

IOC CAPACITY DEVELOPMENT STRATEGY 2023–2030

DRAFT 0 - BASE DOCUMENT

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EXECUTIVE SUMMARY

Capacity Development is an essential tenet of IOC's mission: It enables all Member States to participate in and benefit from ocean research and services that are vital to sustainable development and human welfare on the planet. This Strategy's vision identifies capacity development as the primary catalyst through which IOC will achieve its five high level objectives in the IOC Medium-Term Strategy for 2022-2029.

The IOC has a long-standing history in supporting Member States become more able to manage their marine environments, whether directly by way of its Ocean Teacher Global Academy or increasing capacity to manage marine estates through workshops on marine protected areas or mitigating the effects of sea level rise and hazards such as tsunami and harmful algal blooms through knowledge exchange. Such direct support is complemented via an array of training opportunities delivered by IOC accredited Regional Training and Research Centres or opportunities delivered by partner organisations that are promoted by the IOC.

The need for capacity development has never been more necessary and in demand. The increased prominence of the oceans in recent years, driven by a recognition that the ocean plays a vital role in weather, climate change mitigation and in providing resources have elevated interest in the ocean from all quarters, political, commercial, science and society. Yet the full impact of climate change on the marine environment is still yet to be realised, in which case never has there been a need to ensure that all Member States have an opportunity to contribute to a global endeavour to better understand our seas and ocean.

The UN Decade of Ocean Science for Sustainable Development (2021-2030) recognises capacity development as an essential tenet to achieving evenly distributed capacity across the globe, across generations, and across genders and thus reversing asymmetry in knowledge, skills and access to technology. However, resource constraints, both staff and funding, limit IOC's ability to address Member State science and services needs. In which case now more than ever before is there an imperative for the IOC work collaboratively with its Member States, other UN agencies, in particular those who have a mandate to undertake marine scientific research and to provide capacity development, donors and the scientific community to collectively better understand the importance of responsibly managing the resources and health of the marine environment for the betterment of human welfare.

Time and time again is capacity development recognised by the UN General Assembly in UN Oceans and the law of the sea Resolutions as key to ensuring integrated participation of all States. Most recently reflected in Resolution A/RES/76/72 which calls upon States, international organisations and donor agencies to make efforts to ensure the sustainability of capacity development initiatives. As a leading Intergovernmental Agency with responsibility to support its 150 Member States to work together to protect the health of our shared ocean, the IOC has a critical role in fostering international cooperation for sustained observations of the ocean and to use the data and information to support and encourage interaction between researchers, operational requirements, user communities and decision-makers. In so doing delivering the IOC's High Level Objectives to maximise societal benefit, in particular in Global Priority Africa, SIDS and Global Priority Gender Equality and the inclusion of the next generation of ocean professionals.

This strategy retains the six outputs and activities from the 2015-2021 IOC Capacity Development Strategy, see table below, given that it's recognised that their application supports not only IOC's capacity development ambitions but also those included in other frameworks such as the UN Ocean Decade. These outputs call for investing in people and the institutions of which they are a part, enhancing access to scientific tools and methodologies, reinforcing IOC's capabilities to provide services to Member States, enhancing the communication between

science and policy, expanding ocean literacy and mobilising resources to accomplish these goals.

It will also be important that this strategy motivates the development of an implementation plan such that IOC capacity development activities are clearly articulated and that the benefits are more readily identified. However, in order to achieve the ambitions outlined in this strategy they are contingent on:

- Reinforcing and valuing IOC staff at global and regional levels and, where necessary, participating national ocean scientific and governance institutions;
- Integrating IOC global and regional mechanisms to rapidly expand Member State participation in IOC programmes;
- Empowering IOC regional sub-commissions and other subsidiary bodies to engage with Member States, expanding collaboration and capacity development (including transfer of marine technology) where these are recognised through capacity development needs surveys
- Strengthening global science programmes to increase scientific engagement in Member States;
- Prioritising partnerships with IOC Member States, UN organisations and other agencies, scientific community and civil society;
- Mobilizing resources, e.g., personnel, funds, knowledge, and observing networks, to deliver the capacity development on which science, services and human communities depend; and
- Continued attention to “enabling institutional conditions” as identified in discussions on “The Future of IOC”.

The conclusions identify elements of a draft work plan including conducting needs assessments to establish CD work plans, mobilizing associated resources and enhanced communication and collaboration.

Output	Activity
1. Human resources developed at individual and institutional levels	1.1 Academic and higher education
	1.2 Continuous professional development
	1.3 Sharing of knowledge and expertise including through community building
	1.4 Integration of ocean science in basic education
	1.5 Improving gender, generational and geographic diversity
2. Access to technology, physical infrastructure, data and information established or improved	2.1 Facilitating access to technology and infrastructure
	2.2 Facilitating equitable access to and sharing of ocean data and information
3. Global, regional and sub-regional mechanisms strengthened	3.1 Further strengthening and supporting secretariats of regional commissions

	<p>3.2 Enhancing effective communication between regional sub-commission secretariats and global programmes as well as other communities of practice (incl. other organisations)</p> <p>3.3 Identifying specific national and regional capacity development needs through regular needs assessment</p> <p>3.4 Encouraging regional and sub-regional organisations to be leaders in, and amplifiers of capacity development</p>
4. Development of ocean research policies in support of sustainable development objectives promoted	4.1 Fostering the development of ocean research policies
5. Visibility, awareness and understanding on the roles and values of the ocean and ocean research in relation to human wellbeing and sustainable development increased	<p>5.1 Fostering the development of ocean related public information and communication services</p> <p>5.2 Fostering the development of ocean literacy</p>
6. Sustained (long-term) resource mobilization reinforced	<p>6.1 Enhancing sustained support (in-kind and financial) to the IOC for its international coordination role</p> <p>6.2 Promoting sustained bilateral and multilateral support among Member States</p>

