

**DECARBONISATION  
of the  
FISHERIES SECTOR**

**Session : Greening the  
Fisheries**

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**Executive Director – National  
Maritime Foundation**

## **Chartered Course**

- NMF – A Brief Overview
- Fisheries Ecosystem
- Green Landing Points
- Green Fishing Areas
- Fuel Pathways for Green Vessels
- Implementable Recommendations



**National  
Maritime  
Foundation**

# EVOLUTION

- In late-2004, Naval Headquarters (now IHQ MoD [Navy]), with the active support of the Ministry of Defence, decided to sponsor the establishment of a national-level *'maritime'* think tank (rather than merely a 'navy-centric' one)...
- After some initial toying with 'National Institute of Maritime Affairs' (NIMA) as the name, it was eventually decided to name it the **'National Maritime Foundation'**

The Foundation was inaugurated by the then-*Raksha Mantri* (later the Hon'ble President of India), the late Dr Pranab Mukherjee, on **15 February 2005**



The NMF is a non-governmental, non-political, age-and-gender agnostic, **autonomous** maritime **think-tank** registered (on 23 Dec 2004) as a 'Society' under the Societies Registration Act XXI of 1860, relevant to Delhi (as a National Capital Territory)

CERTIFICATE OF REGISTRATION



SOCIETIES REGISTRATION ACT,  
(XXI) OF 1860

Registration No. S/ 51056 /2004

I certify that National Maritime foundation

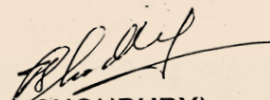
located at

Naval Officers Mess Varuna, NH-8

has been registered under Societies Registration Act – XXI of 1860.

Given under my hand at Delhi on this 23<sup>rd</sup> day of  
December, Two thousand Four.




  
( J S CHOUDHRY )  
Registrar of Societies  
Govt. of NCT of Delhi



- The term '**autonomous body**' denotes a self-governing body that is independent, or, subject to its own laws.
- If an **autonomous body/ institution** is a 'Company', it is regulated by Company Law. If it is a 'Society', it is governed by the law on registration of societies.

**Accordingly, the NMF is guided by its Memorandum of Association (MoA) and Rules & Regulations (R&R). These were last promulgated in 2013**

