



The Second Symposium:
**ADDRESSING CLIMATE-CHANGE-INDUCED THREATS TO
NATIONAL SECURITY**

(INCLUDING MARITIME CRIME, TERRORISM, AND STATE-ON-STATE CONFLICT)

*Jointly organised by
The National Maritime Foundation (NMF), New Delhi, India
and
Konrad-Adenauer-Stiftung (KAS), New Delhi, India*



National Maritime Foundation, NOM
Varuna Complex, Airport Road, NH-8,
New Delhi 110010 (India)



Date: 18 Aug 2023
Time: 0900 - 1845 (IST)

OUTCOME REPORT OF

**THE SECOND NMF-KAS SYMPOSIUM ON
“ADDRESSING CLIMATE-CHANGE-INDUCED
THREATS TO NATIONAL SECURITY (INCLUDING
MARITIME CRIME, TERRORISM, AND STATE-ON-
STATE CONFLICT)”**

18 August 2023

National Maritime Foundation, New Delhi

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PROGRAMME
18 August 2023

Time (IST)	Topic	Speaker/Presenter
0900-0930 (30 Min)	Registration and Login	
OPENING SESSION 0930-0945 (15 min)		
0930-0935 (05 min)	Introduction to the Programme	Ms Divya Rai Programme Executive, NMF
0935-0945 (10 min)	Welcome Remarks	Commodore Debesh Lahiri, IN Executive Director, NMF

PROFESSIONAL SESSION I 0945-1105 h (1h 20 min)		
0945-0955 (10 min)	Sessional Overview by Moderator	Mr Rajani Ranjan Rashmi, IAS (Retd) Distinguished Fellow The Energy Research Institute of India (TERI)
0955-1015 (20 min)	“Securitization of Climate Change” or “Climatization of Security”: Contemporary Contours of the Debate	Vice Admiral Pradeep Chauhan, AVSM & Bar, VSM Director-General, NMF
1015-1035 (20 min)	Maritime Impacts of Climate Change: Causal Relationships	Dr Chime Youdon Research Fellow Head, Blue Economy and Climate Change (BECC) Cluster, NMF
1035-1105 (30 min)	Moderator’s Remarks and Audience Interaction	

1105-1135 (30 Min)	TEA BREAK	
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PROFESSIONAL SESSION II 1135- 1315 h (1h 40 min)		
1135-1145 (10 min)	Sessional Overview by Moderator	Admiral Sunil Lanba, PVSM, AVSM <i>Former Chief of the Naval Staff</i> <i>Former Chairman, NMF</i>

1145-1205 (20 min)	Inundation Resulting from Sea Level Rise: Adaptation Options for Critical National Coastal Infrastructure	Dr Sisir Kumar Dash Scientist 'F' Ministry of Earth Sciences, Government of India
1205-1225 (20 min)	Salinization Resulting from Sea Level Rise: National and Regional Effects and Impacts	Dr Mona Chhabra Anand Technical Lead - Resilient Recovery Asian Disaster Preparedness Center (ADPC)
1225-1245 (20 min)	Coastal Inundation and Salinization Implications upon Coastlines, Baselines, and Maritime Zones	Mr John J Vachaparambil Associate Fellow Public International Maritime Law (PIML) Cluster NMF
1245-1315 (30 min)	Moderator's Remarks and Audience Interaction	

1315-1415 (60 Min)	LUNCH BREAK
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COMMEMORATIVE SESSION 1415-1445 (30 min)		
1415-1425 (10 min)	Commemorative Address	Admiral Karambir Singh, PVSM, AVSM Chairman NMF <i>Former Chief of the Naval Staff</i>
1425-1445 (20 min)	Keynote Address: <i>KAS in the 'Maritime India' Story</i>	Mr Jürgen Hardt Foreign Policy Spokesperson, CDU/CSU Member of the European Parliament, Germany

PROFESSIONAL SESSION III 1445-1625 h (1h 40 min)		
1445-1455 (10 Min)	Sessional Overview by Moderator	Commodore Debesh Lahiri, IN Executive Director, NMF
1455-1515 (20 min)	Human Migration Resulting from Coastal Inundation and Salinization: Likely Scenarios	Dr Anasua Basu Ray Chaudhury Senior Fellow, ORF
1515-1535 (20 min)	Extreme Weather Events: Ground-truthing of Data	Commodore Abhinav Barve Commodore (Naval Oceanography & Meteorology), IHQ MoD (Navy)
1535-1555 (20 min)	Climate Change as an Accelerator of Maritime Crime	Commandant Ravindra K Shrivastava, ICG

		Research Fellow, NMF
1555-1625 (30 min)	Moderator's Remarks and Audience Interaction	

1625-1655 (30 min)	Tea Break	
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PROFESSIONAL SESSION IV 1655-1835 h (1h 40 min)		
1655-1705 (10 Min)	Sessional Overview by Moderator	Mr Franz Xaver Mauerer Senior Foreign Policy Advisor CDU/CSU German Bundestag
1705-1725 (20 min)	CDRI and the IRIS Programme	Ms Riya Rahiman IRIS Programme Lead Coalition for Disaster Resilient Infrastructure (CDRI)
1725-1745 (20 min)	Operational and Material Stretch for Maritime Forces resulting from Coastal Inundation and Salinization	Commodore Sundeep S Randhawa Directorate of Naval Operations (DNO), Indian Navy
1745-1805 (20 min)	Financing Climate Resilient Maritime Infrastructure	Cdr (Dr) Kapil Narula Senior Analyst Breakthrough Agenda UN High Level Climate Champions Team
1805-1835 (30 min)	Moderator's Remarks and Audience Interaction	

CLOSING SESSION 1835 – 1855 h (20min)		
1835-1845 (10 min)	Summative Guidance	Ms Alicia Pommer Programme Officer Konrad Adenauer Stiftung (KAS)
1845-1855 (10 min)	Summative Guidance	Admiral Karambir Singh, PVSM, AVSM Chairman NMF <i>Former Chief of the Naval Staff</i>

(1915-2045)	DINNER RECEPTION (Blue Room, NOM 'Varuna')	
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CONCEPT NOTE

In recent decades, climate change has evolved from a distant problem for future generations into a major, imminent, multifaceted threat for nations across the world. Climate-change-induced food and water shortages, combined with sea-level rise and extreme weather shocks, are powerful destabilising forces, not only within the borders of a given State but across international borders as well. The increasing frequency and intensity of extreme weather events driven by climate change, including heatwaves, floods, droughts, and tropical storms, are threatening the socio-economic conditions of billions of people on the planet, with attendant sociopolitical and geopolitical impacts. Climate change often acts as a threat multiplier by amplifying existing stresses and could push already unstable and ill-equipped regions over the edge.

Recognising the urgency and seriousness of the risks posed by climate change to holistic maritime security in the Indo-Pacific, the **National Maritime Foundation** and the **India Office of the Konrad-Adenauer-Stiftung** have embarked on a unique, long-term project, in which Indian and international experts, academics, practitioners, policymakers, and other stakeholders, are brought together to address the national and regional implications of climate change with regard to the different facets of human security, economic security, and hard security, through a series of symposiums, supported and buttressed by research papers, policy briefs, outreach programmes, etc. The inaugural symposium under this project was successfully organised on 04 October 2022, and focused on the theme “*Addressing Climate-Change-Induced Security Threats to Critical Maritime Infrastructure: National and Regional Perspectives*”. In the second symposium, it is intended to explore the complex dynamics and potential implications of climate change-induced threats on the stability and security of nations (including maritime crime, terrorism, and state-on-state conflict).

Even as the world continues to grapple with the several adverse impacts of climate change, the economic dynamism of the Indo-Pacific region — with its voluminous mercantile trade, incredibly busy ports, crowded maritime routes, strategic chokepoints, and abundance of marine resources — is generating a deeply worrying set of challenges in terms of a set of transnational criminal activities that threaten the internationally accepted rules-based order and seriously weaken ocean governance.

Amidst the ongoing discussion on the merits of the ‘securitisation of climate change’, as opposed to the ‘climatisation of security’, it is important to recognise the profound impact that climate change has on various aspects of maritime security. While climate change may or may not be a direct cause of armed conflict, it certainly amplifies a variety of problematic social, economic, and environmental issues, thereby increasing the likelihood of intensified political and armed conflicts among coastal littorals and island States of the Indo-Pacific. This amplification is evident in situations where climate-induced factors such as unprecedented crop failures, reduced fisheries production, and protracted scarcity of food and water lead to health emergencies, unemployment, and population displacement. Unsustainable resource exploitation also contributes to widespread poverty and social vulnerability. In regrettable displays of short-sightedness, littoral States often adopt self-centric maritime policies ostensibly to implement

poverty-alleviation programmes for their populations. Inevitably, the promised results are not achieved, and vulnerable coastal populations then become susceptible to a range of criminal activities extending from petty theft to far more deleterious practices such as illegal, unreported, and unregulated (IUU) fishing, armed robbery, hijacking, kidnapping, the smuggling of drugs and arms, human trafficking, and trafficking in proscribed species of wildlife, and extending all the way to subversive, extremist, and/or terrorist activities.

The strong connection between rising ocean temperatures and maritime crime is well established. In eastern Africa, for instance, rising ocean temperatures have resulted in a significant decrease in fish production and the concomitant loss of traditional economic opportunities.

Consequently, there has been a significant increase in piracy and other illegal activities in this area. As States of the east African littoral scramble to provide for the economic wellbeing of their respective populaces, they are easily tempted into significant fiscal borrowings from cash-rich countries such as China to pay for public infrastructure projects such as ports and airports that they believe will bring much needed employment and prosperity. For a brief initial period, this is, indeed, what happens. However, most such projects soon fail to generate revenues sufficient to pay back the loans that have been taken. At this point, the draconian conditions attached to a default in loan-repayment kick-in. These States are now forced to surrender sovereign control over their land and fall into the trap of what is widely referred to as ‘debt trap diplomacy’. The economic conditions that were improving in the initial period of the development of the infrastructure-project suddenly deteriorate sharply. This economic downturn leads to an increase in crime. Where ports and fishing harbours are concerned, the failure of these debt-ridden projects leads to a spike in maritime crime.

Extreme weather events, too, pose significant risks to critical infrastructure such as seaports, leading to delays in cargo-delivery, increased production-costs, and compromised quality of goods. This, in turn, slows down maritime trade and has far-reaching effects on global supply- and value-chains, given that approximately 60% of global maritime trade traverses the international shipping lanes of the Indo-Pacific. The resulting disruptions create favourable conditions for maritime crime, including piracy, smuggling, and illicit trafficking. Likewise, when large-scale human migration caused by extreme weather events spills over national borders, geopolitical tensions rise sharply and may even become the *casus belli* for inter-State armed conflict.

Over the next few decades, sea-level rise will cause considerable changes to the coastlines of littoral States. On the one hand, this leads to a sharp increase in the salinisation of coastal aquifers, causes water stress, and forces human migration. On the other, the issue of whether and how maritime zones and maritime boundaries are to be delimited and delineated is very likely to cause significant tension amongst States. Irrespective of whether baselines are considered to be ambulatory or non-ambulatory as a result of the rise in sea level, there will be challenges in terms of maritime zones, safety zones, traffic separation lines, and marine protected areas, giving rise to new claims and disputes between States. Such impacts are likely to have profound consequences for statehood, national identity, sustainable development, livelihoods, and adherence to a rules-based maritime order, all of which would inevitably hinder the realisation of a free, open, and inclusive Indo-Pacific that promotes political and economic stability.

It is against this backdrop, that the theme of the second symposium is “*Addressing Climate-change-induced threats on National Security (including Maritime Crime, Terrorism, and State-On-State Conflict)*.” The symposium aims to promote discussions, deliberations, an examination of case studies, and the sharing of best practices innovative approaches to effectively tackle climate change impact on national security.

The symposium will address some of the critical questions that need to be explored, such as: Is climate change a national security threat? What is the position of nation-states regarding the securitisation of climate change? How does climate change impact the rules-based maritime order, ocean governance, and maritime security, potentially leading to State failure, and/or State-On-State conflict? How does the ‘securitisation of climate change’ differ from the ‘climatisation of security’? How do either or both these approaches impact policy responses and approaches towards addressing climate-related challenges? With these, the symposium seeks to deepen understanding and foster dialogue on effective strategies. It also seeks to promote sustainable practices, enhance holistic maritime security, and ensure a resilient Indo-Pacific marine environment.