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VISION AND MISSION STATEMENTS

1. The IOC Capacity Development Strategy is inspired by the High-Level Objectives in the IOC Medium-Term Strategy 2022-2029 and a need to support removing barriers to full gender and geographic representation and to enable equitable access to ocean knowledge, ocean-related education, training, and transfer of marine technology. Recognising that only by committing to long-term sustained efforts will capacity development efforts truly be recognised. This strategy will ensure alignment with capacity development efforts by other initiatives, such as the UN Ocean Decade and those undertaken by other ocean stakeholders and be flexible to account for differing needs within different regions, where the role of National Focal points will be critical.
2. The **vision statement** of IOC's Capacity Development Strategy:
Through international cooperation, IOC will assist its Member States to collectively achieve the IOC'S high-level objectives (HLOs), and in doing so support the delivery of the societal outcomes of the United Nations Decade of Ocean Science for Sustainable Development (2021-2030), with particular attention to ensuring that all Member States have the capacity to meet them.
3. As the ocean is interconnected and affects earth's climate system as a whole, improved scientific knowledge and capacity to understand and observe the ocean-climate nexus and ecosystems needs to be available equitably to all IOC Member States. To which end the IOC will ensure that all Member States have access to its capacity development initiatives. programmes.
4. Capacity Development, is one of the six functions defined in the IOC Medium-Term Strategy, 2022–2029 cross-cutting all other functions (the others being ocean research, observing system/data management, early warning and services, assessment and information for policy, sustainable management and governance). **In which case IOC's programme structure(s) will be key mechanisms for implementing the strategy through heightened cross-programme integration. This, along with collaborative efforts and complementary activities by other UN organisations will be critical in ensuring cohesive capacity development.**
5. IOC's Capacity Development must be a key tenet to support Member States address their obligations under the United Nations Convention on the Law of the Sea (UNCLOS), in particular Part XIII: Marine Scientific Research, and Part XIV: Development and Transfer of Marine Technology)¹. **It should enhance those activities delivered under the auspices of the UN Decade of Ocean Science for Sustainable Development (2021-2030) and other international programmes. IOCs CD must recognise activities undertaken by its Member States and other marine stakeholder, bringing visibility to opportunities and promoting CD activities. To which end partnership and collaboration are essential pillars of IOC's Capacity Development Strategy, working with other United Nations specialised agencies, Member States, research organisations, civil society and the private sector to leverage capabilities, expertise, platforms, data and joint funding opportunities to maximize efficiencies, effectiveness and impact of CD. Only a one ocean global community approach can accelerate scientific, governance and management capacity to the scale required to address the many competing challenges posed by climate change, biodiversity and habitat loss, and their impact on marine resources and ecosystem services. IOC's capacity development activities should address not only individual's capacity but also that of national institutions and member states, including at management level.**

¹ see: https://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.html

STRATEGIC FRAMEWORK

6. The following framework outlines how six outputs will be used to guide IOC's capacity development initiatives where several activities will generate outputs which will contribute to expected outcomes.

EXPECTED RESULTS (OUTCOMES)

7. The expected outcome of IOC's capacity development is for Member States to learn more about the nature and resources of the ocean and coastal areas and to apply that knowledge for the improvement of management, sustainable development, the protection of the marine environment, and decision-making processes. It will be essential to monitor and report on the results taking into account, *inter alia*, the UNESCO priorities including gender, Africa, LDCs, and SIDS. Regional Sub-Commissions and Regional Committees will play an essential role in planning, implementation and monitoring of the strategic plan. Given the needs for capacity development varying from one region to another, IOC regional sub-commissions and regional committees shall take an adaptive approach to capacity development for their respective regions while taking into account all activities and actions contained in this strategy.

8. The activities and actions undertaken by the IOC within the framework of targeted capacity development will result in a few outputs that, through their use by Member States should result in desired "changes" at the national and sub-regional level in areas such as decision-making, policy, governance, and knowledge.

OVERVIEW OF OUTPUTS

9. The **six outputs** identified, which must be addressed on a long-term and sustained basis, are elaborated in the table below, where key activities are highlighted along with the associated actions required to deliver

10. An Implementation Plan will be developed that will articulate in greater detail how the Actions listed will be delivered and progress and effectiveness monitored:

Output	Activity	Action
1. Human resources developed at individual and institutional levels	1.1 Academic and higher education	1.1.1 Promote and assist with the strengthening and establishment of consortia of higher education and research institutions at the appropriate geographical scale
		1.1.2 Promote collaboration between UNESCO Chairs and IOC, and between IOC and other organizations dealing with ocean matters on human resources development
	1.2 Continuous professional development	1.2.1 Promote and assist with the organization of training courses, workshops and "summer schools", relevant to the IOC mandate, including training of trainers/technicians and executive career development for institutional managers/decision makers, in collaboration with other organisations

