International Atomic Energy Agency (IAEA)

IAEA Input to 2023 SG report on oceans and the law of the sea (RES 78/69)

Second part

Through its Marine Environment Laboratories in Monaco, the International Atomic Energy Agency (IAEA) remained committed to assisting its Member States in implementing and advancing nuclear and isotopic tools and techniques for monitoring coastal and marine environments. These efforts include assessing the impact of human activities on marine ecosystems and resources. Additionally, the IAEA provides guidance based on its Safety Standards for regulating the release of radioactive effluents into the marine environment. This guidance supports environmental monitoring and surveillance of nuclear facilities, as well as the assessment of radiological impacts on both the public and marine flora and fauna.

The IAEA Marine Environment Laboratories are a unique asset within the UN system. As the sole agency with marine laboratories, the IAEA supports Member States in addressing various marine environmental challenges. These include meeting nationally identified targets under Sustainable Development Goals (SDG) 13 (Climate Action) and 14 (Life Below Water), as well as aligning with the SAMOA Pathway for Small Island Developing States (SIDS). The IAEA's support extends to the implementation of the 2030 Agenda, with a specific focus on SDG targets such as 14.1 (pollution) and 14.1.b (plastic pollution). Furthermore, the IAEA Marine Environment Laboratories actively engage with SDG 14.3, which addresses ocean acidification. The IAEA's Ocean Acidification-International Coordination Centre (OA-ICC) serves as an official partner of the UN Decade of Ocean Science for Sustainable Development.

In addition to its SDG-related work, the IAEA assists Member States in fulfilling their obligations under global Conventions. These include the Stockholm Convention on Persistent Organic Pollutants, the Minamata Convention on Mercury, and the Basel Convention, which sets controls on transboundary movements of hazardous wastes. The IAEA also collaborates with UNEP on pollutants related matters and coordinates closely with other UN Agencies with mandate related the environment, through the UN Environmental Management Group platform (EMG) and the UN-Oceans mechanism.

The IAEA launched the NUclear TEChnology for Controlling Plastic Pollution (NUTEC Plastics) initiative in 2021. This initiative supports Member States in integrating nuclear techniques to address plastic pollution challenges. The initiative focuses on research, development, capacity building, and the implementation of nuclear techniques to tackle upstream and downstream aspects of plastic pollution. Upstream aspects are addressed by reducing plastic waste volumes through the use of radiation technologies to improve plastic recycling methods and to develop bio-based alternatives to single use petroleum-based plastics. Downstream aspects are addressed by using nuclear techniques to assess, monitor and better understand the abundance and impact of marine plastic pollution.

Related to §§ 10, 11, 12, 13, 14, 15, 16, 17, 19, 38 of resolution 78/69.

The IAEA, through its Marine Environment Laboratories in Monaco, builds capacity in its Member States to address a range of issues affecting the marine environment, including Seafood Safety, Pollution including from Marine Plastics, and Climate Change. Several mechanisms are used, including the IAEA Technical Cooperation programme (TCP), Coordinated Research Projects (CRPs), and Peaceful Uses Initiative (PUI) projects.

The IAEA Marine Environment Laboratories continued assisting the UN Environment Programme (UNEP) Mediterranean Action Plan (MAP) and Contracting Parties to the Barcelona Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, with the harmonization and coordination of quality assurance for non-radioactive pollutants monitoring in the Mediterranean Sea through the Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL). Bi-annual training courses were provided to experts in laboratories in MED POL member countries (the 21 countries bordering the Mediterranean that are Contracting Parties to the Barcelona Convention), on the determination of trace metals and organic contaminants in marine environmental compartments. Technical evaluations, specifically tailored to each individual laboratory participating in the MED POL Proficiency Tests organised by the IAEA in 2022-2023, were also provided. These communicate key findings on each laboratory's performance and aspects to address in relation to measurement quality. Additionally in 2023, the IAEA organised expert mission visits to two national laboratories to assess their current monitoring capacities.

To date in 2024, the Ocean Acidification International Coordination Centre (OA-ICC) and its global partners have been involved in more than 900 capacity building opportunities with 800 scientists from more than 100 Member States since its inception in 2012. These efforts are helping Member States to build, strengthen, and maintain human expertise and institutional capacities to define national needs, to make informed decisions on action plans and measures to protect the oceans, to deliver sustainable ecosystem services and to ensure sustainable socio-economic development.

The IAEA continued to coordinate the Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA) network, a collaboration of 200 analytical laboratories from 90 countries that work together to encourage and support validation and harmonization of radioanalytical methods. The network is supported through proficiency tests, interlaboratory comparisons, training, and coordination. The capacity of network laboratories to report timely and reliable measurement results in the event of a radiological or nuclear emergency is thus enhanced and maintained.

