

**VICE ADMIRAL KK NAYYAR FELLOWSHIP NATIONAL-LEVEL  
CONFERENCE-2023**

**Theme: India's Coastal Resilience Vis-à-Vis Urban Agglomerations**

**SCOPE CONVENTION CENTRE AUDITORIUM, LODHI ROAD, NEW DELHI  
22 & 23 FEBRUARY 2023**

**Overview and Background**

1. The “Vice Admiral KK Nayyar Fellowship” was established in May 2020 at the NMF, by the family of the late Admiral Kewal Krishan Nayyar, PVSM, AVSM, IN (26 December 1929- 18 September 2018). This fellowship was created to honour the multitudinous achievement of Admiral KK Nayyar, who served as the founding chairman of the National Maritime Foundation and was a veritable colossus within the maritime domain. Each research-project under the “Vice Admiral KK Nayyar Fellowship” aims to conduct research projects that generate meaningful and **policy-relevant recommendations** for the government, as also to other stakeholders. It serves as a platform to promote and support intellectual and policy-relevant research on subjects of maritime consequence to India and, in so doing, commemorates the life and achievements of this evangelist of Indian maritime thinking.
2. The inaugural research project of the fellowship has addressed the issue of India's Coastal Resilience with particular reference to its urban agglomerations such as the megapolis that is Mumbai, but no less to other coastal mega cities such as Chennai, Visakhapatnam, and Kolkata. Dr Chime Youdon, Associate Fellow, NMF, and Dr Saurabh Thakur, now Consultant, UNODC, were the first Fellows of this fellowship and have undertaken a major research project of great contemporary and future relevance, entitled “Rising Seas and Coastal Impacts: Metropolitan Resilience in India”. The monograph, which was the result of that project, addressed the resilience of Indian interests and infrastructure in and off India's coastal stretches in general and in its major coastal cities in particular, in the face of the adverse maritime impacts of climate change. The monograph offers eloquent testimony to the late admiral's vision of nurturing an intellectually effervescent maritime India.
3. The Vice Admiral KK Nayyar Conference (KKNFC-23) which was held on 22 and 23 February 2023 was the culmination of the inaugural project undertaken at the NMF under the aegis of the Vice Admiral KK Nayyar Fellowship. The two-day conference addressed the issue of climate resilience of India's coastal urban agglomerations in the face of the adverse maritime impacts of climate change. It engaged government officials, academia, DRR experts, civil society and the private sector to better understand the different approaches towards the resilience of India coastal cities and identified best practices in coastal urban planning and

policymaking across Indian coastal regions. The Concept Note of the conference is given in **Appendix A** of this report, while the detailed programme of the conference is given in **Appendix B** of this report.

4. The **conceptual overarch** as provided at the beginning of the conference is enumerated below:
  - Security challenges arising from the sea or through the sea not only includes traditional threats arising from state and non-state actors, but also includes threats to India's economical and societal well-being arising from climate change.
  - The groundwork for building coastal resilience should include – Space and Time. Coastal resilience should be dealt with keeping both location and time frame into consideration.
  - The degradation of coastal ecosystems is led by human induced climate change. The anthropogenic activities have accelerated sea-level rise and the subsequent coastal erosion.
  - Sea-level rise requires immediate attention. It will continue to rise for the next 70-100 years. This requires a concentrated effort towards building an optimal coastal resilience.
  - 'Resilience' from an ecological point refers to the ability of a system to absorb disturbances/shocks and persist while maintaining equilibrium in the long run.
5. Broadly, The K.K Nayyar Fellowship Conference 2023, endeavoured to explore multi-dimensional ways to enhance coastal resilience. Various contemporary threats to the coastal environment of India were discussed under three broad themes and strategies to counter them were laid down.

### **Theme 1: India's Coastal Resilience: Challenges**

India's coastal resilience faces several challenges that hinder its ability to effectively prepare for and respond to natural disasters and other threats. The panel consisting of climate experts, focused on discussing and addressing the challenges related to climate change, weak infrastructure, socio-economic vulnerabilities, inadequate data to monitor climate risks, and policy and institutional gaps. The panel's efforts were aimed at building the resilience of vulnerable communities and ecosystems to the impacts of natural disasters and climate change and ensuring a more sustainable and secure future for coastal areas.

