BLUE ECONOMY: WAYS FORWARD FOR SUSTAINABLE DEVELOPMENT OF IONS MEMBER STATES

Focus:

Cooperation on Humanitarian Assistance and Disaster Relief (HADR): Providing Assistance, Protection and Preservation of the Maritime Environment in the Indian Ocean Region (IOR)

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I hereby testify:

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SECTION 1: INTRODUCTION

The Indian Ocean space is bookended by a world of maritime trade and commerce of the Atlantic on one side and the "benign ports" of the Pacific on the other. Besides, the Indian Ocean, with 73,600,00 square kilometres of water space, is the world's third ocean, following only the Atlantic and Pacific Oceans (Vijay Sakhuja, 2011, p. 56). The IOR extends between the Indian subcontinent, the African coast, the Arabian Peninsula, Thailand, the Peninsula of Malaysia, Indonesia, and Australia. The IOR has seven major key chokepoints: The Mozambique channel, the Bab el Mandeb, the Suez Canal, the Strait of Hormuz (SOH), the Straits of Malacca (SOM), the Sunda Strait and the Lombok Straits (Anup Singh, 2008, p.203). With this, most of the sovereign states are geographically situated at a major strategic location, with the Indian Ocean being crucial for the world's oil transportation (ibid., p.201).

Figure 1: Maritime Chokepoints in the Indian Ocean Region

Source: Indian Ocean Rising (Stimson, 2021)

With its geographical position, the Indian Ocean experiences numerous traditional and non-traditional challenges (Dwivedi, 2025). As the lead maritime agency that is entrusted to spearhead national and international maritime security and safety efforts, the Navy and maritime agencies are expected to act as a deterrent to potential maritime security threats. However, nowadays, military forces of several countries are transforming themselves to be relevant to the forces of change in the international environment. A prominent shift was observed in the movement from their traditional role of safeguarding territorial defence to increased deployment for humanitarian missions, now better known as Humanitarian and Disaster Relief (HADR). This shift in role is driven by calls from the international community for military forces to participate in HADR. In addition, the international community considers military forces to be an appropriate tool for HADR tasks. HADR cooperation is increasingly becoming a central theme in international debate. Natural disasters are increasing worldwide, calling everywhere for a collective response. However, the role of the Navy and other maritime agencies can be seen to have moved further along the traditional HADR spectrum, namely their role in preserving ecology and managing climate change (Grare, 2024).

From an ecological perspective, the IOR is characterised by marine biodiversity, coral reefs, mangroves, and fisheries that support millions. This ecological wealth, but, is being put at risk by climate disasters such as cyclones, tsunamis and sea level rise. Among them, the 2004 Indian Ocean tsunami that led to the death of more than 230,000 people in 14 countries is still a shocking memory in the region. More recently, the MV X-Press Pearl incident off Sri Lanka and the 2022 Tongan volcano eruption have highlighted the necessity of rapid response at sea in a coordinated way.

Conversely, the increasing frequency and severity of disasters as a result of climate change also make HADR not just a humanitarian, but a strategic need in the IOR. Low-lying island nations are at risk from advancing sea levels, warming oceans are having a destabilising effect on marine ecosystems, and extreme weather events are likely to become more prevalent. Disaster response is also delayed and not effective often due to a regional capacity that is limited, geographical competition and capacities, and multiple layers of disjointed, fragmented governance.

Recently, humanitarian actors have also begun to question the place of humanitarian action itself. The ongoing debate centres on the different objectives and values that “military”

humanitarian action has, in contrast to “civilian” humanitarian action. So, in this sense, this paper seeks to propose a development of cooperative HADR frameworks in the IOR that encompasses these three overlapping dimensions: assistance to populations affected, protection of human security, and preservation of the maritime environment. The use of this triad ensures that HADR is both reactionary as well as preventative, builds resilience, trust in the region, and protects the ecology of the area. If pursued with this vision of synergy between naval capacities, regional frameworks, and environmental protections, HADR in the IOR could go from an operational, ad-hoc measure to a valuable strategic tool for sustainable maritime security.