Related to §§ 190, 199, 242, 263, 264, 362 of resolution 78/69.

The IAEA Marine Environment Laboratories continued working closely with UNEP within the framework of several conventions including the Minamata Convention on Mercury, the Stockholm Convention on Persistent Organic Pollutants, and the Barcelona Convention UN Environment Mediterranean Action Plan (MAP) Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MED POL). A formal agreement exists with the latter for capacity building and the quality assurance of monitoring data, obtained by laboratories in the Contracting Parties.

Cooperation between the IAEA and the UNEP Minamata Convention Secretariat has been maintained and the IAEA continues to be a member of the UNEP Environmental Global Mercury Partnership since 2020.

Linkages between the IAEA and the UNEP Chemicals and Health Branch continue with a view of finding synergies in capacity building activities for the design of a new phase of the Global Monitoring Plan of the Stockholm Convention on Persistent Organic Pollutants. This is a major pillar for the evaluation of the effectiveness of the Stockholm Convention on Persistent Organic Pollutants (POPs).

The IAEA has also continued to provide analytical quality assurance services through the production of Certified Reference Materials (ISO17034 accreditation) and the organization of worldwide interlaboratory comparison (ILC) exercises and proficiency tests (PT). These services have assisted Member States in producing verified, quality-assured data on the levels of radionuclides, inorganic and

organic hazardous contaminants in diverse marine samples for monitoring and impact assessment in routine and emergency situations.

Under a project entitled 'Marine Monitoring: Confidence Building and Data Quality Assurance', that was initiated in 2014 as a follow-up activity to recommendations related to the decommissioning of the Fukushima Daiichi nuclear power plant in Japan, the IAEA Marine Environment Laboratories continued conducting interlaboratory comparison (ILC) exercises, based on sampling missions to collect seawater, sediment and fish samples undertaken jointly with Japanese scientists. The results of these ILCs confirm that the Japanese sampling methods are consistent with relevant methodological standards and best practice. The results also demonstrate a consistently high level of accuracy and reliability by Japanese laboratories involved in the analyses of radionuclides in marine samples.

In April 2021, Japan announced its Basic Policy on the handling of the ALPS (Advanced Liquid Processing System) treated water currently stored in tanks at the Fukushima-Daiichi nuclear power station (FDNPS) through controlled discharge into the sea surrounding the plant, subject to national regulatory approvals. Source monitoring of the treated water is required prior to discharge and related marine environmental monitoring are required to demonstrate compliance with regulatory limits and to support Japan's radiological environmental impact assessment (REIA) for ensuring the protection of people and the environment. The IAEA has assembled a task force to conduct a review to assess the Government of Japan's plan to discharge Advanced Liquid Processing System (ALPS) treated water based on relevant IAEA safety standards. The review started in September 2021, before the discharges were initiated in 2023, and will continue during and after the discharges will be completed. To independently verify the results of the monitoring carried out by Japanese laboratories, the IAEA organises ILCs for the corroboration of source and environmental monitoring related to the ALPS treated water release, with participation from IAEA and independent ALMERA laboratories. These ILCs promote transparency and provide reassurance to seafood consumers. The ILCs are based on a broad range of radionuclides relevant to ALPS treated water, including H-3; C-14 and I-129 which are the major contributors to dose according to the REIA, and other radionuclides, including Co-60, Sr-90, Ru-106, Sb-125, Cs-134 and Cs-137, which are detectable in ALPS treated water. Separate ILCs are organised for samples of ALPS treated water from the tanks at FDNPS and of seawater, fish and seaweed from locations around FDNPS. These samples are collected in the presence of IAEA staff and split between participating laboratories in Japan and IAEA. Member laboratories of the IAEA ALMERA (Analytical Laboratories for the Measurement of Environmental Radioactivity) network also take part, with selection based on capability and demonstrable performance in relevant analytical techniques. .

The IAEA is continuing supporting the work of OSPAR's Radioactive Substances Committee (OSPAR-RSC) and that of the Contracting Parties of the OSPAR (Oslo-Paris) Convention for the Protection of the Marine Environment of the North-East Atlantic in the areas of analytical quality assurance of marine radioactivity monitoring data and marine environmental radioactivity database development.