### **Theme 2: Analysing India's Current Policy Framework**

The session focused on analysing India's current policy framework towards building coastal resilience and identifying gaps and opportunities for improvement. Through their analysis and discussions, the panel aimed to provide recommendations for enhancing India's policy and institutional framework towards building coastal resilience. Overall, the panel's efforts were aimed at enhancing India's capacity for disaster preparedness, mitigation, and adaptation, and building a more resilient and secure future for the coastal communities and ecosystems.

### **Theme 3: Building Coastal Resilience: The Way Ahead**

The session focused on discussing the way ahead for building India's coastal resilience in the face of increasing climate risks and natural disasters. The panel aimed to provide recommendations for

enhancing India's capacity for building coastal resilience. The panel's recommendations are expected to inform policy and programmatic interventions towards building coastal resilience in India.

## Summary of Key Takeaways

- (a) The Indian coast has undergone irreversible transformations due to human intervention, affecting its ecological, geological, hydrographic, and political ecosystems. These changes have disrupted the natural balance and functioning of coastal environments, impacting flora, fauna, and overall biodiversity.
- (b) Climate change has both material and human dimensions, extending beyond environmental consequences to economic and social spheres. The economic losses resulting from climate disasters can be substantial, representing a significant percentage of affected countries' GDP.
- (c) The case of Cyclone *Amphan* in Odisha demonstrated the severe consequences of inadequate resilience, leading to loss of lives, property, and infrastructure. The impacts encompass various dimensions, including human, political, economic, and ecological aspects.
- (d) Coastal regions in South Asia and South-East Asia are particularly vulnerable to the risks associated with climate change. These risks include extreme cyclones, excessive precipitation leading to flooding, and rising sea levels.
- (e) India heavily relies on maritime trade, with the majority of merchandise transported by sea through major and non-major ports. The significance of the maritime trade and transport sector is evident from the volume of cargo handled by Indian ports. The risks faced by ports arise from their dependence on functional infrastructure and personnel for optimal operational efficiency. While port authorities acknowledge climate change risks, policy and regulatory gaps hinder effective addressing of these challenges. Comprehensive policies and regulations are necessary to enhance port resilience.
- (f) Climate change challenges are interconnected and transboundary, necessitating a comprehensive understanding of the entire system. Recognising interdependencies within systems is crucial for resilience-building, as they can serve as breakpoints or sources of strength. Addressing these interconnections enables the development of effective strategies for climate change mitigation and resilience enhancement.
- (g) Enhancing multi-hazard risk assessment and mapping capabilities is essential for ensuring coastal resilience in port cities. Shifting from risk management to risk adaptation and resilience, while understanding interdependencies as breakpoints and strengths, facilitates the development of multifaceted resilience strategies.
- (h) Comprehensive research tailored to Indian conditions is crucial for developing strategies that address the challenges posed by climate change and promote resilient infrastructure along the Indian coastline.

- (i) Climate justice should be integrated into policies and programs, emphasizing the need for coastal communities to lead and support community-driven initiatives to foster synergy and cooperation.
- (j) Prioritising and promoting sustainable marine ecosystems require a balance between the three pillars of sustainability: people, planet, and profit. Policies should ensure the well-being of human communities and the environment while supporting economic benefits, fostering the preservation of marine ecosystems for future generations. “*Sustainable Marine Ecosystems – People, Planet, Profit towards Policies*”.
- (k) The key takeaway from the thematic discussion is the imperative shift from a response-focused mind-set to resilience thinking. Proactive thinking and resilient strategies are essential for effectively addressing the challenges of climate change. “*We are still thinking response; we need to start thinking resilience*”.
- (l) Embracing a collaborative and adaptive approach to coastal resilience, coexisting harmoniously with the sea, is more effective than combating or controlling it. Understanding and respecting the dynamic nature of the coastal environment allows for sustainable strategies that promote resilience and the long-term well-being of coastal communities and ecosystems. “*living with the sea rather than fighting against it*”.