**CERTIFICATE OF REGISTRATION**

  
सत्यमेव जयते

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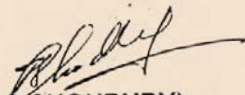
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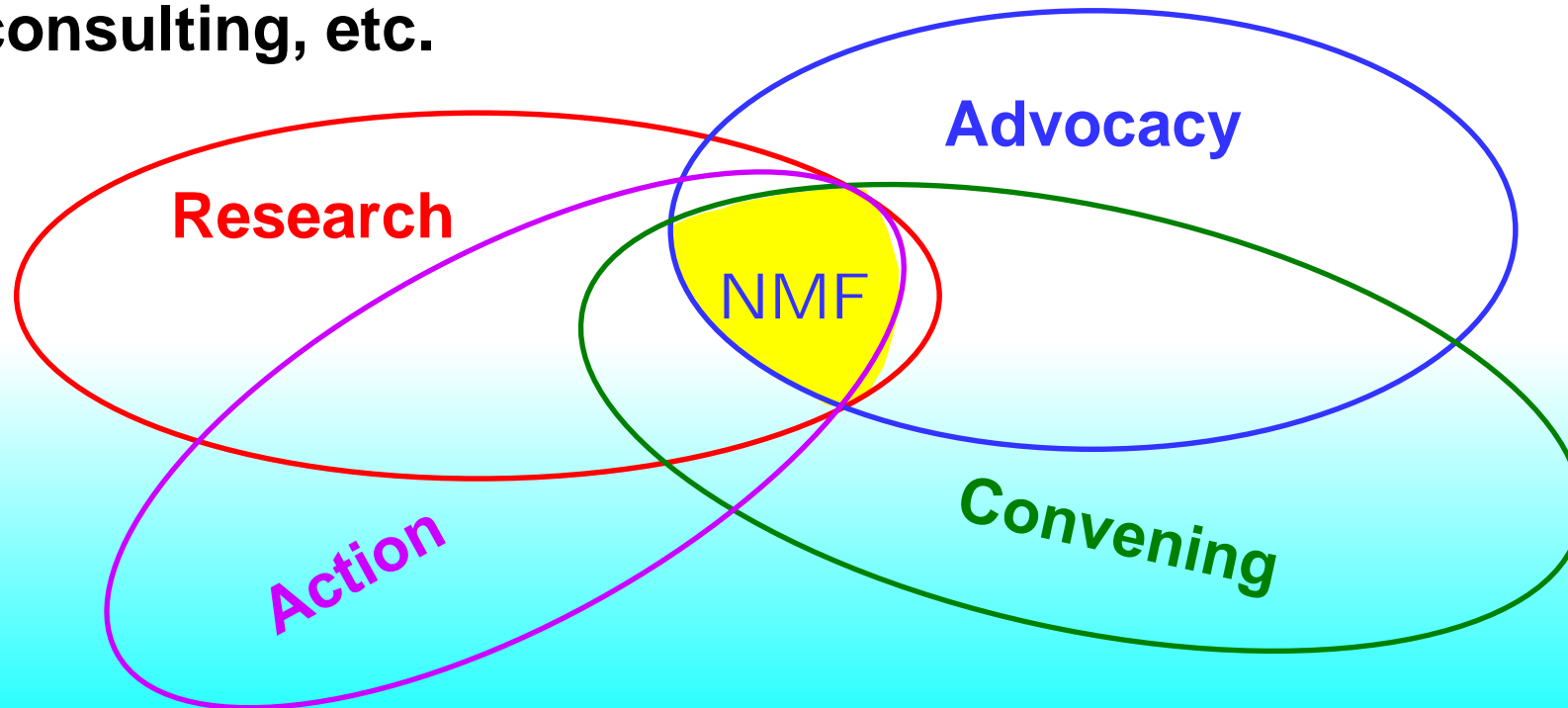
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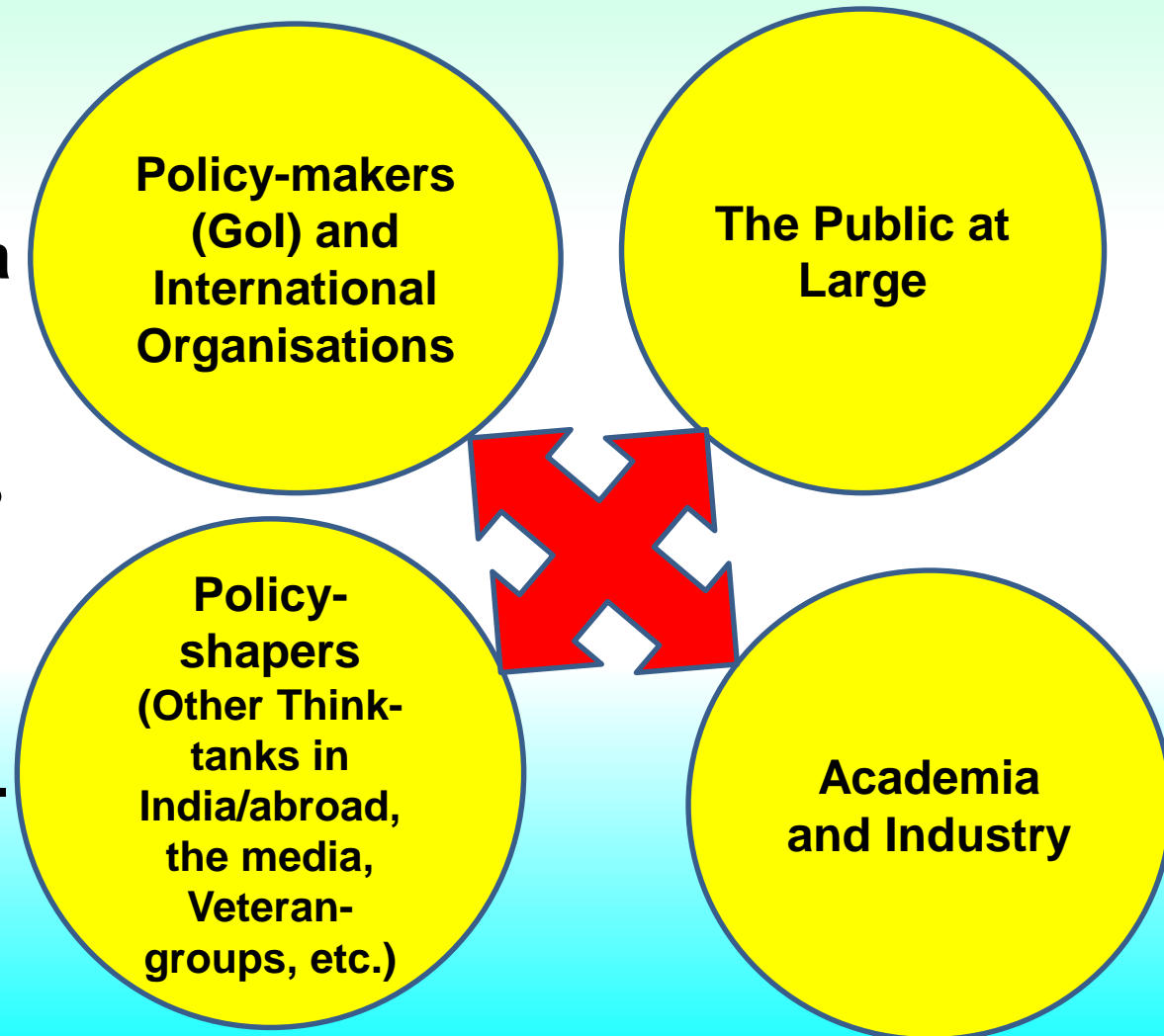
## OVERARCHING COMMENTS