POLICY RECOMMENDATIONS

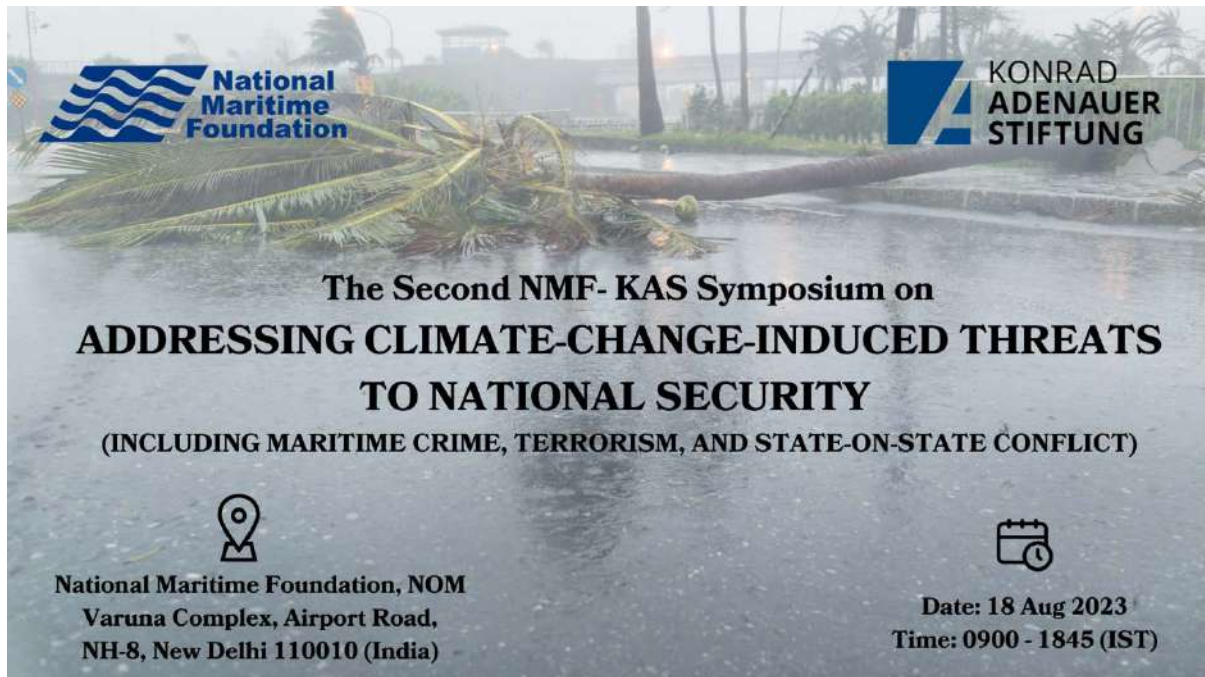
- (a) To enhance coastal resilience effectively, a spectrum of proactive measures must be implemented. Enhancing climate modelling accuracy and precision, as well as establishing robust data sources, stands as a critical imperative. This endeavour necessitates substantial investments in the collection and maintenance of accurate, up-to-date climate data, encompassing vital variables such as temperature, precipitation, sea-level rise, and extreme weather events. Furthermore, it is paramount to continually validate the assumptions embedded within climate models. These validations should encompass factors like greenhouse gas emissions and land-use changes, ensuring that the models remain in alignment with empirical data and real-world conditions. Additionally, addressing biases in model weightage is essential to mitigate potential inaccuracies in climate projections, warranting that models receive weightings commensurate with their demonstrated reliability. Furthermore, the development of advanced techniques to rectify errors related to cloud-related data within climate models is indispensable, ultimately enhancing the overall precision and dependability of these models.
- (b) Addressing the intricate nexus between climate change and criminality necessitates a comprehensive, multidimensional approach. In the context of developing countries, a primary focus should be placed on the implementation of adaptive measures aimed at mitigating the impact of climate change on societal behaviour. This includes bolstering law enforcement capacity to respond effectively to climate-driven criminal activities. Moreover, it is imperative to formulate and implement strategies designed to reduce both the frequency and severity of climate-related hazardous events, ranging from floods and droughts to extreme weather phenomena. Investing in resilience-building measures against climate-induced criminal activity becomes paramount, encompassing the implementation of mitigative policies, the development of climate-resilient infrastructure, and a steadfast adherence to a rules-based order that holds climate defaulters accountable, irrespective of nationality. These effective measures collectively contribute to the mitigation of climate change's impact on criminal behaviour while concurrently fostering a more secure and sustainable future.
- (c) Encouraging the widespread adoption of the “climatization of security” approach is a crucial step in preparing security forces to effectively respond to climate-related crises, adapt to changing environmental conditions, and actively engage in climate mitigation efforts. This approach emphasises the need to integrate climate considerations into the core of security planning, fostering a more resilient and adaptable security framework. By embracing the climatization of security approach, countries, particularly those in the global south, can formulate more effective, inclusive, and forward-thinking strategies. These strategies are designed to address the diverse security challenges posed by climate change comprehensively. It enables security forces and policymakers to better understand and navigate the multifaceted nature of climate change challenges. Ultimately, the adoption of the climatization of security approach contributes to enhanced resilience and preparedness in the face of climate-related crises.

- (d) Within the realm of international climate agreements, it is essential to uphold the principles of common but differentiated responsibility and equity. These principles serve as the foundation for ensuring that responsibilities for climate action are distributed fairly among nations. Common but differentiated responsibility acknowledges that while all nations share the responsibility to combat climate change, they do so to varying degrees based on historical contributions to greenhouse gas emissions and their respective capabilities. Equity further emphasises the need for fairness in distributing the burdens and benefits of climate action. By adhering to these principles, international climate agreements can promote a more equitable and just approach to addressing climate change on a global scale.
- (e) Collaborative initiatives such as the Coalition for Disaster Resilient Infrastructure (CDRI) play a vital role in actively promoting the construction of resilient infrastructure, with a particular focus on vulnerable regions like Small Island Developing States (SIDS) within the Indo-Pacific region. These initiatives facilitate cooperation among nations and stakeholders to address the pressing challenges posed by climate change and its impact on infrastructure. The CDRI serves as an exemplary model of such collaborative efforts, actively engaging in the development of infrastructure that can withstand the adverse effects of climate-related disasters. This is especially critical for regions like SIDS in the Indo-Pacific, which are particularly susceptible to climate-induced vulnerabilities, including rising sea levels, extreme weather events, and coastal inundation. By fostering international partnerships and pooling resources, initiatives like the CDRI aim to enhance the resilience of infrastructure in vulnerable regions. They contribute to the overarching goal of mitigating the impact of the climate crisis and ensuring the sustainable development and security of these areas. In this context, the CDRI's work serves as a significant step towards building a more climate-resilient future for regions facing disproportionate climate-related challenges.
- (f) Implementing measures to enhance the resilience of vulnerable communities is equally crucial. This involves the development of climate-resilient infrastructure, including storm-resistant housing and robust flood protection systems. Additionally, it should encompass the adoption of ecosystem-based adaptation approaches that harness the inherent resilience of natural systems. These strategies not only bolster the ability of communities to withstand climate-related challenges but also contribute to the long-term sustainability of their environments. By combining knowledge empowerment with resilience-building initiatives, vulnerable communities can better navigate the complex landscape of climate change and work towards a more secure and sustainable future.
- (g) In addressing climate-related challenges, a robust climate funding is imperative. This approach involves mobilising capital, enhancing oversight mechanisms, adopting transparent standards, and effectively integrating climate risks into decision-making processes. It also emphasises the importance of reducing risks associated with climate-related impacts, incentivising private finance, and fostering strategic partnerships. These steps collectively pave the way for a more resilient and sustainable response to the growing threats posed by climate change.
- (h) Policymakers and stakeholders in the maritime sector must acknowledge the need to incorporate climate considerations into infrastructure planning and financing. This proactive stance not only safeguards critical maritime infrastructure but also contributes to the overall

resilience and longevity of maritime operations in the face of an increasingly volatile climate. By aligning financial strategies with climate objectives, the maritime sector can better navigate the challenges ahead and ensure a secure and sustainable future.

- (i) The shift of navies from their core military functions to secondary roles, such as diplomatic and constabulary functions, is stretching naval assets. To address these challenges effectively, a series of mitigating measures must be adopted. These measures include substantial investments in resilient infrastructure, the implementation of advanced technology for early warning systems, fostering international collaboration among nations, and promoting sustainable practices in maritime activities. Furthermore, the integration of climate change considerations into all aspects of naval planning, development, and operations is of utmost urgency. This necessity arises from the tangible adverse impacts that climate-related events have on the execution of naval tasks and underscores the critical need for comprehensive action in this regard.
- (j) Addressing the complex issue of climate-induced migration necessitates a collaborative approach involving multiple stakeholders. This includes governments, non-governmental organisations, and representatives of affected communities. To facilitate effective communication and coordination in this endeavour, achieving clarity in terminology and definitions related to climate-induced migration is of paramount importance. Establishing a common understanding of key terms, concepts and mechanisms and legal framework will enhance the precision and effectiveness of strategies aimed at addressing this pressing global challenge.
- (k) The recognition that disasters stemming from climate-related challenges transcend administrative and political boundaries highlights the imperative of addressing humanitarian crises through collaborative and sustainable means, especially for vulnerable communities. These communities grapple with resource constraints and lack of capacities, underscoring the critical need for a well-established mechanism to support their adaptation efforts. Mobilising financial resources is pivotal in this endeavour, encompassing various avenues such as grants, loans, and funding from international organisations. Central to this initiative is the mobilisation of financial resources, which can be sourced through various channels including grants, loans, and funding from international organisations. Ensuring the accessibility of these funds to the affected communities is of paramount importance, as it empowers them to enhance their capacity for effective adaptation and response to climate-related challenges.
- (l) It is imperative to recognise the profound concerns posed by coastal inundation and salinization, as they have the potential to significantly impact nations' progress towards achieving the Sustainable Development Goals (SDGs) and can also affect maritime baselines. Recognising and addressing these challenges is not only essential for sustainable development but also for safeguarding maritime rights and boundaries, ensuring the resilience of coastal communities, and fostering international cooperation to mitigate the impacts of climate change on coastal regions.


GLIMPSES FROM THE SYMPOSIUM




National Maritime Foundation

KONRAD ADENAUER STIFTUNG

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 **COMMEMORATIVE SESSION**



Session 1

Professional Session

Moderator	Mr Rajani Ranjan Rashmi
Speaker	Vice Admiral Pradeep Chauhan
Speaker	Dr Chime Youdon



Session 2

Professional Session

Moderator	Admiral Sunil Lanba
Speaker	Dr Mona Chhabra Anand
Speaker	Dr Sisir Kumar Dash
Speaker	Mr John J Vachaparambil





Session 3

Professional Session

Moderator	Commodore Debesh Lahiri
Speaker	Dr Anasua Basu Ray Chaudhury
Speaker	Commodore Abhinav Barve
Speaker	Commandant Ravindra K Shrivastava



Session 4

Professional Session

Moderator	Mr. Franz Xaver Mauerer
Speaker	Commodore Sundeeep S Randhawa
Speaker	Cdr (Dr) Kapil Narula



KEY TAKEWAYS

- (a) The latest IPCC Sixth Assessment Report underscores that the average global temperature has already risen by 1.1 degrees Celsius from pre-industrial levels. Even in the most optimistic scenario, where carbon emissions are completely eliminated, a projected temperature increase of 1.5 degrees Celsius is anticipated by 2030. This means that we are likely to cross the threshold of temperature that humans are willing to endure, and we currently lack the necessary infrastructure to adequately address the challenges posed by such warming.
- (b) This rate of temperature rise is unparalleled and exceeds any observed over the past 2000 years. Furthermore, current carbon dioxide (CO₂) concentrations in the atmosphere are at their highest levels in the past 2 million years. The fundamental problem lies in the generation of heat. Currently, we are adding energy to the Earth's system at a rate equivalent to the detonation of 42 atomic bombs of the scale used in Hiroshima and Nagasaki every second.
- (c) One of the profound impacts of climate change is sea level rise, a slow-onset phenomenon characterized by a gradual increase in sea levels, currently occurring at a rate of approximately 0.2mm per year. Over a decade, this translates to a 2mm rise. However, the persistence of such sea level rise over decades and centuries poses a significant threat to many coastal cities, impacting both their security and livelihoods. Consequently, climate change can give rise to problems with inherent security implications.
- (d) Over the past 50 years, the cumulative impact of weather and climate change has resulted in daily economic losses amounting to 2 million US dollars. More than 3,000 disasters were reported in the last decades, leading to the loss of over one million lives and causing approximately 2 trillion US dollars in economic damages. Asia bears a significant burden, accounting for one-third of all globally reported water-related diseases, nearly half of all associated fatalities, and one-third of the associated economic losses. Among these disasters, 45% were attributed to floods, and 36% to storms, with storms accounting for 72% of livestock losses, while floods led to 52% of economic losses. Importantly, it should be noted that economic losses from weather events in low-income countries often remain uninsured.
- (e) Oceans absorb more than 90% of the excess heat generated by this CO₂ increase, serving as the largest carbon sink and playing a crucial role in regulating the Earth's temperature. Nonetheless, the warming of the atmosphere also warms the oceans, causing a decrease in pH levels and leading to ocean acidification, which affects their ability to regulate climate. The warming of ocean temperatures carries the potential for an increased release of CO₂ from the ocean, initiating a positive feedback loop within the Earth's climate system.
- (f) The consequences of ocean warming encompass various impacts, such as hypoxia, which involves the depletion of oxygen in oceanic regions. This phenomenon can result in the displacement of fish populations and other significant effects on a global scale. Given that fish serves as a critical source of protein for the human population, the projected global

population of 9 billion people within the next 50 years raises concerns about meeting food demands, especially considering land shortages and other limitations. This situation could potentially drive engagement in Illegal, Unreported, and Unregulated (IUU) fishing and contribute to conflicts in the Indo-Pacific region.

