 2057

Source: Developed by Author- Based on Literature

a. Salary. Salary is the greatest motivation of an occupation in this consumer world and Rabkin (2000) identifies it as one of the most decisive factors influencing US Marines' retention. Therefore, the annual growth, reengagement allowance and the retirement pension may largely influence one to decide whether to retain or leave the naval service. During the original enlistment period, consolidated pay of SLN rating will grow by 1% per annum and increased around 3% after the reengagement. On completion of 22 years of service, a timely advanced rating will secure a pension which is 25% higher than an employee in management service-first class. Even though better paid as a government pensioner, pay increment of a serving navy rating is considerably flat in contrast to the private sector. Further, the fiscal motivation expected through existing reengagement allowance found to have no power to influence young ratings to make their decision to serve beyond the original enlistment. Since Gen X population and Gen Y tailenders are impatient in nature (Berkup, 2014), they tend to disregard long term fiscal benefits in the absence of reasonable salary increments and attractive incentives during the occupation. Since both these generations will continue to make their career defining decisions in future, the navy's attention on highlighted factors will decide the experience retainment in the navy.

b. Societal Influence. The economic downturn in post pandemic Sri Lanka shrunk the real wages in both public and private sectors, increased poverty and spread the fear of food insecurity across the society, leading to a social unrest. In this background, overseas employment opportunities emerged as an escape, developed into a social trend and even attracted the professionals in both public and private sectors. In the absence of considerable salary increment during this period, the navy started to experience higher desertion rates and reluctance in re-engagement. Equally, highest desertion of junior ratings (Recruit to Able Rate) in the recent history was reported between 2021 to 2024. Similar trend was also been seen among the junior officers of Gen Z and early retirement becomes a general interest among the mid-career officers of Gen Y during this period. Figure 1 demonstrates the desertion trend of junior sailors during 2019 to 2024.

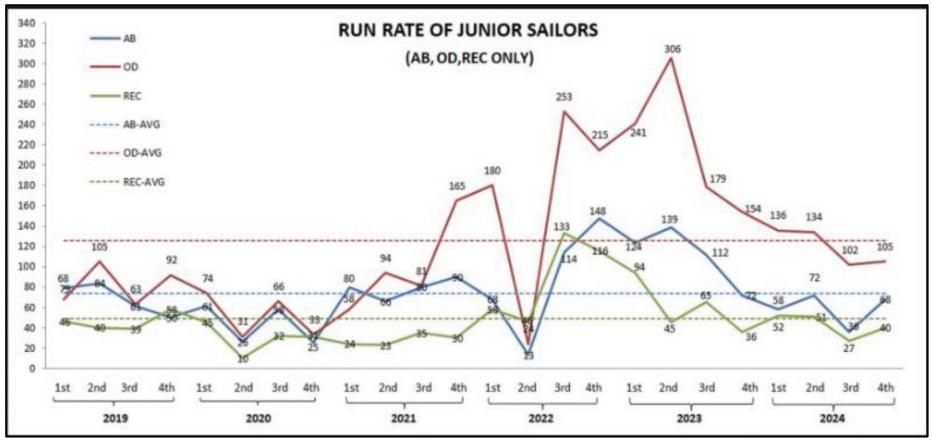

Figure 1: Run Rate of Junior Sailors

Source : Sri Lanka Navy

The above facts clearly bring out the navy's vulnerability to the societal impacts as well as the Gen Z's quick reactions when their expectations were challenged at the work place. Reactions of Gen Z population demonstrate their susceptibility to discouragement and limited loyalty towards the organization which is largely different from their predecessors, who have displayed greater risk tolerance even amidst life threatening situations. Therefore, the navy may require broader approaches to bolster belonginess, loyalty and pride among its cadre to resist the societal impacts whilst ensuring measure to regain the pride of naval veterans.