## POLICY RECOMMENDATIONS

1. **Policy Inputs and Recommendations emerging from the discussions on “India’s Coastal Resilience Vis-à-Vis Urban Agglomerations” are enumerated, in the succeeding paragraphs.**
  1. As India strives for economic growth and the realisation of its vision of becoming a leading “Blue Economy”, there is a need to enhance the resilience of the coastal cities to the climate change impact. A proactive/anticipatory approach is required to address the challenges posed by climate change to the coastal areas and critical maritime infrastructures.
  2. India also need consistent efforts to efficiently exploit blue economic resources. *In this regard, the NMF and International Seabed Authority have signed a letter of Cooperation and are discussing potential projects to explore potential environmental impacts of deep seabed activities and associated management measures in the Central Indian Ocean Basin (CIOB) and manage the risk of interferences between submarine cables and deep seabed activities. Joint capacity-building programmes and activities on deep-sea related matters including legal and policy formulation, exploration, environmental management planning, technology etc. are also being developed.*
  3. The estimated investments in infrastructure, such as energy, transportation, water, and communication networks, between 2016 and 2030, will add up to about USD 95 trillion, or USD 6.3 trillion each year, if concerns about climate change are not considered. Among the necessary investments, transportation makes up 43%, or USD 41 trillion, with the majority of the demand concentrated in developing areas, especially countries like India. Ecosystem-based approach or Hybrid (grey-blue) solution can help Indian coastal cities to bridge the infrastructure investment gap in a cost-effective manner while generating sustainable social, economic and environmental co-benefits. EbA is critical and it has the potential to tackle both climate change adaptation and mitigation challenges.
  4. In terms of coastal risks as a whole, problems at seaports caused by climate risk can spread to other networks that are connected to them. Systemic failures are caused by the way that individual events tend to set off chains of other failures. As global supply chains and trade networks become more interconnected and extreme weather events related to climate change become more frequent, port networks must evaluate systemic risks. Any adaptation strategy must be developed in close coordination with the city authorities and other relevant stakeholders to avoid maladaptation. *The National Maritime Foundation, in partnership with the Coalition for Disaster-Resilient Infrastructure (CDRI) and India-Japan Laboratory in Keio University in Japan, are developing a risk-based forced-decision matrix that evaluates and addresses not only port operations but also wider systemic risk in port cities throughout the Indo-Pacific, including those in India.*
  5. The extent and severity of the shoreline changes are worsening with increasing climate-induced and extreme weather events such as tropical cyclones, severe precipitation, flooding, high waves, and sea level rise. Telecommunications services are negatively

impacted by coastal and riverine erosion as well as salinity intrusion, which affects above-ground transmission infrastructure like cables, towers, masts, antennae, and switch boxes. *In order to assist the policymakers in identifying the potential causes of shoreline change and mapping critical assets that are susceptible to shoreline changes, the National Maritime Foundation has been designing a risk matrix framework for coastal erosion. It is also attempting to introduce local/ ecosystem-based adaptation approaches like coconut coir or bundle to reduce coastal erosion.*

6. The role of India's maritime security agencies, particularly the Indian Navy and the Indian Coast Guard, will be of utmost significance in the face of the growing security challenges brought on by the accelerating climate change. In times of emergencies and humanitarian crises, the Indian Navy and Coast Guard are the first responders. However, it is critical to understand that the Indian Navy and Coast Guard are also susceptible to the effects of sea level rise. Most of the bases, headquarters, and hospitals of the Indian Navy and Indian Coast Guard are in high-risk areas along the coasts of Mumbai, Goa, Karwar, Kochi, Chennai, Visakhapatnam, and Kolkata, as well as on islands in the Lakshadweep and A&N chains. Any damage to critical infrastructure or support facilities, such as power and communication lines, will seriously impair the ability of the Indian Navy and the Indian Coast Guard to provide prompt and effective assistance. It is critical to enhance resilience of critical maritime and naval infrastructure and operations to sea level rise or extreme weather events. It is essential to conduct a climate risk assessment and include future climate risk in the current code of practise for planning and designing ports and harbours (IS 4651) and the current code of practise for designing and constructing ports and harbour structures (IS 9527). *The Indian Navy and the Ministry of Port, Shipping, and Waterways can support and assist organisations like NMF in conducting a critical and urgent risk assessment of vital maritime and navy infrastructure throughout the India Naval Base in order to suggest viable adaptation strategies. The NMF has already developed a Framework to assess climate change risk-to and resilience-of India's Seaport Infrastructure and Operations as a part of CDRI Fellowship.*
7. Marine litter is not only a growing global health concern; it also poses a safety and operational risk to the shipping industry, the tourism industry, and the fishing industry. Numerous studies in India have revealed the presence of macro- and micro-plastics in rivers and coastal areas has been endangering the health of birds, fish, and other marine life like turtles and coral reefs. *There must be initiatives to upgrade the current infrastructure. In this effort, the NMF with the active support of the Ministry of Earth Sciences, plans to organise a Marithon—a hackathon to address marine-related problems—to invite young, motivated, and bright minds from India to identify, support, and promote technological and socially innovative solutions to address marine pollution and other issues relating to the marine ecosystem in India. This is being done with the active support of the Ministry of Earth Sciences. It requires support from different maritime sectors of the government and educational institutions across the coastal states of India.*
8. Climate change adaptation Indian coastal cities face multiple barriers, including: insufficient technical capacity and a limited information base for the analysis of climate risks; a low level of application of cutting-edge technologies in the planning and implementation of climate-smart ecosystem rehabilitation and management measures; and limited institutional and community awareness and knowledge of climate risks and

