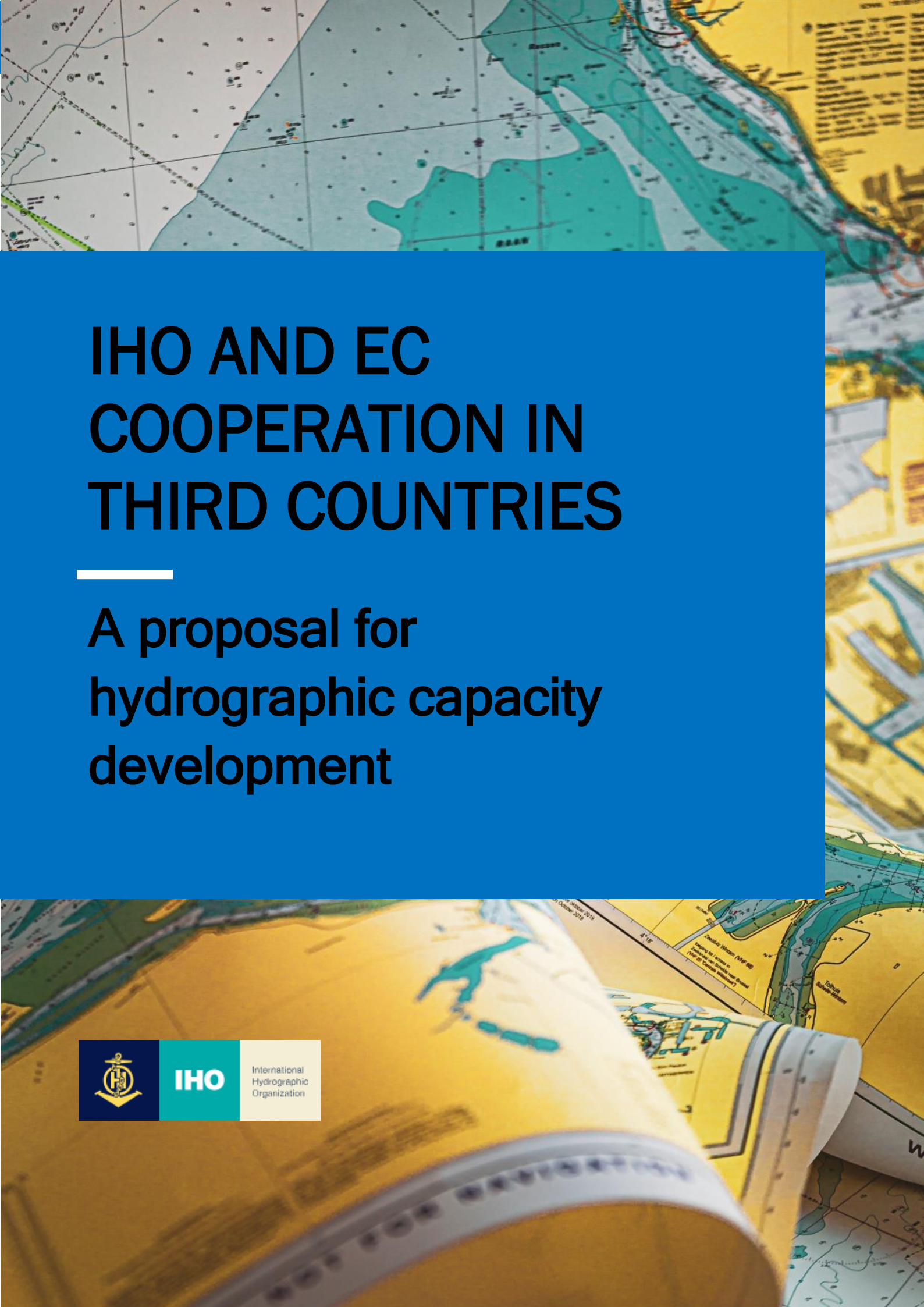


# IHO AND EC COOPERATION IN THIRD COUNTRIES

## A proposal for hydrographic capacity development

IHO International Hydrographic Organization

# Partnership between the IHO and EC

The International Hydrographic Organization (IHO) is an intergovernmental organization that works to ensure the world's seas, oceans and navigable waters are surveyed and charted. It coordinates the international activities of national hydrographic offices and promotes worldwide uniformity in nautical charts and documents. The IHO also works to strengthen the hydrographic capabilities of all developing coastal states.