Output	Activity	Action
		1.2.2 Establish, or collaborate with other organizations to develop internship/fellowship and on-board training programmes
		1.2.3 Establish and collaborate with other organisations on visiting lecturer/scholar/researcher programmes and professional exchanges (peer to peer)
		1.2.4 Promote and assist with the establishment of regional training (and research) centres relevant to the IOC mandate
		1.2.5 Promote the development and sharing of training materials and tools
	1.3 Sharing of knowledge and expertise including through community building	1.3.1 Establish a travel grant “fund”
		1.3.2 Establish or collaborate with other organizations on a mentoring programme
		1.3.3 Promote and assist with the development and strengthening of IOC alumni networks, and professional networks including for youth leaders
		1.3.4 Promote funding, grant and scholarship programs to facilitate ocean research, technical development and scientific exchange through bringing visibility of opportunities via an online CD hub
	1.4 Integration of ocean science in basic education	1.4.1 Promote the integration of ocean science in curricula of primary and secondary schools
		1.4.2 Promote careers in ocean research and ocean management
	1.5 Improving gender, generational and geographic diversity	1.5.1 Promote participation of women in ocean research
		1.5.2 Promote and support “young scientist” and “women in science” awards
2. Access to technology, physical infrastructure, data and information established or improved	2.1 Facilitating access to technology and infrastructure	2.1.1 Establish and maintain a register of infrastructure to facilitate access, and promote transfer of marine technology
		2.1.2 Promote the development of regional collaboration on sustainable scientific infrastructure
		2.1.3 Promote involvement of citizen science in ocean research
	2.2 Facilitating equitable access to and sharing of ocean data and information	2.2.1 Promote the development and wide use of regional and global data and information systems
		2.2.2 Promote the sharing of ocean data and information by stakeholders
3. Global, regional and sub-regional		3.1.1 Improve staffing of secretariat of regional sub-commissions

Output	Activity	Action
mechanisms strengthened	3.1 Further strengthening and supporting secretariats of regional sub-commissions	3.1.2 Reinforce budgeting of regional sub-commissions
	3.2 Enhancing effective communication between regional sub-commission secretariats and global programmes as well as other communities of practice (incl. other organizations)	3.2.1 Establish an effective coordination and communication mechanism between the secretariats of the regional sub-commissions and the global programmes
	3.3 Identifying specific national and regional capacity development needs through regular needs assessment	3.3.1 Organise and conduct biennial capacity development needs survey
	3.4 Encouraging regional and sub-regional organisations to be leaders in, and amplifiers of capacity development	3.4.1 Reinforce engagement of regional and sub-regional organizations in consultation process and capacity development initiatives
4. Development of ocean research policies in support of sustainable development objectives promoted	4.1 Fostering the development of ocean research policies	4.1.1 Compile and compare information on existing ocean research policies, and disseminate to member states for their use
		4.1.2 Assist and enable Member States with the development of ocean research policies, making use of the results of 4.1.1
5. Visibility, awareness and understanding on the roles and values of the ocean and ocean research in relation to human wellbeing and sustainable development increased	5.1 Fostering the development of ocean related public information and communication services	5.1.1 Encourage the development of public information (communication) departments in ocean research institutions
	5.2 Fostering the development of ocean literacy	5.2.1 Assist with the strengthening and development of ocean literacy programmes at national and regional levels
6. Sustained (long-term) resource mobilization reinforced	6.1 Enhancing sustained support (in-kind and financial) to the IOC for its international coordination role	6.1.1 Foster partnerships to increase in-kind support opportunities
	6.2 Promoting sustained bilateral and multilateral support among Member States	6.2.1 Encourage resource mobilisation in particular from Member States, and other donors to support the outcomes of the IOC Capacity Development needs assessment

DETAILED DESCRIPTION OF OUTPUTS AND ASSOCIATED ACTIVITIES

Output 1. Human resources developed at **individual and institutional level**

11. Human resources (academic staff, researchers, technicians, managers as well as students) are the foundation required for any research or management activity. This foundation must not only be built but also maintained. It is also important to ensure that the human resources development creates a “critical mass” of trained staff (i.e. not just one person for each Member State).

Activity 1.1 Academic and higher education

12. Academic education is provided at national Universities or, when these do not provide the necessary curriculum, in other Universities within or outside the region. The IOC Capacity Development Strategy can promote collaboration among Universities (and associated research institutions) and improve the cooperation between UNESCO Chairs and IOC programmes and activities. The following actions are proposed:

⇒ **Action 1.1.1 Promote and assist with the establishment of consortia of higher education and research institutions at the appropriate geographic scale**

13. While it is desirable to have full degree programmes in national Universities this may not always be possible. IOC will promote the establishment of national or regional consortia (of countries within a region) of higher education institutions that develop joint curricula for an integrated course programme and degrees that are recognized by all members of the consortia. This should be done in close cooperation with associated research institutions and among institutions from countries sharing the same language on specific disciplines.

⇒ **Action 1.1.2 Promote collaboration between UNESCO Chairs and IOC, and between IOC and other organizations dealing with ocean matters on human resources development**

14. The UNESCO UNITWIN/UNESCO Chairs Programme makes a major contribution to strengthen in-country academic programme². Launched in 1992, the UNITWIN/UNESCO Chairs Programme promotes international inter-university cooperation and networking to enhance institutional capacities through knowledge sharing and collaborative work.

15. There are currently 14 UNESCO Chairs related to marine science³. The IOC and UNESCO’s Education Sector must collaborate more intensively to enhance marine science education capacity development.