c. Competitive Labour Market. Based on the mandatory service period, officers and ratings have the avenue to decide their future before reaching the age of 40, and therefore qualify to seek an opportunity in the civilian job market. Accordingly, at the decisive moment, such person will weigh his familiar occupation against the prospects of a civilian employment or an entrepreneurship. Interestingly, civilian career prospects are recognised as one of the decisive factors influencing US Marines to leave the service (Kocher & Thomas, 2000). Even though serving in the navy is highly secured, offer clear and systematic career progression opportunities, provide diversified experiences and included with provisions support the family, it demands discipline, teamwork and dedication by large. In contrast, the civilian occupation offer freedom in selecting the job and the venue, greater independence at work, freedom of expression and performance-based increments. According to Berkup (2014), Gen Z favours organic organizations, expect individual workplace, admire work-life balance and seek flexibility at work; which are much aligned with the characteristics of civilian employment opportunities. Since the civilian career gain more influence over the targeted generations, SLN shall revisit its Human Resource Management approaches to achieve the counter balance.

TECHNOLOGICAL ADVANCEMENTS: A NIGHTMARE OR A PROBLEM SOLVER

Technical advancements are continually shaping our environment and will grow its dominance day by day. According to (Verdugo and Babin, 1990), technological advancements will continue to grow its share in shaping the military organizations. Considering the importance of maritime security for an island nation, the government of Sri Lanka steadily invests on the navy's modernisation, leading to fleet expansion and adoption of improved technology into the service. Induction of new technology demand higher user skills, thus influence the navy to set higher enlistment criterions and introduce new training modules. In this background, recruiting of suitable personnel in required number to the navy will become a challenge amidst the existence of more flexible civilian job opportunities favoured by the candidates of a much liberal generation. Responding to similar phenomenon, Singapore aims to acquire more autonomous systems to reduce the man power requirement for manning its lager naval fleet (Yaacob, 2025). However, no direct connection could be unearthed between the technological advancement and retention, except the possible reduction of interpersonal relationship between the servicemen.

RECOMMENDATIONS

Considering the facts highlighted during the discussion, following recommendations are made for the consideration at the navy headquarters to mitigate the challenges exerted through diverse generations and technological advancements

a. Initiate a comprehensive survey among the naval force to identify true factors affecting SLN personnel to decide their retention.

b. Consider possibilities for a systematic and continued campaign to promote navy as a respected career path.

c. Refine navy's media campaigns to address the youth with special emphasis on leadership, decision making and career development opportunities available among all segments of the navy.

d. Seek possibility to amplify the veteran affairs ensuring long term support and their sustainable presence in the society.

e. Expand ongoing programs to promote the navy among young generation through their influencers.

f. Introduced proactive measures to guide young citizens to reach SLN enlistment criterions. At the inception, SLN could make similar initiatives such as medical pilot program and service member preparation courses successfully launched by the U.S.A department of Defence (Olay, 2024).

g. Understand the importance of pecuniary motivation in both enlistment and retention process and make the line ministry educated on its urgent necessity to counter balance the pressure transferring from the competitive labour market.

h. Design programs to promote the belonginess, loyalty and pride among the naval personnel in all levels.

j. Revisit navy's engagements to ensure work life balance amidst the organization's challenges in enlistment and retention.

k. Consider automation as a long-term solution for manpower shortage.

CONCLUSION

The challenges faced by the navy in personnel attraction and retention found to be a result from a much-complexed social phenomenon, which even is globally common. At present, the navy found to be struggling to attract much liberal, self-reliant, freedom loving, technical savvy, pragmatic, motivated and more fragile Gen Z population in expected numbers. Further, the situation found to be further aggravated with the technological advancements demanding for skilled apprentice. However, the navy's potent to offer wider educational and career progression opportunities found to have limitedly exposed to the public; which may result with more positive responses if exposed. Most shockingly, medical and physical disparities of candidates were also exposed, which require coordinated effort with relevant public entities.

In terms of navy's retention challenges, both Gen Y and Z become the centre of attention. Navy's visible fiscal benefits found unappealing to retain the young skilled men, since it is ill powered to counter the greater influence of competitive labour market. Most shockingly, the naval community's vulnerability to the social trends were unveiled and the need to improve certain qualities were also established. Interestingly, the technological advancements found to be a multifaceted influencer which could exert pressure as well as relief on the recruitment and retention drives.

Even though the navy's recruitment and retention drives will pursue Gen Y and Gen Z up to 2035, Gen A will make their appearance in 2028, replacing the X Generation. Therefore, the complexities will continue to develop, urging navy to keep surveillance on generational changes throughout.