- ‘**Research**’, ‘**Advocacy**’, and ‘**Convening**’ form the *mandatory* pillars of any think-tank. Some think-tanks (including the NMF) *additionally* orient some part of their energy towards external ‘**Action**’ such as capability-enhancement through academic teaching, training, consulting, etc.

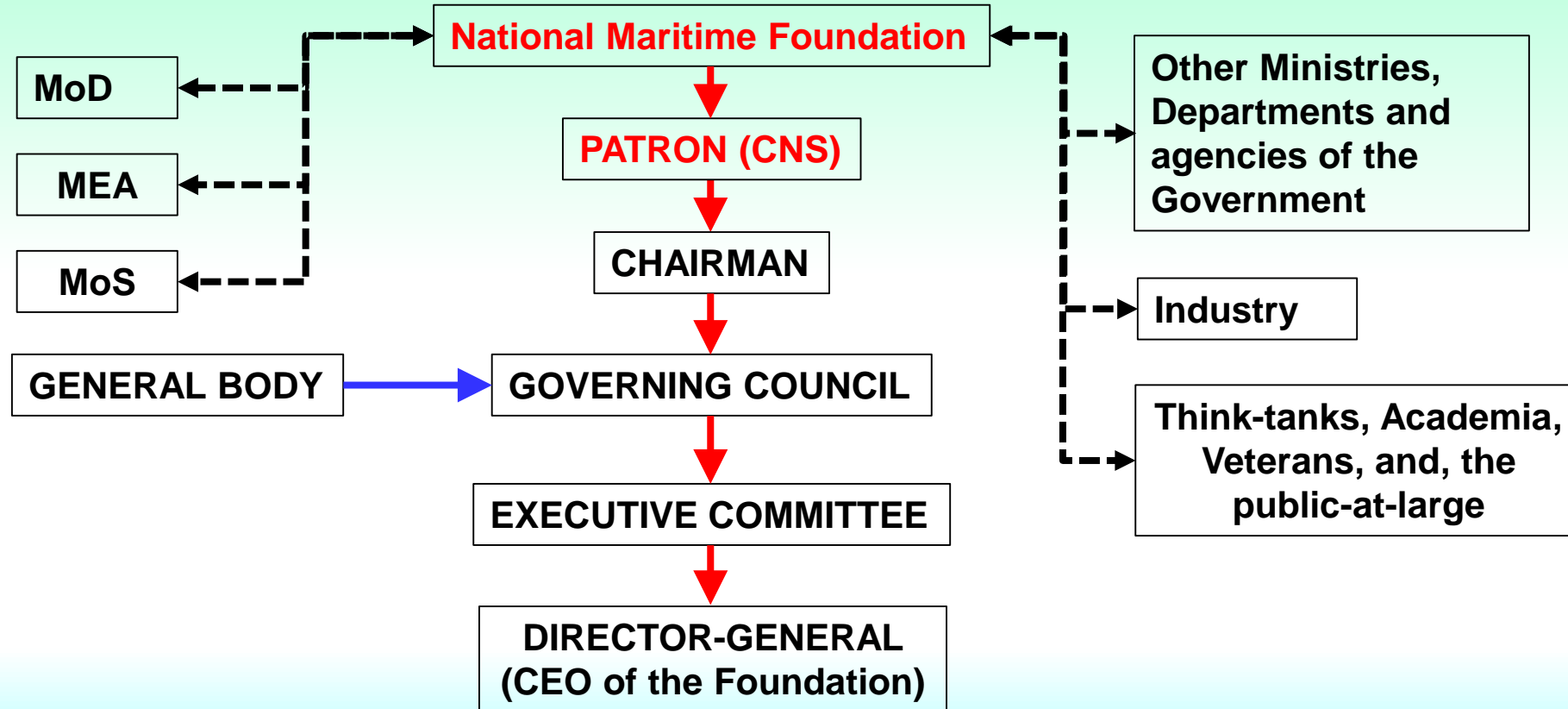




- The primary purpose of the NMF is to generate ideas and debate on matters of public policy
- Our principal target-audience, therefore, comprises policy-makers in the Government of India and abroad, as also policy-shapers, which term includes a variety of think-tanks in India and abroad, the media, and other 'pressure-groups', academia, and, of course, the public at large