Activity 1.2 Continuous professional development

16. The achievement of a University degree is not the end target of education. The rapid evolution in science and technology requires continual/ongoing professional development (CPD)⁴ for the proper application of instruments and data storage

⇒ **Action 1.2.1 Promote and assist with the organization of training courses, workshops and “summer schools” relevant to the IOC mandate, including training of trainers and training of technicians as well as leadership seminars for institutional managers and decision makers, in collaboration with other organizations.**

² see <http://en.unesco.org/unitwin-unesco-chairs-programme>

³ extracted from: <https://www.ioc-cd.org/index.php>

⁴ see: http://en.wikipedia.org/wiki/Continuing_professional_development

17. All IOC programmes organize short-term training courses, in response to requests formulated by Member States during sessions of primary subsidiary bodies (regional or technical). These requests are then formulated in work plans. **Particular emphasis should be directed towards empowering those participating to be able to apply that knowledge after completing training. A special type of training course is the “summer school”. A listing of these opportunities is available at the Ocean CD-Hub⁵**

18. The IOC will strengthen its global programmes and regional subsidiary bodies to expand and integrate training courses in their programmes (**see also Action 3.1.2 and Action 3.2.1**). The IOC will work with partners to enhance training courses and programmes.

⇒ **Action 1.2.2 Establish, or collaborate with other organizations on an internship/fellowship programme (including on-board training)**

19. Internships allow scientists to work for a limited time in a different institution to gain on-the-job training. This is particularly useful when the expertise needed is not available in their own institution.

20. An important example of internship/fellowship opportunities is on-board training. While on-board, on-site experience is essential for the career of an ocean researcher, many Member States do not have a research vessel. It is therefore essential that researchers from such countries are: (i) provided on-board training to acquire the necessary skills; and (ii) are given opportunities to participate in research cruises organized within their region. Their participation may require funding support by bilateral and/or international arrangements.

21. IOC and its partner organizations organize internship programmes and other on-the-job training opportunities for graduate and post-graduate students worldwide. There are also “scholarship/fellowship” support available. A listing of these opportunities is available at the Ocean CD-Hub.

22. IOC will encourage the expansion of an internship/fellowship programme in all regions (taking into account it exists already in the WESTPAC region) and will partner with other organizations through joint programmes and activities as appropriate.

⇒ **Action 1.2.3 Establish, and collaborate with other organizations on a visiting lecturer programme**

23. Visiting lecturers fill a gap of specific expertise required in a teaching or training programme or enrich existing expertise by providing on-site training and related student support services. This is applicable for developed as well as developing countries. This mechanism is complementary and further enhances IOC’s training course programme (Action 1.1.1).

24. Organizations offering visiting lecturer programmes are listed on the IOC Capacity Development Compendium. IOC will promote expanded visiting lecturer programmes through collaboration with partner organizations. This action will further support Action 1.1.1.

⇒ **Action 1.2.4 Promote and assist with the establishment of regional training (and research) centres relevant to the IOC mandate**

25. Based upon the decisions of WESTPAC Member States to establish IOC Regional Training and Research Centres (IOC RTRC) and Member States involved in the International Oceanographic Data and Information Exchange (IODE) programme of the IOC to establish

⁵ <https://oceancd.org>

OceanTeacher Global Academy Regional Training Centres (OTGA RTCS) in existing and well established research or academic institutions, we can conclude that Member States now desire to support such a mechanism to establish a long-term and sustainable training mechanism.

26. In addition to establishing such centres IOC will network these centres in order to:

- (i) enable the sharing of course materials (and their translation into languages other than the original language of its creation);
- (ii) promote student and teacher mobility;
- (iii) promote regional and inter-regional collaboration through community building.

⇒ **Action 1.2.5 Promote the development and sharing of training materials**

27. The sharing of training course materials is essential to expand access to capacity development opportunities regionally and globally.

28. One mechanism, the OceanTeacher⁶ Learning Management System (LMS) which is a tool of the OceanTeacher Global Academy is offered for use by all regional training centres for the storage, management and sharing of training contents. If so desired other systems can of course be used but these should preferably be open systems that allow the exchange (or harvesting) of content.

29. The IOC will seek to facilitate the online sharing of training course materials where appropriate.

Activity 1.3 Sharing of knowledge and expertise including through community building

⇒ **Action 1.3.1 Establish a travel grant “fund”**

30. Sharing research findings and experience with peers is a crucial element in scientific research, scientific progress and capacity development. Currently IOC does not have a dedicated CD “fund” that provides travel grants to allow researchers to attend conferences and workshops (an exception is workshops organized by IOC). In some cases global programmes or Sub-Commissions and Regional Committees provide such travel support. A list of partner organizations providing such support can be found at the Ocean CD-Hub

31. IOC will explore mechanisms to establish/strengthen programmes to share knowledge and expertise through travel grants, regionally and globally.

⇒ **Action 1.3.2 Establish, or collaborate with other organizations on a mentoring programme**

32. Mentoring allows young (starting) scientists to interact with experienced scientists. It can be a very efficient and effective method to transfer working experience. Mentoring works best if the mentor and mentored can work together. The IOC will explore mechanisms to develop a mentoring programme through IOC’s communities of practice. A list of organizations offering mentoring programmes can be found at the Ocean CD-Hub.

⇒ **Action 1.3.3 Promote and assist with the development of IOC alumni networks**

33. Taking into account the many years of experience of IOC in providing technical training in various regions, those who participated have become a “pool” of alumni. An alumni pool can

⁶ <http://www.oceanteacher.org>

be brought directly into the IOC communities of practice expanding the base of participants in IOC programmes and promoting networking between experts. Such a group can be of assistance to IOC: the career path of alumni can be monitored so the impact of the training can be measured. But the alumni can also feedback recommendations to IOC in order to improve the training programmes. IOC/IODE's Alumni system⁷ allows listing students by country and by year. Linked to the OceanExpert⁸ Directory it allows some degree of career tracking. The IOC will build an online community of alumni that have participated in IOC training activities and will establish an appropriate mechanism to maintain the system.