Through its Marine Environment Laboratories in Monaco, the IAEA continues to support the Helsinki Commission's Expert Group on Monitoring of Radioactive Substances in the Baltic Sea (HELCOM MORS EG) and the Contracting Parties to the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area. The IAEA provides analytical quality support for the Baltic marine environmental radioactivity monitoring programme and disseminates the results through IAEA's MARIS database. The HELCOM-MORS EG collaborates in the production and characterization of IAEA reference materials of marine origin, which are subsequently made generally available to laboratories in all the IAEA's Member States.

The IAEA continued to provide support to its Member States for oil spill response by building capacity and assessing impacts related to the accidental discharge of hydrocarbons into the marine environment. In collaboration with OSINet, the Bonn Agreement Oil Spill Identification Network of experts, the IAEA

has developed new analytical methods for identifying the potential source of contaminants following an oil spill. Through the procurement of laboratory equipment and training of staff, the Agency is supporting laboratories in its Member States to enhance their capacity to monitor the effects of oil spills as well as hazardous contaminants in the marine environment and to assess potential short- and long-term toxicological impacts. In May 2024, upon the request of the Government of Trinidad and Tobago, the IAEA provided emergency assistance to this Member State to address the environmental consequences of an accidental oil spill that had occurred close to its coast.

Related to §§ 216, 217, 218, 223, 229, 230, 231, 232, 233, 234, 235, 239, 332 of resolution 78/69.

Through its initiative 'NUclear TEChnology for Controlling Plastic Pollution (NUTEC Plastics)', the IAEA is supporting Member States in integrating nuclear and isotopic techniques into their efforts to address plastic pollution. NUTEC Plastics builds on the IAEA's work addressing plastic pollution through recycling, using radiation technology, and marine monitoring, using isotopic tracing techniques. NUTEC Plastics is closely aligned with other UN organizations tackling this problem, including the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization of the United Nations (FAO), and contributes to global efforts and initiatives. The IAEA's NUTEC Plastics initiative is accelerating the development of nuclear and isotopic techniques for assessing the abundance, distribution and characteristics of marine plastics to better understand their origin, transport, fate, and impact. In the reporting period, harmonized and standardized protocols to identify microplastics in marine environmental samples were established for Latin America and the Caribbean using state-of-the-art analytical techniques that are in line with best practices, and capacity was enhanced for scientists and technicians.

The IAEA continues supporting Member States in developing a toolbox of harmonized methods for marine microplastic analysis. The development of harmonized methods is key for reporting global progress on decreasing plastics pollution and for reporting on progress towards the achievement of SDG14. In 2023, NUTEC Plastics continued its efforts to combat plastic pollution, aligning with ongoing negotiations and contributing scientific expertise to Intergovernmental Negotiation Committee to develop an international legally binding instrument to end plastic pollution including in the marine environment.

Related to §§ 200, 201, 202, 203, 211, 215, 228 of resolution 78/69.

The ocean plays a major role in absorbing CO_2 from the atmosphere, thus regulating climate. The IAEA Marine Environment Laboratories pursued their efforts initiated in 2020, on assessing the capacity of mainly coastal marine areas to sequester organic carbon (Blue Carbon), by advancing scientific knowledge on the capacity of coastal vegetated ecosystems (mangroves, saltmarshes, and seagrasses) to sequester carbon as a nature-based solution to mitigate climate change, jointly with international scientific partners. A large number of research studies are being conducted in more than 30 countries worldwide, and, in parallel, the IAEA is supporting Member States to establish their own capacity via national and regional technical cooperation programs. In 2024, IAEA implemented Blue Carbon projects in 30 countries jointly with local research institutes, applying radionuclides as tools to assess the rates of carbon sequestration in vegetated coastal areas, aiding Member States in evaluating the capacity of these ecosystems to store carbon long-term. On the African continent alone, the IAEA is working with 16 countries on capacity building on Blue Carbon. In 2023, IAEA became a partner in the Ocean Decade Program 'Global Ocean – Blue Carbon' (GO-BC).

Related to §§ 23, 24, 209, 210, 211, 212, 213, 214, 215, 223, 224, 225, 226, 227, 277, 280 of resolution 78/69.

The International Atomic Energy Agency (IAEA) continues to host the Ocean Acidification-International Coordination Centre (OA-ICC), which facilitates global collaboration on the topic of ocean acidification, through capacity building, communication, and targeted research activities that advance knowledge of ocean acidification impacts. The OA-ICC co-organizes and participates in several high-level symposia and events every year and, with its global partners, has facilitated capacity building opportunities for over 800 scientists from more than 100 Member States.

The OA-ICC pursued its activities as a global information hub, by providing access to ocean acidification publications and information on relevant events and opportunities, as well as to unique resources such as: 1) a bibliographic database centralizing all existing knowledge in the field of Ocean Acidification in the form of more than 10,800 references with citations and abstracts; 2) a data portal on the biological response to ocean acidification, containing datasets from over 1,500 research articles.

