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► To cite this version:

Valentina Rossi, Carlo Pipitone, Katherine Yates, Fabio Badalamenti, Giovanni D'anna, et al.. Poor online information on European marine protected areas impairs public participation under the Aarhus Convention. *Marine Policy*, 2024, 161, pp.106012. 10.1016/j.marpol.2024.106012 . hal-04446734

HAL Id: hal-04446734

<https://hal.science/hal-04446734v1>

Submitted on 8 Feb 2024

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1 Poor online information on European marine protected areas impairs public participation under the
2 Aarhus Convention

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48 49 **Highlights**

- 50 • Aarhus Convention's pillars are the mainstay of democratic environmental governance
- 51 • European MPAs websites were surveyed to check for the application of the Convention

- A minor part of European MPAs websites comply with the Convention's principles
- MPAs partly fail to use ICT tools to ensure public participation in MPA management

Abstract

The Aarhus Convention is a globally recognized benchmark for democratic environmental governance. However, no assessment exists on whether European MPAs comply with the legal standards set out by the Convention. Here, we focus on public authorities' websites on MPAs as tools for promoting transparency, public involvement, and democratic processes. We assessed the websites of 61 European MPAs in thirteen countries using a survey structured by the three pillars of the Convention: access to information, participation in decision-making, and access to justice. We show that while most websites are used to disseminate information, they do not serve yet as participatory instruments. Very few have an area dedicated to public participation in decision-making and, when available, they provide scarce information on the outcomes of public involvement. Most websites provide general information on the MPA conservation objectives, but less than half provide access to reports on the results of management. Few websites provide information on available means to challenge unlawful acts. Websites' potential as one of the most widely used, easily accessible, cost-effective sources of information and means for interaction with the general public should be better exploited. Increasing and facilitating the ability of the public to participate in MPA processes is key to ensure MPA success and environmental justice.

Keywords: democratic governance, information and communication technologies, environmental justice, legal standards, European legislation

1. Introduction

Over the past few decades, public participation in government decisions that may have a significant effect on the environment has emerged as an essential element of a new model of environmental governance (Bennett & Satterfield, 2018; Bennett et al., 2019; Bodin, 2017; Cumming et al., 2020). Public participation is intended to foster sustainability of development policies, thus promoting economic efficiency, environmental effectiveness, equity, and political legitimacy (Luyet et al., 2012; Jentoft & McCay, 1995; Gray, 2005). Often using overlapping terms, such as *public participation*, *environmental democracy*, and *civic engagement*, the underlying idea is that people have the right to influence decisions that are likely to affect their environment and, ultimately, their wellbeing.

The international community has acknowledged the importance of public participation in environmental matters in a variety of instruments, first and foremost in Principle 10 of the UN Declaration on Environment and Development (Rio Declaration)¹, which identified for the first time the three pillars of public participation: *access to information*, *participation in decision-making processes* and *access to judicial and administrative proceedings* (UNGA, 1992). Accordingly, in the present paper the expression 'public participation' is used to indicate such three components. This approach has been reflected in acts, policies, regulations and judicial decisions adopted in several international fora (Birnie et al., 2009; Richardson & Razzaque, 2006), including environmental fora (UNEP, 2010), organizations for development (WB, 2013; OECD, 2022), and human rights mechanisms and courts (Boyle, 2012; UNGA, 2018). In this process, a key role has been played by the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters², known as the Aarhus Convention (hereafter also the Convention),