SECTION 2: STRATEGIC LANDSCAPE OF THE INDIAN OCEAN REGION

The Indian Ocean is the largest ocean, and it has attracted attention in maritime issues involving international relations. A more acute focus was directed towards the Indian Ocean when the global shift took place from West to East. With two major rising Asian powers, India and China, and the existence of hegemonic power, the United States of America (USA), together with the increasing importance of political and non-traditional sources of threats, IO is well-known as the "strategic heart of the world ". In fact, Alfred Thayer Mahan has stated that anyone who controls the Indian Ocean will also dominate Asia (Tharishini, 2015, p.91).

The Indian Ocean is important to IOR countries for two reasons: seaborne trade and energy routes, and economic well-being (Dhruva Jaishankar, 2016). First, it enjoys a privileged location at the crossroads of global trade, connecting the major engines of the international economy in the Northern Atlantic and Asia-Pacific. This is particularly important in an era in which global shipping has burgeoned. Today, the almost 90,000 vessels in the world’s commercial fleet transport 9.84 billion tonnes per year. This represents an almost fourfold increase in the volume of commercial shipping since 1970 (ibid). The energy flows through the Indian Ocean are of particular consequence. Some 36 million barrels per day, equivalent to about 40% of the world’s oil supply and 64% of the oil trade, travel through the entryways into and out of the Indian Ocean, including the SOM, SOH, and Bab-el-Mandeb (ibid).

Secondly, the Indian Ocean is rich in natural resources. 40% of the world’s offshore oil production takes place in the Indian Ocean basin (ibid). Fishing in the Indian Ocean now accounts for almost 15% of the world’s total and has increased some 13-fold between 1950 and 2010 to 11.5 million tonnes (ibid). Aquaculture in the region has also grown 12-fold since

1980 (ibid). Although global fishing is reaching its natural limitations, the Indian Ocean may be able to sustain increases in production. Also of great interest are mineral resources, as nodules with nickel, cobalt and iron, and massive sulphides with manganese, copper, iron, zinc, silver, and gold are found in large quantities on the sea floor (ibid). Titanium, zirconium, tin, zinc, and copper are on top of that supplied through coastal sediments in the Indian Ocean. In addition, several other rare earth elements occur, but it is not always economically viable to extract them. The significance of the Indian Ocean in terms of international trade is immense. The role of this ocean is also evident in the shipments of cargo passing through it. Thus, the Indian Ocean's progress will then have a direct consequence on the Asian region's economic development and on global trade.

2.1 Blue Economy Implementation in the IORA

The blue economy diplomacy of the IORA has translated into a number of early ministerial meetings, dialogues, and conferences. The notion of blue economy was broached in the 14th Ministerial Meeting in 2014 in Perth, Australia. A year later, in 2015, India hosted the first dialogue on blue economy, addressing themes related to the operationalisation of blue economy, such as fisheries and aquaculture, renewables in the maritime sector, ports and minerals exploration (Ahadin, Misbakun, 2020).

The blue economy concept gained traction with the IORA Declaration on the Blue Economy at the 2015 IORA Ministerial Blue Economy Conference in Mauritius. The Declaration also provided a set of guidelines for the blue economy in the IOR, which included governance of marine resources. The Declaration also made note of the blue economy's emphasis on food security and poverty alleviation through sustainable livelihoods within fisheries and aquaculture systems; renewable marine energy with an emphasis on economically efficient use of energy and adaptation to the climate threat; ports with a focus on trade, investment and maritime connectivity in the Indian Ocean region; and mineral exploration with a focus on creating new business opportunities and attracting investment in the Indian Ocean (Mauritius Declaration, 2015).