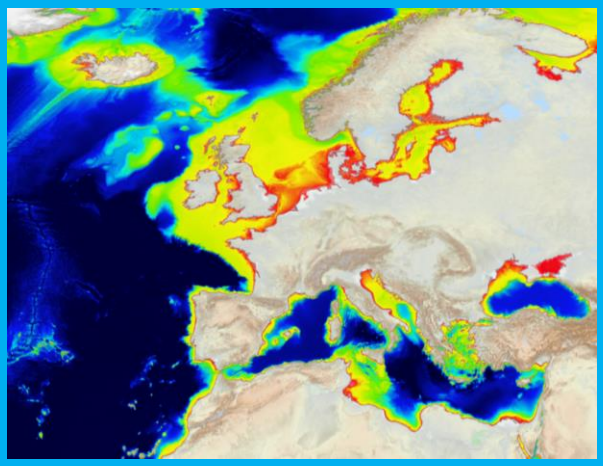
In 2012 the European Commission (EC) and the IHO signed an MoU[1] to provide a continuous liaison between the two partners in specific areas of common interest including surveillance activities, offshore renewable energy, maritime spatial planning, integrated coastal zone management, marine observation and data networks, implementation of the Marine Strategy Framework Directive, marine research, data standards and co-operation with third countries.

The main focus of the partnership to date has been targeted at the improvement of EMODnet Bathymetry. In 2023 the IHO-EC Network Working Group identified new priorities for engaging with the European Commission. One of those priorities is to co-operate with third countries to further IHO and EC strategic ambitions, referred to as Hydrographic Capacity Development in this document.

## EMODnet Bathymetry

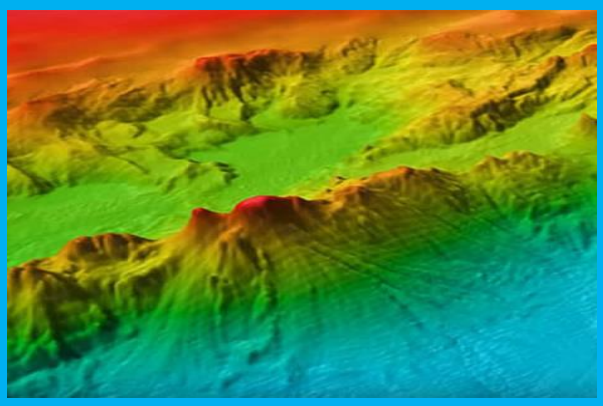
The European Marine Observation and Data Network (EMODnet) is a network of over 120 organisations supported by the EU's Integrated Maritime Policy. These organisations work together to observe the sea, process the data according to international standards and make that information freely available.

Supporting the European Commission initiative, European hydrographic offices made their surveys openly available for the first time and worked together to deliver the first digital map of the European seabed.



Today EMODnet Bathymetry is one of the most used marine data products.

At the tenth anniversary of the IHO-EC MoU, the benefits of EMODnet Bathymetry for the EU were described as "immense". Better knowledge of the shape of the seabed has improved nearly all analysis of the ocean, it has reduced planning costs for wind farms or laying subsea cables, it has enabled better forecasts of storm surges and it has facilitated the identification and monitoring of marine habitats and ecosystems.