adaptation measures. In this regard, it is paramount to mainstream community participation in order to engage with local communities, raise awareness about coastal hazards, and encourage community-based planning and decision-making. The benefits of community-based planning and decision-making include increased ownership and accountability, improved sustainability, greater social inclusion and equity, and enhanced effectiveness and efficiency. Because they are developed with a long-term perspective and take into account the needs and perspectives of the local community, solutions developed through a bottom-up approach with community participation are frequently more sustainable. *Apart from that, introducing or incorporating a manual on adaptation to climate change into the school curriculum and college programme would raise awareness and improve community involvement. In this regard, NMF has taken the lead in educating college students by introducing a three- to six-month internship with a rigorous teaching curriculum covering topics such as blue economy, climate change impact on coastal communities, climate adaptation strategies, and so on.*

9. A better understanding of the environment, not as an external enemy force but rather as a diverse, inclusive nature that includes people, a nature that has the potential to provide citizens of all countries with secure access to basic nutrition, adequate access to health, appropriate shelter, and the security to practise a diverse range of livelihoods. By enabling availability, accessibility, and affordability and placing the six I's—integration, involvement, inclusiveness, interventions, investments, and innovations—at the core of the coastal climate adaptation strategy to improve resilience is critical.
10. Currently, managing risk due to a lack of actionable data is challenging. Even though disasters cannot be prevented, nations and the region would benefit from mitigation strategies that involve sharing data and working together. Additional work is required to systematically collect, manage, and make available to India and its neighbouring small islands developing states with pertinent scientific data and information on natural hazard vulnerability, climate, and disaster risk. This will facilitate evidence-based risk management and adaptation. This can be achieved by making the local “information network” stronger. This will help in making well-informed decisions for the construction of resilient infrastructure, embankments, and green belts in the region's vulnerable States. *Existing institutions and organisations, such as IONS, IOC, IORA, can also be utilised to support this process through the NMF and its partner institutions for resource pooling, planning, and readiness.*
11. Climate change research is an interdisciplinary field, and to understand its social, political, and environmental effects, researchers from different fields need to work together and use different tools to solve the same problems. One of the many benefits of interdisciplinary approaches is that they make it easier for different fields that work together to talk to each other. This fills in knowledge gaps and makes it easier to move forward in each field and in the field of climate change research as a whole. *In this regard, the NMF has been in discussion with the Ministry of Earth Sciences to carry out a study on the theme “Solutions to the Climate Change impact on Shoreline Change in India” adopting multidisciplinary approaches, including social science, physical and Civil Society Organisations.*

## Conclusion

In conclusion, coastal resilience is of paramount importance in India due to the country's vast coastline, which is home to a large population and supports a significant portion of the economy. With the looming threats of climate change, sea-level rise, and extreme weather events, it is crucial to prioritize measures that build the resilience of the coastal communities and ecosystems. Investing in infrastructure and technology, promoting sustainable coastal management practices, and strengthening disaster preparedness are some of the key steps that can enhance the resilience of India's coasts. By doing so, we can safeguard the livelihoods, security, and well-being of the coastal communities while preserving the natural resources that sustain them. Therefore, it is imperative for India to adopt a proactive and holistic approach to coastal resilience that balances economic growth with ecological sustainability and social equity.