2.2 Regional Vulnerabilities: Natural Disasters, Humanitarian Crises and Maritime Environmental Challenges

The IOR is also often subject to climatological, geological, and hydrological disasters. The scale of the 2004 Tsunami and its aftermath brought home the horror of the tragedy at a new level. Nearly 230,000 deaths in 14 countries remain painful memories for much of the world's population. Also, the 2005 Pakistan earthquake and the Manado landslide in North Sulawesi, Indonesia, in 2005, the Tongan volcanic eruption in 2022, Cyclone Idai in Mozambique in 2019 and catastrophic flooding in Karela in 2018 that left the country largely in shambles have also underscored the relevance of HADR to such natural disasters and crises (ibid).

The primary causes of natural disasters and humanitarian crises include the following:

a. Earthquakes and tsunamis caused by tectonic movements of the Sunda Megathrust (Tantray, Shubham, & Langeh, 2024).

b. Warm ocean waters are what provide the necessary energy for the formation of tropical cyclones, as is the case in the Bay of Bengal and Arabian Sea region (Tantray, Shubham, & Langeh, 2024).

c. Coastal zones with high population density are hit by floods and landslides due to the monsoon. (Tantray, Shubham, & Langeh, 2024).

d. Climate change, including sea-level rise, salinisation, and heatwaves (Gooding, Williamson, & Babin, 2023).

Coastal hazard zones are already anticipated to be the most densely populated areas in the world by 2030, and the IOR is expected to be no exception. Over 340 million people will be exposed to this hazard zone, which will be compounded by the weak disaster preparedness, governance, and patchy access to early warning systems (Tantray, Shubham, & Langeh, 2024).

Excluding only natural disasters engrossed in humanitarian crises, man-made pressures are greatly straining the ecological well-being of the Indian Ocean. Among the specific events that can fall under maritime environmental challenges are oil spills, plastic pollution, coral degradation, and illegal, unreported, and unregulated (IUU) fishing.

a. **Oil Spills**: Incidents like the MV Wakashio spill off Mauritius and the MSC ELSA-3 shipwreck off Kerala have devastated coral reefs, mangroves, and fisheries (The PHILOX, 2024; Martin, 2025; Sarkar, 2020)

b. **Plastic Pollution**: The IOR receives massive amounts of plastic debris annually, with nurdles and microplastics infiltrating marine food chains and threatening biodiversity (The PHILOX, 2024; Martin, 2025).

c. **Coral Degradation**: Rising sea temperatures and pollution have led to widespread coral bleaching, undermining marine ecosystems and tourism economies (The PHILOX, 2024).

d. **Illegal, Unreported, and Unregulated (IUU) Fishing**: Overfishing and destructive practices are depleting fish stocks and destabilising coastal livelihoods (Raafi et al., 2024, p.151).

These also undermine ecological resilience and are responsible for more frequent and severe humanitarian crises in island states and low-lying coastal countries.

2.3 Stakeholder Overview

According to this research, the 2004 tsunami was a major factor or starting point that prompted many countries and organisations, especially members of the Association of Southeast Asian Nations (ASEAN), the Indian Ocean Rim Association (IORA), the Quadrilateral Security Dialogue (Quad), and the United Nations (UN), to become involved in shaping the landscape of natural disasters, humanitarian crises, and

maritime environmental challenges. For the IOR countries, all of these organisations, apart from bilaterally, are very active in engaging in HADR operations.

- **ASEAN**: In 2023, ASEAN established formal cooperation with IORA on blue economy and climate adaptation as a ‘general area of cooperation’. Along the lines of sustainable development, the ASEAN 2045: Our Shared Future project shows how ASEAN nations participate in this by offering a platform for humanitarian and disaster relief (Humanitarian Disaster and Relief (HADR)) missions throughout Southeast Asia. These are in continuity with the Sendai Framework for Disaster Risk Reduction (SFDRR) and ASEAN Agreement on Disaster Management and Emergency Response (AADMER) Work Programme 2021-2025. This is also impacted by the uncertain global climate change, but it is only one of the several concerns for the ‘primary objective’ of ASEAN to build ‘an ASEAN Community that is inclusive and resilient to crises requiring coordinated humanitarian assistance’ (ASEAN, n.d).