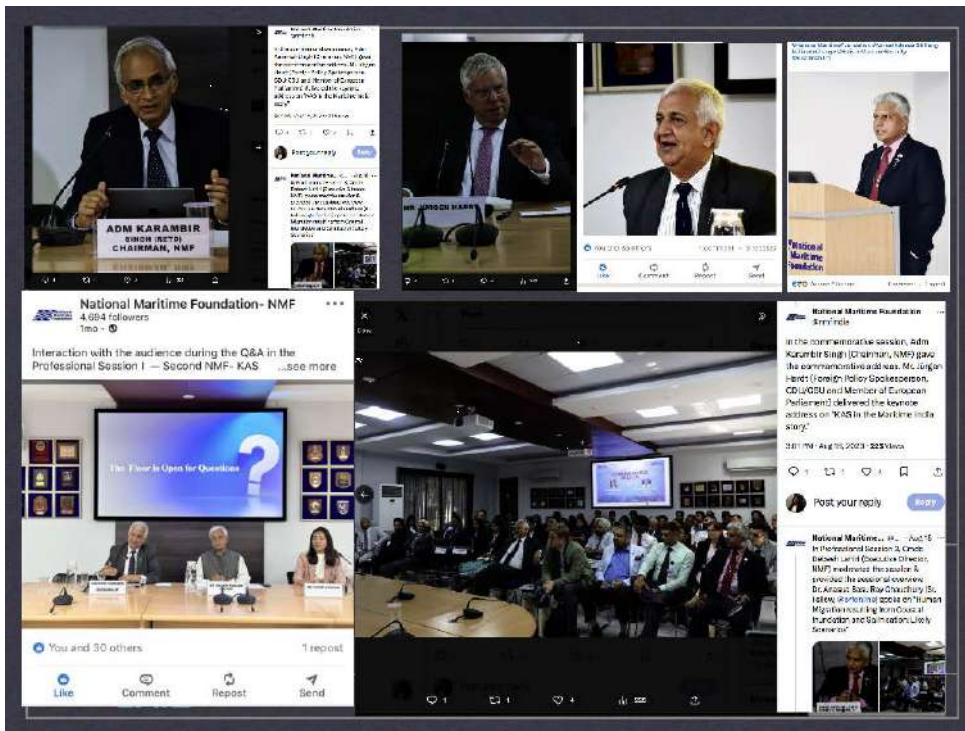
- (g) Climate-induced threats, including super cyclones, sea-level rise, and flooding, compel individuals and communities to seek new opportunities and lands. These environmental changes render their existing homes increasingly uninhabitable, primarily due to factors such as coastal inundation and salinisation. The migration process is often intertwined with a complex web of economic, social, and demographic factors. Despite the escalating vulnerabilities faced by coastal communities, there exists a lack of consensus on how to effectively address climate-induced displacements in this region.
- (h) One significant effect is the increased stratification of the ocean, which hinders the mixing of nutrients across various layers. This disruption causes the death or horizontal movement of vital marine organisms such as fish, phytoplankton, and zooplankton, ultimately disturbing the ocean's delicate food chain. For example, regions like Kerala and Tamil Nadu are experiencing difficulties in capturing substantial quantities of mackerel, placing added stress on the fishing community. The resulting pressures on livelihoods can, in turn, contribute to heightened crime rates in affected areas.
- (i) The significant locust swarm that struck the Horn of Africa in the spring of 2020, followed by its impact on India and Pakistan in May of the same year, stands out as a noteworthy event. According to the Food and Agriculture Organization (FAO), a significant portion of the locust movement was propelled by strong westerly winds triggered by Cyclone *Amphan* in the Bay of Bengal. Cyclone *Amphan* made landfall in India and Bangladesh on May 20, causing the loss of at least 90 lives and resulting in over USD13.2 billion in damages. These voracious locust swarms voraciously devoured substantial agricultural yields, leading to decreased protein production and imposing additional burdens on the fishing community, exacerbating the impact on vulnerable communities.
- (j) India's vulnerability to sea level rise is a matter of grave concern, as it holds the unenviable position of being ranked first in terms of vulnerability in this regard. This vulnerability extends to a substantial portion of its population, with over 30 million individuals exposed to the imminent threat of rising sea levels. This disconcerting vulnerability is not unique to India alone; it is a shared predicament among several countries in the global South. Prominent examples include Bangladesh, Indonesia, the Philippines, and others.
- (k) Changes in the Arctic have profound global ramifications. The reduction of Arctic ice not only accelerates global warming but also disrupts polar jet streams, potentially leading to extreme winters in specific regions. In addition, the thawing of permafrost in the Arctic has the potential to release dormant viruses and bacteria, thereby posing health risks to coastal communities. Moreover, these changing climatic patterns, coupled with the emergence of new diseases, can overwhelm nations, drive increased migration, and have adverse effects on human security.

- (l) Climate change affects maritime crime by influencing economic activity, governance, and the welfare of affected populations. It can lead to the proliferation of illicit activities like illegal fishing, smuggling, and piracy, which, in turn, challenge ocean governance and maritime order. Climate change also indirectly impacts criminal behaviour by creating vulnerable populations susceptible to luring by criminal elements offering survival opportunities. These survival crimes may evolve into more organized and extremist activities.
- (m) In 2022, India faced a substantial number of weather-related disasters, as reported by the Disaster Management Division of the Meteorological Department. According to their data, out of 365 days in the year, India experienced extreme weather events on 314 days. This stark reality underscores the fact that we are currently witnessing the impacts of climate change at an unprecedented rate. If corrective action is not taken promptly, the situation is likely to worsen even further.
- (n) Current global climate finance reveals a stark inadequacy, with only USD 600 billion allocated from 2011-2020, compared to the massive USD 1540 trillion in global assets. A significant portion, roughly 75-80%, prioritises mitigation, leaving less than 10% for adaptation, primarily in the form of debt, which becomes a financial burden for countries. This funding imbalance is notable, with substantial private sector contributions in the global north and governments in the global south bearing the primary responsibility.
- (o) In India's context, climate spending falls significantly short at 110,000 INR Crores compared to the required 1,100,000 INR Crores. The majority of this funding comes from domestic sources and government initiatives, with a stronger emphasis on mitigation over adaptation. While private sector investment is increasing, it remains inadequate in terms of scale and speed, particularly for adaptation and resilience finance. Small Island Developing States (SIDS) and other developing nations encounter difficulties in accessing funds tailored to their specific needs, resulting in limited opportunities.
- (p) A concerning fact is that 10% of the global population is projected to face increasingly frequent inundation events and may eventually find themselves permanently flooded by 2050. Additionally, the rise in sea levels, coupled with storm surges, tides, droughts, and water management practices like groundwater extraction, as well as various connectivity factors such as creeks and canals, collectively contribute to salinization. This, in turn, leads to coastal forest loss and the displacement of species, as salt-tolerant invasive species thrive and degrade habitats. It's worth noting that the salinity levels worldwide have already exceeded 30.4%, and as temperatures are expected to rise by 2 degrees Celsius, both salinity and distribution patterns are likely to be further affected.
- (q) The United Nations Secretary-General has unequivocally characterised climate change as a threat multiplier with the potential to exacerbate situations leading to conflicts. However, the establishment of a direct causal relationship between climate change and national security remains a subject of ongoing investigation. Since 2007, the United Nations Security Council (UNSC) has engaged in discussions related to climate change on eight separate occasions, with the most recent major debate occurring in 2021. India and South Africa have adopted a staunch position against the securitization of climate change. It has been

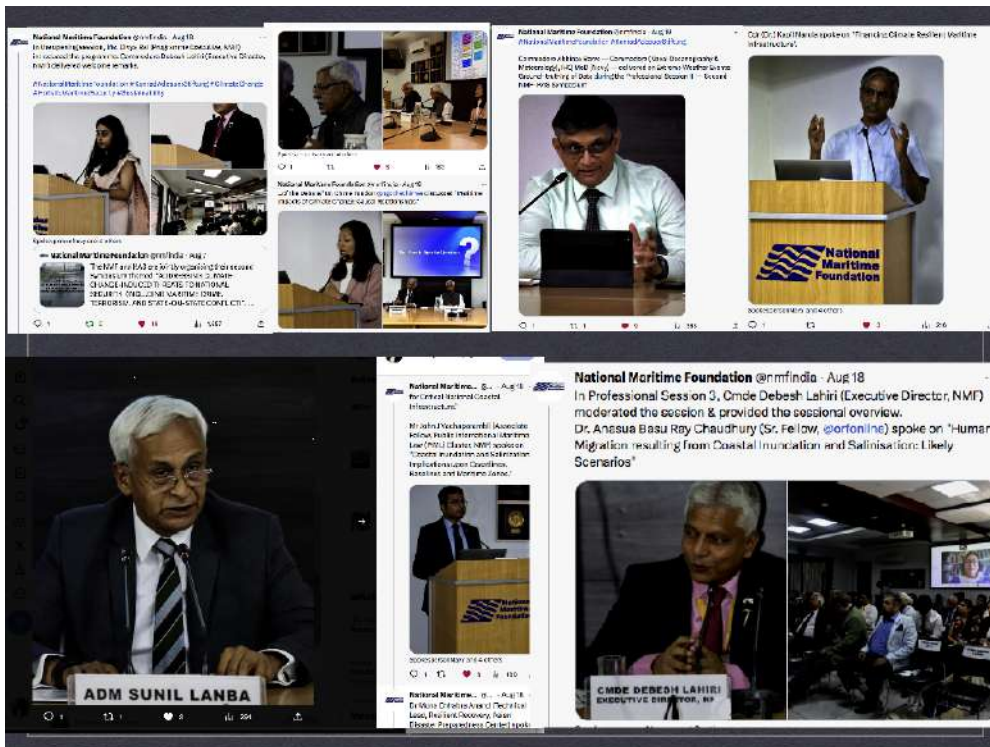
argued that the UNSC may not be the most appropriate platform for addressing climate change, as attributing climate change as a sole cause of conflict oversimplifies the multifaceted nature of such conflicts and may hinder effective resolution efforts.

- (r) The Paris School strongly advocates for the seamless integration of climate considerations into security and defence strategies. Its primary goal is to ensure that security forces are thoroughly prepared to address climate-related crises, adapt to shifting environmental conditions, and actively contribute to climate mitigation efforts. This approach represents a collaborative effort between security and climate experts, fostering a synergistic movement known as the “climatization of security”. In this context, countries like India and other nations in the Global South are encouraged to promote and adopt the principles of the Paris School. This approach emphasises the importance of integrating climate considerations into security planning, offering a more holistic and cooperative perspective as opposed to the securitisation of climate change often advocated by the Global North.

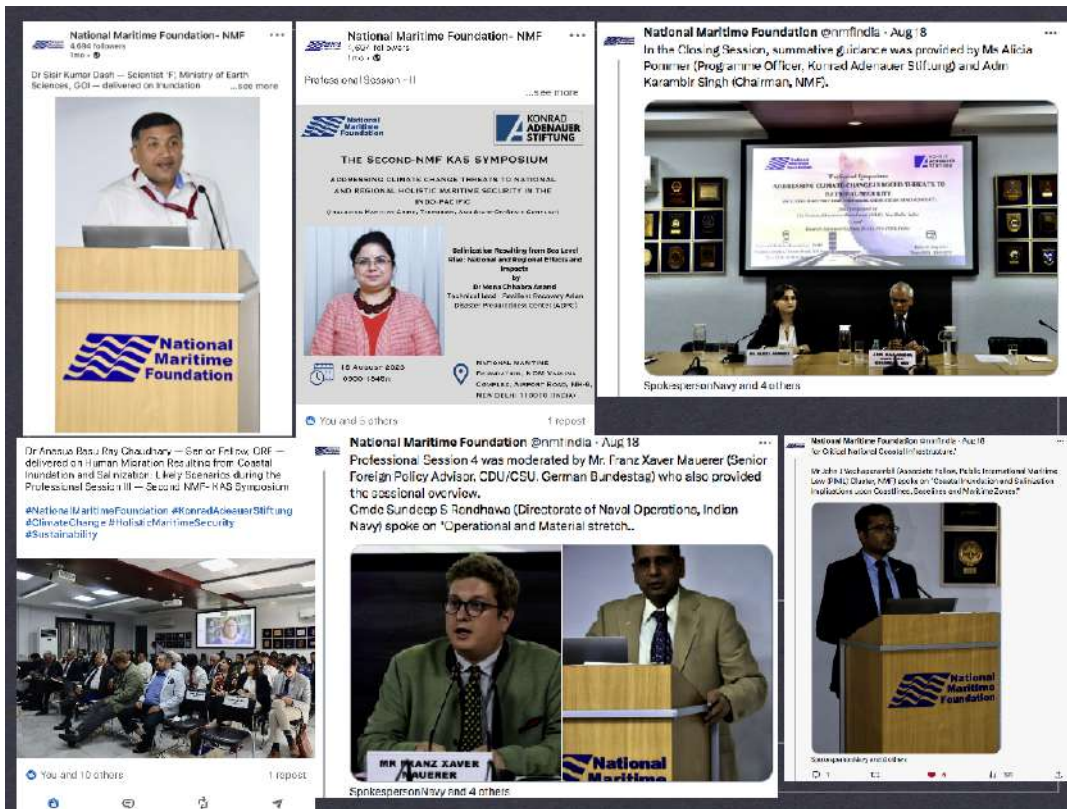
SOCIAL MEDIA COVERAGE



Screenshots #1 of live social media marketing on Twitter and LinkedIn during the event. The tweets were made from the official twitter and LinkedIn handle of the National Maritime Foundation @nmfindia



Screenshots #2 of live social media marketing on Twitter and LinkedIn during the event. The tweets were made from the official twitter and LinkedIn handle of the National Maritime Foundation @nmfindia



Screenshots #3 of live social media marketing on Twitter and LinkedIn during the event. The tweets were made from the official twitter and LinkedIn handle of the National Maritime Foundation @nmfindia

EVENT REPORT

INTRODUCTION

1. As the world continues to grapple with the several adverse impacts of climate change, the economic dynamism of the Indo-Pacific region — with its voluminous mercantile trade, incredibly busy ports, crowded maritime routes, strategic chokepoints, and abundance of marine resources — is generating a deeply worrying set of challenges in terms of a set of transnational criminal activities that threaten the internationally accepted rules-based order and seriously weaken ocean governance. Over the coming decades, rising sea levels will alter coastlines, leading to increased salinization of coastal aquifers, water stress, and human migration. Delimiting maritime zones and boundaries amid sea-level rise is likely to spark tensions among states, affecting maritime zones, safety zones, traffic separation lines, and marine protected areas. These issues may challenge statehood, national identity, sustainable development, livelihoods, and adherence to a rules-based maritime order. Extreme weather events also pose significant risks to critical infrastructure, causing delays in cargo delivery, higher production costs, and compromised goods quality. These disruptions slow down maritime trade, impacting global supply and value chains, as 60% of global maritime trade passes through the Indo-Pacific. Such disruptions create favourable conditions for maritime crime, including piracy, smuggling, and illicit trafficking. Large-scale human migration due to extreme weather can escalate geopolitical tensions and even trigger interstate armed conflicts.

