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Annual report of the Secretary-General under article 166, paragraph 4, of the United Nations Convention on the Law of the Sea

Implementation of the action plan of the International Seabed Authority in support of the United Nations Decade of Ocean Science for Sustainable Development

Report of the Secretary-General

I. Introduction

1. Pursuant to the United Nations Convention on the Law of the Sea[1] and the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982,[2] the International Seabed Authority is mandated to promote and encourage the conduct of marine scientific research in the Area and to coordinate and disseminate the results of scientific research and analysis when available. The Convention also recognizes the possibility for the Authority to carry out marine scientific research concerning the Area. The Authority is also required to encourage the design and implementation of appropriate programmes for the benefit of developing and technologically less developed States with a view to strengthening their research capabilities, training their personnel in the techniques and applications of research, and fostering the employment of their qualified personnel in research in the Area.[3]

2. Following the proclamation in 2017, by the General Assembly of the United Nations Decade of Ocean Science for Sustainable Development from 2021 to 2030,[4] the Assembly of the Authority adopted in December 2020 a dedicated Action Plan in support of the United Nations Decade (the Action Plan for Marine Scientific Research).[5] The Action Plan for Marine Scientific Research is structured around six

* ISBA/27/A/L.1
[1] United Nations Convention on the Law of the Sea, art. 143 (2)
[2] 1994 Agreement, paragraph 5 (h).
[3] United Nations Convention on the Law of the Sea, art. 143 (3).
[4] General Assembly resolution 72/73, para. 292.
[5] See ISBA/26/A/17.

strategic research priorities, whilst recognizing that its content will continue to evolve as new strategic research priorities are identified and endorsed by the Authority members.[6]

3. The importance of the United Nations Decade is also highlighted in the context of the Strategic Plan[7] and the High-level Action Plan[8] of the Authority for the period 2019–2023. In both plans, the commitment of the Authority to contribute to the achievement of relevant Goals and targets of the 2030 Agenda for Sustainable Development is recognized, in particular Goal 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development).

4. The commitment of the Authority is reflected in the nine strategic directions that have substantial implications for advancing marine scientific research in the Area, and the 12 high-level actions and 14 associated outputs that have been identified as relevant for contributing to the four scientific objectives of the United Nations Decade.[9]

5. The present progress report, which is the second implementation report on the Action Plan for Marine Scientific Research, provides an overview of the progress made from November 2021 to June 2022.

II. Progress in the implementation

6. This progress report follows the six strategic research priorities contained in the Action Plan for Marine Scientific Research.

A. Strategic research priority 1: advancing scientific knowledge and understanding of deep-sea ecosystems, including biodiversity and ecosystems functions, in the Area

7. Under strategic research priority 1, emphasis is placed on enhancing the scientific knowledge of deep-sea ecosystems as a critical knowledge base for ensuring the sustainable development of activities in the Area, as well as for achieving an enhanced understanding of the contribution of the deep sea to global environmental and societal benefits. A fundamental condition of this strategic research priority lies in the coordination of research efforts and the promotion of cooperation among key relevant stakeholders including academic communities, the private sector and governmental and non-governmental institutions.

8. In June 2022, in the margins of the 2022 UN Ocean Conference in Lisbon, Portugal, the secretariat launched the Sustainable Seabed Knowledge Initiative (SSKI). The goal of SSKI is to establish a global knowledge-sharing platform to advance scientific understanding of deep-sea ecosystems in the Area. SSKI is supported by the Governments of Argentina, the Republic of Korea, South Africa and the United Kingdom, the European Commission, and with the participation of the Institut français de recherche pour l'exploitation de la mer (Ifremer); the World Register of Marine Species; the Ocean Biodiversity Information System (OBIS) of

[6] Ibid.
[7] ISBA/24/A/10, annex.
[8] ISBA/25/A/15, annex II.
[9] Four scientific objectives have been identified to guide the design and implementation of actions during the United Nations Decade of Ocean Science for Sustainable Development, namely: (a) to increase the capacity to generate, understand, manage and use ocean knowledge; (b) to identify and generate required ocean data, information and knowledge; (c) to build a comprehensive understanding of the ocean and ocean governance systems; and (d) to increase the use of ocean knowledge.

the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO), and the secretariat of the Convention on Biological Diversity (CBD).

B. Strategic research priority 2: standardizing and innovating methodologies for deep-sea biodiversity assessment, including taxonomic identification and description, in the Area

9. Non-destructive, cost-effective and easily replicable methodologies for studying marine biodiversity, including environmental DNA and video surveys, are increasingly being applied in deep-sea environmental studies, enabling the identification of numerous deep-sea organisms. Nonetheless, the utility and scientific value of the information generated by those methodologies needs to be further assessed, considering the lack of consistency across surveys as well as the absence of comprehensive reference catalogues, which are critical to identifying the organisms and matching the genetic sequences.