Action 1.3.4 Promote funding, grant and scholarship programs to facilitate ocean research, technical development and scientific exchange through bringing visibility of opportunities via an online CD hub

34. Research grants and funding communities provide substantial support to facilitate ocean research, technical development and scientific exchange. The lack of access to these vital information makes it difficult for qualified people to avail of these opportunities. These opportunities can be more visible through the IOC online compendium where available funding and scholarship information can be searched and found easily.



Activity 1.4: Integration of ocean science in basic education



Action 1.4.1 Promote the integration of ocean science in curricula of primary and secondary schools

35. To increase the ability of the society to develop ocean awareness, the integration of ocean science in basic education curricula is necessary to promote a ocean literacy among students, teachers and other stakeholders. IOC will explore mechanisms in promoting activities that support incorporation of ocean in primary and secondary schools.



Action 1.4.2 Promote careers in ocean research and ocean management

36. To facilitate access to information and existing opportunities related to potential careers in ocean research and ocean management, IOC will develop an online platform that houses a global compendium of ocean science capacity development activities and programmes by various organizations and institutions around the world.

Activity 1.5: Improving gender, generational and geographic diversity

37. Gender Equality continues to be one of two global priorities of UNESCO (Gender Equality was designated as one of two global priorities of the Organization Medium-Term Strategy, 2008–2013). This priority status is maintained for the current Medium-Term Strategy, 2022–2029. The UNESCO Priority Gender Equality Action Plan for 2014–2021 (GEAP II) provides an operational framework for the implementation of Priority Gender Equality. It explains what gender equality means for UNESCO, provides guidance on how the Organization will ensure that a gender equality perspective is reflected in all its policies, programmes and processes so that gender equality is advanced both within the institutional processes of the secretariat and its work with Member States.

Action 1.5.1 Promote participation of women in ocean research

⁷ see <http://www.ioode.org/alumni>

⁸ see <http://www.oceanexpert.net>

38. Member States are urged to work towards a balance between men and women in ocean research, observation and other disciplines within the remit of the IOC mandate.
39. Member States are urged to consider women and men equally in terms of training opportunities (i.e. all actions under output 1).
40. IOC will strengthen its efforts to increase women participation in IOC training courses and other capacity development activities, and monitor progress of this action through its alumni system (see action 1.3.3).

⇒ **Action 1.5.2 Promote and support “young scientist” and “women in science” awards**

41. Awards can bring community appreciation and an element of (positive) competition into the research environment. They could consist of a certificate, monetary reward, equipment, a medal, a travel/study grant or a combination of these. A list of organizations providing such support can be found at the Ocean CD-Hub.
42. IOC will explore mechanisms to promote and support young scientists’ recognition and awards, in particular at the regional level.

Output: 2. Access to technology, physical infrastructure, data and information established or improved

43. Ocean research and observation requires substantive infrastructure including research vessels, scientific instruments, buildings, commodities (appropriate internet broadband, sustained electricity supply), etc. In addition to procurement these infrastructures are extremely costly to operate (e.g. research vessels) and to maintain. Especially for low-income economies these costs are difficult to cover and sustain. Donors can provide initial funding for procurement and operation for some time (5-10 years) but Member States should accept their responsibility for the maintenance and operation on the longer term.
44. While IOC is not in a position to finance large physical infrastructure (buildings, equipment, research vessels), IOC can assist in the enhanced access to such infrastructures at the regional level. Existing IOC global and regional programmes can encourage expanded access to and maintenance of key infrastructure for their programmes which will help broaden participation in, maintenance of, and benefits from these programmes to Member States.
45. It is recommended that these actions should be coordinated and implemented through the regional sub-commissions.

Activity 2.1 Facilitating access to technology and infrastructure

⇒ **Action 2.1.1 Establish and maintain a register of infrastructure to facilitate access, and promote transfer of marine technology**

46. In order to have an overview of heavy research infrastructure available in Member State institutions IOC will explore the possibility to establish an online register of such infrastructures that could be made available for joint use. This should be done in consultation and collaboration with partners where available.

⇒ **Action 2.1.2 Promote the development of regional collaboration on sustainable scientific infrastructure**

47. Based upon the register described above, IOC should encourage, in consultation with Member States and other organizations concerned, mechanisms (preferably regionally) for facilitating access to infrastructure and assistance of its services, and to build capacity for the utilization of such infrastructure. Where appropriate IOC may facilitate collaboration among Member States in jointly acquiring and maintaining infrastructure and in efforts mobilizing required support from other sources.

⇒ **Action 2.1.3 Promote the involvement of citizen science in ocean research**

48. The involvement of the public in gathering scientific data, analysis and co-design of scientific research empower citizens in increasing their ability to understand and deal with issues relating to the ocean. IOC will explore mechanisms that promote and support a wider deployment of citizen science in national research programmes and strategies, including the development of citizen science related training programmes.

Activity 2.2 Facilitating equitable access to and sharing of ocean data and information

⇒ **Action 2.2.1 Promote the development and wide use of a global data and information system**

49. The concept of delivering a data and information service for the global public good is central to the vision of the IOC Data and Information Management Strategy towards “A comprehensive and integrated ocean data and information system, serving the broad and diverse needs of IOC Member States, for both routine and scientific use.” IOC will continue the development of global data and information system for managing and exchanging oceanographic data and information within the regions including contributing to ocean sciences, operational oceanography development and integrated coastal management and disaster reduction programmes at the regional level.

⇒ **Action 2.2.2 Promote the sharing of ocean data and information by stakeholders**

50. Accelerating more effective development and dissemination of digital technology and sharing of ocean data, information, and knowledge by stakeholders enables sharing of expertise, knowledge transfer and capacity development through the provision of oceanographic data and information products and services to different users. IOC will promote the utilization of its platforms to provide equitable access to sharing of ocean data and information.