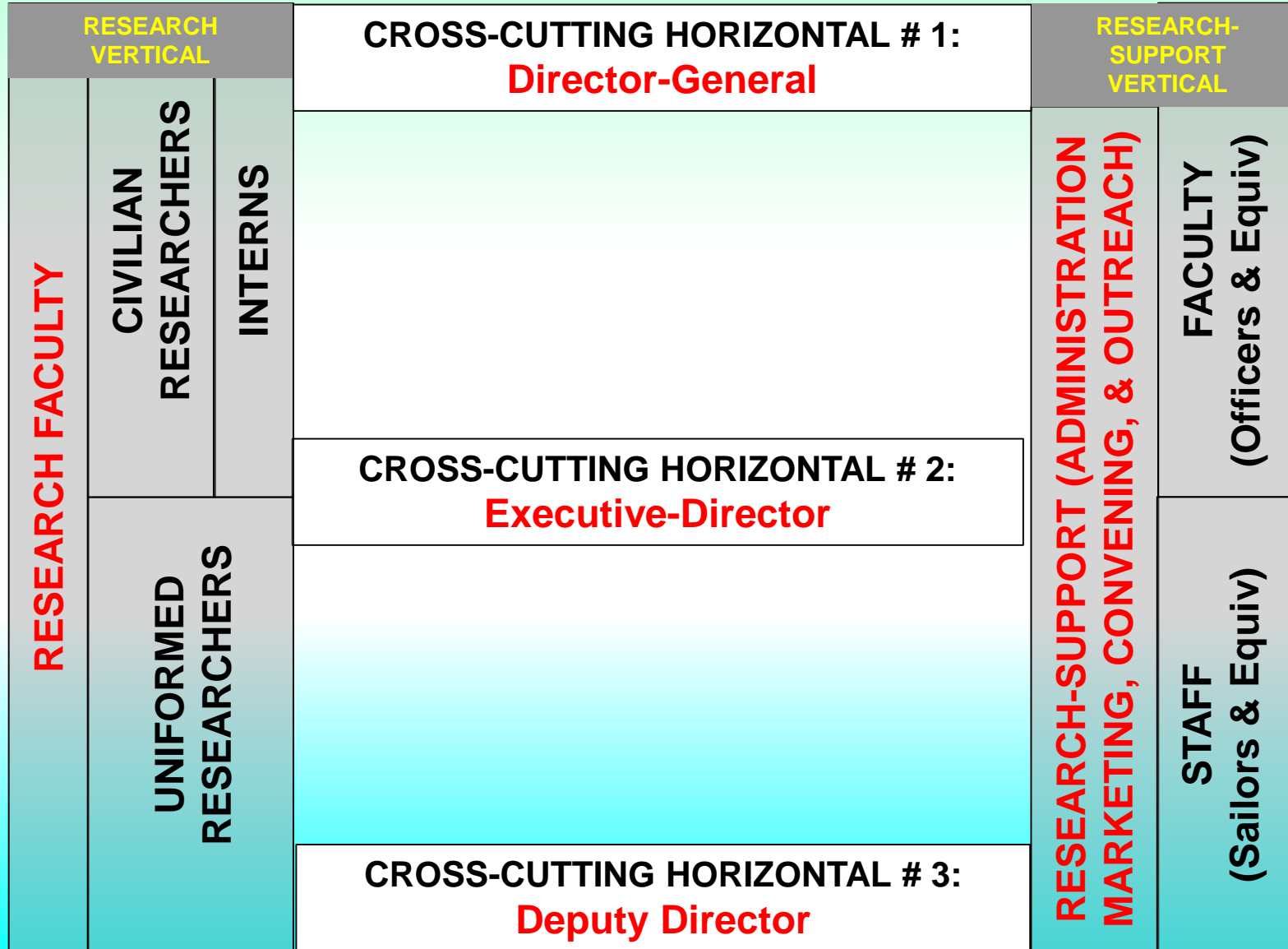


# ORGANISATIONAL STRUCTURE OF THE NMF



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The human resources of the NMF lie in two broad 'verticals' with three cross-cutting 'horizontal's:



# FUNDING

- **The NMF is funded through:**
  - Occasional 'Grants-in-Aid' from the Government of India (MoD)
  - An annual grant from the non-governmental funds of the Indian Navy
  - Fellowships offered by private citizens and institutions
  - Earnings from approach-papers, reports and studies
  - Earnings from the sale of books and monographs, as also the flagship journal of the NMF: "Maritime Affairs"
  - Earnings from teaching-and-training capsules and programmes for academia, the government, and industry.
  - Earnings from 'Convening Events' such as expert-lectures, workshops, dialogues, symposiums, seminars, conferences, etc.

# **NMF's VISION-STATEMENT**

**To be the foremost resource-centre  
for the development and advocacy  
of strategies for the promotion and  
protection of**

***India's Maritime Interests***

**THE NMF's  
AREAS OF  
RESEARCH  
INTEREST**





# NMF's Areas of Research-interest

- **Holistic Maritime Security**
  - Thematic
  - **Country/Region-specific Maritime Geostrategies**
- **'Marine', 'Maritime', and, 'Naval' Technology**
- **'Blue Economy' and 'Climate Change' (BECC) and their 'National' and 'Regional' Impact**
  - **Environmental and Ecological Issues**
- **Oceanic Resources, both living and non-living**
- **Maritime Affairs**
  - **Public International Maritime Law (PIML)**
  - **Maritime History, Maritime Heritage, and, Maritime Culture**
  - **Maritime Trade, and, Maritime Connectivity**
  - **Maritime Safety**

# Thematic Holistic-Security Studies

- **Regional Maritime Security**
  - SAGAR (Security and Growth for All in the Region)
  - IPOI (Indo-Pacific Oceans Initiative)
  - ‘Bilateral’, ‘Trilateral’, and, ‘Multilateral’ Constructs of Maritime Relevance
- **Coastal and Offshore Security**
- **Naval Security (Hard Security)**
- **Trade/SLOC Security**
- **Energy-Security, and, the Security-of-Energy**
- **Port Security**
- **Maritime Food-Security (including Sustainable-Fishing Mechanisms)**
- **Polar Security**
- **Cyber Security**
- **Nuclear Security**
- **‘Surface’, ‘Underwater’, and, ‘Space-based’ Maritime Domain Awareness (MDA)**

# Maritime/Marine-Technology Studies

- Maritime-Impact of Industry 4.0
- 'Unmanned', 'Minimally-manned', 'Semi-Autonomous', and 'Autonomous' Surface-, Underwater- and Airborne- Vehicles
- Maritime-Impact of Outer-Space Technologies
- Maritime-Impact of Inner-space (Cyber) Technologies
- Ocean Renewable Energy Resources (ORER) Technologies
- Oil, Natural Gas, and Gas Hydrates (Upstream and Downstream Technologies)
- Marine Bio-technologies
- Seabed Mining Technologies
- Submarine Cable Technologies
- Underwater Domain Awareness Technologies
- 'Make-in-India', 'Make for India' and indigenisation ('Make by India') Programmes
- Development of Common (Tri-Service) Weapon-Sensor Suites
- Private-Public Partnerships in Defence and Security
- Impact of Technology upon Shipbuilding