2. In light of these challenges, the second symposium's overarching theme was "*Addressing Climate-change-induced Threats to National Security, Including Maritime Crime, Terrorism, and State-On-State Conflict.*" The day-long symposium featured both international and national experts who shared their perspectives and field experiences regarding the various security implications of climate change. The symposium was divided into four professional sessions, which included case studies, scenario building, and the sharing of best practices and innovative approaches to effectively address the impact of climate change on national security. These sessions aimed to tackle critical questions, such as whether climate change poses a national security threat, the stance of nation-states on securitizing climate change, and how climate change affects the rules-based maritime order, ocean governance, and maritime security, potentially leading to state failure or conflicts between states. The symposium also explored the differences between the 'securitization of climate change' and the 'climatization of security' and how these approaches influence policy responses to climate-related challenges. In summary, the symposium aimed to foster better understanding and dialogue, promote sustainable practices, strengthen holistic maritime security, and ensure the resilience of the Indo-Pacific marine environment in the face of climate-induced challenges.

WELCOME REMARKS

3. **Commodore Debesh Lahiri, IN, Executive Director, NMF**, extended a warm welcome to all the dignitaries, panellists, and participants at the Symposium. In his opening remarks, he reflected on the successful inaugural symposium held on 04 October, 2022, which focused on the theme “Addressing Climate-Change-Induced Threats to Critical Maritime Infrastructure: National and Regional Security Perspectives”. He emphasised the collaborative effort of the NMF with the Konrad-Adenauer-Stiftung (KAS) Office India, which initiated a unique, long-term project titled “*Addressing Climate Change Threats to National and Regional Holistic Maritime Security in the Indo-Pacific*”. This project recognises the pressing and critical risks posed by climate change to holistic maritime security in the Indo-Pacific. The project encompasses a series of symposiums supported by research papers, policy briefs, outreach programs, and more. In the second symposium, it aims to promote discussions, deliberations, an examination of case studies, and the sharing the best practices innovative approaches to effectively tackle climate change impact on national security. Commodore Lahiri set the context for *the Second NMF-KAS Symposium on Addressing Climate-Change-Induced Threats to National Security (Maritime Crime, Terrorism, and State-on-State Conflict)* by emphasising the imperative to explore the intricate intersections between climate change and national security. He shared a noteworthy insight from his recent participation in a transnational security course at the Daniel K. Inouye Asia Pacific Center for Security Studies in Honolulu, Hawaii. During the course, participants – 27 senior leaders – were tasked with identifying the most pressing challenge in shaping security regimes. They had a choice of eight options, including traditional military conflict, economic crisis, grey zone warfare, transnational crime, environmental security, maritime disorder and encounters at sea, disease, technology-driven crises, and more. He informed the audience that environmental security and maritime disorder emerged as the top concerns, followed with warfare, economic crisis and transnational crime. Consequently, it becomes paramount to consider the far-reaching implications of climate change in security deliberations. He then referred to the statement by the the UN Secretary-General, who categorically stated that the climate change is a threat multiplier and can advocate situations which can lead to conflict. He noted that since 2007, the UN Security Council has discussed climate change on eight different occasions, with the last major debate occurring in 2021. The resolution to integrate climate-related security risk into conflict prevention strategies was vetoed by China while India and Russia voted against it. Cmde Lahiri cited remarks from the Indian representatives, stating that the UNSC is a structurally unrepresentative institution with an exclusionary approach, and it is not the appropriate forum for discussing climate change as a national security threat. The climate change cannot be determined as a reason for conflict and an oversimplification of causes of conflict will not help resolve it. He underscored the necessity of integrating climate change discussions with broader spheres of security, emphasising the importance of a comprehensive approach. He cautioned against adopting an exclusionary stance, as it would not be conducive to addressing the multifaceted challenges posed by climate change.

COMMEMORATIVE SESSION

4. **Admiral Karambir Singh, PVSM, AVSM, IN (Retd), Chairman NMF and *Former Chief of the Naval Staff***, welcomed the delegates from Germany and acknowledged the value their participation added to the event. In his opening remarks, he highlighted the pressing global challenges, focusing on the “two Cs”: COVID-19 and Climate Change. He emphasised that while COVID-19 could be seen as a black swan event, Climate Change was an increasingly prominent grey Rhino, steadily taking centre stage in global and regional security considerations. He shared his personal experiences that demonstrated the interrelation between climate change and national and regional security. He recounted discussions with senior officials from Pacific Island nations who emphasised the impact of climate change on their territories, attributing Australia’s credibility erosion to its reluctance to address climate change and its consequences. He also mentioned a conversation with the former president of the Maldives, Mr Nasheed, who stressed the importance of sustainable solutions to address the challenges posed by rising sea levels, citing the Dutch floating city as a viable model. He then discussed the prominence of climate change in international naval discussions, especially at the International Sea Power Symposium in 2021, where naval chiefs from around the world deliberated on issues related to maritime security, climate change implications for infrastructure, ship design adaptations, and the shifting maritime baseline. Furthermore, he highlighted the impact of climate change on fisheries, citing the movement of fish species toward cooler waters due to rising seawater temperatures, which affects livelihoods, particularly in South Asia where fishing is predominantly coastal. He mentioned the alarming coral bleaching in Andaman and Nicobar Islands, emphasizing their significance for tourism and the economic vulnerability of smaller island nations. He reminded the audience that the grim statistics on drought and the challenges faced by rice-producing regions in India due to irregular monsoon rainfalls. He stressed that these issues have wider security implications and the need for collaborative efforts to address them. In conclusion, he emphasised the importance of approaching climate change not only from a national security perspective but also from a regional one. He emphasised the responsibility of large powers like Germany and India to promote comprehensive regional and global cooperation, focusing on adaptation, disaster response, best practices sharing, technology exchange, and sustainable resource management. He cited India’s policy and vision of SAGAR (Security and Growth for All in the Region) and quoted India’s External Affairs Minister, Dr. Jaishankar, in stating that “India will grow with others, not alone”.

5. **Mr Jürgen Hardt, Foreign Policy Spokesperson for CDU/CSU and a Member of the European Parliament, Germany**, delivered the keynote address at the symposium. He began by expressing his gratitude for the invitation and shared his background as a former Navy officer, reminiscing about his experiences serving on board a frigate many years ago. Mr Hardt mentioned his special connection to the Indian Ocean Region, where he had participated in naval training, and expressed his enthusiasm for the region. He also discussed his role as a rapporteur on India for his political group and reflected on attending Prime Minister Modi’s speech earlier in the week. Shifting gears, he discussed the influence of the ongoing Ukraine war on German climate policy and international rule of law. Mr Hardt stressed that Russia’s actions in Ukraine not only posed a challenge to Ukraine and its neighbours but also to the United Nations Security Council and multilateral treaties. He expressed concerns that if Russia were successful in Ukraine,

it might embolden further actions in the region, potentially leading to conflicts with NATO. He then discussed Germany's energy dependency on Russian gas and the impact of the war in Ukraine. He explained that prior to the conflict, Germany relied on Russia for 50% of its natural gas, which was used for heating, industry, and electricity generation. This reliance on gas was part of Germany's strategy to transition from coal, oil, and nuclear energy to renewable sources like wind and biomass. However, when the war in Ukraine began in February 2022, Germany decided to reduce its dependence on Russian gas. This transition was prompted by concerns over Russia's actions in Ukraine and a desire to enhance energy security. Germany turned to alternative sources of gas, such as Norway, to replace Russian gas imports. Despite successfully finding alternative sources of gas and avoiding supply shortfalls, this transition came at a cost. Energy prices in Germany increased significantly, which posed economic challenges. He stressed that Germany, nevertheless, was willing to pay the higher prices to reduce its reliance on Russian gas and increase its energy security. He noted that other countries might not have the economic flexibility to absorb such price increases. He acknowledged that India, for example, relies on Russian oil and gas but may not be able to pay the higher prices that Germany can afford. In response to the energy transition, Germany made investments in its energy infrastructure and stockpiled gas to ensure a stable supply in the future. This transition also prompted Germany to consider its role in ensuring freedom of navigation in the seas, and acquiring new ships with extended range capabilities particularly in light of geopolitical threats from Russia and China. He highlighted China as another major geopolitical concern, noting that Germany had shifted its stance on China to consider it not only as a partner but also as a competitor and a rival. He emphasised the need for consensus among states in their interactions with China, especially in areas like trade. He suggested that countries like India and Germany, along with other members of the G7, could work together to define principles for engagement with China that are acceptable and beneficial for all parties. In conclusion, he highlighted the importance of Germany's energy transition, its impact on international relations, and the need for enhanced naval capabilities and coordinate approach among like-minded nations to address evolving geopolitical challenges, including those related to energy security.

PROFESSIONAL SESSION I

6. Mr. Rajani Ranjan Rashmi, IAS (Retd), Distinguished Fellow, The Energy Research Institute of India (TERI), moderated the opening session. In his role as the moderator, he underscored the notion that climate change serves as a threat multiplier rather than an originator of threats. He firmly asserted that there is unequivocal consensus on climate change being one of the most extensively researched and profoundly impactful global environmental challenges of recent times. During his address, he provided insightful perspectives on the historical context and distinctive attributes of the 1992 United Nations Framework Convention on Climate Change (UNFCCC). He emphasised the UNFCCC recognition of climate change as a global challenge, while also acknowledging the varying impacts it has across the nations. He placed particular emphasis on the vulnerability of Small Islands Developing States (SIDS) like the Maldives, Bangladesh, Indonesia, the Philippines, and even India, largely due to their extensive coastline. This highlighted the inequitable reality that these nations, despite having made minimal historical contributions to climate change, bear a

disproportionate burden of its adverse consequences. He pointed out that the global increase in emissions driving climate change has primarily originated from countries that have rapidly and disproportionately consumed fossil fuels over the past 400 years. He attempted to forge a connection between climate change and security concerns by addressing the gradual yet exponential rise in sea levels. He highlighted the potential challenges of the persistent current trend global of sea-level rise, particularly the looming threat of inundation of low-lying areas, which, if left unchecked, could give rise to formidable security challenges and jeopardise livelihoods. Furthermore, he highlighted a notable aspect by pointing out the concept of 'securitisation' is not a component of Paris Agreement. He elucidated the clear differentiation between the concept of securitisation and the fundamental principles that form the bedrock of the operation of the UNFCCC. In conclusion, he advocated for a comprehensive approach to tackle the climate crisis, emphasising the paramount importance of international cooperation, collaboration, and the development of resilient infrastructure. While acknowledging that the climate crisis can exacerbate existing threats to peace and security, it should not be regarded as the primary or sole cause of these threats. Instead, he cautioned against oversimplifying the complexity of security challenges by attributing them solely to climate change. Rather, he encouraged a nuanced perspective that recognises climate change as a contributing factor for security concerns while acknowledging the multifaceted nature of these issues.

7. Vice Admiral Pradeep Chauhan, AVSM & Bar, VSM, IN (Retd), Director-General, NMF, presented his views on “Securitisation of Climate Change” or “Climatization of Security”. In his exposition, he initiated by tracing the origins of the terms “securitisation” within the realm of security studies. He articulated the concept of security as a speech act, emphasising that when the word “security” is invoked, it triggers a cascades of thoughts, perceptions, and subsequent actions, many of which are characterised by their extraordinary nature. He explored three schools of thoughts, each offering a unique perspective through which to analyse and respond to the complex relationship between climate change and security. He explained how scholars from the Copenhagen School – who defined securitisation as the process through which an issue is elevated from the realm of regular politics to a matter of existential security concern – have critiqued the securitization of climate change by arguing that framing climate change as a security threat can lead to exaggerated responses and undermine traditional political processes. He then explored the concept of Human Security, which shifts the focus from state security to individual security and well-being, highlighting climate change as a threat to human security due to its potential to cause displacement, food scarcity, and other challenges directly impacting individuals. He pointed out that discussions of human security often tend to reflect the policy agenda of the global north. This suggests that the school’s approach may not fully address the concerns and vulnerabilities of developing regions disproportionately affected by climate change. He then discussed the Paris School which represents a more recent approach that involves the active participation of security personnel, defense agencies, and coast guards in addressing climate-related challenges. It advocates for integrating climate considerations into security and defence strategies. It reflects the recognition that climate change can have direct implications for national and international security, particularly in areas such as resource scarcity, migration, and conflicts over territory. He stated that this approach seeks to ensure that security forces are prepared to deal with climate-related crises, adapt to changing environments, and contribute to climate mitigation efforts. It

represents a convergence between security and climate experts to address the security implications of climate change, creating a synergistic movement known as the “climatization of security”. He stated that the choice of which perspective to adopt can have significant policy implications in how governments and international organisations address climate-related security challenges. In this line, he endorsed the adoption of climatization of security approach, emphasising its practical sensibility in addressing the security implications of climate change. He reiterated that maritime security as threats arising ‘in’, ‘from’ & ‘through’ the sea. This nuanced understanding forms the basis for addressing security challenges in the maritime domain. He emphasised that the significant correlation between climate change and security, particularly in developing regions where even minor climatic shifts can trigger significant challenges. For instances, locust swarms that travelled from the Empty Quarters of Oman to Pakistan and India, highlighting the security challenge posed by the substantial consumption of agriculture production, which threatened protein production and placed additional pressure on the fishing community. He also drew connection between climate change and broader security concerns, citing examples like the link between droughts and rise of extremist groups like ISIS. He further posed questions about the potential consequences of climate-induced migration, such as Bangladeshi refugees, and the implications of potential alterations of the the Indus Water Treaty by India. Furthermore, he emphasised the strategic significance of the Golan Heights to Israel due to its aquifers, argued that any changes in the region would lead to conflict. He summed up that there is reasonable correlation between climate change and security. In conclusion, Admiral underscored that climate change-related migration and climate risks are major contributors to state failures, creating a chain of risk factor that lead to primary impacts, subsequent collapses, and secondary impacts, ultimately contributing to the rise of extremism.