Output 3. Global, regional and sub-regional mechanisms strengthened

51. Scientific progress requires building of peer communities. Within the IOC context we can identify subject-specific communities (e.g. IODE, HAB, GOOS, Marine Policy and Regional Coordination,...) that are generally of global geographic focus, but also regional communities such as Regional Committees (IOCINDIO, BSRC) and IOC Sub-Commissions (IOCAFRICA, IOCARIBE, WESTPAC).

52. IOC has a long tradition of capacity development coordination and implementation through its Sub-Commissions and Regional Committees. Targeted actions under this expected output will therefore focus mainly on the strengthening of these regional bodies and their secretariats as well as their linkages with the global programmes (enabling collaboration between different levels of communities of practice). In addition the current Global Ocean Science Report project should make a major contribution to understanding capacity needs at regional and national levels.

53. In addition to the strengthening of regional (country to country) collaboration there is a need for closer national (within the country) collaboration, especially within the context of IOC programmes. While some Member States have established national oceanographic committees or coordinating bodies for this purpose, many still have not done so. It is furthermore recommended to establish these bodies at the highest possible government level in order to ensure governmental commitment and associated resources.

54. In addition to intra-regional cooperation IOC could establish inter-regional cooperation between the Sub-Commissions and Regional Committees, in order to promote sharing of expertise, experience and knowledge.

Activity 3.1 Further strengthening and supporting secretariats of regional sub-commissions

⇒ **Action 3.1.1** Improve staffing of secretariat of regional sub-commissions

55. The IOC Sub-Commission mechanism is an effective bottom-to-top governance mechanism that enables Member States to closely work together at the regional level. The mechanism is highly dependent on an efficient secretariat that ensures effective communication streams between the Member States and coordination, implementation and monitoring of activities. IOC should strengthen the secretariats of the Sub-Commissions to ensure they are adequately staffed (both in terms of staff number and competencies). It is recommended that staffing provided by IOC should be supplemented through secondments by Member States or by organizations cooperating with IOC.

⇒ **Action 3.1.2** Reinforce budgeting of regional sub-commissions

56. Taking into account the important role of the IOC sub-commissions and the fact that the majority of IOC Member States belong to one of the three sub-commissions, it is essential that the IOC operational budget adequately reinforces the sub-commissions to provide this core function to Member States. In addition sufficient extra-budgetary funding should be mobilized to enable full implementation of work plans.

Activity 3.2 Enhancing effective communication between regional sub-commission secretariats and global programmes as well as other communities of practice (incl. other organizations)

⇒ **Action 3.2.1** Establish an effective coordination and communication mechanism between the secretariats of the regional sub-commissions and the global programmes

57. The "One Ocean" principle challenges the IOC and its Member States to promote an integrated approach to ocean science and management at national, regional and global levels. The IOC should enhance close interaction and communication among global and regional programmes as a requirement for successful programme implementation and capacity building, facilitated, as appropriate, through mechanisms established by the Executive Secretary.

Activity 3.3 Identifying specific national and regional capacity development needs through regular needs assessment

⇒ **Action 3.3.1** Organise and conduct biennial capacity development needs survey

Regular needs assessment through the organisation and conduct of the biennial capacity development needs survey allows the identification of existing capacities and gaps in specific national and regional entities. IOC will continue to collect data through the IOC CD needs assessment surveys and share the results of these efforts that can be used by Member States to increase the effectiveness of future interventions and capacity development efforts.

Activity 3.4 Encouraging regional and sub-regional organisations to be leaders in, and amplifiers of capacity development

⇒ Action 3.4.1 Reinforce engagement of regional and sub-regional organisations in consultation process and capacity development initiatives

The strengthening of global, regional and sub-regional mechanisms which are essential to enhance close interaction and communication among global and regional and subregional programmes require the scaling up and acceleration of capacity development efforts, thus IOC will reinforce their engagement as leaders and amplifiers of capacity development in important processes for successful programme implementation in the regions.

Output 4. Development of ocean research policies in support of sustainable development objectives promoted

58. There is a crucial need for targeted natural and social science research that builds our understanding of ocean processes, helps identify possible solutions to critical challenges, and provides the knowledge needed to catalyse transformational changes in human behaviour. A variety of efforts to identify ocean research priorities have been undertaken in the past at national and regional levels, often through agency-led approaches that draw on eminent scientists for advice.
59. Understanding differences in research priorities among scientists from different disciplines and regions is particularly important given the need to provide balanced scientific advice to policy-makers and to bring cross-disciplinary research insights specifically to bear on cross-cutting ocean challenges.
60. The growing move toward trans-disciplinary and sustainability science is well-recognized in the environmental field and will likely become increasingly important as scientists are called on to provide various types of science advice that help address society's most pressing and complex problems.
61. Clear communication pathways and interfaces between the research and policy communities are recognized as essential tools for enhancing research and the application of science to human welfare.
62. Very few countries have developed a national marine policy or plan⁹ which is supported by an ocean research and technology plan; in most cases, they exist as a section of the national science and technology framework but are not necessarily with national sustainable development objectives.

Activity 4.1 Fostering the development of ocean research policies

⇒ Action 4.1.1 Compile and compare information on existing ocean research policies, and disseminate to member states for their use

63. The IOC will compile and make available, through electronic means, the existing national (and/or regional) ocean research plans. This could be done through the GOSR (Global Ocean Science Report). Understanding the range of priorities across industry, society and government could guide scientists as to how their scientific priorities align with societal needs. The IOC will also encourage the efforts to standardise training materials globally and to develop an electronic-based platform related to various marine data and information that will

⁹ [IOC CD Needs Assessment Survey 2020-2021](#)

be very helpful, particularly to make up training material, analysis and comparison practice which fulfil the Infrastructure Essential Challenge 8 of the Ocean Decade.