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GENERATION MULTIPLICITY AND TECHNOLOGICAL ADVANCEMENTS: A CHALLENGE IN PERSONNEL RETENTION AND ATTRACTION IN SLN

Lieutenant Commander (E) Lanka Wijesinghe

INTRODUCTION

The Sri Lanka Navy (SLN) faces a dual challenge which are managing diverse generational dynamics and adapting to rapid technological advancements. With personnel ranging from Baby Boomers to Gen Z, differing values, communication styles and expectations can create internal friction, especially within a traditionally hierarchical structure. Simultaneously, the rise of AI, cyber warfare and autonomous systems demands digitally proficient and adaptable personnel. Balancing these pressures is critical for retaining experienced staff while attracting tech savvy recruits. This essay explores these challenges and argues that the SLN must adopt inclusive, flexible and future focused personnel strategies to thrive in the modern naval environment.

UNDERSTANDING GENERATION MULTIPLICITY.

Sri Lanka Navy, much like the broader Sri Lankan society is undergoing a generational transformation within its workforce. This generational multiplicity which is defined as the simultaneous presence of multiple generational cohorts within an organization has created a complex dynamic in the Navy's human resource environment. The active duty population of SLN currently includes officers and sailors from at least three generational groups such as Generation X (born 1965–1980), Millennials or Generation Y (1981–1996) and Generation Z (1997 onwards). Each of these cohorts brings a distinct set of values, learning styles, technological competencies and career expectations which can significantly influence organizational culture and operational cohesion.

Characteristics of Generational Cohorts in SLN. Generation X, now mostly occupying senior leadership positions in the Navy which is typically characterized by a strong work ethic, independence and resilience. This generation matured during a time of socio-political instability in Sri Lanka and values stability, loyalty, and institutional hierarchy. Many among them have had long naval careers shaped by traditional leadership models, conventional warfare training and relatively limited exposure to digital technology in their formative years.

In contrast, Millennials now forming a substantial proportion of the Navy's middle tier leadership and junior officers, grew up in an era of rapid globalization, access to digital media and changing attitudes toward

authority and work life balance. They tend to be more collaborative, adaptive to change and value professional development, technological integration and personal fulfilment. This cohort often questions rigid hierarchical norms which can create tension with their superiors, especially if their opinions and feedback are not encouraged in command decisions.

Generation Z, the newest entrants to SLN has been raised in the era of smartphones, social media and instant information. As digital natives, they are highly connected, multitasking oriented and expect immediacy in communication and feedback. Their exposure to global trends and broader career options outside traditional professions means they are more likely to demand purpose driven work, career flexibility and technological engagement from their employers including the military.

Intergenerational Friction and Institutional Challenges. The coexistence of multiple generations in Sri Lanka Navy offers both advantages and difficulties. While generational diversity can enhance innovation, problem solving and leadership, it can also lead to misunderstandings and strained command dynamics. Older personnel may expect strict discipline and hierarchy whereas younger members often value open communication, mental health support and purpose driven roles. These differing expectations can cause friction. Additionally, generational gaps influence how individuals respond to training, motivation and career incentives with younger personnel favoring interactive learning and short term skill development over traditional methods and long term rewards.

Cultural and Societal Shifts in Sri Lanka. Generational traits in Sri Lanka Navy reflect wider socio economic and cultural changes in society. Today's youth influenced by global exposure and evolving career aspirations are less likely to see military service as a lifelong commitment, preferring private sector jobs, overseas work or entrepreneurship. This shift challenges SLN's traditional recruitment strategies. Additionally, increased awareness of mental health, gender equity and work life balance among younger Sri Lankans requires the Navy to modernize its policies. Maintaining discipline is crucial but ignoring generational needs risks alienating new recruits.

The Need for Generational Intelligence in Leadership. To effectively manage this generational diversity SLN must cultivate 'generational intelligence' within its leadership. This involves understanding the values, expectations and communication styles of each cohort and developing leadership strategies that foster mutual respect and collaboration.

Initiatives such as intergenerational mentorship, reverse mentoring, personalized career planning and hybrid training models can bridge the gap between tradition and innovation.

