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सलाहकार (प्रशमन)
Safi Ahsan Rizvi, IPS
Advisor (Mitigation)

सत्यमेव जयते

राष्ट्रीय आपदा प्रबंधन प्राधिकरण
गृह मंत्रालय, भारत सरकार
एन.डी.एम.ए. भवन
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National Disaster Management Authority
Ministry of Home Affairs Government of India
NDMA Bhawan
A-1, Safdarjung Enclave, New Delhi - 110029
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D.No.8-171/2024-Mitigation (E-118014) **Dated: 25th July, 2025**

Dear Sir/Madam,

Coastal regions represent a highly dynamic and complex environments that are increasingly vulnerable to the compounded effects of climate-induced sea level rise, intensifying storm events, and accelerated coastal erosion—challenges further exacerbated by unregulated and unsustainable human interventions. In this context, NDMA is organizing a one-day workshop titled **"Enhancing Coastal Risk Resilience."** The event is scheduled for **August 22, 2025**, and will be held at **Vigyan Bhawan, New Delhi**, from **0930 to 1800 hours**.

2. The workshop will bring together experts, policymakers, researchers, and practitioners to deliberate on the urgent need for a science-driven, ecosystem-based, and community-centricsustainable coastal management strategy to effectively address the threats and strengthen long-term coastal risk resilience.

3. Given the significance of this initiative, we kindly request you to nominate **two official** from your organisation to attend the workshop. Their insights and contributions will be valuable in enriching the discussions and advancing strategies for coastal risk resilience and response mechanism.

4. The programme schedule and concept note has been shared via emailfor yourkind perusal please.

5. Thank you for your kind consideration of our request.

With regards,

(Safi Ahsan Rizvi)

Addressees:

1.	Dr. M Ravichandran	Secretary, MoES
2.	Ms. PunyaSalila Srivastava	Secretary, MoHFW
3.	Shri Tanmay Kumar	Secretary, MoEF&CC
4.	Ms. Debashree Mukherjee	Secretary, (DoWR, RD&GR)
5.	Prof. AbhayKarandikar	Secretary, DST
6.	Dr. Anil Jain	Chairman, NDSA
7.	Dr. PawanGoenka	Chairman, IN-SPACe

8.	Shri ParameshSivamani	DG, Indian Coast Guard
9.	Shri Piyush Anand	DG, NDRF
10.	Shri Rahul Rasgotra	DG, ITBP
11.	Shri Hitesh Kumar S. Makwana	Surveyor General of India, SOI
12.	Shri Mritunjay Kumar Narayan	Registrar General, Census of India
13.	Shri AsitSaha	DG, GSI
14.	Dr. MrutyunjayMohapatra	Director, IMD
15.	Dr. Om Prakash Mishra	Director, NCS
16.	Dr. ThambanMeloth	Director, NCPOR
17.	Shri Binod Kumar Singh	Director, NATMO
18.	Shri Anoop Singh	Director General, FSI
19.	Dr. Pramod Kumar Satyawali	Director, DGRE
20.	Dr. Mukesh Kumar Sinha	Chairman, CWC
21.	Dr. M.K. Goel	Director, NIH
22.	Shri Rajnarayan Kaushik	Director, Dept. of Agriculture and Farmers Welfare
23.	Shri Rajeev Ranjan Prasad	Chairman and Managing Director, NHPC
24.	Dr. R. Krishnan	Director, IITM Pune
25.	Dr. Purvaja Ramachandran	Director, NCSCM
26.	Shri T. P. Singh	DG, BISAG-N
27.	Dr. BrijendraPateriya	Director, PRSC, Ludhiana, Punjab
28.	Shri G. Varuna Kumar	Addl. Surveyor General, NIGST
29.	Shri Magesh Ethirajan	Director General C-DAC
30.	Dr. Sultan Singh	Director, HARSAC
31.	Dr. Balakrishnan Nair T. M.	Director, INCOIS
32.	Dr. R.S. Kankara	Director, NCCR
33.	Dr. Grinson George	Director, CMFRI
34.	Dr. DuvvuriSeshagiri	Director, NPOL
35.	Prof. Balaji Ramakrishnan	Director, NIOT
36.	Prof. Sunil Kumar Singh	Director, CSIR-NIO
37.	Shri Nilesh M. Desai	Director, SAC
38.	Dr. R.P. Singh	Director, IIRS
39.	Dr. Prakash Chauhan	Director, NRSC
40.	Pro. N.V. Chalapathi Rao	Director, NCESS
41.	Prof. Dipankar Banerjee	Director, IIST
42.	Dr Kannan Srinivasan	Director, CSIR-CSMCRI
43.	Sh. T K Ramachandran	Secretary, Ministry of Ports, Shipping and Waterways (MoPSW)
44.	Admiral Dinesh K Tripathi	Indian Navy
45.	Vice Admiral Lochan Singh Pathania	Chief Hydrographer, NHO
46.	Sh. R. Lakshmanan	Sagarmala Development Company Limited
47.	Prof. Tuhin Ghosh	Director, School of Oceanographic Studies
48.	Dr. G.V.M. Gupta	CMLRE, MoES
49.	Dr. Prabhat Chandra	Director, CWPRS
50.	Prof. Bhaskar Gupta	School of Ocean Science, Jadavpur University
51.	Dr. Kuldeep K. Lal	Central Institute of Brackishwater Aquaculture

