

# Marine Spatial Data Infrastructure for Optimizing Ocean Use

Cdr Rezaur Rahman, (H1), NUP, psc, BN



## Introduction

The socio-economic value of the ocean is enormous, which has driven the use of the ocean exponentially in the last few decades. Envisioning the huge potential of the ocean, Bangladesh government has started formulating economic growth policies based on the concept of the Blue Economy, where various sectors like Marine fisheries, aquaculture, Marine tourism, Shipping etc. will contribute to the economy of Bangladesh. So, the use of the ocean by various stakeholders will increase in the coming days, where ocean data will play a significant role. Therefore, all the maritime stakeholders will be in a need of homogenous oceanic data which can be used by all. The Marine Spatial Data Infrastructure (MSDI) is such a platform,

which is the most apt solution in this regard.

For formulation and implementation of effective national policies, updated data is essential and the timely accessibility to relevant data can be a deciding factor. Geospatial data are crucial for all kinds of development activities. However, the use of Geographical Information Systems (GIS) to measure, observe, monitor, manage and improve the three-dimensional marine environment was insufficient due to absence of coordinated data management and stakeholder input. The growing use of marine resources for socio-economic development and a general consensus to protect the oceans against environmental degradation have recently

propelled the rapid development of modern marine spatial systems.

Spatial Data Infrastructure (SDI) is the relevant base collection of technologies, policies, and institutional arrangements to facilitate the availability and access to spatial data. The term MSDI denotes a framework of technologies, policies, and institutional arrangements to facilitate the creation, exchange, and use of geospatial data and related information resources across an information-sharing community. MSDI will provide an institutionally sanctioned, automated means for posting, discovering, evaluating, and exchanging geospatial information by participating organisations. MSDI facilitates Marine Spatial Planning (MSP) by acting as an organized data source, where all stakeholders can participate, contribute and be benefitted at the same time. These stakeholders may be from local, regional and national governments or diverse sectors such as shipping, defence, aquaculture and conservation.

### Setting up a Marine SDI

Numerous organizations collect substantial amount of marine data, but these are hardly interoperable due to varying standards. To facilitate the publishing, sharing and using by diverse end-users of the marine environment, marine data should be managed as per defined standards and formats. Thus, MSDI requires the data to be held in a generic way, rather than for a particular product for a limited user group or a specific purpose.

To unlock the economic and environmental power of marine geospatial data, MSDI aims to provide reusable data to a broader audience and make marine information available and easily accessible to decision-makers, organizations and people dealing with marine resources. IHO defines MSDI

framework, comprising the following components, as shown in Figure 1.

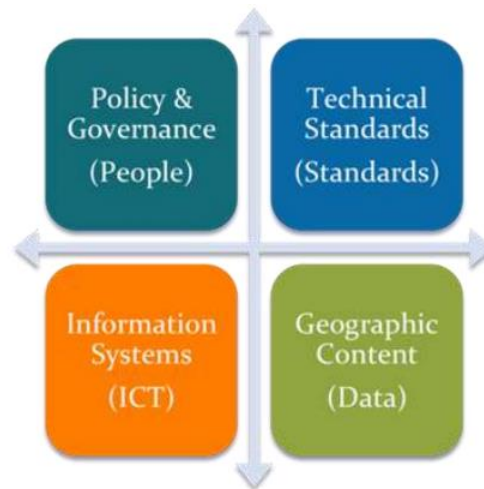


Figure 1: The Four Pillars of MSDI Source: IHO Publication C-17

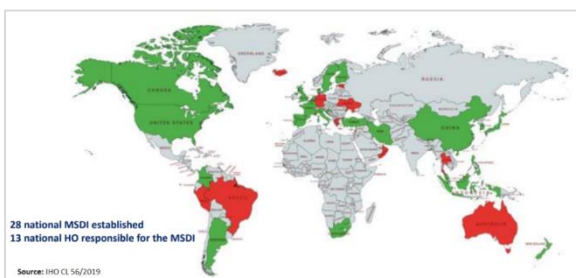
MSDI encompasses reference data, such as bathymetry, maritime boundaries, coastline and geographic areas, names, fishing and traffic information, undersea features, navigational hazards and oceanographic information among many more. MSDI will have direct implications in terms of ocean governance, policy and sustainable use of the ocean. Thus, MSDI will usher in rapid socio-economic development and can help achieve global agendas like the UN Sustainable Development Goals and the UN Decade of Ocean Science.

