### ENHANCING ECOLOGICAL CONNECTIVITIES, ENSURING SUSTAINABILITY:

How the protection and conservation of coastal and marine environments in the ASEAN region may be expanded to include areas beyond national jurisdiction (ABNJs)

The coastal and marine environments (CME) of the ASEAN Member States (AMS) do not exist in a vacuum. They are ecologically connected to each other and to areas beyond their national jurisdiction (ABNJ). The ASEAN CME is part of the Indo-Pacific oceans connectivity-the centre of the world's marine biodiversity and hosts the most extensive and diverse coral reefs, mangrove forests, and seagrass beds (ACB, 2017). It is also an area of global ecological importance providing rich biodiversity resources and valuable ecosystem services and plays a critical role in maintaining and sustaining these provisions (Meñez, 2022). It is also a key contributor to food security, livelihoods, and economic development, supplying 21.9 per cent of the world's total fisheries production in 2019, 39 per cent of which came from marine capture fisheries (SEAFDEC, 2022).

However, the productivity of the region is now approaching irreparable damage if left unaddressed as it faces human-induced threats such as overfishing, pollution, reef damage, and climate change. This is aggravated by the activities in the wider Indo-Pacific ABNJs, such as maritime shipping (oil spills), seabed mining (Meñez, 2022), poaching, and other illegal, unreported, and unregulated (IUU) fishing (ACB, 2017). The current status of CMEs of each AMS is declining at varying rates, and under these conditions, may not survive the impending impacts of climate change (Hilomen & Peñaflor, 2022). This situation endangers the biodiversity, livelihoods, and economies of the AMS. It is, without doubt that the AMS needs to urgently take the necessary and concrete steps to address these challenges immediately.

One key strategy that can be immediately undertaken is to enhance the marine ecological connectivities of the AMS and the Indo-Pacific ABNJs by establishing a comprehensive system of areabased management tools (ABMTs), specifically, an extensive and well-managed network of marine protected areas (MPAs), taking into account Article 14 of the Further Refreshed Draft Text (CRP 13) of the International Legally-Binding Instrument on Biodiversity Beyond National Jurisdiction (ILBI-BBNJ) (United Nations, 2022).



It is the unimpeded movement of species and the flow of natural processes that sustain life on Earth (Convention on Migratory Species, n.d).

It is seamless, transcends national boundaries, and spans different ecosystems (Hilty et al., 2020).

Marine ecological connectivity plays a vital role in the maintenance of marine ecosystems by facilitating the flow of larval and genetic dispersals, and replenishing organisms and nutrients in coastal and marine habitats.



### Marine larval dispersal: a case for enhancing ecological connectivities in the ASEAN region including ABNJs

A study conducted by the ASEAN Centre for Biodiversity (Hilomen & Peñaflor, 2023) illustrates how marine waters within and beyond the national jurisdictions of the AMS are highly ecologically connected and explains the maintenance of high biodiversity through seasonal replenishment of the marine metapopulations.

Following modelling patterns of larval dispersal, the study tracked the directions of particles (larvae) from source AMS across CMEs to settlement sites in adjacent AMS during the northeast (NE) and southwest (SW) monsoon periods.

### **Findings**

- There are several areas with high marine ecological connectivity in the ASEAN region.
- The coastal habitats within the AMS alternately act as sources and recipient sites of larvae depending on the monsoon season, showing dynamic interaction.
- There are strong retention rates of particles during the NE monsoon period, with Myanmar, the Philippines, and Singapore exhibiting high retention of particles.
- None of the AMS fully retained particles during SW monsoon. All shared a portion of their particles with other AMS.
- While all particles originated from ASEAN exclusive economic zones (EEZs), some particles ended up in non-ASEAN EEZ waters across ASEAN boundaries.
- The Kalayaan Island Group (KIG)—an area located at the northeastern section of the Spratly Islands in the South China Sea, dispersed nearly 85 per cent of its particles to the ASEAN region. This supports the notion that the area supplies the ASEAN region with marine larval propagules from several marine species, making it an important resource for the entire region.

# Protect the larvae, enhance connectivities

Marine life forms are maintained and sustained by larval dispersals.