[1] Link: MoU between the European Commission and the International Hydrographic Organisation

# Capacity Development in an IHO context

Capacity Development is defined as the process by which the IHO assesses and assists its Member States and other states, to meet the objectives of the IHO and the obligations related to Safety of Lives at Sea Convention (SOLAS[2]), United Nations Convention on the Law of the Sea (UNCLOS[3]) and other international instruments. The IHO vision for capacity building is to be an effective, reliable and successful programme tailored for achieving the desired level of maturity for a state's hydrographic services. The mission of the IHO is to optimally provide all coastal states with the opportunity to develop their capabilities to establish and maintain the hydrographic products and services required to ensure safe navigation and the sustainable management of marine resources in their waters.

In 2021 the IHO published its revised Capacity Building Strategy[4], detailing its principles, approach and management of capacity development. A summary of the different phases is illustrated on the next page. This approach has been proven through numerous capacity development activities in countries who have now a fully established hydrographic service and demonstrated long-term benefits.

The impact of hydrographic capacity building goes often well beyond establishment of a hydrographic service and the production of up-to-date nautical charts. Hydrographic charts and data are a keystone dataset from sustainable marine management, blue economy activities and coastal protection, amongst many others. The economic benefits of having up-to-date knowledge of the marine environment can be considerable (increased carrying capacities of cargo, reduced insurance costs, reduced project investment risks). Whilst these benefits have already been reaped for the European Seas, through the INSPIRE Directive and the EMODnet programme, this paper focuses, on the potential benefits for developing Coastal States in alignment with EC foreign policy objectives.

# Alignment of European Commission and IHO priorities in the marine space

To explore the common ground between IHO and European Commission priorities in the field of capacity development, a review was undertaken of key policy and country priorities published by the Commission[5]. This was summarised in a table by country, and supplemented with additional information such as IHO Membership status, SOLAS signatory status, Hydrographic Commission, etc. The most common marine priorities identified in the country reports are summarised in the word cloud (page 4).

## International Convention for the Safety of Life at Sea (SOLAS)

The International Maritime Organisation (IMO) SOLAS Convention is considered the most important of all international treaties concerning the safety of merchant ships. The first version was adopted in 1914, in response to the Titanic disaster.

Contracting Governments commit to execute hydrographic surveys, prepare, issue and update nautical charts and publications, and ensure uniformity in their products and world-wide availability for the purpose of aiding safe navigation.

[2] Link: International Maritime Organisation - International Convention for the Safety of Life at Sea (SOLAS)
[3] Link: United Nations Convention on the Law of the Sea (UNCLOS)
[4] Link: IHO Capacity Building Strategy
[5] Link: European Union developing countries priorities

## Phase 0
**Unaware of its national obligations**

The country does not have a National Authority (NA) and/or National Hydrographic Coordinating Committee (NHCC)

Need to raise maritime awareness

Need to create infrastructure to collect and circulate maritime safety information

Need to strengthen links with NAVAREA* Coordinator to enable the promulgation of safety information

Form National Authority (NA) and/or National Hydrographic Coordinating Committee (NHCC)

## Phase 1
**Collection and circulation of nautical information, necessary to maintain existing charts and publications up to date**

Create/improve current infrastructure to collect and circulate information

Strengthen links with charting authority to enable updating of charts and publications

Minimal training needed

Strengthen links with NAVAREA* Coordinator to enable the promulgation of safety information

Keep a National Structure to prevention or mitigation of consequences of marine disasters or climate change

## Phase 2
**Creation of a surveying capability to conduct: Coastal projects and Offshore Projects**

Establish capacity to enable surveys of ports and their approaches

Maintain adequate aids to navigation

Build capacity to enable surveys in support of coastal and offshore areas

Build capacity to set up hydrographic databases to support the work of the NA/NHCC

Provide basic geospatial data via MSDI**

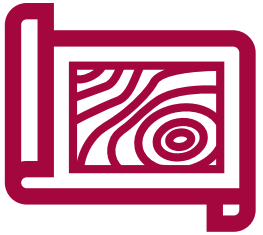
Requires funding for training, advising & equipment or contract survey

## Phase 3
**Produce paper charts, ENC and publications independently**

The need shall be thoroughly assessed. Requires investment for production, distribution and updating

Alternatively, bi-lateral agreements for charting can provide easier solutions in production and distribution (of ENC*** through RENCs****) and rewards.

