A Comprehensive Classification System of Non-traditional Maritime Security Threats: a step towards Enhancing Maritime Security

Shivam Kumar Pandey

Research Scholar, Rashtriya Raksha University
(An Institute of National Importance, Ministry of Home Affairs govt India)

Abstract- The maritime sector, which serves as a crucial channel for worldwide commerce and economic operations, is confronted with growing non-conventional security challenges that surpass conventional naval disputes centered on nation-states. The threats encompass a range of issues, such as maritime crime, environmental concerns, technological and cyber-related risks, and socio-economic and political challenges. This study aims to clarify the need for a thorough categorization of non-conventional navigational hazards and the potential benefits of implementing such a classification framework in enhancing maritime security tactics and countermeasures.

The primary objective of this study is to conduct a comprehensive assessment of non-conventional maritime threats, focusing on their effects on maritime security, economic operations, and marine ecosystems. The study aims to provide a detailed overview of these threats' current state and severity. Moreover, the study examines the diverse entities implicated in these menaces, their incentives, proficiencies, and methodologies. The efficacy of existing detection and response mechanisms vis-à-vis non-conventional threats is evaluated to pinpoint deficiencies in existing maritime security protocols. Drawing upon the analysis, the present study endeavours to develop an all-encompassing system of threat classification that effectively captures these threats' multifaceted and intricate nature.

The proposed classification system is intended to function as a mechanism for enhancing resource allocation, facilitating informed policymaking and optimizing operational response. The study will ultimately propose suggestions on how this categorization framework can enhance policies and strategies related to maritime security and efforts towards international collaboration. Consequently, lead to a more stable and enduring maritime environment.

The present research constitutes a novel methodology for comprehending and handling the intricacies of non-conventional maritime hazards, underscoring the necessity of a flexible and refined outlook in maritime safety discussions.

I. OVERVIEW OF NON-TRADITIONAL MARITIME SECURITY THREATS

Non-conventional maritime security threats are challenges beyond traditional naval warfare or state conflicts. These initiatives encompass a variety of domains and undertakings, frequently featuring participation from non-state entities, and have gained significance in tandem with the rise of globalization, technological progress, and shifts in the natural environment. The emergence of diverse actors implicated in these threats has resulted in a blurring of the distinction between conventional and unconventional threats, necessitating reassessment.

Here is an overview of these **categories** of threats:

1. Maritime Crime and Illicit Activities:
   - Piracy and Armed Robbery: These crimes typically take place in areas like the Gulf of Aden, the Gulf of Guinea, and the waterways around Somalia and Southeast Asia and entail the hijacking of ships, the theft of cargo, and occasionally the kidnapping of crew members for ransom.
   - Drug Trafficking and Smuggling of Goods: Smuggling of illegal drugs, firearms, contraband, and other items can occur in the water because of ample and unrestricted space.
   - Illegal, Unreported and Unregulated (IUU) Fishing: IUU fishing harms marine habitats, depletes fish stocks, and threatens the livelihoods of legal fishermen.
   - Human Trafficking and Migrant Smuggling: The maritime realm is frequently utilized to transport individuals through human trafficking and unauthorized immigration, resulting in humanitarian issues.
2. Marine Environmental Threats:

- Marine Pollution: Marine pollution encompasses various forms of environmental degradation, such as oil spills, the release of plastics and other waste materials, and noise pollution. These anthropogenic activities have the potential to inflict considerable damage on marine ecosystems.
- Climate Change Impacts: The escalation of sea levels, oceanic warming, and acidification poses a significant threat to coastal communities and marine ecosystems and potentially exacerbates other security concerns.
- Biodiversity loss: The degradation of marine ecosystems and the decline of species are being caused by overfishing, habitat destruction, and pollution.

3. Technological and Cyber Threats:

- Cyber Threats: The growing dependence on digital systems in maritime operations has led to cyber threats that pose considerable risks to navigation safety, port operations, maritime infrastructure, and sensitive data.
- Unmanned and autonomous vessels: Whilst these vessels have many lawful applications, they can also be employed for unlawful purposes such as contraband transportation or covert observation.