10. Consistent and harmonized compilation of data emerging from exploration activities and other scientific research projects in the Area will contribute significantly to enhancing and expediting the process of species identification and description. Expanding the use of innovative methodologies can also help to improve broad-scale biodiversity assessments in the deep sea. Fostering interdisciplinary cooperation is essential for developing tools, such as field guides and apps, and technologies, to improve in situ and ex situ deep-sea species identifications.

11. In 2020 and 2021, the secretariat organized two virtual workshops in collaboration with the Ministry of Oceans and Fisheries of the Republic of Korea (MOMAF) and the National Marine Biodiversity Institute of Korea (MABIK), on taxonomic standardization (September 2020), and on enhancing image-based biodiversity assessments to advance deep-sea taxonomy (October 2021). The workshops identified a list of activities to be implemented in the short, medium, and long-term in the form of a roadmap aiming at facilitating the integration of deep-sea taxonomic knowledge into the work of the Authority.

12. Building on this, the secretariat together with MOMAF will organize a third workshop in November 2022 in Korea. The workshop will focus on standardizing methodologies for collecting and sharing genetic sequence data and information in support of improved observation and monitoring capacities of biodiversity in the Area. Particular attention will be paid to challenges and opportunities for enhancing data interoperability between the Authority's DeepData database and international genetic databases (e.g., GenBank, BOLD, NCBI, SILVA, etc.). The workshop will also discuss collaborative approaches to building deep-sea research capacity and literacy with a focus on technologies, methodologies, and tools and their adequate application at a larger scale.

13. As part of its support for the implementation of SSKI (see para. 9), the European Commission signed in May 2022 a grant agreement with the secretariat under the 2021 work programme of the European Maritime, Fisheries and Aquaculture Fund. The grant will support the taxonomic knowledge component of SSKI and initiate the development of innovative tools to facilitate species identification and description in the Area. An inception workshop will be convened in December 2022 in Korea to develop the implementation and monitoring plan for the achievement of the two-year project objectives. These include the description of at least 50 new deep-sea species from habitats currently targeted for mineral exploration, and development of DNA-based and underwater image libraries, among other taxonomic toolkits.

14. The identification of priority taxonomic work will draw on the outcomes of a review of the baseline taxonomic data currently available in published literature for the Clarion Clipperton Zone and in online repositories, including DeepData. The results of this study, undertaken by the Natural History Museum, United Kingdom, with the financial support of the Pew Charitable Trusts, will be published as an ISA technical study in 2022. The assessment of taxonomic knowledge priorities will also take into account the results of baseline studies undertaken by contractors, especially for standardizing species identifications, and availability of taxonomic expertise.

C. Strategic research priority 3: facilitating technology development for activities in the Area, including ocean observation and monitoring

15. Facilitating technological innovation is central to creating the enabling conditions for the equitable and sustainable development of deep-seabed mineral resources. It is also a prerequisite for supporting the sustainable transition from exploration to exploitation of mineral resources in the Area. Building cross-sectoral collaborations between land and ocean mining companies and other relevant industries can promote the exchange of ideas and lessons learned and foster innovative technological developments. Advances in technology are also needed to expand the spatial (horizontal and vertical) and temporal coverage of sustained deep ocean observations and monitoring.

16. The secretariat, together with the National Oceanography Centre (NOC) of the United Kingdom are partnering to advance technology development and innovation in support of the sustainable development of mineral resources, including in relation to environmental protection and the monitoring of activities carried out in the Area. In November 2021, the secretariat organized an online expert scoping meeting, to take stock of existing technologies and gaps and identify existing and potential actors. Drawing on the results of this meeting, the secretariat, in collaboration with other relevant actors from the mining and technology industry, will organize a workshop in 2022 to analyze progress, identify necessary developments, and explore mutual interests and benefits between the land- and seabed-based industries through the advancement of intelligent technologies in support of effective transition from exploration to exploitation.

17. The secretariat also initiated discussions with potential partners in relation to the design of a pilot project for long-term ocean observation in the CCZ involving a wide range of relevant stakeholders including scientific institutions and contractors. The main objective is to undertake an assessment of existing ocean observing capabilities and monitoring programmes, as well as a compilation and synthesis of available oceanographic data from the CCZ collected by contractors and scientific entities. It is expected that, building on the findings of this first phase, the secretariat will be in a position to organize an expert meeting in 2023 to identify further the specific scope of project activities, including methodologies and approaches for collaboration and resource mobilization. The meeting will also discuss needs and priorities for collection and management of oceanographic data, and technological innovations that underpin prediction, forecasting and modelling of potential environmental impacts arising from activities in the Area.