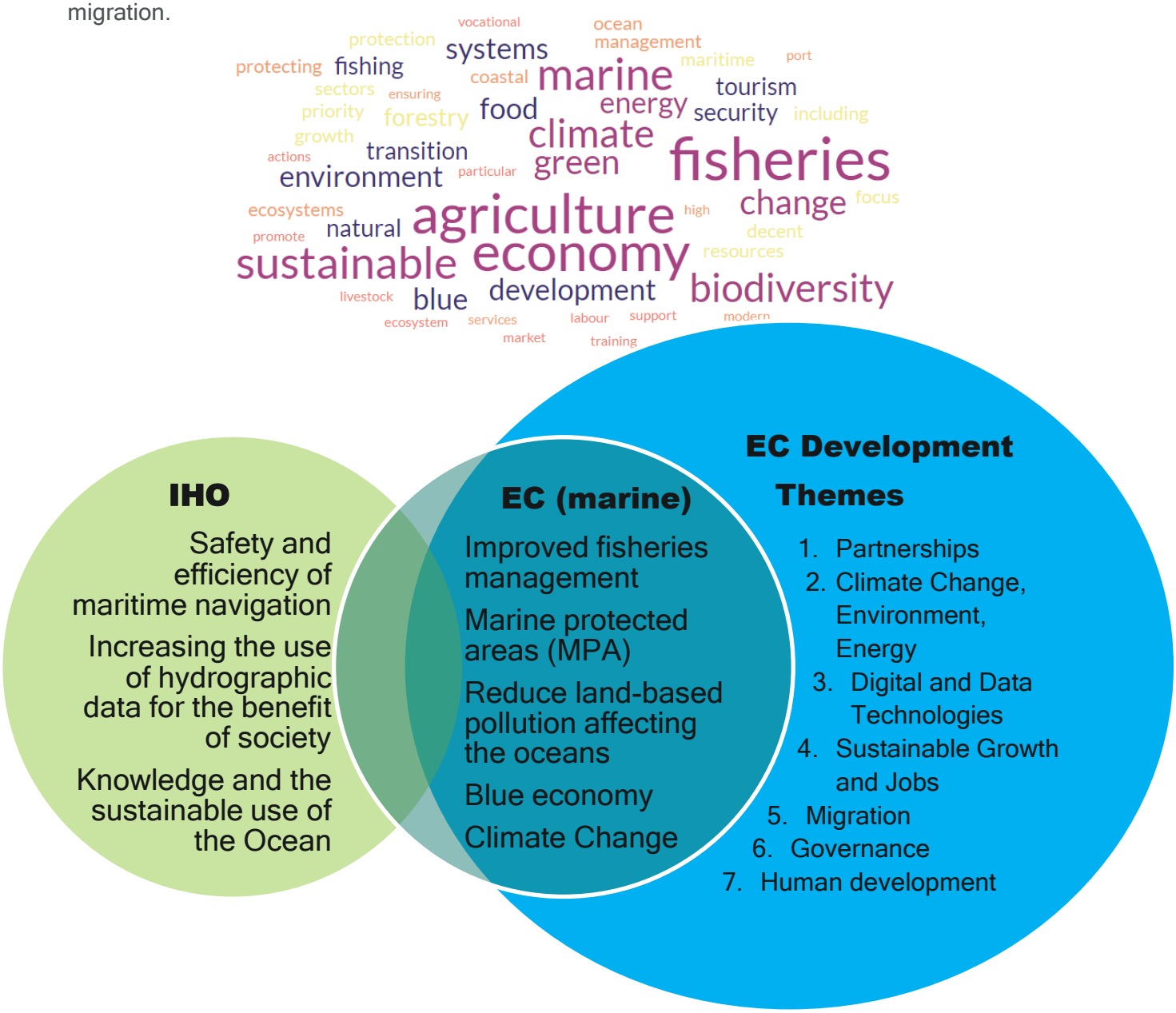
Further development of MSDI



* NAVAREA: the maritime geographic area in which a government is responsible for navigation and weather warnings.
** MSDI: Marine Spatial Data Infrastructure.
*** ENC: Electronic Nautical Charts.
**** RENC: Regional ENC coordinating centre.