- **Indian Ocean Rim Association (IORA)**: The organisation includes 23 member states, IORA focuses on maritime security, disaster risk management, and economic cooperation. In reality, IORA is no longer able to respond directly to disasters. However, for now, it has announced some Guidelines for HADR in November 2021 and addresses any crisis or emergency based on the IORA Review of the Indo-Pacific published in December 2022. The unstructured initiatives within this organisation are seen to rely on individual initiatives, especially in India. However, there is an organisation called the Indian Ocean Commission (IOC) where the mechanism implemented in the Southwest Indian Ocean, funded by the European Union (EU), operates better than IORA, but still does not fully meet the requirements of HADR (Grare, 2024).

- **QUAD**: Australia, India, Japan and the United States signed the Guidelines for a “Quad Partnership for HADR in the Indo-Pacific” in 2022 (MEA, n.d). The partnership is designed to address the vulnerability of the Indo-Pacific region to disasters. This mechanism will enhance their capacity and capability, interoperability and operational synergy to conduct HADR operations (ibid). The entity will also coordinate HADR operations with the UN and other

international agencies and donors, regional and local governments, public and private organisations, and non-governmental organisations, where appropriate and in the interest of humanity (ibid).

- **UN Bodies**: Agencies like the United Nations Office for Disaster Risk Reduction (UNDRR), the United Nations Environment Programme (UNEP), and the International Maritime Organisation (IMO) support disaster risk reduction, marine pollution control, and sustainable development. The UN Office for Disaster Risk Reduction has identified the IOR as a climate adaptation and resilience-building priority zone (Gooding, Williamson, & Babin, 2023).

SECTION 3: UNDERSTANDING HADR THROUGH THE TRIPLE LENS: ASSISTANCE, PROTECTION AND PRESERVATION

Certainly, HADR in the IOR will be viewed through three key strategic lenses: assistance, protection, and preservation. This triad is intended to ensure a comprehensive and resilient response framework. It will address immediate humanitarian needs, protect vulnerable populations, and preserve the maritime environment.

3.1 Humanitarian Assistance: Rapid Response and Relief Logistics

Humanitarian assistance is aid to an affected population that seeks, as its primary purpose, to save lives and alleviate the suffering of a crisis-affected population. The fundamental humanitarian principles of humanity, impartiality and neutrality must provide humanitarian assistance. For these guidelines, assistance can be divided into three categories based on the degree of contact with the affected population. These categories are important because they help define which types of humanitarian activities might be appropriate to support with international military resources under different conditions, given that ample consultation has been conducted with all concerned parties to explain the nature and necessity of the assistance (UNHCR, n.d).

- **Direct Assistance** is the face-to-face distribution of goods and services.

- **Indirect Assistance** is at least one step removed from the population and involves such activities as transporting relief goods or relief personnel.

- **Infrastructure Support** involves providing general services, such as road repair, airspace management and power generation that facilitate relief, but are not necessarily visible to or solely for the benefit of the affected population.

Naval forces are pivotal in a maritime context due to their mobility, reach, and self-sustaining capabilities. Some case studies can be linked to humanitarian assistance. Among them is Operation SAMUDRA SETU (2020), launched by the Indian Navy to evacuate approximately 3,992 Indians who were stranded abroad when the world was hit by the COVID-19 pandemic (Ministry of Defence, 2020). Another case study is during the tsunami, when the Indian Navy was involved in five simultaneous operations involving relief that showcased the scale of maritime HADR logistic support.

3.2 Protection: Safeguarding the Populations

Humanitarian activities involve affording the victims of disaster zones not only assistance but also protection, as provided for by humanitarian principles. The key humanitarian objective of providing protection to populations in need may at times necessitate a pragmatic approach, which might include civil-military coordination. The key components of evacuation operations using naval platforms provide shelter and safety by temporary housing, sanitation, protection from secondary hazards and security and order with the aim of supporting the prevention of exploitation and maintaining stability.