# **‘Blue Economy’ and ‘Climate Change’ (BECC) and their ‘National’ and ‘Regional’ Impact**

- Practical Manifestations of India’s transition from a ‘Brown’ economy to a ‘Blue’ economy.
- The ‘Blue Economy’ as a foreign-policy tool for India
- Opportunities and Challenges for Indian Industry resulting from the ‘Blueing’ of the Indian Economy
- Effectiveness of ‘Blueing’ the Indian Economy as a Mitigating Strategy against Climate Change
- Quantifying Climate-Change Impacts on India’s Naval Security
- Leveraging the International ‘Coalition for Disaster Resilient Infrastructure’ (CDRI)
- Resilience of India’s Urban Agglomerates to Climate Change Impacts
- Regional ‘Adaptative’ and ‘Mitigative’ Best Practices vis-à-vis Climate Change
- Marine Pollution and trans-boundary movement of oceanic waste
- Ocean Acidification
- Degradation of the Underwater Acoustic Habitat

# Oceanic Resources (Living and non-Living)

- **Living Resources**
  - **Fish and Fishing**
  - Bioactive Natural Products
  - Marine Bio-organisms
  - Submerged Aquatic Vegetation (SAV)
- **Non-living Resources**
  - **Minerals and Sea-bed Mining**
  - **Conventional Energy**
    - Crude Oil and its Products
    - Natural Gas
  - **Non-Conventional Energy**
    - Biofuels
    - Gas Hydrates
    - Offshore Wind
    - Ocean Energy (Ocean-Mechanical and Ocean-Thermal)

# Maritime Affairs : Public International Maritime Law

- UNCLOS
- SUA Convention and its Protocols
- Legal Aspects of Piracy and Maritime Crime
- San Remo Manual / IHL (Laws of War)
- Legal Aspects of 'Unmanned', 'Minimally-manned', 'Semi-Autonomous' and 'Autonomous' Surface-, Underwater- and Airborne- Vehicles
- Legal Aspects of 'Privately Contracted Armed Security Personnel' (PCASP) and Floating Armouries
- Legal Aspects of Maritime Terrorism
- Legal Aspects of Underwater Cables
- Legal Aspects of Seabed Mining
- Legal Aspects of Fishing (including IUU Fishing)
- Legal Aspects of MDA
- Legal Aspects of 'Areas Beyond National Jurisdiction' (ABNJ)
- Legal Aspects of 'Biodiversity Beyond National Jurisdiction' (BBNJ)
- Legal Aspects of Marine Pollution and Climate Change (London Convention and its Protocol, Basel Convention, Waigani Convention, etc.)
- Legal Aspects of the Impacts of Climate Change



## Maritime Affairs : Public International Maritime Law

- Legal Aspects of the Protection of Critical Maritime Infrastructure
- Legal Aspects of Maritime Energy Extraction and Transportation
- Legal Aspects of Maritime Salvage beyond the Territorial Sea
- Legal Aspects of Derelicts and Wrecks beyond the Territorial Sea
- Legal Aspects of the protection and preservation of India's Underwater Cultural Heritage
- Legal Aspects of India's Processes for Ratification of International Treaties and Conventions
- Legal Aspects of Naval / Coast Guard HADR (Humanitarian-Assistance and Disaster-Relief) Operations
- Duties, Responsibilities and Obligations of Flag States, Port States, Coastal States vis-à-vis Mercantile Trade

# Maritime Affairs : Maritime History, Maritime Heritage, and Maritime Culture

- India's Maritime (Seafaring) History
- Maritime History of the Indian Ocean
- India's Maritime Heritage
- India's Underwater Cultural Heritage
- Maritime Kingdoms of Ancient India
- Maritime Kingdoms of Medieval India
- India's Naval History
- Indian Maritime Customs and Traditions
- Indian Naval Battles
- Indigenous Ships and Craft of the Indian Ocean
- The MAUSAM Initiative

# Maritime Affairs : Trade, Maritime Connectivity, Ports and Shipping

- Maritime Connectivity
- Comparative Analysis of India's Merchant Marine
- Analysis of India's Dependence upon Seaborne Merchandise Trade
- Coastal Shipping
- Inland Waterways
- Maritime Leisure/Sport, and Maritime Tourism
- Cruise-Ship Tourism
- Advocacy of the need for national-flag shipping
- Analysis of Flags of Convenience
- Analysis of the Northern Sea Route
- Analyses of Indian Shipbuilding
- Impact of Industry 4.0 upon Shipping (Shipping 4.0)
- India as a Regional Hub for Ship-repairs
- Shipbreaking in India