The EC International Development themes and summary EC marine priorities in developing Coastal States are listed in the Venn diagram below, alongside the IHO Strategic Priorities. Whilst there is no direct overlap, indirectly these priorities are clearly related. Achieving IHO priorities enables or contributes towards achieving EC priorities. For example, the IHO priority to contribute to the sustainable use of the oceans, clearly relates to improved fisheries management or marine protected areas. Indeed, in both these case hydrographic data will be an important base data layer to inform research and decision making.

This demonstrates that IHO priorities and EC international development priorities are synergetic, thereby offering potential for mutual benefits by intensifying cooperation. Therefore, there is an opportunity to align IHO and EC activities to realise the desired impact for both parties. Whilst there are examples of such collaboration being very productive within Europe (e.g. EMODnet Bathymetry), capacity development in developing States would be a new collaborative effort. The EC supporting the IHO in the development of hydrographic offices would enable data gathering and charting in developing States in support of safe and efficient navigation. In turn it will support a range of coastal and marine management solutions in line with EC maritime priorities and broader international development themes. Furthermore it supports the other EC foreign policy priorities such as the Maritime Security Strategy (EUMSS), through transport safety along major trade routes, border security and environmental protection, access to raw Earth minerals and managing irregular marine migration.

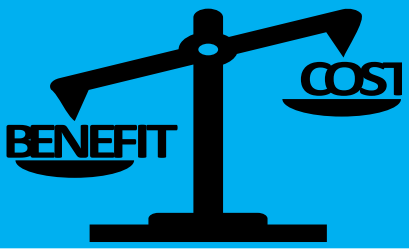


# Benefits of hydrographic surveying and charting

Several cost and benefit assessments of hydrographic surveying and charting have been undertaken by independent organisations. All studies found high levels of benefits compared to the cost of hydrographic surveying and charting. A 2014 case study for the Pacific Island Vanuatu[6] reported benefits of 96 to 296 times the investment cost. Other studies[7], often in more developed countries, found a lower but still very favourable cost:benefit ratio of on average 1:10.

## Cost : Benefit

Based on estimates from independent studies, a typical 10 million Euro programme may lead to benefits up to 2.96 billion Euros or 100 million Euros in the most conservative estimate.




Besides the direct and measurable economic benefits hydrographic surveying and charting will also lead to positive impacts in the following areas:

- Improved Navigation Safety: reducing the risk of accidents.
- Sustainable management of living and non-living marine resources: enable economic development while minimising environmental impact.
- Tourism Development: providing detailed charts for the enjoyment of the environment on and below the water surface, greatly contributing to the education of the population on marine environmental protection.
- Disaster Risk Reduction: contribute to disaster risk reduction by providing data for coastal zone management, early warning systems, and disaster response planning.
- Maritime boundaries: delineation of these zones is increasingly important in determining the rights and responsibilities of coastal states and avoidance of potential maritime conflicts.
- Maritime security: permits the free flow of seaborne trade and gives tactical advantage during operations against irregular migration, piracy and others.

The UNCTAD 2023 Handbook of Statistics[8] shows that, in 2021, developing economies accounted for the majority of global seaborne trade and that seaborne trade grew faster between 2016-2021 in developing (3.9%) than in developed countries (2.4%). **Maritime trade is a key growth sector for developing countries**.

The OECD report "The Ocean Economy in 2030[9]" identified **ocean-based industries to have the potential to outperform the growth of the global economy** as a whole. The fastest growth in jobs is expected to occur in offshore wind energy, marine aquaculture, fish processing and port activities. Hydrographic surveying and charting support the development of these sectors.