4. Socio-economic and Political Threats:

- Territorial Disputes: Maritime boundary and resource disputes can potentially cause tensions or even conflict, especially in areas such as the South China Sea.
- Geopolitical Risks: The factors mentioned earlier encompass strategic rivalry in vital maritime routes, alterations in the distribution of naval capabilities, and the precarious political situation of littoral nations.

An integrated and adaptive approach to maritime security must address the various categories of non-traditional threats, each demanding distinct detection, prevention, and response strategies.

II. RESEARCH METHODOLOGY

The paper titled "Maritime Security Threats: A Risk Assessment Methodology," (Khalid Bachkar and Khalid Benali) presented a risk assessment methodology for maritime security threats, including piracy, terrorism, and smuggling. The methodology combines quantitative and qualitative analysis to identify the most significant threats and prioritize risk mitigation measures.

Literature review

Several initiatives have been taken to prevent maritime vectored terrorism. However, implementing these programs without proper analysis could harm competitiveness. According to Barnes et al. (2005), the interaction between ports, maritime operations, and supply chains creates vulnerabilities that require extensive analysis beyond the structured requirements of these initiatives, posing significant management challenges. Carapezza et al. (2008) propose a distributed sensor network for a coastal maritime security system, while Wei et al. (2009) present an innovative Automated Intelligent Video Surveillance System for Ships (AIVS3) as a vision-based solution for ship security. The system uses a classification algorithm based on the confusion matrix (CM) of the imaging sensors belonging to the system, as

explained by Giompapa et al. (2009). Bateman (2011) assesses the potential success of addressing these challenges through regional forums, while Honna (2013) discusses practical ASEAN-Japan cooperation in combating them. Chauvin et al. (2013) introduce a modified version of the Human Factors Analysis and Classification System, adapted to the maritime context, to analyze human and organizational factors in collisions reported by the Marine Accident and Investigation Branch (UK) and the Transportation Safety Board (Canada).

Furthermore, Chen et al. (2014) investigate knowledge discovery using a genetic algorithm for maritime situational awareness, proposing a knowledge discovery system called GeMASS. Finally, Aldowesh et al. (2019) conducted an experimental investigation to analyze different micro-Doppler signatures of various consumer drones in different frequency bands to distinguish them from other flying targets with similar characteristics. Other influential work includes that of Komorčec et al. (2016).

Research gap

After reviewing the provided references, it is evident that there is a research gap in the specific classification of non-traditional maritime security threats. While the references highlight various non-traditional threats, such as illegal fishing, piracy, drug trafficking, terrorism, human smuggling, navigation threats, asylum seekers, sea boundary problems, climate change, natural disasters, and environmental pollution, a clear and comprehensive classification system for these threats is lacking. Moreover, there is insufficient research on prioritizing these threats and developing effective strategies to tackle them. Hence, more research is required to develop a comprehensive classification system for non-traditional maritime security threats and prioritize them based on their potential impact and likelihood of occurrence.

Research Objective

This research aims to evaluate the importance and consequences of categorizing non-traditional maritime threats. Our team aims to create a versatile and comprehensive threat classification system that can improve maritime security strategies and responses.

Here are the sub-objectives we will focus on:

1. Understanding the Current Landscape of Maritime Threats: This involves identifying and categorizing non-traditional maritime threats, such as maritime crime, environmental threats, technological threats, and socio-economic and political threats.
2. Assessing the Impact and Severity of Different Threats: This objective evaluates the potential impact, prevalence, and severity of various threats on maritime security, economic activities, and marine ecosystems.
3. Analyzing the Role of Different Actors: We will examine the roles of different actors, such as state, non-state, and individual entities, involved in these threats. We will also study their motivations, capabilities, and modus operandi.
4. Evaluating Current Detection and Response Mechanisms: This objective aims to assess the effectiveness of existing strategies, protocols, and technologies in detecting and responding to non-traditional maritime threats.

5. Developing an Integrated Threat Classification System: Based on the understanding of the threats, their impact, and the actors involved, we will create a comprehensive and nuanced classification system that can help in better resource allocation, policy making, and operational response.

6. Improving Maritime Security Policies and Strategies: Our team will recommend ways the developed classification system can enhance maritime security policies, strategies, and international cooperation efforts.

Our research aims to contribute to a more practical approach to managing non-traditional maritime threats, thereby enhancing maritime security and sustainability.