India, for example, has made clear their commitment to protecting at-risk groups in its more recent HADR missions in the IOR via rapid evacuations, medical assistance, and other forms of diplomacy. Missions like OPERATION BRAHMA to Myanmar (2025) and OPERATION SADBHAV to Southeast Asia (2024) are significant examples of India forward-deploying naval and air assets to deploy relief material and set up field hospitals. These initiatives complement India's larger strategic outlook, captured in the

MAHASAGAR framework and the philosophy of Vasudhaiva Kutumbakam of regional solidarity and all-inclusive security. India's HADR efforts, as a first responder, are also a function of humanitarian instincts along with geopolitical vision to position India as a 'net security provider' in the region (Chanana & Pandey, 2024; Grare, 2024).

3.3 Preservation: Environmental Stewardship and Climate Resilience

One mainstream definition of HADR relates more to operations that provide "help and relief to the civil population in an emergency or crisis situation". As previously mentioned, HADR can be considered as actions undertaken in ''response to the need to save or protect life, alleviate suffering, and preserve human dignity in some crises brought about by natural geological hazards- earthquakes, tsunamis, volcanic eruptions, and landslides, and climatic- tropical cyclones, floods, droughts, and wildfires (as well as human-made disaster, i.e., chemical, industrial or major transport accidents and environmental incidents).

But, technologically, the maritime environment has undergone several transformations, and among others, climate change, loss of marine biodiversity and marine pollution have impacted the world today. This has led to a broader application of a mild emphasis on HADR, in which cooperation to protect the oceanic space takes precedence. These include also cooperation, information exchange, naval exercises and capacity building. And finally, it is this pillar which guarantees that HADR operations by military and civil aid agencies are also not omitted from the attempt to stop the environment from degrading, which indirectly takes human lives.

Green governance and climate adaptation have factored more and more prominently as elements of HADR and regional collaboration in India's recent IOR interventions. Joint initiatives like the Annual Joint HADR Exercise (AJHE-23) conducted by the Indian Navy in Goa advocated for climate adaptation, disaster risk reduction, and multi-agency responses. The drill included eight IOR countries and included technologies such as Geographic Information Systems (GIS), remote sensing and early warning systems as a means of better protecting and preparing the ecology (Press Information Bureau, 2023).

The triple-lens framework transforms HADR from a reactive tool into a strategic maritime diplomacy and resilience instrument. By aligning Assistance, Protection, and Preservation, regional actors can build trust and interoperability, promote environmental stewardship, and enhance civil-military synergy. This approach is especially vital in the IOR, where climate vulnerability, geopolitical competition, and ecological fragility intersect.

SECTION 4: CURRENT OPERATIONAL MECHANISMS AND MULTILATERAL COOPERATION IN HADR

HADR in the IOR, indeed, requires good operational processes and multilateral cooperation to be effective. Due to the high risk of disaster in the area due to climate and geopolitical realities, a coordinated response protocol, joint disaster response training, and technology sharing are important necessities for an effective, environmentally sensitive, and timely response.

4.1 Joint Naval Exercises and HADR Drills in the Indian Ocean Region

Multilateral naval exercises are, therefore, the preferred strategic platform to develop HADR capabilities between regional and extra-regional maritime actors. Such drills allow these navies to align their standard operating procedures, increase trust between them, and practice collective responses to challenging disaster situations like tsunamis, maritime accidents, and environmental crises. Some well-known examples are MILAN in India, KOMODO in Indonesia and AMAN in Pakistan (Bradford et al., 2022, p.265). The nature of these drills shows an increasing focus on non-traditional security threats and the evolving role of navies in civil support operations. Through the incorporation of simulated real-world scenarios, these enhance SOPs, civil-military interoperability, and project a united front of regional stabilisation and environmental concern. Also, the participation of states, both small and large, of all powers, includes them in a delicate balance between disaster and diplomacy. The cooperative nature of the IORA in responding to humanitarian emergencies is highlighted by multilateral naval exercises as well (ibid., p.266). Such interactions help enhance a more integrated maritime security framework, through both a higher level of operational preparedness and by a greater understanding of issues via both tactical and environmental awareness.