[6] Link: Assessing the Costs and Benefits of Hydrographic Survey and Charting - A Case Study of Vanuatu

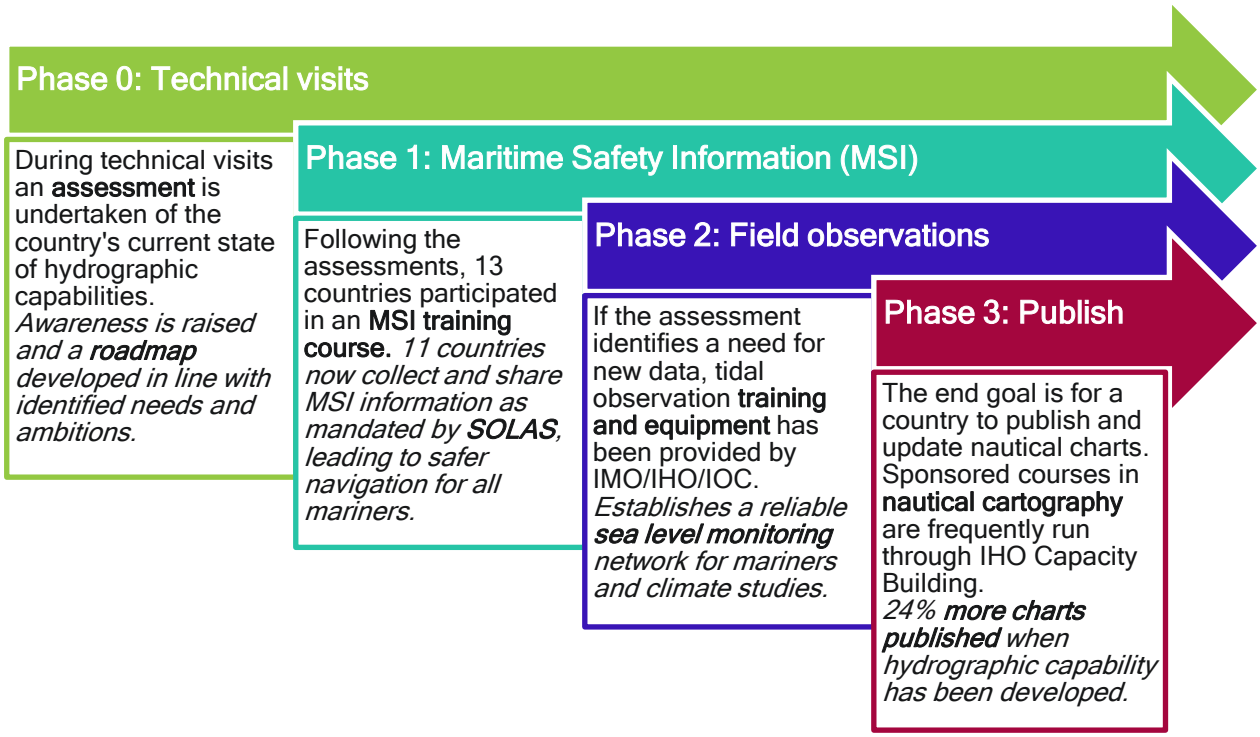
[7] Link: Economic Impact of Hydrographic Surveys

[8] Link: UNCTAD Handbook of Statistics 2023 - Maritime Transport

[9] Link: The Ocean Economy in 2030

# Examples of hydrographic capacity development initiatives and their impact

Many of the hydrographic capacity development activities supported by the IHO are delivered through the Regional Hydrographic Commissions (RHCs). An example of the capacity development activities supported in recent years in the Meso American-Caribbean Sea Hydrographic Commission are illustrated below. Activities have been undertaken in each of the capacity development phases with the outcome of the activities in italics.




The examples above have a clear link to the IHO priority on safety and efficiency of maritime navigation. However, these outcomes also have an indirect impact on reducing the impacts of climate change on vulnerable communities, by having a reliable sea level monitoring network; more charts are often generated in areas with proposed port developments, where new maritime trade routes are established or where Blue Economy activities are planned; and improved charts and knowledge of the marine realm supports sustainable management of the environment and fisheries resources. The availability of a hydrographic capability and data are often the starting point to achieve long term impacts important to the EC.