D. Strategic research priority 4: enhancing scientific knowledge and understanding of potential impacts of activities in the Area

18. Advancing the scientific basis for the improved assessment of risks related to deep seabed exploration and future exploitation activities is essential. Comprehensive environmental baseline information coupled with robust and coherent modelling

approaches is needed to understand the potential impacts that activities in the Area may have at multiple spatial and temporal scales and across all depths. It is also crucial for informing decision-making processes and ensuring that a precautionary approach is followed at all stages of the exploration process, as well as for developing robust monitoring programmes and methodologies.

19. The secretariat has joined the advisory boards of two scientific research projects, namely the Seabed Mining and Resilience to Experimental impact (SMARTEX)[10] and the Conservation and restoration of deep-sea ecosystems in the context of deep-sea mining (DEEP REST) project.[11] Drawing on field experimental assessment of impacts from test mining activities in the CCZ, SMARTEX, funded by the Government of the United Kingdom, aims to investigate how deep-sea ecosystems respond to and recover from broad-scale disturbance. Likewise, DEEP REST, led by Ifremer and financially supported by the Governments of France, Netherlands, Belgium, Germany, Ireland, Portugal, and Spain, will compare ecological processes between abyssal plain and mid-ocean ridge ecosystems to identify key traits and functions affecting community resilience. DEEP REST also aims to test the effectiveness of different restoration actions on the recovery of communities from potential impacts of future exploitation activities.

20. The Secretariat further continues to enhance its collaboration with the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP),[12] including by contributing to its work on the impacts of the introduction of mining wastes and other matter into the marine environment. GESAMP is a group of independent scientific experts established in 1969 to provide advice to the UN system on scientific aspects of marine environmental protection.

21. The secretariat organized a virtual side event on the margins of the 2022 UN Ocean Conference in Lisbon, Portugal, on scientific collaboration in support of regional environmental management planning in the Area. The side event provided insights into the science-policy interface in the development and implementation of the Authority's regional environmental management plans and related progress in the development of scientific tools and approaches. The event was organized in collaboration with the European Commission, the Ministry of Natural Resources of China, the Ministry of Earth Sciences of India, Ministry of Climate and Environment of Poland, and the Commonwealth Scientific and Industrial Research Organisation of Australia.

E. Strategic research priority 5: promoting dissemination, exchange and sharing of scientific data and deep-sea research outputs and increasing deep-sea literacy

22. Promoting the dissemination, exchange and sharing of scientific data and the outputs from deep-sea research activities, thereby increasing deep-sea literacy, is an inherent part of the Authority's mandate under the Convention. In the past four decades, the work of pioneer investors and contractors has contributed significantly to advancing the scientific knowledge and understanding of the deep-sea environment and seabed resources in the Area. The scientific data and information resulting from over one hundred oceanographic expeditions for the exploration of mineral resources by contractors have been systematically collected, compiled and organized in DeepData.

[10] Seabed Mining And Resilience To EXperimental impact | National Oceanography Centre (noc.ac.uk)
[11] DEEP REST (ifremer.fr)
[12] http://www.gesamp.org/

23. Establishing effective collaborative links, including data interoperability, between DeepData and other relevant global databases, is essential for contributing effectively to the global understanding of deep-sea ecosystems and biodiversity.

24. In March 2022, the Authority signed a letter of collaboration with the World Register of Marine Species (WoRMS) with a view to help ensuring the quality of deep-sea taxonomic information and data contained in the DeepData database through periodic scientific reviews between DeepData and WoRMS' thematic subregister, the World Register of Deep-Sea Species (WoRDSS). This collaboration will enable both entities to co-develop training and sensitization activities for data providers and users of taxonomic data in order to improve standardization of data exchange protocols and promote the use of biodiversity information for scientific research in the Area.

25. Building on the agreement of cooperation signed in 2017, the Authority and the International Hydrographic Organization are partnering through the AREA2030 initiative launched on World Oceans Day (8 June 2022), to facilitate the voluntary contribution of bathymetric data by contractors for a consolidation of seabed mapping of the Area. The webinar on 8 June 2022[13] brought together representatives of the Government of Mauritius, BGR, Fugro, GSR, Jogmec and HafenCity Universität to discuss the importance of this initiative and its contribution to the objectives of the Action Plan for Marine Scientific Research of the Authority as well as the UN Decade.