Technology plays a critical role in enhancing coastal resilience by enabling better monitoring, prediction, and response to the various hazards and stresses that affect coastal areas. With the increasing frequency and severity of natural disasters and climate change impacts, technology-based solutions offer a potent tool for improving the resilience of coastal communities and ecosystems. From early warning systems to remote sensing and mapping tools, from eco-friendly coastal engineering to smart infrastructure and renewable energy, technology can provide a range of innovative and cost-effective options for coastal resilience. Moreover, technology can also enhance community engagement and participation, by providing access to information, networking, and capacity building opportunities. However, the effective deployment of technology for coastal resilience requires a holistic and context-specific approach that considers the local socio-economic, environmental, and cultural factors. Thus, integrating technology into the coastal resilience strategy can significantly enhance the resilience of the coast, providing a more secure and sustainable future for the coastal communities and ecosystems.

India's efforts to enhance coastal resilience have been significant, given the country's long coastline and vulnerability to multiple hazards and stresses. The government has undertaken several measures to improve the resilience of the coastal communities and ecosystems, such as implementing coastal regulation zones, developing early warning systems, building cyclone shelters, and promoting eco-friendly coastal engineering. In addition, India has also launched several programs and initiatives, such as the National Cyclone Risk Mitigation Project, the Integrated Coastal Zone Management Project, and the National Adaptation Fund for Climate Change, to enhance the capacity of the coastal states and communities for disaster preparedness, mitigation, and adaptation.

However, there are still several challenges and gaps that need to be addressed to improve India's coastal resilience. These include strengthening the institutional and policy framework, enhancing community participation and engagement, promoting sustainable coastal management practices, leveraging innovative technologies, and addressing the social and economic vulnerabilities of the coastal communities. Moreover, India needs to prioritize the conservation and restoration of the coastal ecosystems, which provide critical services such as carbon sequestration, storm surge protection, and fisheries.

Overall, India's efforts to enhance coastal resilience need to be more comprehensive, participatory, and sustainable to address the complex and evolving challenges facing the coast. By adopting a proactive and holistic approach to coastal resilience, India can build a more resilient and secure future for the coastal communities and ecosystems.

## CONCEPT NOTE

It is an established and well-recognised fact that the world is passing through a climate-crisis of monumental proportions. South Asia in general, and India in particular, is highly vulnerable to an entire range of hydrometeorological hazards that are rapidly rising, both in terms of their intensity and frequency. India's average temperature, for instance, has risen by around  $0.7^{\circ}\text{C}$ , over the period from 1901 to 2018. Within India's proximate maritime domain, the situation is even worse. In just the period from 1951 to 2015, Sea Surface Temperature (SST) in respect of the tropical Indian Ocean has risen by  $1^{\circ}\text{C}$  on the average, which is markedly higher than the global average over the same period.

Irrespective of the precise causal-factors, the effects of this rise in temperature are uniformly deleterious. In the proximity of the Indian sub-continent, they include changes in the comparative heating of landmasses and sea areas, with consequent changes in pressure gradients. We are consequently experiencing significant changes in precipitation (especially rainfall) and difficulties in its predictability. On the one hand, we have unexpected droughts, while on the other, there are increasing incidences of uneven, sporadic, but intense rainfall which, far from nourishing the land, simply washes away topsoil thereby reducing agricultural productivity, and produces widespread and non-seasonal flooding. Both these have serious socio-economic and socio-political impacts that are keenly felt along the coast, and particularly in mega urban coastal agglomerations such as Mumbai.

All this is worsened by the increase in the frequency and ferocity but concomitant decrease in the path-predictability of tropical revolving storms (cyclones) and the storm surges that occur in their wake, causing significant loss of land through the sharp increase in coastal erosion. Indian metropolises on the country's western coast, for example, which had hitherto been accustomed to relatively calm maritime conditions, have been witnessing a sharp surge in extreme cyclonic activity these past few years. High-intensity cyclones such as *Ockhi* (2017), *Vayu* (2019), *Nisarga* (2020), and *Tauktae* (2021), have wreaked year-on-year havoc in India's coastal areas. Cyclone *Tauktae*, for instance, caused a loss of about Rs 15,000 crore (US\$ 1.93 billion), with the agriculture sector in Gujarat and Maharashtra being the most severely hit. India's east coast is even worse affected. For instance, Cyclone *Amphan*, which made landfall on the east coast in May of 2020, is notorious for being the world's costliest natural disaster — with the economic loss being estimated to be over one lakh crore rupees (US\$ 1.28 trillion!). Given this magnitude of fiscal impact, it is painfully obvious that climate-proofing of coastal cities is a task to which policymakers and planners must bend their efforts with alacrity and sharp focus.