8. Dr Chime Youdon, Research Fellow, and Head of the Blue Economy and climate change (BECC) cluster NMF, delivered a comprehensive presentation on the Maritime Impacts of Climate Change and the Causal Relationships involved. She began by highlighting key data from the latest IPCC’s Sixth Assessment Report, where it was indicated that average temperature has risen of 1.1 degree Celsius from pre-industrial levels. She mentioned that changes in the climate system are unprecedented, and global average temperatures have increased at a faster rate in 2000 years, and Carbon dioxide concentration have reached their highest level in at least 2 million years. She highlighted that causes of global temperature rise are mainly human activities of burning fossil fuels, deforestation releasing large amount of greenhouse gases in the atmosphere, industrialisation and land use changes converting forests into agricultural lands and urban areas also contribute to climate change. She further discussed the climate change impact on the oceans. She pointed out that one of the consequences of warming of global temperature is the rising of sea levels. Sea-level rise is occurring due to the melting of glaciers and ice sheets and the thermal expansion of seawater as it warms. Rising sea levels have the potential to inundate coastal areas, posing significant risks to communities living near coastlines. She also mentioned that the oceans are becoming more acidic as they absorb excess carbon dioxide (CO₂) from the atmosphere. She also discussed the decreasing levels of oxygen in the oceans that can have detrimental effects on marine ecosystems, including the displacement of species and the alteration of food webs. The pH levels of the oceans are decreasing as they become more acidic which can disrupt the physiology of marine organisms and affect their

ability to survive and thrive. She supported her discussion with graphs illustrating the rise in sea levels across the globe. These graphs showed the historical trends and projected future increases in sea levels. India was singled out as particularly vulnerable to sea level rise, with projections suggesting that over 30 million people in the country could be exposed to the risks associated with rising sea levels. This vulnerability underscores the urgent need for climate adaptation and mitigation measures to protect coastal populations and ecosystems from the impacts of climate change. She delved into the intricate repercussions of climate-induced salinisation on coastal ecosystems, sharing its multifaceted adverse effects on multiple fronts. Notably, rising salinity levels have contributed to the loss of coastal forests, fostering the invasion of salt-tolerant species that degrade critical habitats. Such ecological disruption has led to tangible consequences such as reduced crop yields and diminished farm productivity, exacerbating food security concerns. Furthermore, the heightened salinity has fuelled the proliferation of algal blooms, resulting in adverse impacts on marine ecosystems. She emphasised on increasing frequency and intensity of extreme weather events, particularly tropical storms and cyclones, while noting their decreasing path predictability – a trend that is expected to continue due to climate change. She highlighted the significant toll these events have taken, with over 10 lakhs lives lost and around 2 trillion USD in economic damages reported. She reminded the audience that Asia alone bears a disproportionate burden, accounting for one-third of global water-related diseases and nearly half of the associated economic losses. Floods and storms constituted the majority of 45% of these disasters, with storm being responsible for 72% of lives lost and flood causing 57% of economic losses. Notably, many lower-income countries lack insurance coverage for these losses. Furthermore, she underscored the interconnectedness of physical changes, human activities, and alterations in ecosystem brought about by climate change can cause adverse impact on ocean ecosystem and communities. She also discussed how climate change, or climate hazards, not only yield direct consequences but also trigger cascading risks that subsequently affect national security. She concluded by posing critical questions about how different countries prioritise climate change in the face of economic threats, national security concerns, and environmental protection imperatives. She highlighted the varying levels of climate vulnerability and how they influence the urgency and course of adaptation strategies among different nations, emphasising the need for these questions to drive future discussions and policy actions.

PROFESSIONAL SESSION II

9. **Admiral Sunil Lanba, PVSM, AVSM IN (Retd), Former Chief of the Naval Staff, and Former Chairman, NMF**, moderated the second professional session of the Symposium. In his opening remarks, he highlighted India's vulnerability to climate change and identified five tipping points affecting the country, which are, extreme heat, floods, cyclones, water scarcity, and rising sea surface temperatures. He addressed that given India's extensive coastline and substantial coastal population, these extreme climate-related events have significant human and economic costs. He further emphasised that climate change impacts in bordering countries can lead to border defence challenges, particularly due to migration which becomes the follow-up act in these dire situations. Rise of temperature in land and sea-surface temperature contributes to the formation of severe super cyclones that have increasingly affected the Indian coastline the past few years, for instances, Cyclone *Amphan*, Cyclone *Tauktae*, Cyclone *Yaas*, Cyclone *Hudhud*.

He then underlined that climate-related security threats not only induce tensions between the countries but also between the states within the countries, impacting political, social, and economic stability. While he acknowledged that a direct relation between climate change and conflict has not been definitively established, he expressed the view that climate change exacerbates intermediate stresses, including political, social, and economic factors, which can contribute to security challenges.

10. Dr Sishir Kumar Dash, Scientist 'F' at the Ministry of Earth Sciences, Government of India, delivered a comprehensive presentation on the critical issue titled *Inundation Resulting from the Sea Level Rise: Adaptation Options for Critical National Coastal Infrastructure*. His key focus of the presentation was the profound impact of coastal inundation, primarily driven by various natural hazards like sea-level rise, cyclonic storms and coastal flooding posing risk, especially to maritime infrastructure and coastal communities. He mentioned that sea-level rise triggers a range of adverse impacts on coastal areas, including submergence of low-lying wetlands, shoreline erosion, increased susceptibility to coastal flooding, and intrusion of saltwater into estuaries and nearby groundwater aquifers. The discussion underscored the substantial risk faced by over one billion worldwide, residing in areas situated at elevators of less than ten meter above the sea level. In the contemporary temporal context, he stated that natural disasters have reached unprecedented levels. In the latter half of the 20th century, the world witnessed a surge in disasters and their cascading impacts. He highlighted staggering statistics, a 250 percent increase in the number of recorded disasters, a 500 percent increase in the number of affected individuals, a 1500 percent increase in the total cost incurred due to disasters, affecting nearly 2.2 billion people worldwide. The impact of climate change has exacerbated these hazards, leading to more severe coastal inundation. This poses a substantial risk, considering that billions people globally reside in areas located less than ten meters above sea level. He indicated that as per the Flood Vulnerability Index of 2021, states such as Punjab, West Bengal, Bihar, Uttar Pradesh, and Andhra Pradesh are ranked as the top flood-prone regions in India which can wreaked havoc. According to a report from the Central Water Commission (CWC), 7.21 million hectares of land have been permanently flooded, resulting in the loss of 3.78 million hectares of agricultural land. He emphasised that the economic toll of these floods is substantial. In light of these challenges, he expressed the importance of the Decision Support System (DSS) in assessing the impacts of the climate change on coastal environments. The DSS serves as a risk management framework aimed at bringing existing methodological gap and facilitating the development of viable climate change adaptation strategies. He provided an example of vulnerable Kadmat Island, which has immense strategic relevance for India is grappling with recurrent inundation. He also expounded upon a spectrum of proactive measures aimed at mitigating the coastal inundation caused by climate-induced events. These measures encompassed both the robust approaches of hard protection strategies, involving the construction of resilient infrastructure in the aquatic domain, and the innovative strategies of soft measures advocating ecosystem-based adaptation. He also emphasised the pressing need for the development of cutting-edge coastal models to effectively combat coastal vulnerability, especially coastal inundation. In conclusion, he called for the urgency of comprehensive disaster risk reduction strategies and underscored the paramount importance of proactive adaptation strategies in safeguarding critical national coastal infrastructure.

11. Dr Mona Chhabra Anand, Technical Lead- Resilient Recovery, Asian Disaster Preparedness Centre (ADPC), gave a presentation on Salinization Resulting from Sea Level Rise: National and Regional Effects and Impacts. She underscored that a fundamental aspect of any climate change assessment is a first-hand evaluation of its impact on the human lives. During her presentation, she shared compelling photographs captured during her field visit. These images vividly portrayed the makeshift houses of the local inhabitants in these vulnerable regions, which lacked adequate adaptive measures. These visual representations underscored the economic hardships faced by these communities in the wake of anthropogenic climate change. It was evident that many of the people residing in these low-lying areas not only grappled with the challenges posed by extreme weather but also lacked access to essential resources and funding to build resilience. She stressed that communities faced with these formidable obstacles, they resorted to devising local adaptive measures in their bid to cope with the changing climate. Drawing from her field visit experiences, she provided a peak into the Sundarbans mangrove forests spanning both sides of the border. The Sundarbans are considered as the climate hotspots, have subjected local residents to the daily challenges posed by sea level rise. She shared the make-shift structures of houses of inhabitants in these regions, equipped without any adaptive measures showed their economic struggle in the face of anthropogenic climate change. She delved into the human dimension of sea-level rise impacts highlighting how people both in 24 South Pargana and Khulna district of Bangladesh have adapted certain local adaptive measures like floating toilet and raising the plinths of their houses to mitigate the impact of sea level rise. The people in the region are also forced to shift their livelihood choices as available land at disposal keeps on shrinking with each inundation. In conclusion, she emphasised a critical point – disasters do not recognise administrative and political borders. Humanitarian crises can exert significant pressure on governments, potentially escalating into national security concerns. Her presentation focused on the intricate relationship between environmental challenges, human adaptation, and how it can escalate to boarder geopolitical implications. Her presentation served as a powerful reminder of the resource constraints and resilience struggles faced by these vulnerable communities, shedding light on the imperative need for support and sustainable solutions to address their climate-related challenges.

12. Mr John J Vachaparambil, Associate Fellow, Public International Maritime Law (PIML) cluster, NMF presented his views on Coastal Inundation and Salinization Implications upon Coastlines, Baselines and Maritime Zones. Introducing the topic, he reiterated that the threat of climate change induced sea level rise and extreme weather events is the root cause for coastal inundation. For ease of explanation, the presentation was divided into two legal scenarios – (a) implications for coastal States, and (b) implications for archipelagic States. The underlying reason for this division is that as per the provisions of the United Nations Convention on the Law of the Sea (UNCLOS), 1982, only coastal and archipelagic States can promulgate baselines and delimit maritime zones. He also referred to the UNCLOS while defining the sovereignty of both coastal and archipelagic States. He emphasised that whilst the implications of coastal inundation will only lead to a shift in the baseline and the outermost limits of the maritime zones, the threats that could emanate from this shift, could violate States’

sovereignty and impact national security. In this context, he also mentioned that the impact of coastal inundation on archipelagic States would in fact question the existence of the island nations – threaten the Statehood. To define the threats, he referred to the provisions of UNCLOS, the Montevideo Convention on the Rights and Duties of States, 1934, and the Convention relating to the Status of Stateless Persons, 1954. His main argument was that the shift in the outermost limits of the maritime zones could change the nature of rights and freedoms guaranteed to States’ under the UNCLOS, thus leading to a possible increase in maritime claims and disputes. However, he also highlighted that UNCLOS has not fully evolved to answer certain questions – (a) whether nations can freeze baselines, (b) can nations generate maritime zones around artificial islands? (c) what is the navigational regime applicable to UUVs, and floating armouries? He also raised a question – if developed countries fail to meet the mandate under international climate change law – UNFCCC – how will island nations survive the impact of sea level rise? Further, he also highlighted a study by Matthew Stutz, et.al which contradicts the general notion of islands sinking due to rising sea levels. He also gave an update on the ITLOS advisory opinion on climate change and international law filed by the Commission of Small Island States. Concluding his presentation, he mentioned that “it is important to reduce the ‘cumulative impact’ of climate change (defined in the BBNJ Agreement)” which can only be achieved by (a) strengthening regional cooperation, (b) bilateral or trilateral agreements to preserve the maritime zones, and (c) achieving the climate change mandates under respective international law. At the end, he said that coastal inundation and salinisation could impact nations targets under the SDGs.

PROFESSIONAL SESSION III

13. Commodore Debesh Lahiri, Executive Director, NMF, moderated the third professional session. He provided a brief yet comprehensive understanding of three key aspects. First, he emphasised the importance of involving coastal communities in discussions and decisions related to maritime issues. Second, he underscored the need for rigorous fact-checking in these discussions. Finally, he highlighted the crucial link between climate change and maritime crime, offering valuable insights into reducing criminal activities while advancing sustainability and enhancing ocean governance. In addition to these insights, Commodore Lahiri played a pivotal role in providing a concise overview of the session’s objectives and in establishing a structured framework for the ensuing discussions.

