CONCEPT NOTE

Project Title: Project A3.1 Workshop to raise awareness of coastal and marine protection and conservation issues and its importance to the Blue Economy

Background

Ocean covers 72% of the planet's surface, and nearly 40% of the world's population lives within 100km of coastline. Therefore, the ocean represents a significant reservoir of vital resources providing food and livelihood to the world's population. In fact, 50% of the fish humans consume comes from aquaculture, and 350 million people worldwide are employed in the fishing industry. Furthermore, 80% of commodities are transported by sea for global trade, greatly impacting economic growth. The marine and coastal environment also constitutes a key resource for the important global tourism industry, supporting all aspects of tourism development.

The following decade is important for meeting the Sustainable Development Goals (SDGs) outlined in Agenda 2030 and much more for advancing the sustainable development of the oceans. The Blue Economy is defined as the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs while preserving the health of ocean ecosystems.

However, marine and coastal environments continue to be extremely vulnerable to climatic change, weather extremes, waste management, and human development activities. Sectors depend on reef tourism being particularly sensitive to ocean temperature and acidity.

Climate Change

Climate change is one of the main concerns with respect to the future of marine and coastal environments. It affects some of the critical ecosystem services, including environment, tourism, and human health.

The oceans absorb most of the world's heat and carbon dioxide; abrupt and severe changes to their environment would cause permanent harm to the ecosystem. As a result, both the global and national economies will suffer economic and social losses. The Great Barrier Reef in Australia's coral bleaching due to warming is an obvious illustration of how climate changes are affecting marine ecosystems. Unchecked climate change is predicted to result in over 90% of income losses for coral reef tourism.

While the rising carbon dioxide level is weakening fundamental elements of many marine ecosystems through ocean acidification (OA), changing of ocean chemistry. OA is known to significantly impact calcifying organisms, such as the reduced ability to form and maintain calcium carbonate shells and skeletons. This condition will

reduce the survival rate, growth of larval development and also affect the coral reef-building organisms, which causes a net decrease in coral reef coverage and associated species. According to projections, the pH for the more vulnerable ocean regions might hit the aragonite tipping threshold within a few decades, altering the chemistry of ecosystems and possibly having catastrophic consequences. In addition, oceans lose their ability to absorb carbon dioxide from the atmosphere as ocean acidity rises, which reduces their ability to slow climate change.

It has been discovered that certain important coastal ecosystems, including mangroves, salt marshes, and seagrass meadows, fix carbon at a significantly faster rate than land-based systems. This carbon sequestration function highlights once again how crucial it is to preserve and, where feasible, restore such ecosystems as a means of ecological climate mitigation.

Amid rising concerns over climate change's impact on oceans, increasing monitoring activities in the marine environment is imperative. Enhanced data collection helps track temperature shifts, sea-level rise, ocean acidification, and ecosystem changes, informing effective policies and interventions to safeguard marine life, coastal communities, and planetary health.

Jellyfish blooms

Meanwhile, rising temperature and polluted waters have also led to an influx of jellyfish blooms, creating significant problems at coastlines and ports and, in recent years, in power plants. In addition, the minimal to nearly zero need for oxygen further ensures jellyfish bloom even in polluted waters.

There is currently a lack of baseline knowledge of many species' biology and occurrence, contributing to the difficulties of studying jellyfish in the face of limited resources. This can be due to low genetic variations amongst a large geographic range, which results in inconsistent populations throughout the world. Due to research limitations, these organisms are barely studied in Southeast Asia as opposed to the rest of the world, and records of past publications are only limited to local envenomation and fisheries. Therefore, the jellyfish fisheries local to this region are pretty much unknown.

Jellyfish from the phylum Cnidaria contain stinging organelles called cnidae or nematocysts. Such organelles can be found in their tentacles, oral arms, and even the bell of the jellyfish. The effects of some nematocysts on humans may be innocuous, but a combination of others such as those belonging to box jellyfish (Class Cubozoa) are known to confer more harmful, systemic effects. The stings from Irukandji jellyfish may cause complications in humans, such as hypertension, and may even lead to death. Jellyfish stings are getting more and more frequency and severe, impacting coastal tourism in Malaysia, including the Western Pacific and adjacent seas.

Beyond individual harm, jellyfish in smacks or blooms can negatively disrupt economy-driven operations such as those in coastal marine tourism, fisheries, aquaculture, and industrial power plants (Purcell et al., 2007). To mitigate the problems, researchers are continually studying fundamental biology, occurrence patterns, and triggers (both natural and anthropogenic) for jellyfish proliferation. It is also important to note that these jelly-like creatures are quite fragile and disappear as fast as they appear after the blooming season ends. Jellyfish are still relatively understudied in the Indian Ocean and Adjacent Seas, with limited documentation.

Jellyfish research and outreach initiatives are essential to help us better understand the biology, ecology, and behaviour of jellyfish, which can lead to improved management strategies and better-informed decisions. To increase awareness about jellyfish, educating scientists, the public, and related government agencies is important. It can also help dispel common misconceptions and promote more informed decision-making when managing jellyfish populations and mitigating the impacts of blooms and stings in coastal environments.

A multidisciplinary approach to jellyfish research and outreach is essential to ensure that the research is holistic and comprehensive, considering the many different factors that can contribute to jellyfish blooms and stings. This usually means bringing together scientists from a range of disciplines, including biology, ecology, oceanography, and public health, as well as practitioners from the tourism or medical sectors.

The transboundary involvement of scientists and practitioners is crucial, as jellyfish populations can move across borders and affect multiple regions. Collaboration between scientists and practitioners from different countries can help to promote greater understanding and cooperation in managing jellyfish blooms and stings and can lead to more effective solutions that benefit everyone involved.