TECHNOLOGICAL ADVANCEMENTS AND THEIR IMPACT ON NAVAL OPERATIONS AND PERSONNEL.

Technological evolution has become a defining force in modern naval warfare and maritime security operations. The global maritime domain is being rapidly transformed by innovations in cyber warfare, unmanned systems, advanced sensors, artificial intelligence (AI) and integrated communications networks. For SLN, as a regional maritime power tasked with safeguarding the island's sovereignty and maritime interests the adoption of new technologies is not optional but it is imperative. However, with this technological transition comes a profound impact on naval personnel, especially in terms of training demands, career expectations and inter generational adaptability.

Technological Integration in Sri Lanka Navy. Over the past decade, Sri Lanka Navy has significantly modernized its operations by adopting advanced technologies such as maritime surveillance systems, electronic navigation and networked command structures. These upgrades have enhanced maritime domain awareness, particularly in anti smuggling and anti narcotics missions. Automation aboard vessels has reduced manual workloads but requires greater technical expertise. Additionally, the Navy's focus on research and development has led to indigenous innovations like unmanned surface vehicles and fire control simulators. Success in these areas relies on technically skilled and adaptable personnel traits more common among younger generations.

Foreign Naval Examples of Technological Adaptation. Foreign navies illustrate how technology is reshaping naval roles and workforce structures. The U.S. Navy has embraced autonomous systems and cyber focused roles, attracting tech savvy youth through careers in AI and electronic warfare. The UK's Royal Navy is incorporating autonomous systems, hybrid vessels and immersive training methods like AR/VR to better engage younger generations (British Royal Navy, 2023). Meanwhile, the Indian Navy has advanced in information warfare and AI by partnering with academic institutions, boosting both capability and recruitment. These examples offer Sri Lanka Navy important insights for adapting its own force structure and attracting skilled, tech oriented personnel.

Challenges in Technological Adoption within SLN. Despite progress, Sri Lanka Navy's technological transformation faces several challenges. A digital divide persists between senior officers accustomed to analog systems and younger personnel more familiar with modern technology. Rapid tech evolution also risks skill obsolescence without ongoing training. Although the SLN offers strong traditional military education, its development programs need to emphasize continuous digital learning. Additionally, financial and infrastructure constraints limit the Navy's ability to independently acquire and customize advanced technologies, often relying on foreign assistance that may not include tailored training, leading to integration and capability gaps.

Generational Implications of Technological Change. Technological change and generational differences significantly impact personnel management in the Sri Lanka Navy. Younger recruits often embrace new systems, while senior ranks may resist or struggle to adapt, leading to communication issues and morale problems. Gen Z personnel are more likely to stay if the Navy fosters innovation, invests in technology and promotes continuous learning. Without these, many may leave for civilian tech careers. To address this, SLN should pursue a dual track development strategy which is enhancing digital skills among current staff while creating tech focused, future-ready career paths for new recruits through education partnerships and flexible career models.

IMPACT ON PERSONNEL RETENTION AND ATTRACTION IN THE SRI LANKA NAVY.

The confluence of generational multiplicity and technological advancement creates a complex dynamic within SLN, directly affecting its ability to attract, retain and effectively utilize its personnel. These dual forces demographic shifts and digital transformation have introduced new expectations among recruits, altered career aspirations and demanded greater organizational flexibility. Understanding their impact is essential for shaping a future ready naval force capable of meeting both conventional and asymmetric maritime threats.

Generational Preferences and Retention Dilemmas. Each generational cohort in SLN exhibits distinct values and motivations. Older personnel, particularly from Generation X and early Millennials often value stability, hierarchy and a defined chain of command. They tend to stay loyal to the organization due to pensionable service structures, career continuity and a sense of duty. On the other hand, younger Millennials and Generation Z entrants show a greater inclination towards flexibility, purpose driven work, technological engagement and work life balance.

This generational divergence affects retention. For instance, younger officers and sailors who join with degrees in engineering, computer science or electronics may grow disillusioned if they are placed in roles that underutilize their technical skills. In recent years, there have been cases of SLN technical branch officers seeking early retirement or transition into civilian IT, telecom or maritime security sectors attracted by better pay, more autonomy, or the opportunity to work in innovation driven environments.