4.2 Civil-Military Partnerships and NGOs in HADR

Good civil-military coordination is fundamental for successful HADR responses, especially in 'complex emergencies' where humanitarian needs overlap with logistical and security challenges. The strengths of military forces and NGOs in responding to disasters are somewhat complementary. Military assets provide speedy deployment, strategic lift capabilities, and command-and-control structures, and NGOs provide "ground-level knowledge, medical expertise, and community role." Their coordination guarantees a timely, efficient, and principled response.

The military is seen as an increasingly relevant partner in disaster response due to rapid deployment and logistical capabilities. They represent skilled and organised manpower that is able to organise and execute large-scale operations and can be mobilised at a moment's notice, particularly in a context of a degraded local infrastructure. Military aid within the context of HADR could be in the form of transport and logistical aid, evacuation, rescue, medical, shelter and emergency supplies.

Both military and civilian aid agencies need to practice common basic HADR principles. These principles require rigorous analytical and information management skills, discipline, common sense, timeliness and a high standard of planning and accountability as lives are at risk. The challenges to provide humanitarian and emergency relief are:

a. Relevant to immediate and longer-term humanitarian needs.

b. Coordinated with local government, other agencies, NGO and the affected community.

c. Implemented quickly, professionally and flexibly.

d. Consistent with international humanitarian principles and practice.

Levels of military involvement in HADR differ in each country, but all militaries involved should be in line with the UN Security Council or Multinational Forces (MNF) mandate and directions or other relevant international agreements and frameworks. In many cases, the military has the primary responsibility and nearly all of the resources to carry out HADR missions. In all other countries, the military is a support structure that becomes engaged only in matters of life and death.

Practice, such as the establishment of Multinational Coordination Centres (MNCCs), the importance of empowering local communities, and ensuring civilian leadership over HADR operations, can further enhance the integrity of governance and improve overall operations. Continued differences between, for example, their mandates or access to resources may make collaboration difficult, particularly in highly political contexts. The experience of the COVID-19 pandemic laid bare issues with civil-military integration and gave rise to the call for more inclusive and agile frameworks (RSIS, 2023). HADR ecosystems linking civilian, military and NGO efforts are particularly important because they promote synergy and complex adaptive systems thinking between various actors. Through institutionalising coordinating mechanisms such as CMCCs and RCGs and making community-led responses a priority, actors can overcome these operational gaps to provide humanitarian assistance in a way that is more precise and accountable.

4.3 Integration of Satellite Data, UAVs, and Maritime Domain Awareness Systems in HADR Operations

The new technology loops in satellite, unmanned aerial vehicles (UAVs), and Maritime Domain Awareness (MDA) system data, which have altered the structure of HADR operations in the IOR as well. This combination of three technologies can improve real-time on-the-ground understandings of situations, cut down response times, and increase coordination between regional actors. Synthetic Aperture Radar (SAR) satellite assets, such as Sentinel-1 and RADARSAT, have the potential for continuous monitoring that is essential for oil spill detection, monitoring of coastal degradation, and detection of uncooperative vessels, even during cloud-covered skies (Landicho, 2024).

In areas of disaster, UAVS can quickly provide reconnaissance and damage assessments. In parallel with acquisitions such as the MQ-9 Reaper, the Indian Navy is currently working towards the development of high-altitude, long-endurance, high-speed UAVs that will allow for continuous monitoring and shortened reaction times, again across the vastness of the IOR (Indian Defence Research Wing, 2025). Thermal imaging, search and rescue, and pollution monitoring have all been done with aerial drones operating in spaces where other types of assets can't go.

Indian Navy's Information Fusion Centre – Indian Ocean Region (IFC-IOR), for instance, is an MDA system that is central in fusing the multi-source data into usable intelligence. The IFC-IOR also acts as a mechanism for sharing information among the world's navies, coast guards and civil maritime community, enabling India's "Security and Growth for All in the Region" (SAGAR) vision (Haldar, 2024). The strategic nature of the centre is further reflected in its work alongside international liaison officers and its participation in multilateral constructs such as the Indian Ocean Naval Symposium (IONS).