Just a few short decades ago, thermal expansion of the oceans was considered to be the principal contributor of rises in sea level. Today, however, the follow-on effects of the rise in global temperature have wrought a change in this thinking to the point where global sea-level rise is now being principally ascribed to the melting of glaciers across the world and the alarming loss

of the vast icesheets of Antarctica and Greenland. Once again, however, irrespective of the cause, sea-level rise is indeed occurring far more rapidly and far more significantly than had earlier been imagined.

Once again, sea level rise has a whole slew of adverse impacts and generates a staggering range of systemic risk, as also follow-on socio-economic and socio-political challenges, especially in countries such as India, which are endeavouring to accelerate their economic development. It is, thus, both ironic and tragic that these adverse impacts are most keenly felt in precisely those nodes that connect the economic and developmental lifelines of trade and commerce — namely, coastal population-centres and entrepôts. Coastal urban agglomerations have long been recognised as vital symbols of economic progress and innovation, and, since they are melting pots of diverse cultures, socio-political and socio-economic disturbances or turmoil have far-reaching and enduring impacts.

In common with much of the global South, India must necessarily balance sustainability against the imperatives of economic development in a far more geographically-interdependent — if not globalised — world. There is, encouraging evidence that India is, indeed, recognising the magnitude of this threat to its critical maritime infrastructure, and is taking significant steps towards building resilient development pathways through efforts such as the *Smart City Mission (2015)*, the *Atal Mission for Rejuvenation and Urban Transformation (AMRUT)*, the *Coalition for Disaster Resilient Infrastructure (CDRI)* — an international coalition of countries, United Nations (UN) agencies, multilateral development banks, the private sector, and academic institutions — established by PM Narendra Modi in 2019, and the recently launched *Infrastructure for the Resilient Island States (IRIS)*, a dedicated initiative that was co-created by the CDRI and representatives of Small Island Developing States (SIDS) at the COP 26. Prime Minister Narendra Modi's sustained push for accelerating India's transition from a 'brown' model of economic development to one that fully embraces the several facets and nuances of a resilient and sustainable 'blue' economy is evidenced in initiatives such as the country's maritime policy (encapsulated in the acronym SAGAR), the SAGARMALA mega-project that has now been subsumed into the *Maritime India Vision 2030*, and the *Pradhan Mantri Matavya Sampada Yojana (2020)*. All these are manifestations of a renewed focus upon the transformation of India's coastal cities and critical maritime infrastructure such as ports. These encouraging developments notwithstanding, a holistic and dynamic strategy — marked by clarity of thought and specificity of action — to mitigate (where possible) and adapt-to (where mitigation is not possible or insufficient) the adverse impacts of climate-change, is nevertheless critical if India is to realise its dream of becoming a leading 'blue economy' in a largely postmodern world.

Following the Paris climate accord of 2015, the world is witnessing an upsurge in the participation of local governments and cities as main stakeholders in climate action. Initiatives such as "C40", the "Urban Climate Action Programme" (UCAP), and "100 Resilient Cities", have proven to be successful in raising awareness, climate-finance, and stakeholder-participation amongst coastal cities around the world. Several coastal cities of India, too, are beginning to realise that the loss and damage that would accrue from a business-as-usual approach are so large as to be politically and financially unacceptable. Three Indian coastal cities — Mumbai, Chennai, and Kolkata — are currently part of the C40 initiative, and Mumbai has gone a step further with its "Mumbai Climate Action Plan" (MCAP). However, for coastal cities in the developing world,

raising climate finance and rapid urban infrastructural transformations will be critical and unavoidable challenges going forth, which they must pursue with an active political and economic will. As if all these were not challenging enough, India's geographical location dictates that climate-change related issues will also acquire increasing geopolitical and hence geostrategic salience.