Moreover, the lack of lateral career progression or dual specialization pathways can discourage high potential personnel. Unlike the Royal Australian Navy, which offers modular career planning with options to move between operational, technical and academic streams, the SLN's career ladder remains relatively rigid (Royal Australian Navy, 2020). This rigidity hampers efforts to retain officers who value continual skill enhancement or cross disciplinary exposure.

Recruitment Challenges in the Age of Digital Natives. Attracting Generation Z recruits, who are digital natives, poses unique challenges for the Sri Lanka Navy. While the Navy offers a prestigious career, it competes with private sector jobs that are seen as more dynamic and tech driven. Although university students show initial interest in Navy's advanced technology roles, enthusiasm often fades due to perceptions of bureaucracy and limited tech integration. In contrast, navies like those of India and Singapore have successfully used digital campaigns, tech focused roles and academic partnerships to attract and retain skilled youth, offering models the SLN could adapt to improve recruitment and retention.

Inservice Morale and Career Satisfaction. Retention is not just about preventing exit, it is also about maintaining in service morale and satisfaction. In SLN, one of the under addressed issues is the uneven technological exposure across different branches and units. For example, personnel assigned to technologically advanced vessels or shore based units like the Naval Research Wing or Electronic Warfare Unit enjoy greater engagement with modern systems. Meanwhile, those in older platforms or administrative postings may feel professionally stagnant, especially if promotional criteria remain static and not reflective of new competencies.

Additionally, the traditional evaluation systems and career progression models have yet to fully integrate technological excellence as a core metric. A junior officer who demonstrates innovative use of unmanned aerial systems or develops a digital tool for onboard logistics

might not receive as much institutional recognition as someone who merely fulfills conventional command duties. This undervaluing of innovation affects morale and may prompt talented personnel to seek opportunities elsewhere.

To address this, SLN could emulate programs like the U.S. Navy's 'Innovation Awards' and the 'Athena Project' (United States Navy, 2023), which reward inservice innovation and empower junior personnel to pitch ideas directly to senior leadership. Recognition and implementation of grassroots innovations not only enhance capability but also strengthen organizational commitment.

Institutional Flexibility and Structural Reform. Another pressing issue is institutional rigidity. While SLN has commendably updated several training modules and curricula particularly at the Naval and Maritime Academy (NMA) and the Naval Artificer Training Institute (NATI) many policies remain slow to adapt to emerging realities. Personnel seeking mid career specializations or lateral transfers between technical and operational tracks face bureaucratic resistance or lack of institutional pathways. This has a negative effect on those with high adaptability but low tolerance for stagnation.

The Royal Canadian Navy has addressed this by introducing a Career Transition Support Program (Canadian Armed Forces, 2021), enabling personnel to re-skill into cyber or digital roles while retaining their rank and benefits. This flexible model could serve as a blueprint for SLN, particularly as it seeks to expand its cyber defense posture and maritime intelligence capability.

SLN Women employees though a progressive step can also be expanded to include technological roles such as unmanned systems operations, cyber threat monitoring and GIS analysis which are not physically intensive but require high cognitive ability. Doing so could help attract a more diverse and capable cadre into the Navy.

STRATEGIES TO ADDRESS THE CHALLENGES.

To remain a modern and competitive maritime force, Sri Lanka Navy must evolve institutionally to manage the dual challenge of generational multiplicity and rapid technological advancement. This involves a multi faceted approach that integrates leadership development, structural reforms, technological adaptation and cultural realignment. Below are key strategies designed to strengthen both personnel attraction and retention.

Cultivating a Multi-Generational Leadership Model. A one size fits all leadership style is no longer sufficient. Commanding officers must be trained to understand inter generational dynamics and manage teams with varying values, communication styles and learning preferences. SLN can enhance leadership development through targeted workshops at the Naval and Maritime Academy (NMA) and Naval Command and Staff College (NCSC) that explore topics such as emotional intelligence, adaptive leadership and digital literacy.

Furthermore, embedding reverse mentoring where junior sailors with technological expertise mentor senior officers can foster mutual respect and break down hierarchical barriers. The British Royal Navy, for instance has successfully implemented such programs which have helped senior leaders stay informed about technological trends while empowering younger personnel.