Yet it is not all roses. Interoperability, privacy and dual-use require not only sound governance, but also a set of ethical standards around the data. Satellite observation, coupled with open source analysis, is becoming more accessible, increasing the overall availability of maritime intelligence, but it also creates an imperative for the littoral states to become equipped to respond (Brewster, 2024). This should be part of an effort to bridge these gaps and make sure that technology, in this case, does turn into resilient and inclusive HADR systems. This should not be taken to neglect the fact that in spite of some of these challenges, the advent of satellite, UAV, and MDA technologies in the Indian Ocean Region has brought about a distinct sea change in disaster response. These systems contribute to maritime security and climate resilience in one of the most geopolitically important regions in the world by crossing spatial divides and facilitating timely and informed interventions.

SECTION 5: CHALLENGES AND DIFFICULTIES IN HADR COOPERATION IN THE INDIAN OCEAN REGION

Cooperation in HADR continues to be an increasingly important theme in international debate. The IORA is no exception, facing several challenges and difficulties in effectively implementing HADR coordination mechanisms. Limited capacity and capability in a large number of regional states, weak ocean governance, political frictions between IORA countries and the influence of major powers, especially the presence of China and the USA in the Indian Ocean, add to the difficulties in all multilateral initiatives to establish regional or sub-regional HADR coordination mechanisms (Grare, 2024).

However, this study identifies the main challenge or difficulty, "**COOPERATION/COLLABORATION,"** that needs to be given immediate and serious attention by all IORA nations. This multinational cooperation /collaboration challenge has yet to be overcome.

5.1 Cooperation or Collaboration Gap Within IOR Nations and Regional Architecture

IOR states are multiple and vary in capabilities, governance structures and strategic priorities. Such heterogeneity often results in an asymmetric coordination in which larger powers dictate the responses while smaller ones have difficulty integrating them in a productive manner. At the regional level of the IOR, South Asian Association for Regional Cooperation (SAARC), IORA, and Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) all have similar agendas but have no centralised control. For instance, although signed in 2010, the SAARC Agreement on Rapid Response to Natural Disasters (SARRND) has only been ratified by India, which has minimised the treaty's efficiency (Grare, 2024).

5.2 Cooperation or Collaboration Asymmetries Among Regional Navies and Disaster Agencies

Regional navies and disaster agencies' lack of communication in language, protocols, and equipment hinders combined operations. The Indian Ocean Naval Symposium

(IONS) issued guidelines for HADR coordination in 2017, but implementation remains uneven. In fact, the guidelines do not touch on the preservation of the maritime environment, and it is clear that a review is very much needed.

Additionally, a critical missing element in disaster relief approaches is civilian and military engagement (Gong & Jayaram, 2023). Its HADR operations and exercises are primarily led by the military, leading to a huge gap in civil-military engagement that is crucial for HADR in IOR. Both civil and military operate with different organisational philosophies and are subject to different types of international law. The military operates with ROEs, while the civil operates with humanitarian principles and codes of conduct. Coordinating the civil and military components in humanitarian assistance or disaster relief operations is not new. It has always been a difficult challenge and one of the most prominent aspects of humanitarian-military coordination during complex emergencies.

Coordinating humanitarian assistance is becoming an increasingly important and challenging undertaking for three reasons. First, there is a large number of humanitarian organisations that are often present in crises. Second, humanitarian crises require a broad range of support services and enabling activities that can often be shared. Perhaps more important are the enabling activities, which may include basic security for humanitarian workers and negotiating access to populations in need. Third, coordination is critical in the political environment that often surrounds a humanitarian crisis. When a humanitarian crisis is the result of a natural disaster, the partnership between international humanitarian organisations and local authorities is often straightforward. In situations of complex emergencies, however, the political environment may be fluid and extremely complex. In some emergencies, there may be several parties to the conflict, regional and sub-regional dimensions and multiple ways in which the UN and other international bodies and governments are involved.

