Submission to United Nations Open-ended Informal Consultative Process on Oceans and Law of the Sea, twenty-fifth meeting, 16 to 20 June 2025, on the theme 'Capacity Building and the transfer of marine technology: new developments, approaches and challenges.'

By the Secretariat of the International Seabed Authority

January 2025

As the steward of the Area and its resources, ISA is entrusted to promote and encourage marine scientific research[1], transfer of technology and scientific knowledge to developing States[2], and to ensure effective participation of developing states in exploration and exploitation activities in the Area[3]. Consequently, capacity-building have been an integral feature of ISA's activities since its establishment in 1994.

The Secretariat recognizes capacity building from a perspective of mutually reinforcing individual development, institutional development, and creating an enabling environment at the national level. Therein, ISA designs, implements, and facilitates various training programmes, projects and initiatives for the needs of developing States.[4] In December 2020, a capacity development workshop on resources and needs assessments was held in Kingston, Jamaica. Thereafter, based on the outcome of the workshop, the ISA Assembly formally endorsed a programmatic approach to capacity development. It requested the Secretary-General to prepare and implement a dedicated strategy to meet the needs identified by ISA members, in particular geographically disadvantaged States, LDCs, LLDCs, and SIDS.[5] In November 2022, the Assembly endorsed the Capacity Development Strategy guided by the priority needs of developing States.[6]

In implementing the ISA Capacity Development Strategy, ISA executes different programmes including national expert deployments, research fellowships and internship programmes to strengthen the technical capacity of national experts from ISA developing Member States in relation to activities undertaken in the Area[7]. ISA, in collaboration with States, national institutions

[1] UNCLOS Article 143
[2] UNCLOS Article 144
[3] UNCLOS Article 148
[4] https://www.isa.org.jm/publications/capacity-development-strategy/
[5] ISBA/26/A/7
[6] ISBA/27/A5
[7] National Expert Deployment Programme - International Seabed Authority

and international organizations, is mandated to establish national and regional centres. [8] ISA has therefore established Joint Training and Research Centres, (JTRC) which play a pivotal role in fostering expertise, facilitating research and promoting responsible marine resource management.[9] The first National JTRC was established in 2019 following the signing of a Memorandum of Understanding between ISA and the State Oceanic Administration of China. The first regional JTRC was established in 2024 following the signing of a Memorandum of Understanding[10] between ISA and the National Institute of Oceanography of Fisheries in Egypt.[11] Both initiatives have trained over 100 experts in deep seabed related affairs.

ISA Contractors' Training Programme (CTP) is particularly exceptional in nature and effectiveness as it relates to ensuring that ISA Contractors meet their legal obligation to provide and fund training opportunities for personnel from developing States and those of ISA. Through the Contractors Training Programme, personnel from developing States gain appropriate operational expertise through diverse training programmes in exploration activities which enable them to participate in activities related to the Area. Training programmes include at-sea and post cruise on-land training, academic fellowships, dredging courses and engineering training. As at December 2024, more than 350 professionals have benefitted from the Contractors' Training Programme. This number includes 115 women and 118 placements going to personnel from LDCs, LLDCs and SIDS.

In a bid to address the challenge of underrepresentation on women in marine science, women's empowerment remains a central focus of ISA's capacity development initiatives. In the context of the ISA's Women in Deep-Sea Research (WIDSR) project, 95% of ISA contractors have pledged to allocate 50 per cent of Contractors' Training Programme opportunities to qualified women applicants.[12] A survey of 128 participants across 23 LDCs, LLDCs and SIDS reported that more than half (59 per cent) of employed women have in the past declined opportunities to work or study abroad, which can be vital to success in deep-sea research related careers. ISA is implementing a tailor-made career mentoring programme for women called "See Her Exceed" (S.H.E). Within this programme, 8 women experts from 8 developing countries have been paired with senior mentors to strengthen their leadership skill in deep-sea research while boosting their careers.