⇒ **Action 4.1.2** Assist and enable Member States with the development of ocean research policies, making use of the results of 4.1.1

64. The IOC could promote such potential targeted actions for the development of national marine science management procedures and related policies including the following:

- Advice for national and regional marine policy making, assistance and training in the development and implementation of science-based marine strategic plans
- Training for marine ecosystem management, marine spatial planning (MSP) and marine assessment
- Training in best practices —“proven marine technology”— related to the implementation of international agreements that have a potential to enhance national capacity to monitor and evaluate the protection and conservation of marine ecosystems. Many countries are now in the process of preparing their national marine development plans. This would give unique opportunities to align and integrate IOC’s international and regional strategies and programmes with national ones.
- Establish CD focused regional networks (Community of practices) bringing together science community and policy makers (through IOC Sub-Commissions, UNEP Regional Seas and Large Marine Ecosystems, as well as other opportunities).

Output 5. Visibility, awareness and understanding on the roles and values of the ocean and ocean research in relation to human wellbeing and sustainable development increased

Activity 5.1 *Fostering the development of ocean related public information and communication services*

⇒ **Action 5.1.1** Encourage the development of public information (communication) departments in ocean research institutions

65. Where ocean research is funded by governments, i.e. public funding, the spending of public funding must increasingly be justified in terms of its relevance and great value to society. It is therefore important that visibility, awareness and appreciation exists at the level of the general public as well as at the level of decision/policy makers about the importance of ocean research as a contributing element to management and decision making. Research findings must therefore not only be published in scientific journals but also be reported to the general public through appropriate communication tools. These can be newsletters, newspapers, exhibitions, open door days, World Ocean Day, inclusive of new media or social media campaigns etc. National institutions are therefore urged to establish public information departments and a related communication strategy. Close working relationships with media (journalists) is important. This is also linked to Ocean Literacy (see Activity 5.2). The IOC will promote the development of communication programmes in ocean research institutions.

66. Improved communication and public information and engagement will also facilitate mobilization of funds from other sources (private and public), discussed under output 6.

Activity 5.2 *Fostering the development of ocean literacy*

⇒ **Action 5.2.1** Assist member states with the development of ocean literacy programmes at the national and regional levels

67. Better public understanding of the ocean is an important element of resolving critical environmental challenges and supporting the science and management measures that may

be required for sustainable development. Increasing ocean literacy at all levels of national, regional and local leadership will build the capacity for adaptation, enhance the resilience of vulnerable communities, promote best practices in resource management and encourage innovative solutions for a sustainable economy and disaster risk management. Leaders and citizens that have an understanding of ocean and climate science, and who can access information, will be better prepared to respond effectively to future ocean challenges. Integrated programmes of research, education and community build fundamental understanding of the importance of ocean research and coordination and elicit support for funding educational opportunities at all levels. Diverse media and formal and informal training (including virtual and distance), education and outreach are among the key ocean literacy tools. Substantial ocean literacy efforts are underway in several regions and a community of practice would facilitate sharing experience within and across regions.

68. The IOC could foster development of an IOC ocean literacy programme as a community of practice to share experience and best practices within and across regions and facilitate expanded strategic focus on public outreach, citizen science and ocean literacy in ocean research institutions and public agencies and civil society. Common key messages about ocean literacy tailored appropriately to target the different audiences can serve as a founding principle of the community of practice.

Output 6. Sustained (long-term) resource mobilization reinforced

69. Research is often funded by public funds. Today's environmental concerns (climate change, marine biodiversity, sea level rise, ocean acidification, tsunami warning and mitigation...) are typically long-term and require long-term monitoring and studying. This is mostly not compatible with the more short-term government timelines (4-6 years between elections). It is therefore often difficult to convince decision-makers of the need to provide long-term funding (decades) for research activities that may not produce concrete results or clear decision support guidance. An international global approach is often the only way to obtain buy-in from governments to provide long-term funding (e.g. conventions). A reinforcing factor is public awareness and support, as described above.
70. In addition to public funding the option of private funding also needs to be taken into account. Increasingly governments expect that research findings should be applicable to industry and accordingly research proposals, projects and programmes are expected to address their possible use for industrial innovation.
71. In terms of capacity development to support developing countries/regions it should be emphasized that the IOC is not a donor agency. All funds available through IOC are based upon contributions by Member States: either through the assessed contributions by UNESCO Member States to UNESCO, or through contributions by Member States to UNESCO Funds-in-Trust, through direct contributions to IOC or through other financial and in-kind mechanisms that are aimed to support IOC. In comparison to bilateral arrangements between countries, funding provided to Member States by IOC, is usually quite small as actions are focused regionally rather than individually.
72. In order for IOC's capacity development strategy to deliver benefits to Member States at the appropriate scale (nationally, regionally, globally), substantial new resources are required. This can be achieved through: (i) IOC's resource mobilization from donors for capacity development; (ii) increased financial contributions by Member States to IOC (through the mechanisms mentioned above); or (iii) close collaboration between bilateral projects and IOC.

Activity 6.1 Enhancing sustained support (in-kind and financial) to the IOC for its international coordination role

⇒ **Action 6.1.1 Foster partnerships to increase in-kind support opportunities**

73. Some Member States are offering fellowships and grants for students from other countries within the same or other regions. These may be for short-term actions (internships, on-board training and research) or for long-term actions (M.Sc., Ph.D. programmes). Other Member States may be able to provide ship time, equipment or other in-kind support, while others may be able to second staff to IOC to assist the IOC secretariat at HQ, at secretariats of Sub-Commissions or other decentralized offices. IOC should foster partnerships and facilitate exchange of information in this regard in order to increase in-kind support opportunities.