Larval dispersal refers to the spread of larvae from a spawning source to a settlement site (Pineda, et al., 2007)

The survival of the larvae depends on the quality of the migration routes and the habitats where the larvae settle in and grow into adults.

By enhancing marine ecological connectivities, the larvae's survival in every stage of its life cycle can be safeguarded.

#### **Implications:**

- The study illustrates how the coastal and marine environments of the AMS are inextricably connected, and how this connection extends to areas beyond their national jurisdictions. This highlights the need to enhance the marine ecological connectivities, within and across the AMS and ABNJs, if larval dispersals are to be sustained.
- In the AMS where strong retention rate of particles is observed, protection and conservation of marine habitats within each of these AMS may be expanded. This will likely increase the sources and volume of larval propagules, which when dispersed, can populate marine habitats within and outside the AMS.
- In areas where dynamic exchanges of particles between two or more adjacent AMS are observed, potential partnerships to collaboratively conserve and manage important marine habitats may be created.
- In areas where dynamic exchanges of particles between AMS and adjacent countries outside the ASEAN EEZs are observed, potential partnerships may be forged to conserve these critically-important marine biodiversity areas.

#### **Recommendations:**

Enhancing connectivities in the AMS and ABNJs can be achieved through the establishment of large and effectively managed MPAs and MPA networks. The establishment of large and effectively managed MPAs and MPA networks of the AMS should include the BBNJs (located in ABNJs) to protect and restore marine biodiversity in the ASEAN region. The results of the studies above on the connectivity of these MPAs through the larval dispersal of some economically-important fish species may be taken into account by the AMS or by groups of AMS which they can then package as part of the information that they will submit to the Conference of the Parties of the international legally binding instrument on BBNJ, taking into account Annex 1 (c) or the special importance for the life history stages of species and other relevant items of information, for the establishment of such ABMTs as provided for in the CRP 13 of the ILBI-BBNJ draft.

## Target 3 of the Kunming-Montreal Global Biodiversity Framework:

"Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities, including over their traditional territories."

### Why MPA/MPA Networks?

The establishment of large and effectively-managed MPA and MPA networks within the AMS and ABNJs will maintain and sustain the integrity of ecological connectivities.

MPA/MPA Networks will increase production of marine larval propagules by conserving marine habitats. More larval propagules means faster recovery of marine habitats. Healthier habitats mean more recruits. More recruits mean more fish for the people.

Expanding MPA/MPA networks will protect the unique biodiversity and fragile ecosystems found in the ABNJs from exploitative and destructive practices, particularly poaching and other IUU fishing practices.

Establishing MPA/MPA networks in the AMS and ABNJs will also help achieve Target 3 of the Kunming-Montreal Global Biodiversity Framework and will be a very significant contribution of ASEAN to the world. Protection within the AMS will translate to about 24.71 per cent of the target areas protected, while expanding protection in the ABNJs will translate to 35.5 per cent of areas protected in the region.

# Enhance ecological connectivities now!

### Call for action to conserve and protect marine biodiversity in the ASEAN region including ABNJs

The declining status of marine biodiversity in the ASEAN region is currently under serious and continuous threats from various human-induced factors and may breach the threshold for collapse if these threats continue or no action is done. Hence, it is imperative that the following actions must be pursued:

- 1. Mobilise resources for the AMS to pursue the following:
  - a. establishment of transboundary MPAs encompassing BBNJs supplemental to the large conserved marine areas between and across the AMS
  - cooperation in the conservation of important marine biodiversity areas among AMS, and adjacent countries outside ASEAN EEZs, located around/across pockets of BBNJs
  - c. conduct of various studies to monitor stability of ecological connectivity among sources and sink habitats, within and beyond the AMS jurisdictions, as part of indicative criteria for identification of areas that will go into the proposed ABMTs
- Include larval dispersal information and related phenomena as part of the proposed ABMT, including MPAs, as provided for in the ILBI-BBNJ, which AMS may propose individually or collectively to the COP of the ILBI-BBNJ.
- 3. Develop a set of metrics for the monitoring and review of proposed ABMTs.



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