Research Questions::

1. Understanding the Current Landscape of Maritime Threats: What are the different types of non-traditional maritime threats currently prevalent in international waters?

2. Assessing the Impact and Severity of Different Threats: How do non-traditional maritime threats impact maritime security, economic activities, and marine ecosystems, and how can we assess their severity?

3. Analyzing the Role of Different Actors: Who are the main actors involved in non-traditional maritime threats, and how do their motivations, capabilities, and modes of operation differ?

4. Evaluating Current Detection and Response Mechanisms: How effective are current strategies, protocols, and technologies in detecting and responding to different types of non-traditional maritime threats?

5. Developing an Integrated Threat Classification System: What key elements must be considered when developing a comprehensive classification system for non-traditional maritime threats?

6. Improving Maritime Security Policies and Strategies: How can the developed classification system improve maritime security policies, strategies, and international cooperation efforts?

These questions are designed to guide the research and help gain a deeper understanding of non-traditional maritime threats, their impact, and how best to address them.

Research hypotheses:

1. Understanding the Current Landscape of Maritime Threats: A diverse range of non-traditional maritime threats are currently impacting global maritime security.

2. Assessing the Impact and Severity of Different Threats: Non-traditional maritime threats significantly impact maritime security, economic activities, and marine ecosystems, varying severity across different threats.

3. Analyzing the Role of Different Actors: The motivations, capabilities, and modes of operation of the actors involved in non-traditional maritime threats are significantly influenced by the nature of the threat itself.

4. Evaluating Current Detection and Response Mechanisms: Current strategies, protocols, and technologies have gaps in their ability to effectively detect and respond to the diverse range of non-traditional maritime threats.

5. Developing an Integrated Threat Classification System: A comprehensive classification system can enhance our understanding of non-traditional maritime threats and improve response strategies.

6. Improving Maritime Security Policies and Strategies: Implementing a comprehensive threat classification system can significantly enhance maritime security policies, strategies, and international cooperation efforts.

These hypotheses aim to anticipate the research results based on the proposed objectives and questions. However, they are testable propositions and may be confirmed or refuted by the research findings.

Need for a Comprehensive and Standardized Classification System

A standardised classification system is essential to address non-traditional maritime security threats effectively. Such a system would enable efficient allocation of resources, prioritization of challenges and development of appropriate strategies to counter these threats. Implementing this system would be of great benefit to countries and organizations alike. Therefore, a comprehensive and standardized classification system is necessary to identify and respond to various non-traditional maritime security threats.

Having a consistent classification system in place is crucial for ensuring maritime security. This system enables effective communication among various stakeholders involved in maritime security, such as policymakers, law enforcement agencies, and international organizations. A standardized system is significant for addressing transnational maritime security challenges that require coordinated action. It helps authorities focus their efforts, implement appropriate enforcement measures, and monitor compliance more efficiently. Furthermore, a standardized classification system facilitates the collection and analysis of data on non-traditional maritime security threats. This results in a better understanding of current and emerging threats, identifying patterns and trends, and supporting evidence-based decision-making. A comprehensive and standardized classification system is essential for developing effective strategies to address the diverse and complex challenges that threaten the safety and security of maritime areas.

Developing a Comprehensive Classification System

Developing a standardised classification system is crucial for enhancing knowledge sharing and collaboration among various stakeholders engaged in maritime security. Such a system would lead to better allocation of resources, facilitate efficient communication, and serve as a foundation for data collection and analysis. With the increasing complexity of non-traditional maritime security threats, a widely accepted and applicable system is essential for a coordinated and effective response. However, developing such a system is challenging due to the contested nature of maritime security and the diverse actors involved, ranging from legal experts to naval officers and resource-user groups. Building upon previous efforts and leveraging existing frameworks is necessary to create a comprehensive classification system for non-traditional threats. This system would ensure that stakeholders comprehend and respond to current and emerging threats, such as piracy, terrorism, illegal logging, and fishing. Additionally, it would provide a basis for developing proactive measures to prevent future threats, ensuring that no threat is overlooked or underestimated.

Standardizing Maritime Security Threat Classifications

Establishing a unified classification system is crucial to effectively tackle the different types of non-traditional risks in maritime security. This will enable stakeholders to respond efficiently to existing and potential threats, advocating for the sustainable use of ocean resources and enhancing global maritime security. Developing a comprehensive classification system would involve participating and cooperating with various parties, such as legal specialists, naval officers, resource-user groups, and policymakers.