Increasing deep-sea literacy

26. It continues to be important to increase deep-sea literacy and general understanding of the work of the Authority, in particular to combat misrepresentations and common misunderstandings. To that end, diverse initiatives to enhance communication activities for stakeholders have been developed during the reporting period to raise awareness of the role and mandate of the Authority, as well as its contribution to the achievement of the scientific objectives of the United Nations Decade.

27. In March and May 2022, the secretariat held two webinars under its "Deep DiplomaSea" series organized for the personnel of permanent missions to the Authority and the United Nations. More than 130 participants joined the two webinars.

28. The 2022 edition of the Authority's celebrations of World Oceans Day, on 8 June 2022, was dedicated to the celebration of deep-sea exploration. The event entitled "Fostering international cooperation for advancing seabed mapping and better understanding of the Area and its environment for the benefit of humankind" was attended by more than 100 participants and brought together experts from the Legal and Technical Commission, members and observers of the Authority and representatives of contractors and the scientific institutions. The interactive discussion was followed by the announcement of the winners of the art competition organized by the secretariat on the theme "Exploring the deep sea".

29. The secretariat, together with interested contractors, is currently working on a new initiative aimed at increasing the visibility of the contribution of deep-sea exploration activities conducted in the Area, in order to advance the global understanding of deep-sea ecosystems and resources. The initiative will take the form of a compendium highlighting the collective achievements of the contractors in advancing the state of knowledge of the deep sea for the benefit of humanity. The compendium will be published by the end of 2022.

[13] https://isa.org.jm/event/isa-celebrates-world-oceans-day

30. Further efforts on inclusive and transparent communications and awareness-building activities will be guided by the deep-sea literacy action plan, which is under development by the secretariat and will be made available by the end of 2022.

F. Strategic research priority 6: strengthening deep-sea scientific capacity of Authority members, in particular developing States

31. Owing to the rapid pace at which technology and know-how related to research, in particular in the deep sea, are developing, the disparity in capacity among countries will continue to increase. The Authority is committed to addressing the situation and facilitating better coordination and collaboration, as well as the identification of the financial and technical resources needed. Specific attention will be given to assisting technologically disadvantaged States, least developed countries, landlocked countries and small island developing States. Continued efforts to improve women's empowerment and leadership in deep-sea research will also be made.

32. In May 2022, the ISA-China Joint and Training Research Center organized its first training workshop on survey and assessment of mineral resources, characteristics of deep-sea ecosystems and environmental management, and the global repository of data from exploration activities in the Area.[14] The workshop gathered 55 participants from 20 countries, including 24 participants from nine different LDCs, LLDCs, and SIDS. More than 45 percent of the participants were women.

33. The secretariat, in cooperation with Ifremer and with the financial support of the Government of France, established in 2021 a deep-sea taxonomy postdoctoral fellowship for candidates from developing States members of the Authority. The 18-month fellowship will focus on developing and testing new methods and technologies for deep-sea species identification. The fellowship will be part of the Ifremer Blue Revolution project[15] and will involve work on the development and testing of three-dimensional imaging techniques for the identification of meiofauna organisms of deep-sea ecosystems found in areas currently being explored for mineral resources. The fellowship will also contribute to identifying key species that can be used as indicators for assessing potential environmental changes in the future. After a thorough selection process, the project selected Dr Ranju Radhakrishnan from India who will be joining Ifremer in September 2022.

34. The secretariat further progressed in the implementation of the internship programme funded by the National Oceanography Centre, United Kingdom. Implementation of this initiative had been delayed owing to global travel restrictions. The programme focuses on developing technical capabilities on taxonomic identification and standardization, and data collection and processing. Two female candidates have been selected for the internships, from China and the Cook Islands respectively. The candidates are expected to join the secretariat between August and December 2022.

35. In addition, the secretariat is currently developing an e-learning platform titled "Deep Dive" that will support the development of capacities and skills of young professionals and experts in the work of the Authority. This will be the first and only e-learning platform exclusively devised to address all elements of the legal regime in Part XI of the Convention and the 1994 Agreement. An entire module is dedicated to discussing the legal regime as well as the technical and scientific aspects pertaining to the conduct of marine scientific research. The Deep Dive platform is expected to be launched in 2022.