52.	Dr. Mangi Lal Jat	Indian Council of Agricultural Research
53.	Sreenath KR - Director General	Fisheries Survey of India
54.	Chairman	Andhra Pradesh State Coastal Zone Management Authority (APSCZMA)
55.	Shri Suneel Pamidi, IFS.	Karnataka Coastal Zone Management Authority (KCZMA)
56.	Ms. Valsa Nair Singh	Maharashtra Coastal Zone Management Authority (MCZMA)
57.	Dr. RathanKelkar IAS	Kerala Coastal Zone Management Authority (KCZMA)
58.	Thiru. A.R. Rahul Nadh, IAS	Tamil Nadu Coastal Zone Management Authority
59.	Nigel Francis D'Souza	Goa Coastal Zone Management Authority
60.	Shri HarshrajDinkarWathore, IFS	Deputy Conservator of Forests in Daman and Diu
61.	Shri. Sanjeev Kumar, IAS	Gujarat Coastal Zone Management Authority
62.	Dr. Prabhat Chandra	Central Water and Power Research Station
63.	Sh. T K Ramachandran	Ministry of Port Shipping and Waterways
64.	Dr. Rajesh Gupta	Ministry of Home affairs
65.	Sh. Gouri Shankar Jha	Ministry of Home affairs
66.	Shri Sanjeev Kumar Jindal	Ministry of Home affairs
67.	Dr. Sajjan Singh Yadav	Department of Expenditure
68.	Dr KamakotiVeezhinathan	IIT Madras
69.	Prof. ShireeshKedare	IIT Bombay
70.	Prof. Suman Chakraborty	IIT Kharagpur
71.	Prof. Dhirendra S Katti	IIT Goa
72.	Prof. RajatMoona	IIT Gandhinagar
73.	Prof. ShreepadKarmalkar	IIT Bhubaneshwar
74.	Prof. B S Murty	IIT Hyderabad
75.	Dr. Kalidindi N. Satyanarayana	IIT Tirupati
76.	Prof. A. SeshadriSekhar	IIT Pallakad
77.	Prof. Venkappayya R. Desai	IIT Dharwad
78.	Dr. M. N Bandyopadhyay	NIT Calicut
79.	Prof. B. Ravi	NIT Surathkal
80.	Prof. O R Jaiswal	NIT Goa
81.	Dr. MakarandMadhaoGhangrekar	NIT Puducherry
82.	Prof. JaruguNarasimhaMoorthy	IISER Thiruvanantapuram
83.	Prof. Santanu Bhattacharya	IISER Tirupati
84.	Prof. Sunil Kumar Khare	IISER Kolkata
85.	Professor HirendraNath Ghosh	IISER Odisha