Addressing Challenges in Identifying Non-traditional Threats

Creating a comprehensive classification system to address non-traditional maritime security threats poses several challenges. One major hurdle is striking a balance between a comprehensive system encompassing all potential threats and a more specific system prioritising high-risk areas and threats.

Due to the constantly evolving nature of non-traditional threats, the classification system must be continuously monitored and updated. For example, piracy and illegal immigration are more prevalent in certain regions, such as Indonesian waters, as discussed by Al Syahrin in his article on Pikoli in 2021. Therefore, developing region-specific classifications to tailor responses to unique challenges is crucial. It is equally vital that any classification system for non-traditional maritime security threats is globally inclusive, reflecting the need for cooperation and collaboration among stakeholders from different regions instead of being dominated by any single state or region. The challenge lies in balancing inclusivity and practicality while recognizing the diverse nature of threats in different regions.
In conclusion, developing a standardized classification system for non-traditional maritime security threats is essential for promoting the sustainable use of ocean resources and enhancing global maritime security. However, this task poses various challenges, including balancing inclusivity and practicality, monitoring and updating the classification system to reflect evolving threats, developing region-specific classifications, and ensuring a global perspective reflecting threats' diverse natures in different regions. Additionally, maritime security threats are complex, requiring expertise from various actors, including legal experts, naval officers, international organizations, and academics. Therefore, a collaborative effort from all stakeholders is necessary to ensure the development and implementation of an effective classification system for non-traditional maritime security threats.

International Cooperation in Maritime Security

In order to effectively address non-traditional maritime security threats, it is imperative to establish a comprehensive classification system that operates with international cooperation. Such challenges often cross national boundaries, posing difficulties for individual states or regions to ensure sufficient maritime security. Experts, such as legal specialists, naval officers, international organizations, and academics, must navigate the complexity of these security threats. A well-structured classification system involving various stakeholders would enable cross-border cooperation and collaboration, ultimately enhancing the security of maritime activities.

Enhancing Maritime Domain Awareness is essential for an ever-evolving classification system

In order to effectively combat non-traditional threats to maritime security, it is crucial to enhance Maritime Domain Awareness. This refers to the ability to monitor, track, and understand activities in the maritime domain, including illicit activities, environmental concerns, and natural hazards. To improve this awareness, it is necessary to integrate various platforms and information sources, such as satellite imagery, radar, automatic identification systems, and weather data. Collaboration with law enforcement agencies and reporting systems would also help identify and track illegal activities.

It is crucial to regularly develop and update the classification system to reflect evolving threats and changing regional dynamics. This ongoing process would ensure the system remains relevant in addressing emerging non-traditional maritime security threats. The classification system should also provide a framework for defining and categorizing new threats, such as cyber threats or the proliferation of unmanned aerial systems in the maritime domain. Moreover, a comprehensive and standardized classification system should be developed to ensure consistency in identifying and categorizing non-traditional maritime security threats across different regions, allowing for effective coordination and cooperation among different actors.

Implementing Best Practices for Mitigating Security Threats

It is crucial to collaborate with specialists from various regions and incorporate their expertise and insights into the system. The categorization system must also be created to recognize similarities and dissimilarities in non-traditional maritime security risks throughout different areas. To effectively address security threats, it is necessary to establish a comprehensive and standardized classification system for non-traditional maritime security threats and implement the best practices for risk mitigation.

Case Studies: Lessons Learned from Non-traditional Threats

Building upon previous efforts and using existing frameworks to create a thorough classification system for non-traditional maritime security threats is vital. The complexities of maritime threats require the involvement of various professionals from different backgrounds. However, developing a standardized system widely accepted across different regions, contexts, and stakeholders poses challenges. Despite these challenges, establishing a comprehensive system is crucial for enhancing maritime safety and security. With this system, stakeholders can effectively comprehend and respond to current and emerging non-traditional threats like piracy, terrorism, illegal logging, and fishing.