14. Dr Anasua Basu Ray Chaudhury, Senior Fellow, ORF Kolkata, delivered a presentation on the topic Human Migration Resulting from Coastal Inundation and Salinization: Likely Scenarios. She delved into the concept of coastal insecurities in the Bay of Bengal concerning climate-induced migration and displacement. She then discussed the linkages between climate change/environmental degradation and human migration. She explained how climate-induced displacement and migration have surged both in numbers and magnitude worldwide due to climate change hazards like heatwaves, droughts, hurricanes, earthquakes, floods, and forest fires, as well as slower-onset changes like sea-level rise. She stated that as per the International Organization on Migration (IOM) estimates, on a global scale, between 25

million and 1 billion people could be compelled to migrate from their homes due to climate change and environmental degradation by 2050. Consequently, this trend is likely to exacerbate poverty and inequality, potentially derailing the achievement of Sustainable Development Goals (SDGs) within the stipulated timeframe. She also highlighted how vulnerable communities perceive insecurity threat related to climate change. The impact of climate change on countries in the Global South is disproportionately severe, where large-scale sudden displacement could lead to violations of people's basic rights. She explained that the Bay of Bengal region is known for its ecologically fragile coastal zones, confronts heightened environmental security concerns as it lies within the "World Hazard Belt" of the Indian Ocean. Due to their geographical location, many Bay littorals experience varying degrees of vulnerability to natural disasters, such as cyclones, tsunamis, coastal inundation, land erosion, sea-level rise, and earthquakes, resulting in the loss of lives, livelihoods, or displacement and migration of millions from their abodes. She asked a question, how do the vulnerable communities perceive their insecurity related to climate change? For that she provided case studies of India's neighbouring state, Bangladesh, illustrating how communities living along the coastlines are susceptible to the detrimental impacts of extreme climate events. She discussed how climate-induced threats such as super cyclones, and sea-level rise, and flooding, force people to seek new opportunities and lands as their home become increasingly uninhabitable due to factors like coastal inundation and salinisation. She emphasised how these vulnerable communities become migrants who suffer from the lost sense of belonging in their new area where the locals may or may not accept and wish to share their resources and land. This migration may be temporary or permanent in its nature. However, in this context it is important to understand that climate change is usually not the only cause of migration in the Bay region. Their process of migration usually interacts with a range of other economic, social, and demographic factors. She expressed that despite growing vulnerabilities among coastal communities, there is a lack of consensus on addressing climate-induced displacements. It was also emphasised there is no common definition of climate-induced migration, terms such as "environmental refugees", "climate refugees", "climate migrants", and "environmental migrants" are often used interchangeably. In most cases, these affected people migrate within their countries and are regarded as internally displaced persons. She concluded her presentation by stressing the need for multilateral engagements involving various stakeholders, including governments, non-governmental organizations, and the representatives of the affected communities.

15. Commodore Abhinav Barve, IN, Naval Oceanography and Meteorology, IHQ MoD, offered the domain expertise on the topic, Extreme Weather Events: Ground Truthing of Data. He began his presentation by posing a critical pertinent question — Are we overreacting to climate change? He presented historical background with scientific data to answer the question he posed. He highlighted that climate change has become an inconvenient truth as frequency and intensity of various extreme weather events rises, including tropical storms, sea-level rise, Arctic and Antarctic Ice, and extreme temperature rises. In his presentation, he emphasised that the global climate change debate encompasses a wide range of factors. These factors include social justice, scientific research, environmental concerns, economic interests, political dynamics, energy policies, international relations, consumer behaviour, technological advancements, media influence, public health, and the presence of scepticism and denial. These factors have both direct and indirect impacts on climate-related events, often exacerbating and accelerating them. He

underscored the importance of incorporating objectivity into the discussion to ensure a fair and unbiased exploration of climate change issues. Objectivity is a fundamental quality necessary for addressing climate change comprehensively and effectively. He persuaded minds involved in climate thinking to always research and educate ourselves from different sources while questioning the veracity of the evidences and conclusions that are derived from it. He provided an interesting example of misunderstanding using the example of forest fires that could have been curbed with human management of forest but instead the issue was directly and fully blamed on climate change. The understanding here is that forest fires are not the impacts of climate change, instead the emissions from the fire may impact or contribute to global warming on glacier's melting rate. He addressed that we need to be on the lookout for sane fact checks and comparative analysis. The climate change is not an isolated phenomenon; in its broader canvas it creates an impact ecosystem that needs to be studied well. He further brings the topic closer to home by bringing us data and statistics on India's weather disasters in 2022 sourced from the Disaster Management Division, Meteorological Department, where 314 out of 365 days, India experiences extreme weather events bringing us to the reality that we right now are facing the impacts of climate change at an unprecedented rate looking at going even higher than the present unless some action is taken to prevent and curb. He addressed that climate modelling can be prone to errors when there is a lack of accurate data, model assumptions, weighting models, and cloud errors. He indicated that we have to develop data and models that provide accuracy and precision to inform and encourage policymakers for better design, adaptive strategies, and to avoid malfunctions.

16. Commandant Ravindra K Shrivastava, ICG, Research Fellow, NMF, invoked a relationship between the through his presentation, which was entitled, Climate Change as an Accelerator of Maritime Crime, laid out various ways in which climate change and other weather-related events impact the non-traditional maritime security threats. Maritime crime, driven by atrocious set of activities was one significant subject to the symposium and lent clarity to the audience by elaborating on the inducing factors. He provided insights on how climate change has brought about new and modified criminal activities to the domain of maritime crime. He explained that changes in the Arctic have significant global consequences. As the Arctic ice diminishes, it leads to increased warming, which affects polar jet streams and could potentially result in extreme winters in certain regions. The melting ice also contributes to rising sea levels, posing a threat to low-lying coastal areas and leading to mass migrations. Additionally, the thawing of permafrost may release dormant viruses and bacteria, which can pose health risks to coastal communities. He also highlighted that extreme weather events disrupt ports, diminish fish stocks, and lead to impact tourism, while resources scarcity drives rural populations to urban centres. Destabilisation of the social milieu of coastal communities lead to instability in the area, social inequalities, economic crisis which further lead to proliferation of illicit activities like IUU fishing, smuggling, and piracy, which, in turn, challenge ocean governance and maritime order. Climate change also indirectly impacts behaviour by creating vulnerable populations susceptible to luring by criminals' elements offering surviving opportunities. He discussed how the nexus between the economics of crime and climate change is intricately interconnected, primarily through the mediating factors of poverty, inequality, and unemployment. These underlying conditions, exacerbated by the impacts of climate change, form a critical backdrop for understanding the dynamics of criminal behavior in climate-affected regions. When governments fail to address the needs of populations grappling with climate-induced challenges, it often leads to heightened tensions, violence, and an upsurge in

illegal border crossings as individuals seek improved living conditions beyond their borders. Furthermore, severe climate conditions, capable of triggering economic downturns, can act as a catalyst for criminal activities. Climate change-induced criminality encompasses a range of offenses, encompassing property crimes, bribery, prostitution, and human trafficking. Additionally, environmental disasters can serve as catalysts, activating rebel movements, Naxalite insurgencies, and even terrorist groups. In conclusion, he stated that comprehending the complex relationship between climate change and criminality necessitates a multidimensional approach. Addressing climate-induced criminal activities demands a multifaceted response, including policy interventions, alterations in societal behaviour, and disaster preparedness and response strategies. Building resilience against climate-induced criminal activity requires the formulation and implementation of mitigative policies, the development of climate-resilient infrastructure, and the establishment of a rules-based order that holds climate defaulters accountable, free from discrimination based on nationality. While humanity cannot halt the progression of climate change entirely, effective measures and a holistic approach can ameliorate its influence on criminal behaviour, thereby contributing to the creation of a more secure and sustainable future.

PROFESSIONAL SESSION IV

17. Mr. Franz Xaver Mauerer, Senior Foreign Policy Advisor for CDU/CSU in the German Bundestag, assumed the role of moderator and extended a warm welcome to the panellists participating in Professional Session IV. In his opening remarks, he emphasised the paramount importance of strategic policy planning in addressing climate-related issues. He underscored that the efficacy of planning is contingent upon the adept and efficient addressing of climate change policies that can significantly impact national security.

18. Commodore Sundeep S. Randhawa, Cmde (Operations) from the Directorate of Naval Operations (DNO), gave a presentation on the Operational and Material Stretch of Maritime Forces due to Coastal Inundation and Salinisation. His presentation provided an insightful analysis on how challenges faced by Indian Navy due to coastal inundation and salinisation in the changing climatic scenario from an operational perspective. He argued that increasing frequency of extreme weather events and the expanding role of the Indian Navy in diverse capacities, including Humanitarian Assistance and Disaster Relief (HADR) operations. He stated that, in recent years, there are rising number of severe tropical cyclones such as *Biparjoy*, *Tauketae*, *Amphan*, *Hudhud*, etc. hit both on the east coast and west coast. He also addressed concerns about China's involvement in Illegal, Unreported, and Unregulated (IUU) fishing and the rising piracy incidents in the Indian Ocean Region. These activities, when viewed in the context of climate change, can have cascading and indirect impacts. Consequently, they have placed significant strain on the operational capabilities of the Indian Navy and Coast Guard. To systematically address the impact of coastal inundation and salinisation, he categorised these effects into four key dimensions. First is change in fishing patterns, it was indicated that climate-induced shifts in ocean conditions have altered traditional fishing patterns, necessitating increased naval resources for monitoring and surveillance of ocean waters, particularly in combating Illegal, Unreported, and Unregulated (IUU) fishing. The second risk he emphasised was the potential

inundation of coastal infrastructure, including ports, shipyards, fishing harbours, and naval bases, due to sea level rise and extreme weather events. He noted that this vulnerability of coastal communities and their infrastructures poses a significant threat by potentially reducing naval resources available for operations. Consequently, this could hinder the operational capabilities of the Indian Navy and Indian Coast Guard, impacting their ability to project global power. Another significant risk he addressed was change in baselines. Sea-level rise poses a threat to change maritime baselines which can impact their interests within the evolving boundaries. He suggested that Naval forces across Indo-Pacific may require to assert new rights and employ new hydrographic assets to accurately demarcate shifting maritime zones. Vulnerable communities inhabited on the low level coastal region are likely to force to migrate or retreat due to coastal inundation caused by sea-level rise. It could impact on the regional stability as competition over food and water resources increases. Consequently, point out that the shift of navy from its core role of military functions to more secondary roles of diplomatic, constabulary and other benign roles are stretching already stressed naval assets would increase. He also proposed a series of mitigating measures to address these challenges, including investment in resilient infrastructure, utilisation of advanced technology for early warning systems, fostering international collaboration among countries, and promoting sustainable practices in maritime activities. He stressed the importance of leveraging information technology to equip naval commanders with timely data, enabling proactive assets for securing human lives. In conclusion, Cmde Randhawa emphasised the urgency of integrating climate change considerations into naval planning, development, and operations. He cautioned that the Indian Navy's tasking is already displaying signs of adverse impact due to climate-related events, underscoring the critical need for timely and comprehensive action in this regard.

19. Commodore Dr. Kapil Narula, Senior Analyst for the Breakthrough Agenda, at the UN High Level Climate Champions Team, delivered a presentation on the paramount significance of finance in constructing climate-resilient maritime infrastructure. He structured his presentation into four key segments, providing a comprehensive framework for understanding climate-related financial considerations. He outlined the diverse categories of climate-related risks, opportunities, and impact. He categorised climate risks into two risks. First is the transition risks which are associated with the pace and extent at which organisations manages and adapt to the internal and external pace of climate to reduce greenhouse gas emissions and transition to a lower-carbon economy or renewable energy. Secondly he discussed the physical risks, stemming from climate change impacts like extreme weather events and sea-level rise. He stressed that these risks provide new opportunities for organisations in terms resource efficiency, cost savings, the adoption of low-emission energy sources, the development of new products and services, access to new markets, and building resilience along the supply chain. He then underlined the total value of maritime assets at risk, encompassing trade, ocean resources, coastlines, and more, is estimated at approximately USD24 trillion, compared to the global economy's overall worth of USD 80-90 trillion. Given that 152 out of 196 countries have coastlines, the imperative of climate-resilient infrastructure becomes evident. He pointed out the significance impact of disasters on both national and global GDP, ranging from 1% to 10% and emphasised the importance of climate resilience in preserving both economic and social ecosystems. He underscored the necessity of employing both mitigation and adaptation strategies to mitigate climate change's impact.

He further explained how climate risks transform into financial risks affecting at both macro level and micro level. At micro level, businesses may face property damage and disruptions, while households experience income loss. At the macro level, capital depreciation and increased investment, shift in prices, which result in operational risk like supply chain disruption, banks might need to underwrite the loans taken. Combination of these risks threatens whole economy. He drew attention to the inadequacy of climate finance, with only USD 600 billion allocated during the 2011-2020 period compared to the massive USD 1540 trillion. He pointed out that a majority of the funding, approximately 75-80%, was directed toward mitigation activities, while less than 10% was allocated to adaptation efforts. The majority of this funding arrived in the form of debt rather than grants, increasing the financial liabilities of countries. He highlighted the disparity in funding sources, with the private sector contributing significantly in the global north, while governments in the global south bore the primary responsibility. In the context of India, he pointed out that its climate spending, at 110,000 INR Crores, falls far short of the required 1,100,000 INR Crores. The majority of this funding is domestically sourced and government-led, with a greater emphasis on mitigation rather than adaptation. Private sector investment is increasing, but not at the scale and speed necessary for the transition. Finance towards renewable energy made the most progress, whereas adaptation and resilience finance lags significantly. Therefore, reaching climate objectives will require climate investment to increase at least seven times by the end of this decade as well as alignment of all other financial flows with Paris objective. He delved into the challenges associated with financing climate-related projects, including the absence of climate risk integration into financial decision-making, substantial upfront costs, and risks related to construction period and regulatory hurdles. The current climate and development finance systems fail to accommodate SIDS and other developing countries' unique needs, realities, and vulnerabilities, resulting in fewer funding opportunities. In conclusion, he provided recommendations, including mobilising capital, enhancing oversight, adopting transparent standards, integrating climate risks, reducing risks, incentivizing private finance, and building partnerships to enhance capacity. He emphasised the cost-benefit ratio of investing in climate resilience and the need to incorporate climate considerations into infrastructure planning and financing. His presentation underscored the urgency of comprehensive financial strategies to address climate impacts on maritime infrastructure, offering valuable insights for policymakers and stakeholders in the maritime sector.