ISA has also adopted innovative approaches to capacity development. For example, ISA has developed Deep Dive, a unique eLearning programme exclusively devised by an intergovernmental institution to address all elements of the legal regime set out in Part XI of UNCLOS, the 1994 Agreement, and the rules, regulations and procedures adopted by ISA.[13]

---

[8] UNCLOS Articles 275, 276

[9] https://www.isa.org.jm/capacity-development-training-and-technical-assistance/isa-china-joint-training-and-research-centre/

[10] ISBA/28/A/13

[11] https://www.isa.org.jm/capacity-development-training-and-technical-assistance/isa-egypt-joint-training-and-research-centre/

[12] See www.isa.org.jm/capacity-development-training-and-technical-assistance/widsr-project/

[13] Deep Dive

[15] UNCLOS Article 144

Moreover, ISA, through the partnership established under the MoU between ISA and the International Relations Institute of Cameroon, is working to create a dedicated curriculum on the law of the sea for African diplomats. The partnership will also implement capacity building activities to facilitate cooperation with African States in matters relating to the work and mandate of ISA. ISA has also shaped new strategic partnerships with organizations such as the United Nations Technology Bank for Least Developing Countries (UN Tech Bank) and Indian Ocean Rim Association to address the capacity building and technology needs of LDCs, SIDS and LLDCs.

Since 1994, more than 1,000 individuals have benefited from these and other capacity development initiatives implemented by ISA such as national capacity development workshop, ISA Secretary-General's Award for Excellence in Deep-Sea Research, Africa Deep Sea Research project, Abyssal Initiative for Blue Growth, and post-doctoral fellowships. Beneficiaries of ISA capacity building programmes, projects and initiatives are invited to be members of ISA Capacity Development Alumni Network (iCAN). iCAN allows monitoring the midterm and long-term impact of training provided while encouraging transfer of knowledge to developing States and ensuring the expansion of opportunities for participation in the Area. The transfer of marine technology is defined in UNCLOS[15]. ISA plays a pivotal role in promoting and encouraging its transfer of technology to developing States and the Enterprise for facilitating the access of the Enterprise and of developing States to relevant technologies and promoting the advancement of technologies by providing opportunities to personnel from the Enterprise and from developing States for information, training, research and development. Building on the knowledge acquired during more than 40 years of marine exploration and the increasing demand for critical minerals, different actors have expressed increasing interest in engaging with the opportunities provided by seabed minerals in the Area, while ensuring the effective protection of the marine environment from harmful effects. This requires advanced technologies and intelligent solutions to support exploration activities, surveys, mineral extraction, monitoring and enforcement. Each of these phases rely on the best available technology which in turn, favorably supports progress and innovation in deep-sea related technology and the equipment. Of fundamental importance for the development of such technology is the need to ensure reliable, transparent, and cost-effective systems for the prediction and continuous environmental impact monitoring of exploration and exploitation activities. Considering the extreme conditions within which such systems need to operate, emphasis is also placed on ensuring that technology and novel solutions are integrated to operate autonomously in remote areas while providing real-time data for the regulator to carry out its supervisory functions, for contractors to successfully perform against the conditions set out by the legal and regulatory framework, and for other interested stakeholders to have access to the necessary information.

It is in this context that the ISA Secretariat initiated assessments for the current technologies used in deep-sea exploration and associated research. Five priority areas were identified, including: (i) ocean observation and communication; (ii) monitoring; (iii) autonomy, automation and robotics; (iv) machine learning and artificial intelligence; and (v) mining, energy, and processing. ISA

started a series of expert scoping workshop on advancing technologies to support the sustainable development of mineral resources of the Area in April 2024 in Porto, Portugal. The workshop was attended by more than 120 participants including 31 government representatives from 29 different countries including 13 developing States from Africa, Asia and Latin America and the Caribbean. It assessed current and available technologies, the best industry practices, and strategic partnerships to build and develop the capacities of developing States, members of ISA, and current needs and priorities. It also discussed emerging technologies to identify the strategic directions for targeted research and innovation efforts towards developing effective technologies for activities in the Area.