Additional examples of the successes of hydrographic capacity building programmes across the world are shown on the next page.

# Examples of Capacity Development activities and their impact

During a cooperative hydrographic survey in Tema, Ghana, discrepancies of 0.5m to 5.8m in depths were observed compared to available charts. Accurate charts have facilitated the expansion and modernisation of Tema Port to become one of the largest container ports in Africa.

In 2014 a capacity development programme started in Lebanon. In the aftermath of the destructive Lebanon port explosion in 2020, European Hydrographic Offices undertook hydrographic surveys and produced up-to-date charts to support the recovery and relief operations. Lebanon progressed through all development phases and became a full member of the IHO in 2021, thereby ensuring mariner safety and meeting is international obligations.

Hydrographic Capacity Development in Saint Vincent and the Grenadines goes back two decades. This culminated in a large scale survey of its entire coastal waters (0-40m) in 2016/2017. The data were used to underpin the case for a deep water port development, with projected completion date in 2025. The data were also critical for a coastal erosion study on the island's east coast.

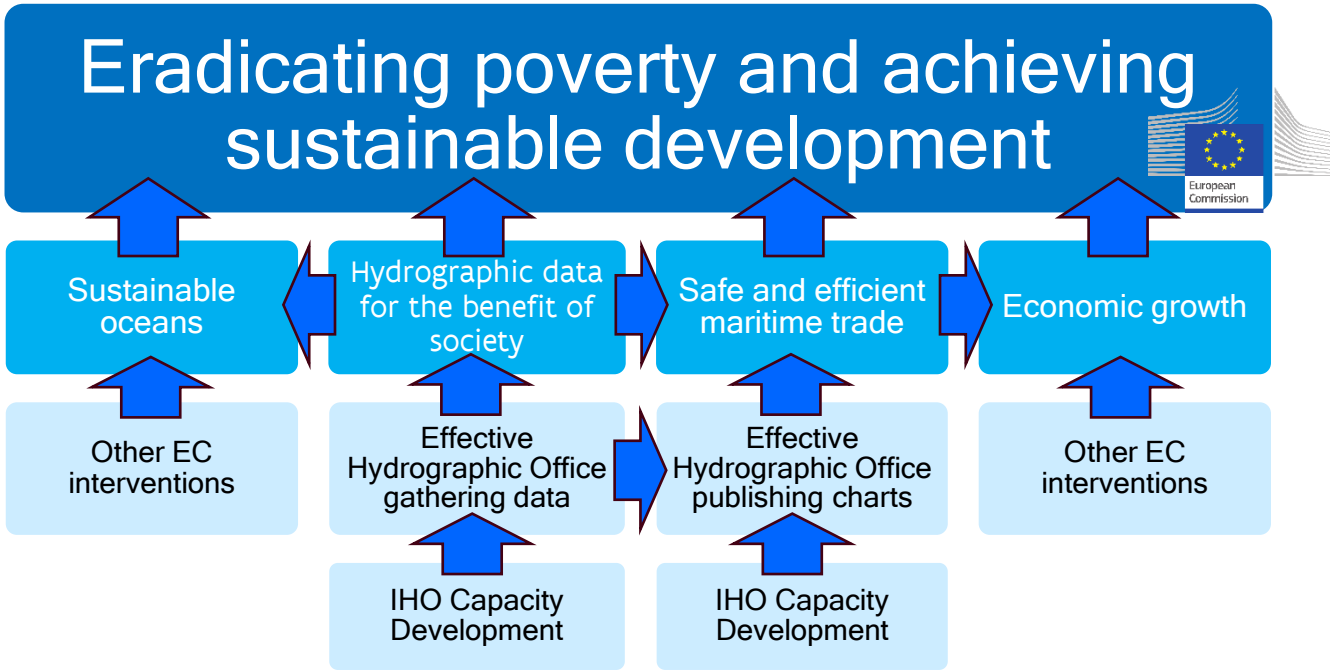
As a result of hydrographic capacity building Nigeria has established an effective hydrographic service. Recently technical assistance was provided during the build and commissioning of a state-of-the-art hydrographic survey vessel. This ensured Nigeria acquired a fit-for-purpose platform and has the skills to operate and maintain the advanced equipment to survey its waters for years to come.