Concept Note

Committee on Disaster Risk Reduction (CoDRR) Workshop-15: Enhancing Coastal Risk Resilience

Organized by

National Disaster Management Authority (NDMA)
In collaboration with the Indian National Centre for Ocean Information Services (INCOIS)

Date: August 22, 2025
Venue: Vigyan Bhawan, (Hall No. 5), New Delhi

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Executive Summary

India’s coastal regions, now spanning over 11,000 kilometers, are facing unprecedented threats from climate-induced sea-level rise, intensified cyclones, erosion, and unregulated human activities. Recognizing the urgent need for coordinated action, the National Disaster Management Authority (NDMA) is organizing a high-level workshop on August 22, 2025, to advance science-based and community-driven coastal resilience strategies. The workshop aims to unite policymakers, scientists, practitioners, and local stakeholders to deliberate on cutting-edge solutions tailored to India’s diverse and vulnerable coastal ecosystems. Through five thematic sessions, the event will explore a wide range of issues including technological innovations in hazard forecasting, infrastructure resilience, nature-based solutions, policy gaps, and state-level implementation challenges. A strong emphasis is placed on hybrid infrastructure, blue carbon ecosystem restoration, and the integration of indigenous knowledge with modern coastal engineering. The workshop will also serve as a platform to share state perspectives on the proposed Integrated Coastal Risk Mitigation and Resilience Programme (ICRMRP), highlighting on-ground realities and solutions. Expected outcomes include actionable strategies, policy recommendations, capacity-building roadmaps, and the creation of collaborative networks across sectors. A post-workshop knowledge compendium containing detailed case studies and contact information will be published to support ongoing knowledge exchange and collaboration. This workshop marks a pivotal step in mainstreaming climate-resilient coastal planning into national and sub-national agendas. It underscores a collective commitment to transform India's vulnerable coastlines into resilient, sustainable, and thriving coastal landscapes.