Marine Debris

Plastics, by far, are the most abundant marine debris and account for 60% - 80% of marine waste. Past studies show that 85% of marine debris is sourced from land-based activities, while the remaining comes from ocean-based activities. Plastic debris can be transported by rivers, winds, waves, and sewage systems to estuaries, beaches, and bays, indicating that Asian rivers contributed 86% of the global plastic input. The arrival of plastic debris in a certain habitat can ultimately affect the organism and environment. Plastic debris will be embrittled and broken down into microplastics, increasing bioavailability to organisms in the intertidal area. Besides that, it also decreases the aesthetic value and affects the beach preferability and, subsequently, the economy.

Education is critical in instilling an understanding of the adverse effects of plastic debris on the ecosystem and associated organisms, which will eventually affect us as humans. Along with education, waste management awareness plays a pivotal role in

promoting sustainable tourism. By reducing environmental impact, preserving natural beauty, and fostering responsible practices, destinations can attract conscientious travelers, benefit local economies, and ensure long-term viability, creating a harmonious balance between tourism and the environment. Hence, international coordination, enforcement, legislation, and governance measures are critical in resolving the plastic pollution problem before it worsens.

Hence, this workshop through international cooperation aims to raise awareness of coastal and marine protection and conservation issues and its importance to the Blue Economy. A science-based approach is essential to the development of the Blue Economy; commencing with the assessment and critical valuation of the coastal environment. This will serve as a foundation for strategic management and well-informed decision-making. Furthermore, this emphasizes the importance of capacity building in the pursuit of sustainable development.

It is crucial not only to minimize the degradation of the resources but to protect and also regenerate them. The objective is to ensure the coastal and marine environment can keep fulfilling their strategic environmental functions while still allowing existing and new economic activities.

Summary

A large portion of global tourism is focused on the marine and coastal environment and this is set to rise. However, tourism development brings various issues and challenges and the environment continues to be extremely vulnerable. Hence, the transition in tourism development will be aided by a Blue Economy strategy that values ecosystem services and incorporates them into development planning. This strategy will direct the growth of the tourism industry and encourage lower-impact activities like ecotourism and nature-based tourism, where the preservation of the environment is a key component of the process. A study among IORA member countries will be carried out on the research being conducted on climate change, jellyfish bloom and marine debris in coastal and marine environments; citizen science approaches to raising the awareness of coastal and marine resource conservation and sustainable use, and policy best practices on governance and regulation relating to coastal and marine conservation and tourism. Following completion of the study, a 3-day international workshop will be organised. The workshop programme will include keynote presentations from experts on topics such as sustainable coastal and marine tourism, the vulnerability of coastal areas to climate change, the impact of jellyfish occurrences on the coastal socio-economy, and policies for coastal development. The 3-day workshop will consist of:

- **Keynote presentations** from experts on topics such as sustainable coastal and marine tourism, the vulnerability of coastal areas to climate change, the impact of

jellyfish occurrences on coastal socio-economic, and policies for coastal development.

- **Country report presentations.** A template will be circulated to the speakers.
- **Plenary discussion on way forward.**
- **Technical tours.**
  1. Centre for Marine and Coastal Studies (CEMACS), Universiti Sains Malaysia, for exposure to the coastal conservation and green aquaculture projects.
  2. The UNESCO World Heritage Site of Georgetown for cultural exposure.
- Questionnaires will be circulated before and after the workshop

The workshop's outcome is to exchange knowledge, research studies, awareness programs and best practices on coastal and marine conservation and tourism in IORA member states. The workshop will also produce practical suggestions for member states to implement individually or jointly.

Aims and Objectives of the Workshop

The overall objective of the workshop is to provide a platform for IORA member states to share scientific research findings and measures to strengthen policy, legal, and institutional framework for coastal and marine resource conservation and sustainable use.

In more detail, the workshop's objectives are as follows:

- Sharing of research studies that have been conducted on coastal and marine environments in climate change, jellyfish bloom, and marine debris;
- Sharing of citizen science approaches to raising the awareness of coastal and marine resource conservation and sustainable use;
- Sharing of information and best practices on governance and regulation relating to coastal and marine conservation and tourism;
- Identify and propose solutions for sustainable coastal and marine tourism development.

Target Participants and Topics to be Addressed

Government officials, academicians, and researchers will be invited to participate in the Workshop.

The topics to be addressed are the following:

- Sustainable coastal and marine tourism
- The vulnerability of coastal areas to climate change;
- The impact of jellyfish occurrences to coastal socio-economic;
- Policies and coastal development.

Mode of Execution

A study/survey will be disseminated online prior to the Workshop. Following an analysis of the responses received, the Workshop will be organised in a fully in-person format.

Proposed Dates

Task		2023						
		Jun	July	Aug	Sept	Oct	Nov	Dec
Stage 1	Establish a committee for the project							
Stage 2	Preparation of module and workshop announcement *(Poster, Invitation letter to agency/speakers, Registration form, Tentative Program)*							
	Selection of participants *(Invitation letter to participants)*							
Stage 3	Online Engagement with participants							
Stage 4	Progress report to MOTAC							
Stage 5	Planning for the workshop *(flight arrangements, booking of venue, transportation, catering, etc.)*							
	Physical Workshop (3 Days 2Nights)							
Stage 6	Analyse and Outline recommendations							
Stage 7	Final Reporting							

Proposed Venue for Workshop

- JEN Hotel, Georgetown, Penang, Malaysia

Requirement of Funds and Support from Partner Organizations

Application for the IORA Special Fund