Measuring the Effectiveness of Maritime Security Strategies

After implementing the classification system, it will be possible to take proactive measures to prevent future threats and evaluate the effectiveness of existing maritime security strategies in addressing identified threats. Developing this comprehensive system requires international cooperation since maritime insecurity transcends national borders. Implementing best practices for mitigating security threats, incorporating

technological solutions, and improving maritime domain awareness are crucial components of an effective system.
Suggestive/proposed classification system

One possible approach to designing a classification system for these threats is to consider various factors such as the nature of the threat, the individuals or groups responsible, their geographical location, and the potential level of harm they could cause.

Type 1
Simple, **non-exhaustive classification** system:

1. Illegal Activities:

Piracy: Unlawful acts of violence or detention committed for private ends in maritime areas.

- Terrorism: Acts of violence intended to cause fear, often in pursuit of political goals, such as bombing ships or ports.

Drug Trafficking: The smuggling of illicit substances across maritime borders.

- Human Trafficking: Using maritime routes to illegally transport individuals from one region to another.

- Illegal, Unreported and Unregulated (IUU) Fishing: Fishing activities that violate national and international fishing laws or occur outside regulated areas.

- Smuggling of Goods: Illegal transport of goods or commodities across maritime borders to evade taxes or legal restrictions.

2. Environmental Threats:

- Marine Pollution: The release of harmful substances or waste materials into the sea that cause damage to marine ecosystems. This includes oil spills, plastic waste, and chemical pollutants.

Climate Change Impacts: Changes in sea levels, ocean temperatures, or ocean acidification affect marine life, coastal communities, and maritime operations.

- Loss of biodiversity: The decline in marine species and habitats due to human activities such as overfishing, habitat destruction, and pollution.

Invasive species: Non-native species transported through ballast water or on the hulls of ships that harm local ecosystems.

3. Technological threats:

- Cyber Threats: Hacking attacks on maritime information systems, navigation systems, or port infrastructure.

Autonomous Vessels Misuse: The illicit use of unmanned maritime vehicles for smuggling, surveillance, or other illegal activities.

Type 2

For a more **diverse classification system**, we can add layers of complexity to the categories based on dimensions such as the **scope, actors involved, impact level, geographical areas, and mode of operation**. Here is an expanded framework:

1. Threat Type: As outlined in the previous response, we can classify threats according to their nature, such as illegal activities, environmental threats, and technological threats.

2. Actors Involved:

- State actors: Threats posed by nation-states, such as territorial disputes, aggressive naval maneuvers, and state-sponsored piracy or terrorism.

- Non-state Actors: Threats from organized crime syndicates, terrorist organizations, pirates, and illegal fishing operators.

- Individual actors: Threats from individuals, such as lone wolf terrorists or individual hackers.

3. Geographic Scope:

- Global: Threats that have a global impact, such as climate change or cyber threats targeting international shipping routes.

- Regional: Threats specific to a particular region, like piracy in the Gulf of Aden or territorial disputes in the South China Sea.

- Local: Threats affecting a specific local area, such as local illegal fishing or pollution in a specific port.

4. Impact Level:

- High Impact: Threats with potentially severe consequences, such as a large-scale terrorist attack, a major oil spill, or a significant cyberattack on critical maritime infrastructure.

- Medium Impact: Threats with significant, but not catastrophic, consequences, like a moderate-sized oil spill or localized pirate attacks.

- Low Impact: Threats with relatively minor immediate consequences but potentially severe long-term effects, like illegal fishing or the gradual introduction of invasive species.

5. Mode of operation:

- Physical: Threats that involve physical harm or damage, like piracy, terrorism, or environmental pollution.

- Cyber: Threats that involve digital attacks on systems and infrastructure, such as hacking of port systems or navigation systems.

Hybrid: Threats that involve a combination of physical and cyber elements. For example, a cyber-attack leads to a physical

consequence, like hacking into a ship's navigation system to cause a collision.

Type 3

The diverse nature of non-traditional maritime threats allows for their classification into multiple categories, aiding our comprehension of their complexities. However, it is crucial to acknowledge that this classification is not comprehensive, as these categories frequently overlap and interact in complex ways. Furthermore, the significance and relevance of specific threat types can vary significantly depending on the maritime context and region under consideration.

Here is an expanded version of the classification system:

1. Maritime Crime and Illicit Activities:

   Piracy and Armed Robbery: Maritime piracy and armed robbery against ships.

   Maritime Terrorism: Acts of violence or sabotage against ships, people, ports, or offshore facilities.