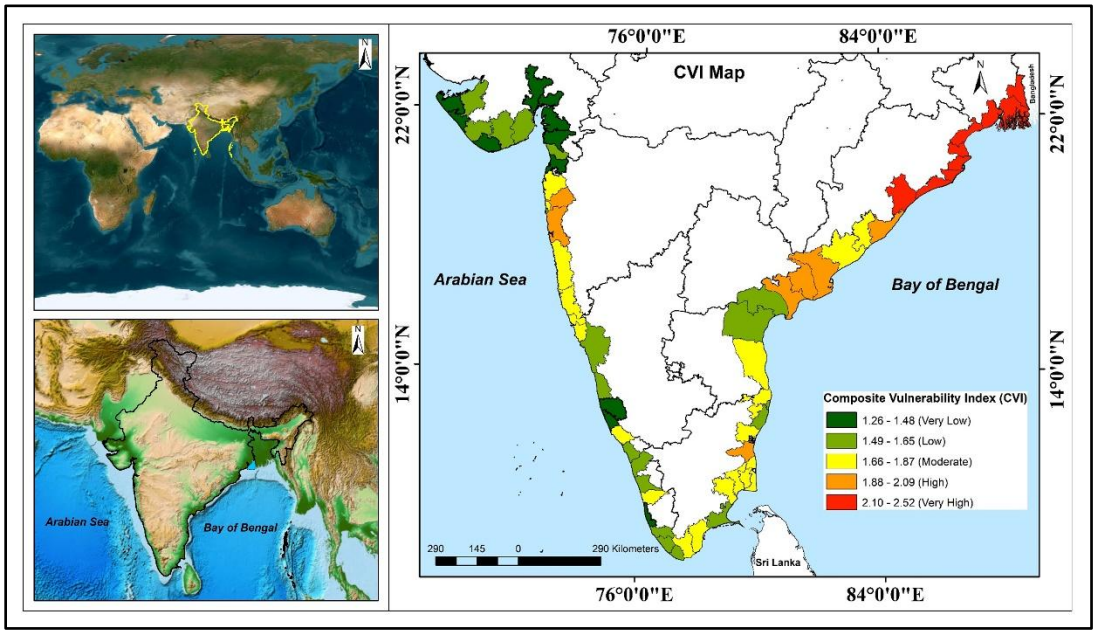
1. Background

India's coastline, previously measured at 7,516.60 km, has been recently reassessed and revised to 11,098.81 km, by the Naval Hydrographic Office (NHO), in coordination with the Survey of India (SoI). This reflects the nation's immense maritime boundary that stretches across nine states and four union territories. The vast coastline is dotted with pristine beaches, ports, traditional fishing villages, and culturally rich heritage sites, reflecting both natural beauty and a deep maritime legacy. The East and West coast of India exhibit substantial differences in their geographical characteristics and cultural environments. The west coast, stretched along the eastern Arabian Sea, features a diverse landscape of sandy beaches, rugged cliffs, and the Western Ghats, a UNESCO World Heritage Site, aligned parallel to the coastline. This region includes Gujarat, Daman and Diu, Maharashtra, Goa, Karnataka, Kerala, and Lakshadweep and is renowned for pristine beaches, such as those in Goa and Kerala's palm-fringed shores. Major ports such as Mumbai and Mangalore add to the region's economic importance. In contrast, the East Coast, which extends along the Bay of Bengal, is predominantly flat, featuring extensive sandy beaches and mega river deltas. It includes the state of West Bengal, Odisha, Andhra Pradesh, Puducherry, Tamil Nadu, and Andaman & Nicobar Islands. Both sides are profoundly enriched in cultural and historical importance, showcasing ancient ports, temples, and architectural heritage sites. Their diverse ecosystems, including coral reefs to the west and mangrove forests to the east, substantially enhance India's natural diversity.

The West Coast features essential ecosystems, such as wetlands, mangroves, coral reefs, and significant biological hotspots like the Western Ghats. Mangrove ecosystems in Gujarat and Kerala safeguard coastlines against erosion and storm surges, whilst fostering marine biodiversity. Coral reefs along the shores of Goa, Gujarat, the Gulf of Mannar, and the Lakshadweep Islands support essential flora and fauna, while the Konkan coast and Kerala's backwaters provide habitats for migrating birds and bolster local economies. However, these areas are increasingly under threat due to the rapid coastal urban and industrial expansion, pollution, and climate change, emphasizing the need for effective conservation initiatives. Equally important, the East Coast hosts globally significant ecological zones, including the Sundarbans Mangrove Forests, one of the largest continuous mangrove ecosystems globally and a sanctuary for species like the endangered Bengal tiger. The principal river deltas of the region, namely Ganges-Brahmaputra-Meghna, Mahanadi, Godavari, Krishna, and Cauvery, offer essential ecosystem services such as flood control, sediment deposition, and nutrient cycling. The coastal waters of the East Coast sustain marine life crucial for biodiversity and local economies. The beaches of Odisha are significant nesting sites for the olive ridley sea turtle, adding to the ecological importance of the region.

Despite their rich ecological and cultural significance, both the eastern and western coasts of India are increasingly threatened by severe coastal erosion. The West Coast is increasingly vulnerable to coastal erosion and flooding due to rising sea levels, erratic monsoons, and more frequent and intense cyclones, with urban centers like Mumbai and low-lying areas of Kerala at particular risk. Meanwhile, the East Coast is more susceptible to intense tropical cyclones generated in the Bay of Bengal, frequently impacting Odisha, Andhra Pradesh, and West Bengal, although it is similarly affected by erosion and flooding due to rising sea levels and very strong storm surges. Overfishing, pollution, and the degradation of natural buffers such as mangroves,

coral reefs, and wetlands has significantly increased the vulnerability of coastal communities and infrastructure to climate extreme events and coastal hazards. Addressing this crisis requires a holistic, science-based, and community-inclusive coastal zone management strategy focused on restoring ecosystems and building long-term resilience against coastal hazards and disasters.