SPEAKER PROFILES

(In order of their appearance in the Programme)



Commodore Debesh Lahiri, IN, Executive Director, NMF is an alumnus of the Naval Engineering Course (NEC), Naval Engineering College, INS Shivaji, Lonavala and College of Defence Management (CDM), Secunderabad, Commodore Debesh Lahiri was commissioned into the Indian Navy on 25 Nov 1988. He is a Marine Engineer by profession and has completed his Master's (MTech) from Indian Institute of Technology (IIT), Chennai. He has completed a World Bank programme on Alternate Dispute Resolution-Arbitration, Conciliation and Mediation. He was the

Deputy Naval Attaché at the Embassy of India, Moscow, and has been at the helm of two Naval Ship Repair Yards, at Port Blair and Karwar respectively.

He has a wide experience at sea, having been Engineer Officer on three different types of propulsion, viz. Internal Combustion Engines (Ghorpad), Gas Turbines (Veer) and Steam (Udaygiri, Ganga, Gomati and Beas) and has also been the Fleet Engineer Officer, Western Fleet. He has been Additional General Manager (Quality Assurance and Production) at Naval Dockyard, Mumbai, and is well-versed in Human Resource Management, having been Director of Personnel at Naval Headquarters. As Commodore Dockyards, he was responsible for the creation of marine infrastructure in the Navy. He is a fellow of the Institute of Marine Engineers (FIMarE) and his papers have been published by the American Society of Mechanical Engineers (ASME), Society of Automotive Engineers (SAE), International Naval Engineers Conference (INEC), Indian National IC Engines Conference and the Journal of Marine Engineering. He has also authored service papers on matters of importance to the Indian Navy and has written a dissertation on Comprehensive National Power. His articles and poems on Shipbuilding in Ancient India, Energy, Emissions, Environment, Quality Techniques, Leadership and Personnel Management have been published in Naval Despatch, Personnel Update, among several other magazines and periodicals. He is a keen sportsman, weekend-golfer, avid reader and sometimes poet.



Admiral Karambir Singh, PVSM, AVSM, IN (Retd), Chairman, NMF was the Republic of India's 24th Chief of the Naval Staff (31 May 2019 to 30 November 2021), assumed the chairmanship of the National Maritime Foundation, New Delhi, on 17 January 2022.

An alumnus of the National Defence Academy, Khadakwasla, the Defence Services Staff College, Wellington, and the College of Naval Warfare, Mumbai, the Admiral was commissioned into the Indian Navy in July of 1980. A Naval aviator, he earned his wings in 1981 as a helicopter pilot and has flown extensively on the *Chetak* (Alouette Mk III) and several variants of *Kamov* helicopters. Over the

four decades of service under the Indian Navy's White Ensign, he has commanded the Indian Coast Guard Ship *Chandbibi*, the guided-missile corvette INS *Vijaydurg*, and two of the Indian Navy's frontline guided-missile destroyers, namely, INS Rana and INS Delhi. He has also tenanted the seagoing appointments, including those of Fleet Operations Officer of the Western Fleet. He has served in the Directorate of Naval Air Staff at the Integrated Headquarters of the Ministry of Defence (Navy) and has been Captain (Air) and Officer-in-Charge of the Naval Air Station at Mumbai.

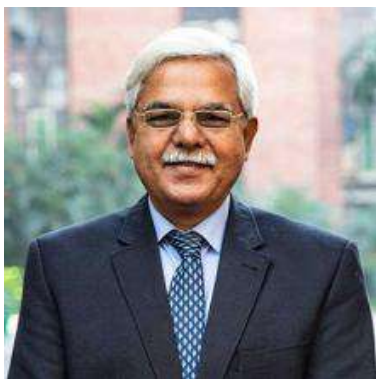
On promotion to the flag rank, the Admiral has served as the Chief of Staff of the Eastern Naval Command. He has also tenanted other critical flag-appointments, including those of Chief of Staff of the Tri-Services Unified Command in the Andaman and Nicobar Islands, and the Flag Officer Commanding Maharashtra and Gujarat Naval Area (FOMAG).

As a Vice-Admiral, he was the Director-General, Project Seabird, and oversaw all aspects of the development of the Indian Navy's expansive and modern base at Karwar in India's southern state of Karnataka. Appointed thereafter as the Deputy Chief of Naval Staff, he discharged his responsibilities towards the Indian Navy's current and future operational and combat capacity and capabilities. He then served as the Vice Chief of Naval Staff, involved with the development of the "future Navy". He has a rich store of senior command experience and has been the Flag Officer Commanding-in-Chief, Eastern Naval Command, with his headquarters at the port-city of Visakhapatnam. He assumed Command of the Indian Navy on 31 May 2019, serving until his retirement from active service on 30 November 2021.



Mr. Jürgen Hardt is a German politician of the Christian Democratic Union (CDU) who has been serving as a Member of the German Parliament since 2009.

From April 2014 until April 2018, Mr. Hardt was appointed by Chancellor Angela Merkel to be the Government's Co-Coordinator of Transatlantic Cooperation. On behalf of German government, Mr. Hardt worked to strengthen Germany's relationship with the United States and Canada. Mr. Hardt is also the Foreign Policy spokesperson of the CDU/CSU Parliamentary Group. Mr. Hardt has been tasked with leading of the "Working Group" of the 32 CDU members and deputy members of the Bundestag's Foreign Affairs Committee. He is also the Deputy on the Committee for Affairs of the European Union and the Defence Committee. In all of these positions, Mr. Hardt seek to help strengthen mutual understanding between Germany and partners worldwide.



Mr Rajani Ranjan Rashmi is engaged with the Resource Efficiency & Governance Division of the Energy and Resources Institute as a Distinguished Fellow. At TERI, Mr Rashmi works on issues relating to climate policy, strategy, carbon markets, and environmental sustainability.

A retired officer of the Indian Administrative Service, Mr Rashmi is an expert on climate change related policies, strategy, actions, and international negotiations. He has been involved with formulation and implementation of public policies of the central and state government in the field of environment, commerce, and finance for over 35 years.

Mr Rashmi has been part of climate change policy making in India in the run-up to and after the Paris Agreement on Climate Change. In the Ministry of Environment, Forest and Climate Change where he held senior positions for several years, he was India's principal negotiator under the UN Framework Convention on Climate Change. As Special Secretary in the Ministry, he guided work and policy relating to national and state level climate action plans, pollution, environmental clearances, and Green India Mission.

In 2018-19, Mr Rashmi served on the Sub Committee of the Ministry of Finance on Climate Finance. He is a member of the Technical Advisory Body of the International Civil Aviation Organisation for administering CORSIA since 2019, and a member of the Core Committee on Environment set up by the NHRC since 2022. He is associated, in advisory capacity, with several other organisations such as the NAFCONS, the Consultancy wing of the NABARD on international climate business and the Network for Certification and Conservation of Forests (NCCF).

In 2008, he was awarded the Prime Minister's Award for Excellence in Public Administration for his contribution to management of finances in the state of Manipur. An alumnus of Patna University, Mr Rashmi is also a management graduate from the Free University (Vriet Universitiet) of Brussels.



Vice Admiral Pradeep Chauhan, AVSM & BAR, VSN, IN (Retd), Director-General, National Maritime Foundation, New Delhi. An alumnus of the National Defence Academy, the Defence Services Staff College, the Naval War College, and the National Defence College, with BSc, MSc and MPhil degrees under his belt, Vice Admiral Pradeep Chauhan, AVSM & Bar, VSM, is currently the Director-General of the National Maritime Foundation, New Delhi, which is India's foremost resource centre for the development and advocacy of strategies for the promotion and protection of India's maritime interests.

The admiral retired on 30 November 2013 after an illustrious, rich, and varied four-decade-long career in the Executive Branch of the Indian Navy, in the course of which he has been publicly commended three times by the Hon'ble President of India. Not one to rest on past laurels, he has remained active even after retirement and is a much sought-after thought-leader and leadership

mentor. Apart from being on the visiting faculty of the higher-command establishments of all three of India's defence services, as also tri-Service establishments such as the College of Defence Management, Hyderabad and the National Defence College, New Delhi, he has also been advising the government through his interaction with the Integrated Headquarters of the Ministry of Defence (Navy), the Ministry of External Affairs, and the National Security Council Secretariat. He is, in addition, a prolific writer with over **95** published professional articles and papers, and, a respected Adviser and Fellow of several important think-tanks.



Dr Chime Youdon is a Research Fellow, and the Head of the Blue Economy and Climate Change Cluster at the National Maritime Foundation in New Delhi, India. She was the recipient of the Coalition for Disaster Resilient Infrastructure (CDRI) Fellowship (2021–2022). She was also a VAdm KK Nayyar Fellow. Her research areas of interest include global climate change politics, climate resilience and adaptation of critical maritime infrastructure, nature-based solutions, blue economy, and sustainable development of coastal urban agglomerations. She has earned her doctorate degree in Comparative Global Climate Change Policies from the School of International Studies, Jawaharlal Nehru University, New Delhi. She is also the author of Monograph titled “*Rising Seas and Coastal Impacts: Metropolitan Resilient of India*”, 2023.



Admiral Sunil Lanba PVSM, AVSM, IN (Retd), former Chief of the Naval Staff, Indian Navy and former Chairman of the NMF.

An alumnus of the National Defence Academy, Khadakwasla, the Defence Services Staff College, Wellington, the College of Defence Management, Secunderabad, and, the Royal College of Defence Studies, London, Admiral Sunil Lanba assumed command of the Indian Navy, as the 23rd Chief of the Naval Staff, on 31 May 16. He was appointed Chairman, Chiefs of Staff Committee on 31 December 2016.

Admiral Lanba is a specialist in Navigation and Aircraft Direction and has served as the navigation and operations officer aboard several ships in both the Eastern and Western Fleets of the Indian Navy. He has nearly four decades of naval experience, which includes tenures at sea and ashore, the latter in various headquarters, operational and training establishments, as also tri-Service institutions. His sea tenures include the command of INS *Kakinada*, a specialised Mine Countermeasures Vessel, INS *Himgiri*, an indigenous *Leander* Class Frigate, INS *Ramvijay*, a *Kashin* Class Destroyer, and, INS *Mumbai*, an indigenous Delhi Class Destroyer. He has also been the Executive Officer of the aircraft carrier, INS *Viraat* and the Fleet Operations Officer of the Western Fleet. With multiple tenures on the training staff of India's premier training establishments, Admiral Lanba has been deeply engaged with professional training, the shaping of India's future leadership, and, the skilling of the officers of the Indian Armed Forces.

On elevation to Flag rank, Admiral Lanba tenanted several significant assignments in the Navy. As the Chief of Staff of the Southern Naval Command, he was responsible for the transformation of the training methodology for the future Indian Navy. The Admiral was thereafter appointed Flag Officer Sea Training and ushered a whole slew of measures to greatly enhance the battle effectiveness of Indian warships, and rationalised their combat manning. Later, as the Flag Officer Commanding Maharashtra and Gujarat Naval Area, he implemented significant coastal security initiatives and multiagency coordination mechanisms, which have since ensured safe seas and secure coasts along India's western seaboard.

As a Vice Admiral, he has been the Chief of Staff of the Eastern Naval Command, and, thereafter, took over as the Commandant of the prestigious National Defence College, New Delhi. Upon his appointment as the Vice Chief of the Naval Staff, the Admiral streamlined the framework for transformation of the Navy's combat capabilities and infrastructure development. The several tri-Service initiatives that he launched have made a lasting contribution towards integration and jointness.

Prior to assuming command of the Indian Navy as the Chief of the Naval Staff, Admiral Lanba had been the Flag Officer Commanding-in-Chief of both, the Southern Naval Command, and thereafter, the Western Naval Command. Rising manfully to the challenges inherent in these apex-level appointments, he provided the required impetus to training and skill-development, synergising combat operations, coastal security and safety, and infrastructure development all along India's western seaboard, including the Lakshadweep Islands

For his exceptional services to the nation, the President of the Republic of India has first awarded Admiral Lanba the *Ati Vishist Seva* Medal and then the *Param Vishist Seva* Medal. He is also the Honorary Aide-de-Camp to the President. He also served as the Chairman of National Maritime Foundation, New Delhi from 07 June 2019.



Dr Mona Chhabra Anand is a Director at the Research and Knowledge Management (RKM) wing of the Coalition for Disaster Resilient Infrastructure (CDRI), New Delhi.

Prior to joining the CDRI, Dr Anand served as the Country Programme Lead in India for Asian Disaster Preparedness Center (ADPC). As part of several working groups of the Government of India, Mona has been extensively involved in strengthening institutional capacities for disaster preparedness, response and recovery that have resulted in progressive policy initiatives for safe and sustainable development. She has also worked with UNICEF, UNDP, IIT Delhi and civil society on developing process innovations in this direction. Trained as an architect and development planner, Dr Mona Chhabra has been involved in policy development and the practice of safe and sustainable habitat development in south Asia. Through this process, Mona has leveraged research and knowledge-based initiatives to inform policy decisions mainly within South Asia. She holds a PhD in Disaster resilience from the Indian Institute of Technology, Delhi.



Dr Sisir Kumar Dash, Scientist-F, National Centre for Coastal Research (NCCR), Ministry of Earth Sciences, Government of India.

EDUCATIONAL QUALIFICATIONS

•Ph.D. (Image & Information Sciences) – Mar, 2006 – “Two-direction method on atmospheric correction in ocean color algorithm: Direct estimation of surface reflectance and aerosol optical thickness.” - Graduate School of Science & Technology, Chiba University, JAPAN.