Activity 6.2 Promoting sustained bilateral and multilateral support among Member States

⇒ **Action 6.2.1 Encourage resource mobilisation in particular from Member States, and other donors to support the outcomes of the IOC Capacity Development needs assessment**

74. The IOC Medium-Term Strategy states that *“Existing resource mobilization approaches for Members States, institutional and private sector partners, tightly linked to the priorities approved by IOC Governing Bodies and its capacities to deliver will be intensified, as will be public-private partnerships and information and visibility efforts.”*

75. The IOC Assembly at its 27th session in 2013 adopted a flexible approach allowing the Commission to allocate resources and implement the programme, including performance indicators and benchmarks, taking into account a set of Guiding Principles for budget allocation to maximize funding opportunities. These principles identify innovative approaches for mobilizing funding and other resources at the global and regional levels.

76. Member States have been providing support to IOC through various mechanisms detailed above. Taking into account priorities set by Member States in terms of focus countries, regions and preferred programmes, IOC will seek to mobilize financial and other resources to assist in achieving the priorities that Member States have articulated for the IOC capacity development programme.

CONCLUSIONS

77. The 2012 World Summit on Sustainable Development’s “The Future We Want” stressed¹⁰ “the importance of the conservation and sustainable use of the oceans and seas and of their resources for sustainable development, including through the contributions to poverty eradication, sustained economic growth, food security, creation of sustainable livelihoods and decent work, while at the same time protecting biodiversity and the marine environment and addressing the impacts of climate change. We therefore commit to protect, and restore, the health, productivity and resilience of oceans and marine ecosystems, and to maintain their biodiversity, enabling their conservation and sustainable use for present and future generations, and to effectively apply an ecosystem approach and the precautionary approach in the management, in accordance with international law, of activities impacting on the marine environment, to deliver on all three dimensions [ecological, economic, social] of sustainable development.” IOC’s capacity development efforts will be constantly evaluated for their contribution towards this goal.

¹⁰ See paragraph 158 of ‘The Future We Want’.

78. The IOC will use its unique strength in capacity development on ocean science, observations, and services to mainstream the contribution of ocean science and governance in sustainable development of developing countries, in particular Priority Africa and SIDS. The pillars of IOC's programme must be founded on: (i) IOC's institutional strengthening of its global programmes and regional subsidiary bodies, including reinforced staffing to maximize opportunities to serve Member State interests; (ii) heightened integration of IOC global programmes and regional subsidiary bodies to accelerate opportunities for Member State participation in and benefit from IOC engagement; (iii) new and reinforced partnerships through IOC engaging Member States and the whole of civil society; and (iv) mobilization of resources to catalyse these partnerships as the engine of capacity development.
79. Through its Decision EC-XLVII/Dec 4 (Future of the IOC), the IOC Executive Council identified some of the enabling conditions that must be met to enhance implementation of this capacity development strategy: (i) the IOC should further articulate its functional autonomy and mobilize resources; and (ii) Member States and the IOC should raise IOC's profile in the UN to better communicate its mission and capabilities, and *"enhance visibility of IOC across the marine science and marine policy sector and stimulate involvement from youth and young scientists."*
80. As capacity development plays a critical role in achieving the objectives of the Ocean Decade, a Chapter dedicated to Capacity Development in the Decade Implementation Plan highlights the principles of capacity development as identified from global and regional planning meetings. The revised IOC CD Strategy will contribute to the Decade through synergies and linkages focusing on desired outputs especially those espoused by the Decade Actions.
81. In its initial phase of implementation, IOC will use the integrated strengths of its Regional Subsidiary Bodies and global programmes to conduct assessments required for the subsequent implementation plan as well as a key conduit for engaging States and partners to maximize the impact of the strategy.
82. Delivering benefits at global, regional, national and individual levels requires a highly coordinated and collaborative programme within IOC, collaboration with numerous partners to maximize synergies and prevent duplication, and a comprehensive communications approach to heighten engagement in the capacity development strategy. An implementation plan must mobilize the diverse strengths and address the priority requirements of different regions and Member States.
83. The IOC capacity development vision for the new biennium should be: (a) mobilized resources for Member State capacity development; and (b) a strengthened IOC institutional capacity to deliver that programme through the Commission, its Member States partners.
84. As preliminary elements of a draft work plan it is proposed that the IOC:
- Develop programmatic and regionally relevant capacity development work plans based on this strategy and related needs assessments conducted in a consistent manner, building on on-going activities, especially contributing to the Ocean Decade objectives;
 - Mobilize resources in order to reinforce staffing of its regional Sub-Commission secretariats other subsidiary bodies and global programmes through programme development;
 - Enhance collaboration and communication between its global programmes and regional subsidiary bodies, to contribute to (a) and (b) above.

85. In the starting biennium 2022-2023 of the strategic term 2022–2029, capacity development remains a key activity of the IOC and in order to create conditions for more harmonious human relations with the ocean, IOC Member States and IOC partners are encouraged to:

- Identify new opportunities to participate in and benefit from reinforced partnerships through the IOC to achieve their capacity development goals in marine science and governance;
- Mobilize the knowledge, personnel, infrastructural and financial resources to support IOC's catalytic role in helping Member States achieve these goals;
- Communicate and raise the visibility of IOC's unique niche as a catalyst in capacity development.

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