### Necessity of Implementing MSDI in Bangladesh

Bangladesh has total forty-three Ministries and Divisions. At present, numerous maritime organizations in Bangladesh are collecting marine data. Bangladesh Navy (BN), Bangladesh Inland Water Transport Authority (BIWTA), and Chittagong/Mongla/Payra Sea Port Authorities have their own Hydrographic services. Moreover, Bangladesh Shipping Corporation (BSC), Bangladesh Oceanographic Research Institute (BORI), River Research Institute (RRI), Space Research & Remote Sensing

Organisation (SPARRSO), Bangladesh Meteorological Department (BMD), Geological Survey of Bangladesh (GSB), Government and private organizations, numerous universities also collect marine data. Nevertheless, due to the inherent differences in type, format and attributes, data collected by each of these organizations are usually being used by that organization alone, causing duplication of efforts and increasing costs. For effective data management, conformity of marine data and metadata will have to be ensured. However, such a transition, specially sharing of data would demand some fundamental changes in policy, regulatory and governance issues.

To optimize the storage and dissemination of collected data, the Government of Bangladesh (GoB) has introduced National Spatial Data Infrastructure (NSDI) in 2016. This newly introduced NSDI can truly transform the long-cherished desire for 'Digital Bangladesh' and popular well-being. However, considering the vast maritime area of Bangladesh, there is a need to establish a Marine SDI for sustainable use of the ocean. Needless to say that, marine data and land data varies from their attributes, formats and usage. Keeping the economic prospect from the ocean, many countries in the world have adopted separate MSDI for marine stakeholders. As per IHO state of 2019, 28 countries have established a national MSDI where 13 National Hydrographic Offices (HO) have been responsible for their respective MSDI.



## Steps Towards Implementing MSDI

MSDI can operate at the organizational level, national level (parallel to NSDI) or at the regional level across borders (eg. Arctic SDI). However, to implement MSDI at the national level, the following preparedness is to be initiated.

- a. Build awareness among policymakers regarding the importance of establishing MSDI and stewardship of HO (Bangladesh Navy Hydrographic Service).
- b. Prepare and define the policy, role and function of MSDI.
- c. Nomination of Bangladesh Navy Hydrographic Service as the Lead Implementing Agency and Bangladesh Navy Hydrographic & Oceanographic Centre (BNHOC) as Marine Spatial Data Hub.
- d. Collection of marine spatial data as per standards defined by IHO-MSDIWG (IHO MSDI Working Group), by all marine stakeholders.
- e. Create necessary physical and technological infrastructure for the Lead Implementing Agency to host MSDI related functions.

## Conclusion

MSDI is the element of an SDI, focusing on the marine domain in terms of governance, standards, ICT and content. It is a framework of suggested best practices and guidance for managing marine geospatial data that support interoperability, integration, institutional collaboration and coordination. MSDI can facilitate the discovery, access, management and preservation of marine spatial data. Ensuring the safe storage, easy access and security of all marine data is a colossal task and demands intricacy and sophistication. The lack of coordination and the overlapping jurisdiction among numerous maritime stakeholders make

things even more complicated. With the required infrastructure and experience, BNHS may be nominated as MSDI Lead Implementing Agency for collecting, storing, and disseminating all marine data. Finally, the implementation of MSDI and its successful promulgation can make Bangladesh truly digital and

turn the dream of a developed country by 2041 into a reality.

**Writer: Commander Rezaur Rahman, (H1), NUP, psc, BN is presently serving as Commanding Officer of BNS ANUSHANDHAN.**

**Email: rezaur2000@gmail.com**