SECTION 6: TOWARDS A STRATEGIC VISION FOR A RESILIENT AND SUSTAINABLE HADR ARCHITECTURE

With the identification of challenges or gaps in the previous Section, this study looks forward to HADR moving beyond reactive responses. It must integrate operational preparedness and

regional cooperation into a coherent framework. This Section proposes a Matrix of maritime humanitarian response (MMHR) model guided by ASEAN centrality to form a resilient and sustainable HADR architecture.

The MMHR model is a conceptual framework that aligns maritime operational readiness with environmental protection and human security. It integrates three core dimensions:

a. **Operational Readiness**
   - Rapid deployment protocols
   - Pre-positioned logistics hubs
   - Interoperable naval platforms and SOPs

b. **Humanitarian Coordination**
   - Civil-military coordination centres
   - Community-led resilience programs
   - Gender-sensitive and culturally aware aid delivery

The MMHR model draws inspiration from New Zealand's Integrated Maritime Incident Readiness and Response Strategy, which emphasises intelligence-led readiness and ecological safeguards (Maritime New Zealand, 2022). It also aligns with the ASEAN Maritime Operational Threat Response Protocol, which promotes interagency coordination and early resolution of maritime threats (ARF, 2019).

ASEAN's role as a convening platform for regional security and disaster response is pivotal. The ASEAN Outlook on the Indo-Pacific (AOIP) emphasises inclusivity, rules-based cooperation, and sustainable development. ASEAN-led mechanisms such as:

- AADMER (ASEAN Agreement on Disaster Management and Emergency Response)
- ADMM-Plus Expert Working Group on HADR
- Changi Regional HADR Coordination Centre (RHCC)

...have facilitated multi-level engagement and joint exercises with partners like the QUAD, EU, and UN bodies.

SECTION 7: CONCLUSION

Ultimately, the IOR is at a critical juncture in which humanitarians, security professionals, and environmentalists can come together, from divergent paths, to find a common regional future. This essay has sought to present a multifaceted view of HADR through a triad explaining HADR as including assistance to vulnerable populations, protection of human security, and preservation of the maritime environment. These components are mutually dependent on each other and are all vitally important to the construction of a durable, inclusive maritime structure.

The operational environment in which the IOR works is marked by the complex geopolitics of the region, its delicate ecology and vulnerability to natural disasters related to climate. Concrete examples ranging from the Indian Navy's OPERATION SAMUDRA SETU to the 2004 international disaster relief effort from the tsunami and oil spill response led by the Seychelles and Sri Lanka only further evidence the immediate need for national and regional integrated systems for HADR. These exercises show that humanitarian assistance is inextricable from maritime security, and both need environmental management to make them viable.

There are challenges, but uncoordinated responses are insufficient. Regional splintering of the framework ends any possibility of effective collective action. The IOR maritime security architecture is disparate and in dire need of a progression process that seeks unified, all-inclusive and forward-looking cooperative processes. To fill this gap, the following article presents the MMHR, a strategic model which combines operational readiness, environmental awareness, and humanitarian coordination. Based on the principle of ASEAN centrality, the MMHR imagines an HADR future which is not only proactive but also adaptive and ecological.

In this vision, the IOR must endeavour to develop regional security cooperation, a sustainable maritime security regime and a regional identity that supports the environment. This vision is not idealistic, but is instead very rational and required. Thus, coupled with the growing security threats and environmental hazards posed by now indisputable climate risks and increasing geopolitical competition, the only way to protect the natural environment, the

people, and its own important strategic interests, the region will be a comprehensive, united, and politically and ecologically sophisticated HADR platform.

Drawing linkages between these ideas of humanitarian, naval, and environmental interests is not abstract. Instead, it is the very foundation of a safe and prosperous Indian Ocean. Should the IOR address its existing weaknesses through investing in a more imaginative approach, fortified regional synergies and a dedicated concern for sustained resilience, perhaps this challenge will become an opportunity for collective progress.

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