Career Personalization and Skill Mobility. A rigid career structure discourages innovation and undermines morale. SLN should consider introducing a modular career framework, allowing personnel to pursue specializations across technical, operational and academic streams. Officers and sailors could periodically select 'elective tracks' (e.g., AI systems, drone operations, cyber warfare, or maritime law) based on performance and aptitude.

Incorporating micro credentialing systems short term certifications in niche areas through partnerships with institutions such as the University of Moratuwa or KDU could further support skill development. The Royal Netherlands Navy provides a relevant model, offering its sailors government certified technical diplomas while in service, which improves retention and post service employability.

Enhancing the Role of Technology in Career Branding. To attract the digital native generation, Navy must actively rebrand itself as a technologically advanced, intellectually rewarding and mission driven career. A dedicated SLN digital outreach unit can be established to run modern recruitment campaigns across social media, YouTube and campus job portals. Content should highlight cutting edge operations, such as the use of UAVs for surveillance, cybersecurity exercises and joint naval tech projects with foreign partners.

Further, creating an online platform that simulates naval tasks in a gamified recruitment portal inspired by the U.S. Navy's 'America's Navy' interactive platform can boost engagement among tech savvy youth.

Investing in Cross Branch Technological Exposure. Retention is reinforced when personnel perceive growth and relevance. SLN should rotate officers and ratings across units with varying degrees of technical complexity to ensure even exposure. A system of temporary attachments to high tech units, such as the Naval Research Wing, EW Unit or Fleet Maintenance units can enable hands on experience and encourage career aspirations in technology oriented fields.

Additionally, Naval Dockyard apprentices and junior officers in engineering branches should be routinely involved in innovation competitions, field trials of indigenous tech solutions and collaborations with local defense R&D agencies.

The Indian Navy's Directorate of Indigenization and Modernization runs similar initiatives (Indian Navy, 2023), where young officers contribute to developing indigenous ship components and receive recognition from Naval Headquarters. A similar setup within SLN can enhance innovation culture and improve job satisfaction.

Introducing Retention Incentives for Tech Talent. To retain high demand personnel, SLN must create tailored incentive schemes. These could include:

a. Tech specialist pay bands or allowances for cyber, AI and electronic warfare experts.
b. Fast track promotion channels for officers contributing to innovation or strategic technological initiatives.
c. Post retirement employment pathways, coordinated with state owned enterprises such as Sri Lanka Ports Authority, Telecommunications Regulatory Commission or Lanka Logistics for technical appointments.
d. A model for this can be drawn from the Singapore Armed Forces Talent Retention Scheme (Singapore Armed Forces, 2022), which ties long term educational support and external employment guarantees to continued service in critical technology roles.

Fostering Inclusive and Agile Organizational Culture. The Navy's culture must evolve from rigid hierarchy to mission oriented flexibility. This means recognizing technical excellence equally with command competence, especially during appraisals and promotions. Institutionalizing recognition mechanisms, such as 'Innovation of the Quarter' awards or inclusion of technical publications in performance evaluations can signal this shift.

More inclusive gender policies are also essential. Women officers should be actively deployed in cyber and intelligence units and given opportunities to attend international technology defense courses. Expanding this inclusion enhances both the Navy's image and talent base.

Finally, to remain agile, the Navy should establish a Naval Futures and Innovation Cell, staffed by young officers, civilian scientists and industry partners. This team would identify global tech trends, evaluate their defense implications and serve as a bridge between operational units and policy makers.

CONCLUSION.

Sri Lanka Navy must evolve not only in its technology and fleet but also in how it manages and develops its personnel. With multiple generations serving together and rapid technological changes transforming naval operations, effective retention and recruitment hinge on institutional adaptability. This essay highlighted that while older generations offer experience and discipline, younger ones bring tech savviness and innovation differences that, if unmanaged, can lead to friction and attrition. The growing demand for advanced tech skills further underscores the need for updated training, flexible career paths and supportive policies. Drawing on global best practices and local context SLN must become a modern, inclusive employer that values innovation and invests in its people to remain effective and future ready.

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A Publication of the Sri Lanka Navy

ISSN 2448-9409