   Illegal, Unreported, and Unregulated (IUU) Fishing: Fishing activities violating international conservation and management measures.

   -Smuggling of Goods: Drug trafficking, weapons smuggling, and illicit wildlife trade.

   Human Trafficking and Migrant Smuggling: Using maritime routes to illegally transport individuals from one region to another.

   Maritime Fraud: Cases of deceit or trickery in maritime trade and business practises.

2. Marine Environmental Threats:

   Marine Pollution: Release harmful substances or waste into the sea, causing damage to marine ecosystems, including oil spills, plastic waste, and chemical pollutants.

   Climate Change Impacts: Effects of climate change on maritime security, such as rising sea levels and increasing severity of storms.

   Invasive aquatic species: Non-native species that can harm local ecosystems when transported through ballast water or on the hulls of ships.

3. Technological and Cyber Threats:

   Cyber Attacks: Attacks against digital systems of ships, ports, or maritime institutions that can disrupt operations.

   Unmanned Technologies: The misuse of unmanned maritime vehicles (UMVs) and autonomous maritime systems for illicit activities.

   Disruptive Technologies: The misuse of emerging technologies (e.g. 3D printing, AI) for illicit maritime activities or threats.

4. Socio-economic and Political Threats:

   Border and Territorial Disputes: Disputes over maritime boundaries can lead to security incidents.

   Illegal Maritime Migration: Unregulated movements of large groups of people by sea, often in unsafe conditions.

   Resource Conflicts: Conflicts over marine resources, such as fish stocks and undersea minerals.

   Geopolitical Risks: Broader geopolitical tensions that can impact maritime security, such as power competition in critical sea lanes or disputed waters.

III.   CONCLUSION

Within the maritime domain, non-traditional security threats can emerge from various sectors, including military, environmental, economic, societal, and political. Collaborative efforts across these sectors can classify these threats, enabling policymakers to develop targeted policies and strategies to tackle them effectively. Strategies and tools for detection, prevention, and response must differ for each threat. Therefore, a practical maritime security framework must be comprehensive and adaptable to handle various challenges. For instance, security threats may require increased naval patrols or armed guards on ships, while economic threats may necessitate better regulation and enforcement of fisheries management. Stricter regulations and enforcement of environmental laws may be required for environmental threats, and improved cybersecurity measures for ships and ports may be necessary for technological threats.

The research aim of classifying non-traditional maritime security threats is to create a comprehensive and standardized classification system, per the references provided. Non-traditional threats to maritime security are plentiful and include illegal fishing, piracy, drug trafficking, terrorism, human smuggling, navigation threats, asylum seekers, sea boundary problems, climate change, natural disasters, and environmental pollution; however, there is no clear and comprehensive classification system for these threats. Therefore, the objective is to develop a classification system to categorize better and prioritize these threats to understand and address them. The objective is to provide a framework that can be used by policymakers, researchers, and practitioners to identify and respond to non-traditional maritime security threats effectively.

Suggestion:
Classification of the maritime security threat definitions depends on importance levels.
Classification of the Maritime Security Threat Definitions Depending on İmportance Levels
1st Grade

Maritime interstate disputes
Energy, food and resource security Maritime terrorism
Cyber security and secure information systems 2nd Grade
Security against biological and chemical threats
Illegal human trafficking Smuggling weapons and narcotics
Piracy 3rd Grade

Illegal fishing
Armed robbery at sea Effects of climate change on maritime
security   Deliberately and illegally harming the marine
environment