As part of its own ongoing contribution to India's quest for economically and politically viable policy-relevant solutions, the National Maritime Foundation has made the "**India's Coastal Resilience Vis-à-vis Urban Agglomerations**" the central theme of its inaugural **Vice Admiral KK Nayyar Fellowship Conference (KKNFC-2023)**, which is scheduled to be held in physical format, at the Scope Convention Centre Auditorium (Lodhi Road, New Delhi), **on 22 and 23 February 2023**.

## Appendix B

### Detailed Programme

<b>Day One: Wednesday, 22 Feb 2023</b>		
<b>INAUGURAL SESSION (Duration: 1 h 45 min)</b> <b>(1100-1245 IST)</b>		
<b>1100-1105</b> (05 min)	Administrative Remarks	<b>Ms Divya Rai</b> Programme Executive, NMF
<b>1105-1115</b> (10 min)	Conceptual Overarch	<b>Vice Admiral Pradeep Chauhan</b> , AVSM & Bar, VSM, (Retd) Director-General, National Maritime Foundation
<b>1115-1125</b> (10 min)	Tribute to the Late Vice Admiral Kewal Kishan Nayyar, PVSM, AVSM	<b>Ms Gita Nayyar</b>
<b>1125-1140</b> (15 min)	Chairman's Address	<b>Admiral Karambir Singh</b> , PVSM, AVSM (Retd) Chairman, National Maritime Foundation <i>Former Chief of the Naval Staff</i>
<b>1140-1155</b> (15 min)	CNS's Address	<b>Admiral R Hari Kumar</b> , PVSM, AVSM, VSM Chief of the Naval Staff
<b>1155-1215</b> (20 min)	Presentation of Abstract of Monograph (Research Project)	<b>Dr Chime Youdon</b> , Associate Fellow, NMF and <b>Dr Saurabh Thakur</b> , Consultant, UNODC
<b>1215-1220</b> (05 min)	Release of Main Conference Paper, and Photo-Op	<b>Shri Kamal Kishore</b> Member Secretary, National Disaster Management Authority (NDMA), <b>and</b> Co-chair, Coalition for Disaster Resilient Infrastructure (CDRI), New Delhi
<b>1220-1240</b> (20 min)	Keynote Address	<b>Shri Kamal Kishore</b> Member Secretary, National Disaster Management Authority (NDMA), <b>and</b> Co-chair, Coalition for Disaster Resilient Infrastructure (CDRI), New Delhi
<b>1240-1245</b> (05 min)	Vote of Thanks and Session- Closure	<b>Ms Divya Rai</b> Programme Executive, NMF

**1245 -1345: Lunch Break (60 Min)**

<b>Day One: Wednesday, 22 Feb 2023</b>		
<b>PROFESSIONAL SESSION ONE (Duration: 2 h 40 min)</b> <b>(1345-1625 IST)</b>		
<b>“India’s Coastal Resilience: Challenges”</b>		
<b>1345-1350</b> (05 min)	Administrative Remarks	<b>Ms Divya Rai</b> Programme Executive, NMF
<b>1350-1410</b> (20 min)	A Framework of Enhancing Resilience and Managing Systemic Risks in Seaports	<b>Mr Arunabh Mitra</b> Chief Continuity Officer (CCO) HCL Technologies Ltd Noida, UP
<b>1410-1430</b> (20 min)	Social and Health Infrastructure Resilience	<b>Dr (Ms) Mona Chhabra Anand</b> Director-Research and Knowledge Management Coalition for Disaster-Resilient Infrastructure (CDRI) New Delhi

<b>1430-1450</b> (20 min)	Reducing Marine Litter in Coastal Ecosystems	<b>Ms Rachna Arora</b> Team Leader, Marine Litter and EU-REI, GIZ New Delhi
<b>1450-1510</b> (20 min)	Mapping 'Coastal Resilience' in Anthropocene: Science, Stakes and Policy	<b>Prof Sanjay Chaturvedi</b> Dean of Faculty of Social Sciences Department of International Relations South Asian University New Delhi
<b>1510-1530</b> (20 min)	Framework, Challenges, Opportunities in the Maritime Sector	<b>Commodore Debesh Lahiri</b> Executive Director, NMF
<b>1530-1625</b> (55 min)	Hard Talk & Audience Interaction	<b>Discussant:</b> VAdm Pradeep Chauhan, AVSM & Bar, VSM, (Retd) Director-General, National Maritime Foundation