[14] https://www.isa.org.jm/training/JTRC
[15] BLUE REVOLUTION project (ifremer.fr)

36. Building upon the objectives of the Africa Deep Seabed Resources project, including the identification of potential capacity-building activities and strategies to be further developed at the national, regional and international levels, the secretariat held in June 2022 the second webinar of its new series dedicated entirely to addressing the priority needs for capacity development identified by African member States.[16] This webinar focused on the Authority's data management strategy and the role of the DeepData database, including various data flows from sources to users. The webinar also focused on different types of data analytics and their use for marine scientific research in the Area. It further identified Africa's priorities, challenges, and future areas of collaboration for facilitating access to and sharing of data on the marine environment in the Area, as well as for advancing the development of DeepData.

37. Since 2017, the Authority has placed particular importance on advancing women's empowerment and leadership, including in deep-sea research, as reflected in the voluntary commitment registered at the 2017 UN Ocean Conference (#OceanAction15467). Building on that voluntary commitment, the Authority, in partnership with the United Nations Office of the High Representative for the Least Development Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS), launched the Women in Deep-Sea Research (WIDSR) project in March 2021. The WIDSR project aims at developing and implementing specific activities to advance participation and empowerment of women scientists from the least developed countries (LDCs), landlocked developing countries (LLDCs) and small island developing States (SIDS) in deep-sea research. Several strategic partnerships have already been established with Governments, international and regional organizations, academia and contractors to implement activities in four action areas: policy development and advocacy; capacity development; sustainability and partnerships; and communication and outreach. Within the ambit of the project, the secretariat has, for example, contributed to the Global Women's Leadership Training Programme organized by MABIK in Marine Bioresources Information Systems, for female experts and scientists from Fiji, in October 2021.

38. During the reporting period, efforts have been engaged to undertake the first ever gender mapping of deep-sea research and related disciplines and activities in LDCs, LLDCs and SIDS. The report "Empowering Women from LDCs, LLDCs and SIDS in Deep-Sea Research", which also contains an analysis of critical barriers encountered by women scientists, was launched during a side event organized at the 2022 UN Ocean Conference in June.

III. Engagement and resource mobilization

39. The Authority has continued to work collaboratively with IOC-UNESCO in the planning and implementation of the UN Decade. As such, the secretariat has continued to provide inputs through its participation in the Decade Advisory Board, the Ocean Decade Alliance, the monitoring and evaluation working group and the communications working group.

40. Implementation of the Action Plan for Marine Scientific Research requires dedicated financial and human resources. As of mid-2022, the secretariat had recruited a dedicated Programme Coordinator for the Action Plan. Although many of the activities described in the present report were financed through the programme budget of the Authority, several activities also received extrabudgetary and in-kind support from members of the Authority, partner organizations and donors, as well

[16] See https://isa.org.jm/event/webinar-msr-information-series-africa-topic-1-deep-sea-mineral-resources-and-technologies.

observers. However, to fully realize the ambitions of the Action Plan and its strategic research priorities, additional financial resources will be needed.

41. The Strategic Plan and High-level Action Plan of the Authority for 2019-2023 both recognize the importance for the organization to identify long-term options for the sustainable financing of its operations (High-level action 8.4.1) and to develop measures and mechanisms to encourage contributions by Members and relevant stakeholders to the programmes, projects and initiatives of ISA, especially those relating to capacity development (High-level action 8.2.1). In 2022, the secretariat hired a consultant to develop a resource mobilization strategy and action plan to assist in identifying and mobilizing the financial resources needed. The resource mobilization strategy and plan are currently under development in consultation with a wide spectrum of key relevant stakeholders (Finance Committee, Legal and Technical Commission, representatives of members, partners, donors, contractors, observers and non-governmental organizations) and thorough review by the Finance Committee.

42. Pursuant to the decision of the Assembly relating to the implementation of a programmatic approach to capacity development (ISBA/26/A/18), the Secretary-General also undertook a review of the terms of reference of the Endowment Fund for Marine Scientific Research in the Area (EFMSR) to address the challenges identified in its implementation, in particular to allow the use of the capital of the Fund to support training and technical assistance activities and submitted proposals for consideration by the Finance Committee (ISBA/27/FC/3). Subject to the recommendation of the Finance Committee on this matter, the revitalized Fund could provide significant support to the Action Plan in terms of training and technical assistance.

IV. Recommendations

43. The Assembly is invited to:

(a) Take note of the information provided in the present report;

(b) Request the Secretary-General to continue his efforts to mobilize the necessary resources for the implementation of the strategic research priorities under the Action Plan for Marine Scientific Research;

(c) Encourage all members of the Authority, other States, relevant international organizations, academic, scientific and technical institutions, philanthropic organizations, corporations and private persons to contribute to the implementation of the Action Plan for Marine Scientific Research.