Depending on the above gradation, the figure can be drawn as:
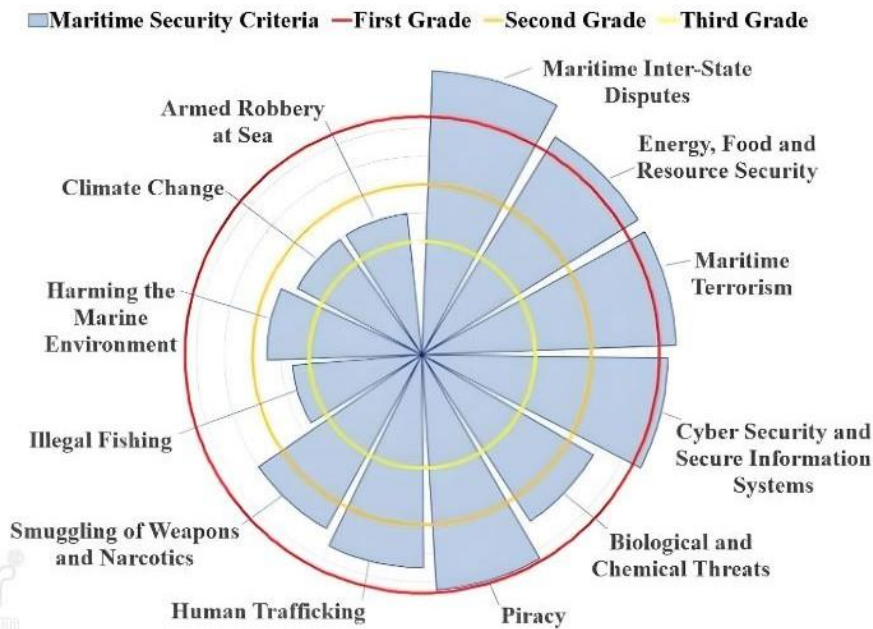

Fig 1.

REFERENCES

[1]   [1] Paul H. Barnes; Richard Oloruntoba; "Assurance of Security in Maritime Supply Chains: Conceptual Issues of Vulnerability and Crisis Management", JOURNAL OF INTERNATIONAL MANAGEMENT, 2005. (IF: 4)

[2]   [2] Edward M. Carapezza; Jerry Butman; Ivar Babb; Ann Bucklin; "Sustainable Coastal Sensor Networks: Technologies and Challenges", 2008.

[3]   [3] Hai Wei; Hieu Nguyen; Prakash Ramu; Chaitanya Raju; Xiaoqing Liu; Jacob Yadegar; "Automated Intelligent Video Surveillance System for Ships", 2009. (IF: 3)

[4]   [4] S. Giompapa; F. Gini; A. Farina; A. Graziano; R. Croci; R. Distefano; "Maritime Border Control Multisensor System", IEEE AEROSPACE AND ELECTRONIC SYSTEMS MAGAZINE, 2009. (IF: 3)

[5]   [5] Sam Bateman; "Solving The "Wicked Problems" of Maritime Security: Are Regional Forums Up to The Task?", CONTEMPORARY SOUTHEAST ASIA: A JOURNAL OF INTERNATIONAL AND ..., 2011. (IF: 3)

[6]   [6] Jun Honna; "ASEAN-Japan Cooperation on Maritime Non-traditional Security Issues: Toward A New Paradigm", 2013.

[7]   [7] Christine Chauvin; Salim Lardjane; Gaël Morel; Jean-Pierre Clostermann; Benoît Langard; "Human And Organisational Factors In Maritime Accidents: Analysis Of Collisions At Sea Using The HFACS", ACCIDENT; ANALYSIS AND PREVENTION, 2013. (IF: 6)

[8]   [8] Chun-Hsien Chen; Li Pheng Khoo; Yih Tng Chong; Xiao-Feng Yin; "Knowledge Discovery Using Genetic Algorithm for Maritime Situational Awareness", EXPERT SYST. APPL., 2014. (IF: 3)

[9]   [9] Domagoj Komorčec; Dario Matika; "Small Crafts Role in Maritime Traffic and Detection By Technology Integration", POMORSTVO: SCIENTIFIC JOURNAL OF MARITIME RESEARCH, 2016.

[10] [10] Abdulrazaq Aldowesh; Thamer BinKhamis; Tareq Alnuaim; Adel Alzogaiby; "Low Power Digital Array Radar for Drone Detection and Micro-

Doppler Classification", 2019 SIGNAL PROCESSING SYMPOSIUM (SPSYMPO), 2019. (IF: 3)

[11] [11] Lindley (2020). Criminal Threats Undermining Indo-Pacific Maritime Security: Can International Law Build Resilience? Journal of Asian Economic Integration, 2(2), 206-220. https://doi.org/10.1177/2631684620940477

[12] [12] Ryan (2019). The disciplined sea: a history of maritime security and zonation. International Affairs, 5(95), 1055-1073. https://doi.org/10.1093/ia/iiz098