<b>1625-1700</b>	<b>End-of-Day Tea (30 mins)</b>
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<b>Day Two: Thursday, 23 Feb 2023</b> <b>PROFESSIONAL SESSION TWO (1000-1255 IST)</b> <b>Coastal Resilience: Analysing India's Current Policy Framework</b>		
<b>1000-1005</b> (05 min)	Administrative Remarks	<b>Ms Divya Rai</b> Programme Executive, NMF
<b>1005-1025</b> (20 min)	Keynote Address (Deep Ocean Mission)	<b>Dr GA Ramadass</b> Director National Institute of Ocean Technology (NIOT) Chennai
<b>1025-1030</b> (05 min)	Photo Session	
<b>1030-1050</b> 20 Min	Resilience of India's Coastal Cities: People, Planet, Profit Towards Policies	<b>Ms Devleena Bhattacharjee</b> Founder of Numee8 Sustainable Marine Ecosystem Mumbai
<b>1050-1110</b> (20 min)	Building Coastal Resilience: Mainstreaming Community Participation	<b>Mr Vijai Dharmamony</b> Associate Director Marine Conservation, WWF-India
<b>1110-1130</b> (20 min)	Analysing India's Current Policy Framework of the Port Sector	<b>Mr Sushil Kumar Singh</b> Joint Secretary, Government of India, Ministry of Ports, Shipping and Waterways
<b>1130-1150</b> (20 min)	Risk Assessment of Coastal Resilience	<b>Mr Abinash Mohanty</b> Global Head, Climate Change and Sustainability, IPE Global, New Delhi
<b>1150-1210</b> (20 min)	Ecologically Sensitive Areas: Legal Frameworks	<b>Dr Deepak Samuel V</b> Scientist 'E' & Project Lead, Conservation of Coastal and Marine Resources Division (CMR), National Centre for Sustainable Coastal Management (NCSCM), Chennai
<b>1210-1255</b>	Hard Talk & Audience Interaction	<b>Discussant:</b>

(45 min)		<b>Admiral Karambir Singh, PVSM, AVSM</b> Chairman NMF <i>Former Chief of the Naval Staff</i>
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1255-1355: Lunch Break (60 Min)

<b>Day Two: Thursday, 23 Feb 2023</b> <b>PROFESSIONAL SESSION THREE (Duration: 2 h 30 min)</b> <b>(1345-1605 IST)</b> <b>“Building Coastal Resilience: The Way Ahead”</b>		
1355-1400 (05 min)	Administrative Remarks	<b>Ms Divya Rai</b> Programme Executive, NMF
<b>1400-1420</b> (20 min)	Coastal Resilience and Energy Infrastructure	<b>Ms Swati Ganeshan</b> Shakti Rise Fellow Shakti Sustainable Energy Foundation New Delhi
<b>1420-1440</b> (20 min)	Building Coastal Resilience: Best Practices	<b>Cdr (Dr) Kapil Narula</b> Adjunct Fellow, NMF
<b>1440-1500</b> (20 min)	Enhancing Climate Resilience of India’s Port Infrastructure and Operations	<b>Dr Pushp Bajaj</b> National G-20 Consultant UNDP New Delhi
<b>1500-1520</b> (20 min)	Sustainable Development: Best Practices	<b>Ms Marion Velut</b> Counsellor Sustainable Development Regional Economic Department for India and South Asia The French Embassy
<b>1520-1605</b> (45 min)	Hard Talk & Audience Interaction	<b>Discussant: Commander Prashant K Srivastava (Retd)</b> Advisor/Scientist ‘G’, Ministry of Earth Sciences New Delhi
<b>1605-1625: Tea Break (20 mins)</b>		

<b>Day Two: Thursday, 23 Feb 2023</b> <b>(1625-1700 IST)</b> <b>CONCLUDING SESSION (Duration: 35 min)</b> <b>(1635-1710 IST)</b>		
1625-1635 (10 min)	In Memoriam	<b>Mr Ashok Nayyar</b>
<b>1635-1655</b> (20 min)	Summative Remarks	<b>Admiral Karambir Singh, PVSM, AVSM, IN (Retd)</b> Chairman, National Maritime Foundation
<b>1655-1700</b> (5 min)	Vote of Thanks Photo Session Conference-Closure	<b>Ms Divya Rai</b> Programme Executive, NMF