Post Graduate Diploma in Computer Science – 1996-1997 – C, C++, ORACLE 8.0, Unix etc. – Lakhotia Computer Center. M.Phil. (Oceanography) – Jul 1996 – Chemical Oceanography – Berhampur University, Berhampur, Odisha, INDIA M.Sc. (Oceanography) – Nov 1994 – Chemical Oceanography – Berhampur University, Berhampur, Odisha, INDIA

EXPERIENCE

- Started Career as Project Scientist in MARSIS Project under Dept of Ocean Development for “Identification of Potential Fishing Zone along Indian Coast” during 1998-1999. Subsequently, Joined as Junior research Fellow and Senior Research Fellow under IGBP programme to estimate primary productivity over Bay of Bengal during 1999-2002
- Awarded Monbukagakusho fellowship from Govt. of Japan in 2002.
- Worked as Research Student at Centre for Remote Sensing, Chiba University in 2003
- Completed Ph.D in Chiba University in 2006.
- Worked as Assistant professor at Yamaguchi University for two years from 2006-2008.
- Worked as Programme Manager at iWave Japan Inc upto 2009.
- Joined as Scientist-C in Ministry of Earth Sciences, Govt of India in 2009.
- Currently served as Scientist-F at National Centre for Coastal Research (NCCR), Ministry of Earth Sciences.

Achievement

- Significant achievement made in developing Integrated Flood Warning System for Chennai and Mumbai.
- Developed DRR related tools and techniques.
- Developed Marine Spatial Planning for Puducherry and UT Lakshadweep incorporating Shoreline studies.
- Conducted 50+ training programmes.
- Awarded Certificate of Merit for his outstanding contribution in the field of Ocean Science in the year 2015.
- Published 30+ publications in National and International Journals



Mr John J Vachaparambil is an Associate Fellow at the National Maritime Foundation (NMF), New Delhi. His research work focuses on the legal aspects of IUU fishing, and the conservation of the marine biological diversity beyond areas of national jurisdiction (BBNJ). His interest cut across protection and conservation of the marine environment and marine living resources, conservation of the polar aquatic ecosystems and biodiversity, and the sustainable use of marine living resources (SDG 14).

John has a Master's degree in Infrastructure and Business Law from the Teri School of Advanced Studies (TERI SAS), New Delhi. He is an alumnus of the School of Law, Christ University, Bangalore. He also successfully completed a certificate course on Oceans Law and Policy from Gujarat Maritime University (GMU).



Anasua Basu Ray Chaudhury, Ph.D in International Relations, is Senior Fellow with the Neighbourhood Initiative, Observer Research Foundation, Kolkata chapter. She is the Editor, ORF Bangla. She specialises in regional and sub-regional cooperation in South Asia, the Bay of Bengal region and the Indo-Pacific, energy politics, forced migration and women in conflict zones. She was the coordinator of the research project entitled “Proximity to Connectivity”. (see <https://www.orfonline.org/people-expert/anasua-basu-ray-chaudhury/>). She is also the recipient of the Public Service Broadcasting Trust Senior Media Fellowship (2007) and the Kodikara Award from the Regional Centre for

Strategic Studies, Colombo (1998–99). Her recent publications include *Caste and Partition in Bengal: The story of Dalit refugees, 1946-61* (OUP, UK, 2022); *BIMSTEC: Mapping Sub-regionalism in Asia* (Co-edited Routledge:UK, 2022); *New futures of BIMSTEC: connectivity, commerce and security* (co-edited Routledge: UK, 2021), *Reimagining BIMSTEC: Strengthening regional solidarity across the Bay of Bengal region* (Co-edited/ ORF, New Delhi, 2021); *India–Myanmar Borderlands: Ethnicity, Security and Connectivity* (co-edited/ Routledge, UK, 2020); *Connecting Nations: India and Southeast Asia* (coedited/ Primus, New Delhi, 2019).



Cmde Abhinav Barve, Commodore (NOM) was commissioned into the Indian Navy on 21 Feb 1992. An Electrical Engineer from Shivaji University, Kolhapur, he holds a Post Graduate degree in Defence Studies from the Defence Services Staff College, Wellington as well as a Masters in Management Studies from the College of Defence Management, Secunderabad. He has been commended by the Flag Officer Commanding-in-Chief (Western Naval Command) in 1997 and the Chief of the Naval Staff in 2005.

Comde Barve has assumed duties of Commodore (Naval Oceanology & Meteorology) on 20 Jan 23. Prior to his present appointment, he has held diversified and prestigious stints spanning over 32 years which include Instructor tenure at INS Valsura & INS Mandovi, Command Met Officer & Public Relations Officer at Headquarters Andaman & Nicobar Command, as well as HQWNC, NA to Flag Officer Commander-in-Chief (West), Systems Manager to CNS, Directing Staff at College of Defence Management, Secunderabad, Head of Faculty (BS&H) and Registrar at the Indian Naval Academy, Ezhimala.

The officer is an avid sports lover and plays cricket, badminton and Golf. He also loves music, reading books and solving crosswords. He is married to Mrs. Rupali and the couple are blessed with two children Ria and Akshaj. Ria has completed her Bachelor's Degree in Industrial Design and Akshaj has completed his graduation in Business Analytics.



Commandant Ravindra Kumar Shrivastava, ICG, Research Fellow, NMF is a serving officer who joined the Indian Coast Guard(ICG) in January 1994. He is an Air Cushion Vehicle (ACV or Hovercraft) Pilot, an environmentalist and a specialist in oil spill pollution response. He has commanded a Coast Guard Station and an ACV Squadron with various other operational ship & staff appointments. Presently, he is appointed as a Researcher at the National Maritime Foundation in New Delhi India.

The officer has successfully executed numerous SAR, Pollution Response, Anti-Smuggling and Anti-Poaching Operations in active coordination with Navy, Police, Intelligence Agencies, Customs & Forest officials. He has been actively involved in planning & execution of Joint Services Coastal Security Exercises, National Level SAR Exercises and National Level Pollution Response Exercises. He has overseen Oil Spill Contingency Planning of multiple Oil Handling Agencies (OHAs)/ Ports and conducted a number of Table Top Exercises and Joint Drills at Sea.

He has organised several Community Interaction Programs (CIPs) for Fishermen/Coastal Populace significantly addressing issues of safety & security at sea. He has actively participated in planning & execution of mass mobilization of the coastal population during cyclones/ floods. He has handled and managed various cases pertaining to abandoned derelict vessels in the Territorial Waters of India.

The Officer has been a member of: –

- Overview Committee of Vessel Traffic Service (VTS) Gulf of Kutch (GoK), Gujarat, India.
- Disasters Management Committee of Navi Mumbai, Maharashtra, India.
- Port Security Advisory Committee(PSAC) at Deendayal Port Authority Kandla, Gujarat, India.
- PSAC Jawaharlal Nehru Port Authority Navi Mumbai, Maharashtra, India.

He has been closely associated with Coastal Surveillance Network (CSN) sensors installations on the coastline of India. He has been participating in various governmental committees for strategic/

policy deliberations on issues pertaining to Marine Policing, Marine Environment/ Pollution Response, Wildlife Trafficking, Marine Protected Areas, Fishers Safety & Security, Anti-Smuggling & Narcotics, Maritime Terrorism, Maritime Borders and Anti-Poaching etc. from time to time. He is a Science graduate with post-graduation degrees in Sociology & Environmental Management. His research areas of interest include, EEZ Surveillance, transnational maritime crimes and maritime environment.



Mr Franz Xaver Maurer is a speaker on EU issues and human rights in the CDU/CSU parliamentary group. Since 2011, Mr. Maurer was working as the Embassy Secretary at the Federal Foreign Office in Berlin. He was appointed as the Chairman of the Association of German Officials Abroad at the Federal Foreign Office and also served as the Advisor for relations with Jordan, the Arab League, Hungary, Austria and the national action plans for Central Europe.

In 2020, Mr. Maurer shifted from the Federal Foreign Office to CDU/CSU parliamentary group as the Europe and Human Rights Coordinator. He currently works as a Senior Foreign Policy

Adviser at CDU/CSU parliamentary group in the German Bundestag.

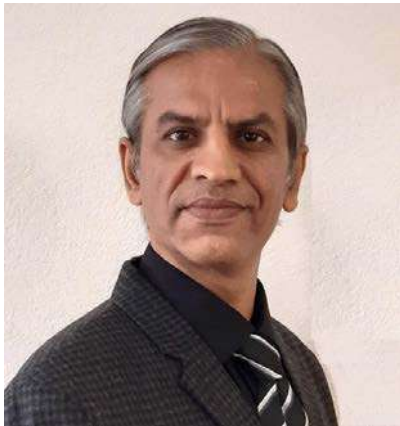


Cmde Sundeep Singh Randhawa, Cmde (Naval Operations), is an alumnus of the Indian Naval Academy and was commissioned into the Indian Navy on 01 Jul 1996. He is currently tenanted the appointment of Cmde (Naval Operations) at Naval Headquarters, Delhi.

A qualified Ship's Diver and a specialist in Navigation and aircraft direction, his tenures of duty at sea have included minesweeper *INS Bhavnagar*, missile corvette *INS Kirch*, aircraft carrier *INS Vikramaditya* and P15 destroyer *INS Delhi*. His Command tenures have included the Dvora class Fast Attack Craft INFAC 80, missile vessel *INS Nashak* and indigenous Kolkata class destroyer *INS Chennai*. He has the distinction of being the commissioning Executive Officer of the aircraft carrier *INS Vikramaditya* and was among the first set of serving officers chosen to tenant Director-level posts at the newly created Department of Military Affairs at the Ministry of Defence. His appointments ashore have included Flag Lieutenant to the Chief of Naval Staff, Staff Officer (Navigation and Direction) at Headquarters, Flag Officer Sea Training, Command Plans Officer at Headquarters,

Western Naval Command Directing Staff at Naval War College, Goa and Officer-in-Charge Navigation and Direction School, Kochi.

The officer holds an MPhil in Defence and Strategic Studies from University of Mumbai and a Masters in Defence Studies from Kings College, London. He has undergone the Advanced Command and Staff Course at Joint Services Command and Staff College, Shrivenham (UK) in 2008-09 and the Naval Command Course at US Naval War College, Newport, Rhode Island in 2016-17. He has been a recipient of Commendations from the Chief of the Naval Staff and the FOC-in-C, Southern Naval Command.



Cdr (Dr) Kapil Narula is Senior Analyst, Break Through Agenda at the UN High Level Climate Champions Team and has over two decades of versatile work experience in international organisations, government, think tank and universities. He works on clean energy transition, climate change and maritime sustainability. He is the author/editor of seven books and more than 100 articles/papers. He has earlier worked as Economic Affairs Officer at the United Nations, Advisor (Energy) at NITI Aayog, lecturer at the University of Geneva and an officer in the Indian Navy. He is an Honorary

Adjunct Fellow at the National Maritime Foundation and is on the International Board of Advisors for a think tank. He holds an interdisciplinary PhD degree in economics, master's degree in engineering and has a certification in sustainability and climate risk.



Ms Alicia Pommer is currently working as a Research Officer at the India Office of the Konrad Adenauer Stiftung (KAS). Ms. Pommer, a former scholarship holder of KAS, holds a Master's degree in Political Science from the University of Bonn, Germany in which her areas of focus comprised Global Power Shifts, Soft Power, Indian Politics and Global South Perspectives in International Relations. Besides her studies, she worked for more than two years with the Bonn-based NGO, Andheri Hilfe e.V., which supports about 80 projects that aim to strengthen the social and economic development in India and Bangladesh in line with the Agenda 2030. Ms. Pommer has also served as a chairwoman of the Young European Federalists Bonn and Hannover, a political youth NGO advocating for the creation of a democratic European federation as a guarantee for peace, the rule of law and human rights for more than four years.

ABOUT THE ORGANISERS

National Maritime Foundation (NMF)

Located in India's capital, New Delhi, the National Maritime Foundation (NMF) is one of India's premier think-tanks and the only one in India that is focused entirely upon the maritime domain and is the foremost resource-centre for the development of strategies for the preservation, promotion, pursuit, and protection of India's maritime interests. The NMF is a 'Track 1.5' institution, with a healthy mix of highly-qualified and experienced uniformed and civilian scholars, who conduct research on a wide range of important strategic, economic, socio-economic, socio-cultural, environmental, scientific, legal, and historical issues in the maritime domain. For more information, visit <https://maritimeindia.org/>. Follow us on Twitter, LinkedIn, and Facebook for regular updates about our events and activities.

Konrad-Adenauer-Stiftung (KAS)

The Konrad Adenauer Stiftung (KAS) is a political foundation. Established in 1955 as "Society for Christian-Democratic Civic Education", in 1964 the Foundation proudly took on the name of Konrad Adenauer, the first Chancellor of the Federal Republic of Germany. With 16 regional offices in Germany and over 120 offices abroad, the Konrad Adenauer Foundation is committed to achieving and maintaining peace, freedom, and justice through political education. We promote and preserve free democracy, a social market economy, and the development and consolidation of the value consensus. We focus on consolidating democracy, the unification of Europe, and the strengthening of transatlantic relations, as well as on development cooperation.

The leitmotif of the Konrad Adenauer Foundation Germany. The next chapter is supported by a thematic focus. With the three main topics Innovation, Security and Representation, and Participation, it is quite clear which topics the Konrad Adenauer Foundation will focus on in the coming years.

We cooperate with governmental institutions, political parties, and civil society organizations, building strong partnerships along the way. In particular, we seek to intensify political cooperation in the area of development cooperation on the foundations of our objectives and values. Together with our partners, we make a significant contribution to the creation of a global order that empowers every country to determine its own developmental priorities and destiny in an internationally responsible manner.

The Konrad Adenauer Stiftung has organized its program priorities in India into five working areas:

1. Foreign and Security Policy
2. Economic, Climate, and Energy Policy
3. Rule of Law
4. Political Dialogue focused on Social and Political Change
5. Media and Youth

The India Office of the Konrad Adenauer Foundation takes great pride in its cooperation with Indian partner institutions that implement jointly curated projects and programs.