[13] [13] Zafar (2022). Russia's permanent military presence in the Syrian Tartus port for the coming 49 years: Increasing maritime security challenges in the region. PJMR, 1(4), 1. https://doi.org/10.53963/pjmr.2022.006.4

[14] [14] suseto, Othman, Razalli (2019). Assessing the Evolution of Maritime Strategy in the Asia Pacific. JSP, 2(23), 87. https://doi.org/10.22146/jsp.41709

[15] [15] Premarathna (2021). Maritime Security Challenges in the Indian Ocean: Special Reference to Sri Lanka. IJRISS, 01(05), 158-173. https://doi.org/10.47772/ijriss.2021.5107

[16] [16] Suseto (2021). Indonesian Maritime Threats: A Preliminary Study. SINERGI, 1(1). https://doi.org/10.17576/sinergi.0101.2021.05

[17] [17] Fathun (2019). ASEAN Contemporary Security: Maritime Diplomacy in Handling of Maritime Security Threats in Malaka Strait. ins, 1(6), 50. https://doi.org/10.20884/1.ins.2019.6.1.1414

[18] [18] Chapsos, Ahmad (2017). Maritime security in Indonesia: Towards a comprehensive agenda? Marine Policy, (76), 178-184. https://doi.org/10.1016/j.marpol.2016.11.033

[19] [19] Trisni, Permata, Nanda, Miko (2019). THE POTENTIAL SOURCE OF CONFLICT IN ASEAN SEAWATER., 157-165. https://doi.org/10.1515/9783110678666-021

[20] [20] Parnini, Othman, Ghazali (2013). The Rohingya Refugee Crisis and Bangladesh-Myanmar Relations. Asian and Pacific Migration Journal, 1(22), 133-146. https://doi.org/10.1177/011719681302200107

[21] [21] Ryan (2019). The disciplined sea: a history of maritime security and zonation. International Affairs, 5(95), 1055-1073. https://doi.org/10.1093/ia/iiz098

[22] [22] Chapsos, Ahmad (2017). Maritime security in Indonesia: Towards a comprehensive agenda? Marine Policy, (76), 178-184. https://doi.org/10.1016/j.marpol.2016.11.033

[23] [23] Lindley (2020). Criminal Threats Undermining Indo-Pacific Maritime Security: Can International Law Build Resilience? Journal of Asian Economic Integration, 2(2), 206-220. https://doi.org/10.1177/2631684620940477

[24] [24] Fathun (2019). ASEAN Contemporary Security: Maritime diplomacy in Handling of Maritime Security Threats in the Malaka Strait. ins, 1(6), 50. https://doi.org/10.20884/1.ins.2019.6.1.1414

[25] [25] Zafar (2022). Russia's permanent military presence in the Syrian Tartus port for the coming 49 years: Increasing maritime security challenges in the region. PJMR, 1(4), 1. https://doi.org/10.53963/pjmr.2022.006.4

[26] [26] Suseto (2021). Indonesian Maritime Threats: A Preliminary Study. SINERGI, 1(1). https://doi.org/10.17576/sinergi.0101.2021.05

[27] [27] Premarathna (2021). Maritime Security Challenges in the Indian Ocean: Special Reference to Sri Lanka. IJRISS, 01(05), 158-173. https://doi.org/10.47772/ijriss.2021.5107

[28] [28] suseto, Othman, Razalli (2019). Assessing the Evolution of Maritime Strategy in the Asia Pacific. JSP, 2(23), 87. https://doi.org/10.22146/jsp.41709

[29] [29] Khan (2022). NON-TRADITIONAL SECURITY THREATS IN MARITIME ZONES OF PAKISTAN AND LAW ENFORCEMENT BY PMSA: AN OVERVIEW. PJMR, 1(4), 1. https://doi.org/10.53963/pjmr.2022.005.4

[30] [30] Parnini, Othman, Ghazali (2013). The Rohingya Refugee Crisis and Bangladesh-Myanmar Relations. Asian and Pacific Migration Journal, 1(22), 133-146. https://doi.org/10.1177/011719681302200107

AUTHORS

First Author – SHIVAM KUMAR PANDEY, RESEARCH SCHOLAR, RASHTRIYA RAKSHA UNIVERSITY
(An Institute of National Importance, Ministry of Home Affairs govt India)