¹ UN Doc. A/CONF.151/26 (1992):

https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf

² <https://unece.org/DAM/env/pp/documents/cep43e.pdf>

98 adopted in the context of the United Nations Economic Commission for Europe (UNECE, 1998). For
99 a long time, the Convention has been the only legally binding instrument putting into practice
100 Principle 10 of the Rio Declaration with a comprehensive and structured approach. It focuses on the
101 decision-making process as the key legal element in sustainable development (Birnie et al., 2009),
102 and is based on the premise that public participation is an indispensable means for more equitable,
103 legitimate and effective decisions, resulting in enhanced implementation and reduced conflicts
104 (Richardson & Razzaque, 2006; Adger et al., 2003). The Aarhus Convention is globally recognised
105 as a benchmark for democratic environmental governance due to the ground-breaking character of
106 the treaty, which goes to the heart of the relationship between governments and society in the
107 environmental sector. The Convention combines notions and approaches from the environmental and
108 human rights law and imposes obligations on State Parties, focusing on the interactions between
109 States' public authorities and the public (individuals or legal persons and their groups or associations),
110 with a right-based approach. Further, traditional means of control and enforcement have proved to be
111 scarcely effective in ensuring effectiveness of international environmental law (Hoffman et al., 2022;
112 Treves et al., 2009). This is due to the fact that traditional means of international dispute settlement
113 are not well suited for public interest environmental disputes resolution, because of legal and technical
114 issues, i.e. evidence of the causal link. The Aarhus Convention, similarly to other multilateral
115 environmental agreements, provides for a regime-specific system to control and assist
116 implementation and compliance, modelled in part on those existing in human rights systems. Based
117 on Article 15 of the Convention, in October 2002, the Meeting of the Parties (MOP) has established
118 the Aarhus Convention Compliance Committee (UNECE, 2002). The Committee represents a
119 relevant innovation: coherently with the human right based approach of the Convention, this
120 international compliance mechanism may be triggered not only by State parties but also by members
121 of the public, entitled to submit communications to the Committee concerning a Party's compliance
122 with the Convention (Tanzi & Pitea, 2009). As explained in detail later in this article, the Compliance
123 Committee is showing how important it is to have an independent international body to review
124 compliance with environmental law by state Parties and to open this body to communication by non-
125 State actors. Finally, despite regional in scope, the Convention was designated as a global instrument:
126 it is opened to accession by any UN Member. To date, it has been ratified by 47 Parties, including the
127 EU and all its Member States. The European Union (EU) has adopted Directives 2003/4/EC and
128 2003/35/EC to ensure the uniform implementation of the first two pillars by member States, and has
129 issued an *ad hoc* regulation (Reg. 1367/2006) concerning its implementation by EU institutions and
130 bodies. This means that the Convention provisions have been transposed in EU law and are subject
131 to judicial (and very effective) control of the EU Court of Justice (EUCJ) (see, *ex multis*, Case
132 C-243/15, Judgment 8 November 2016).

133 The governance approach of the Convention is reaffirmed in Sustainable Development Goal 16 of
134 the Agenda 2030³ on peace, justice and strong institutions, which sets out for the first time targets
135 concerning the governance component of sustainability and embraces transparency, public
136 involvement and access to information and justice (UNGA, 2015). The international community has
137 thus endorsed public participation as a crucial element of democratic governance that, according to
138 the United Nations Development Programme, is based on the essential characteristics of good
139 governance (IFAD, 1999) but must also be concerned with institutions' accountability and human
140 rights matters (UNDP, 2008).

141 This governance approach based on public participation is particularly relevant in nature conservation
142 (Lockwood et al., 2010). Biodiversity is a public good that provides an array of ecosystem services
143 (Mace et al., 2012), and its regulation requires instruments and approaches adequate to address its
144 complex distributive and procedural justice implications. In this regard, public participation has been
145 recognized as an important tool to foster a fair balance between all competing interests and to help
146 ensure the understanding and articulation of alternative and universal perspectives (Redgwell, 2002).