Given the escalating vulnerabilities caused by coastal hazards and disasters, proactive and sustained mitigation efforts are crucial. By adopting nature-based solutions to climate change, sea level rise, and anthropogenic impacts, the Nations can protect its essential ecosystems and empower vulnerable communities. Through the advancing of climate-resilient infrastructure, implementing integrated river basin management, and restoring natural defenses such as mangroves, coral reefs, seagrasses, native vegetation, and sand dunes, India can protect its coastal environments and secure the livelihoods of millions who depend on them. Addressing the escalating crisis of coastal disaster requires a holistic, science-based, and community-inclusive coastal zone management strategy focused on restoring ecosystems and building long-term resilience against coastal threats. In this context, the workshop aims to bring together experts, policymakers, researchers, and practitioners to deliberate on the urgent need for a science-driven, ecosystem-based, and community-centered coastal management approach to effectively mitigate the coastal disasters and enhance coastal resilience across India.

2. Aim and Objectives

The aim of this workshop is to bring together experts, stakeholders, and practitioners to discuss, share knowledge, and develop actionable coastal risk resilience strategies tailored to India's unique environmental challenges, promoting sustainable solutions for the protection of vulnerable regions.

The specific objectives of the workshop are to:

- **Enhance Awareness and Knowledge Sharing:** Create a platform for experts, policymakers, local communities, and environmental organizations to exchange knowledge on the causes, impacts, and innovative solutions to coastal threats in India.
- **Promote Sustainable and Site-Specific Solutions:** Identify and discuss region-specific risk resilience strategies that are both environmentally sustainable and socially feasible, with a focus on integrating local practices and cutting-edge technologies.
- **Facilitate Policy Development and Collaborative Action:** Foster interdisciplinary collaborative discussion among key stakeholders to develop actionable policy recommendations and encourage collaborative partnerships to implement mitigation measures effectively at local, regional, and national levels.

3. Workshop Materials

- **Pre-Workshop Reading:** Concept note containing the details of the workshop.
- **Knowledge Compendium:** A comprehensive report containing detailed case studies, discussed strategies, and contact information for networking will be published after the workshop.
- **Presentation Slides:** Will be shared post-workshop for reference.

4. Workshop Structure

The workshop will feature a dynamic and participatory agenda, comprising plenary sessions, panel discussions, thematic workshops, and interactive exercises. Each session is designed to engage participants actively and foster dialogue, collaboration, and knowledge exchange.

(i) Session-1: Emerging Cyclone Trends

This session will focus on the evolving patterns of cyclonic activity, with emphasis on increasing frequency, intensity, and shifting trends due to climate change. Experts will discuss recent scientific findings and real-time data analysis to understand emerging cyclone behavior. The session will also highlight the implications of these trends for coastal planning and disaster preparedness.

(ii) Session-2: Forecast to Early Warning

This session will emphasize the critical role of accurate forecasting and timely early warning systems in reducing the impacts of coastal hazards such as cyclones, storm surges, swell waves etc. Experts will present advancements in meteorological modeling, oceanographic monitoring, and risk communication strategies tailored for coastal communities. The discussion will underscore the need and means for integrating science, technology, and last mile connectivity for effective Early Warning System.

(iii) Session-3: Socio-Economic Recovery & Resilience to Coastal Threats

This session will address the multifaceted impacts of coastal hazards on livelihoods, and social well-being, emphasizing strategies for building long-term resilience and accelerating recovery. Experts will share the case studies and frameworks that integrate economic rehabilitation, social protection, and sustainable development in pre and post-disaster contexts. The discussion will highlight the importance of inclusive planning and investment in resilient coastal economy to safeguard vulnerable coastal populations.

(iv) Session 4: Coastal Infrastructure Resilience

This session will focus on strengthening the durability and functionality of critical coastal infrastructure in the face of rising sea levels, storm surges, and cyclones. Experts will discuss engineering innovations and risk-informed planning to enhance the resilience of ports, roads, seawalls, and coastal establishments and settlements. The session will emphasize the importance of integrating climate projections and disaster risk assessments into infrastructure design and maintenance.