Leading figures at the Hydrographic Office of Nigeria and Suriname have benefitted from IHO Capacity Building sponsored training and knowledge exchange opportunities. Today they occupy influential positions at national and international level within the hydrographic community.

# Opportunities for IHO and EC cooperation

The overarching aim of the European Commission's actions under the topic "Development and cooperation" is: "Eradicating poverty and achieving sustainable development".

As demonstrated in this document and summarised in the graphic below, hydrographic capacity building is an important contributor to this aim.




Capacity development of hydrographic offices in developing Coastal States remains a major challenge for the international hydrographic community. Building on the effective partnership between the IHO and EC-DG MARE, and the commitment made in the MoU to cooperate with third Countries, there are real opportunities to work together to increase hydrographic capacity development alongside other EC interventions. Potential activities could include:

- Undertake **technical visits and assessments** on the status of hydrographic capabilities and needs.
- Support the **Regional Hydrographic Commissions** and deliver tailored training courses for hydrographers. Stimulate **regional cooperation** through activities focused on improving hydrographic services and maritime safety promoting regional integration and cooperation in maritime affairs.
- Provide **technical assistance and equipment** to national hydrographic offices to improve their capacity for conducting hydrographic surveys, producing nautical charts and ensuring maritime safety.
- Expand the **IHO e-learning center**[10] with increased opportunities for remote learning.
- Strengthen **collaboration between IHO and EC agencies** (e.g. European Maritime Safety Agency) and **EU delegations** in countries, to raise awareness of the need for and potential of hydrographic capacity building, and jointly develop technical assistance initiatives.
- Strengthen **maritime governance and institutional frameworks** in developing coastal states. Support the development of national policies, legal frameworks and capacity to effectively deliver the duties of a hydrographic office and comply with international standards and regulations.

[10] Link: IHO e-learning center

# Examples of potential capacity development activities

**Technical visits and assessments** are the starting point of a capacity development journey. Increased collaboration between IHO and EC agencies with a track record in capacity development (e.g. European Maritime Safety Agency) could be beneficial to maximise long-term impact. This activity aims to strengthen maritime governance and institutional frameworks in developing coastal states and work towards **compliance with international standards and regulations**.

**Education** remains a cornerstone for hydrographic capacity development. Specialist knowledge ensures the efficient and accurate charting of water bodies, which is crucial for safe navigation and maritime operations. Education plays a pivotal role in promoting international cooperation and standardisation within the hydrographic community. Most hydrographic capacity development education takes place outside of the EU. Expanding the **IHO e-learning center** increases opportunities for remote learning.

Based on a review of EU international priorities in the **Americas and Caribbean region**, hydrographic capacity building has the potential to contribute to the development of the **blue economy, sustainable fisheries and coastal protection** in countries such as Colombia, Guatemala and Guyana.

Based on a review of EU international priorities in the **African region**, hydrographic capacity building has the potential to contribute to **port development, the development of the blue economy, sustainable fisheries and maritime security** in countries such as Benin, Cabo Verde, Comoros, Congo (Republic), Gabon, Guinea, Guinea-Bissau, Kenya, Liberia, Mauritania, Mauritius, Sierra Leone, Somalia, South Africa, Sudan, Tanzania and The Gambia.

Based on a review of EU international priorities in the **Asian and Pacific region**, hydrographic capacity building has the potential to contribute to **the development of the blue economy, sustainable fisheries and maritime security** in countries such as India, Maldives and Small Island Developing States in the Pacific Region.

# Hydrography

# Open up the future of the ocean