Since the 2023 report, the OA-ICC has organized and supported a total of 8 events, including technical and consultancy meetings, training courses, and side events within the framework of high-level international conferences. The OA-ICC held an engaging side event addressing ocean acidification impacts and solutions, focusing on the Persian Gulf, the Red Sea, and the Mediterranean, during the 2023 UNFCCC climate conference (COP28) in Dubai, UAE. The OA-ICC co-organized two high level workshops with global experts on capacity building capacity for Ocean Acidification and on a best-practices guide for Ocean Acidification practitioners. In addition, the OA-ICC co-organized an event on “Marine carbon dioxide removal: from blue carbon to ocean alkalinity enhancement” during Monaco Ocean Week in March 2024. At the UN Ocean Decade Conference in Barcelona in April, the OA-ICC co-organized a satellite event “Moving from science to action on ocean acidification”. Additionally, IAEA became a partner of the Ocean Decade Program: ‘Ocean Acidification Research for Sustainability’ (OARS).

The IAEA is co-focal lead of the UN Community of Ocean Action on Ocean Acidification, a process to facilitate progress on more than 250 Voluntary Commitments that have been submitted by various stakeholders across the globe on SDG 14.3. The Community of Ocean Action on Ocean Acidification is directly aligned with the goals and objectives of the UN Decade of Ocean Science for Sustainable Development (2021-2030).

Related to §§ 194, 195, 206, 214, 216, 243, 262, 263 of resolution 78/69.

The IAEA supports its Member States by providing technical expertise on the processes and mechanisms that may lead to marine biodiversity loss, such as pollution, climate, and ocean change impacts. Research and development efforts focus on the effects of multiple stressors, such as ocean acidification and toxic trace elements on the biological response in marine species. Such research helps Member States determine the vulnerability of oceanic resources, such as coral reef habitats and important seafood species, and can therefore help evaluate the potential biological and socio-economic impacts of changes in ecosystems and ecosystem services (sustainable food security). Through its work on Blue Carbon, the IAEA supports Member States in their contributions to the restoration of coastal vegetated ecosystems and their biodiversity.

Related to §§ 11, 21, 23, 35, 36, 200, 202, 336 of resolution 78/69.

The IAEA is supporting Small Island Developing States (SIDS) to address Ocean Acidification through its Ocean Acidification International Coordination Centre (OA-ICC). In 2023-, the OA-ICC held a series of meetings on Designing Climate Adaptation Pathways for Atoll Islands, in which SIDS experts participated.

Additionally, the OA-ICC provided capacity building opportunities on ocean acidification with participation from SIDS researchers.

As part of the Subregional Approach to the Pacific Islands (SAPI) for Fiji, Marshall Islands, Palau, Papua New Guinea, Samoa and Vanuatu, the IAEA is supporting development in the areas of water resources and coastal zone management. This supports Member States in developing institutional and human capacities for the effective and sustainable implementation of integrated management of water resources and related ecosystems, in line with the need recognised in the SAMOA Pathway requirement. The project is building capacity in isotopic and complementary techniques to tackle the integrated management of water resources and coastal ecosystems. The project is also encouraging and supporting education, training and development of networks and partnerships among SIDS and with regional and international collaborators in relevant topical areas.

Related to §§ 366, 384 of resolution 78/69.

As a member of the UN-Oceans mechanism, the IAEA attends coordination meetings and contributes to outreach activities to strengthen UN coordinated action for Ocean conservation. The Agency contributed to the UN-Oceans side event 'Coordinating for a greater ocean-based climate change ambition – A UN-Oceans perspective' at COP 28 in Dubai in December 2023.

Related to §§ 365 of resolution 78/69.

Through its Marine Environment Laboratories, the IAEA contributes to effective coordination between UN Agencies through its participation in the Environment Management Group (EMG). The IAEA continued attending the annual Senior Officials Meeting and the EMG Mid-Term Technical Segment. The Agency also contributed to the preparation of a UN Common Approach towards a Pollution-Free Planet as part of the Consultative Process and the Small Drafting Team coordinated by the Environment Management Group (EMG). The Common Approach aims to help the UN align its efforts and mobilize the entirety of its relevant expertise and mandates to accelerate the sustainable, inclusive, and just transition towards a pollution-free economy, building on existing efforts undertaken by various UN and related entities. The IAEA further contributes to the EMG Issue Management Group (IMG) that facilitates a coordinated approach to the implementation of the UN Common Approach on Pollution and reports on progress achieved.