(v) Session 5: Mitigation & Nature-Based Solutions

This session will highlight the role of coastal protection structure and ecosystem-based approaches in mitigating coastal hazards and enhancing climate resilience. Experts will present the successful case-studies of nature-based solutions by mangrove restoration, dune stabilization, and artificial reefs etc. as cost-effective, sustainable alternatives to hard infrastructure. The discussion will emphasize the integrating nature-based solutions into coastal planning for long-term risk reduction and environmental sustainability.

5. Workshop Structure

The workshop will be a one-day event with five thematic technical sessions. Each session will feature presentations moderated by one facilitator, followed by a discussion with three discussants to explore key insights and engage participants.

6. Target Audience

The workshop is intended for:

- Officials from National and State Disaster Management Authorities (NDMA, SDMAs).
- GIS and remote sensing professionals.
- Emergency response and civil protection personnel.
- Environmental scientists and researchers.
- Coastal Planners.
- NGOs and start-ups working in disaster risk reduction.
- Academics and researchers from related disciplines.

7. Expected Outcomes

- **Improved Understanding:** Participants will develop a clear and comprehensive understanding of innovative approaches to mitigate coastal erosion, empowering them to make more informed and effective decisions.
- **Integrated Solutions:** By encouraging thematic and interdisciplinary collaboration, the workshop will promote holistic strategies that consider the environmental, social, and economic dimensions of erosion and adaptation.
- **Actionable Strategies:** The sessions will result in concrete, actionable strategies and tailored policy recommendations to support policymakers, practitioners, and communities in addressing erosion challenges.
- **Collaborative Networks:** The workshop will create opportunities for meaningful networking and partnerships, strengthening resilience efforts and advancing sustainable development goals across sectors and regions.

8. Conclusion and Way Forward

India's coastal zones stand at a critical juncture, facing mounting threats from climate-induced sea-level rise, intensified storms, and widespread severe erosion - further aggravated by unregulated human interventions. The workshop "Navigating the Future: Enhancing Coastal Risk Resilience in the Face of Climate Change" served as a timely and dynamic platform to bring together a broad coalition of stakeholder's policymakers, scientists, practitioners, civil society, and international agencies—united by a common purpose: to safeguard our coasts through informed, collaborative, and future-ready action.

A key conclusion of the deliberations is the growing consensus on the need for **integrated, science-based, and community-centric approaches** that prioritize long-term resilience over short-term responses. **Nature-based solutions (NbS)** - such as mangrove restoration, dune stabilization, and sustainable land-use practices - emerged as vital tools that not only mitigate risks but also enhance ecosystem services, local livelihoods, and carbon sequestration.

Looking ahead, the path forward demands a **multi-pronged and inclusive strategy**:

- **Strengthen Interdisciplinary Collaboration:** Build robust networks across scientific disciplines, governance institutions, and community stakeholders to co-design and co-implement adaptive coastal strategies.
- **Align Policy and Planning Frameworks:** Mainstream coastal resilience into national and sub-national development agendas, disaster management plans, and climate adaptation policies to enable coordinated action.
- **Invest in Adaptive, Nature-Based Infrastructure:** Prioritize eco-engineered solutions and hybrid systems that combine traditional knowledge with innovative, climate-resilient designs.
- **Empower Coastal Communities:** Enhance capacity-building, awareness, and participatory governance at the grassroots to ensure that local knowledge and needs are central to planning and implementation.

- **Promote Data-Driven Monitoring and Responsive Governance:** Establish real-time observation systems and decision-support tools to guide adaptive management and evaluate long-term effectiveness.

This workshop marks not an end, but a beginning - a collective commitment to advancing coastal resilience through science, policy, and people. By fostering sustained dialogue, driving innovation, and embedding equity at the heart of our actions, we can transform India's vulnerable coastlines into resilient and thriving zones. The insights, collaborations, and momentum generated here will serve as catalysts for more resilient, inclusive, and sustainable coastal zone management across the nation.