# Maritime Affairs : Trade, Maritime Connectivity, Ports and Shipping

- Port Analysis
- Analysis of Transshipment Ports
- Analysis of Critical Cargoes
- Development and Refinement of an Efficiency Matrix for Port-development within India
- Impact of Industry 4.0 upon Ports (Ports 4.0)
- Analysis of Port-development (by Indian public/private/joint-ventures) as a foreign-policy tool for regional development
- Analysis of Ro-Ro Shipping as a bridging strategy for the development of quayside infrastructure
- Analysis of the relationship between India's vision of SAGAR (Security and Growth for All in the Region) and India's mega-project for port-led national development, viz., SAGARMALA

# Maritime Affairs : Safety Issues

- Role and Functioning of the IMO
- 'Regional Seas Programme' (RSP) and 'Shared Seas' Concept
- SOLAS Convention
- VIMSAS (Voluntary IMO Member State Audit Scheme)
- 'Triple-i' (Implementation of IMO Instruments) Code
- Assessing the efficacy of 'Flag-State', 'Port State', and 'Coastal State' Controls
- Regional Structures for Safety at Sea within the Indo-Pacific
- Assessing and Countering Risks of Marine oil-Pollution
- Risk Assessment of Oil-Spills in the Gulf of Kachchh
- Regional Maritime Humanitarian-Assistance and Disaster Relief
  - The Role of IONS
- Maritime Leisure / Tourism Safety
- Maritime Search and Rescue (SAR)
- Maritime Salvage

- It should **not** be concluded that **all** the indicated subjects/ *topics/ themes* are being actively addressed by the present members of the NMF's research-faculty
- However, a single member of the NMF's research-faculty often addresses a number of research-areas.
- Also, a 'cluster' approach has been adopted where a given cluster comprises a mix of the NMF's own researchers and researchers drawn from outside the NMF's faculty.
- The 'Blue Economy and Climate Change (**BECC**) Cluster', the 'Public International Maritime Law (**PIML**) Cluster', and, the '**Indo-Pacific** Cluster' are producing very promising results.



## **Fisheries Ecosystem**

Fishers & Fishing Community

Fishing Vessels/Gears/Eqpts

Fishing area and the methods of fishing employed

Development of Landing Areas and Subsequent Connectivity

Processing of Catch and Sale

## **Fisheries Ecosystem (Contd)**

Cooperatives and Local/Regional  
Organisations

Weather Information and Warnings

Scientific Training and Skill Development

Enabling Legislation

Enforcement Authorities

## Considerations for De- Carbonising the Fisheries Sector

- Time span – will not happen overnight, will take years
- Defined boundaries/goals – geography and emissions
- Show consistent progress over established baselines
- Lessons learnt must be shared with the fishing community
- Requirement of third-party certification

# Green Landing Points

- Encourages environmental-friendly & sustainable operations
- Adopts green technologies
- Balances economic, environmental and social dimensions of development
- Digitalisation
- Small ecological footprint
- Emphasis on spatial planning
- Climate change adaptation and mitigation strategies
- Transport to processing facilities.

# Green Fishing Areas

Specific areas where zero-emission solutions are supported

Spirit – focus and coordinate decarbonization efforts in a concentrated geographic area

Something akin to, COP 26 (Glasgow 2021) – Clydebank Declaration, 22 countries including US committed to establish corridors by 2025

COP 27 (Sharm el Sheikh 2022) – Green Shipping Challenge, to limit global temp rise to 1.5 deg C

# Fuel Pathways

- Biomass-based fuels, poor long-term scalability, may be in transition period
- Green Ammonia – fuel safety standards, available ICEs likely in Q4 of 2024
- Green Methanol – presently most advanced solution as ICEs available
- Green Hydrogen – tech challenge, cryogenic storage will increase costs
- Synthetic Diesel – Nil changes reqd for ICEs or storage, but long-term challenges for carbon feedstock procurement



## Specific Implementable Recommendations

- Heartening to note - findings being presented by several field studies. Studies need to be scaled up and made pan-India/ BIMSTEC
- Knowledge-building through continuous education and the empowerment of women
- Interaction programmes with the fishers community must continue preferably in the vernacular language
- The NMF is ever-willing to be the knowledge partner of like-minded institutions who are keen to examine, research and recommend specific implementable suggestions to policy makers.



Jai Hind

***THANK YOU !!!***