³ UN Doc. A/RES/70/1: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf>

147 In the specific context of Protected Areas (PAs), the cornerstones of biodiversity conservation on
148 land and at sea, it has long been suggested that disregard for justice implications is one important
149 reason for the experienced conflicts and the lack of regulatory effectiveness (Paavola, 2004). The
150 growing attention on the procedural justice dimension of PAs governance is reflected in recent
151 practice of the bodies of the Convention on Biological Diversity (CBD)⁴, with substantive and
152 procedural equity aspects becoming a central issue during the Conferences of the Parties⁵. Analysing
153 progress towards Aichi Target 11⁶ on effectively and equitably managed PAs, the Subsidiary Body
154 on Scientific, Technical and Technological Advice of the CBD examined the procedural component
155 of this Target and pointed out the need to evaluate this element effectively and broadly, in particular
156 through site-level assessment (Franks et al., 2018; Schreckenberget al., 2016; Zafra-Calvo et al.,
157 2017; CBD-SBSTTA, 2018a, 2018b).

158 The importance of public participation is especially critical in the marine environment, where
159 boundaries are often unclear, and interactions and tensions between concurrent and new interests,
160 coupled with the increasing accessibility of marine space and resources, are challenging the existing
161 regulatory regimes (Rahman et. al, 2022). An example of implementation of such approach is the EU
162 International Ocean Governance Forum (IOG Forum)⁷, a platform for online engagement of ocean
163 experts and stakeholders, from Europe and beyond, that identified the key international ocean
164 governance ‘Actions’ to be implemented by the EU to help set the course for a sustainable blue planet.
165 One of the priority Actions identified is to support the systematic and expanded application of
166 Environmental Impact Assessments (EIA) and Strategic Environmental Assessments (SEA) across
167 all marine spaces. Enhanced transparency in how assessment results are used to support decisions is
168 also deemed necessary for these decisions to gain wider social acceptability. In this perspective, one
169 of the recommendations proposes to make the results of these assessments publicly available and
170 easily accessible through a dedicated portal/web page (e.g. dedicated page of the European Maritime
171 Forum), in relation to the ecological implications of all investments supported by EU funds (EU IOG
172 Forum, 2021). This was also confirmed during the recent intergovernmental conference on an
173 international legally binding instrument under the United Nations Convention on the Law of the Sea⁸
174 on the conservation and sustainable use of marine biological diversity of areas beyond national
175 jurisdiction. The implementing BBNJ (Biodiversity Beyond National Jurisdiction) Agreement
176 officially adopted on 19 June 2023, (UNGA, 2023), in its Part III on “Measures such as area-based
177 management tools, including marine protected areas”, devotes an article to consultations on and
178 assessment of proposals regarding the establishment of marine protected areas (MPAs) in areas
179 beyond national jurisdiction. The article provides for consultations on proposals that “shall be
180 inclusive, transparent and open to all relevant stakeholders [...] as well as civil society, the scientific
181 community, Indigenous Peoples and local communities”.

⁴ <https://www.cbd.int/doc/legal/cbd-en.pdf>

⁵ CBD, COP 10, *Decision X/31 on Protected Areas* (UNEP/CBD/COP/DEC/X/31) 29 October 2010; CBD, COP 11, *Decision XI/24 on Protected Areas*, (UNEP/CBD/COP/DEC/XI/24), 5 December 2012 ; CBD, COP 13, *Decision on Progress towards the achievement of Aichi Biodiversity Targets 11 and 12*, (UNEP/CBD/COP/DEC/13/2), 12 December 2016; CBD, COP 14, *Decision XIV/1 on Updated Assessment on Progress Towards selected Aichi Biodiversity Targets and options to accelerate progress*, (UNEP/CBD/COP/DEC/14/1) 30 November 2018; CDB, COP, *Decision XIV/16 Methodological Guidance concerning contribution of indigenous peoples and local communities*, (UNEP/CBD/COP/DEC/14/16), 30 November 2018; CBD, SBSTTA, *Note by the Secretariat. Voluntary Guidelines on effective governance models for management of protected areas, including equity*, (CBD/SBSTTA/22/6 Annex II), 22 March 2018.

⁶ <https://www.cbd.int/aichi-targets/target/11>

⁷ The EU International Ocean Governance Forum, https://maritime-forum.ec.europa.eu/theme/governance/ocean-governance-forum_en

⁸ https://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf

182 Although the need to set up an inclusive and transparent process for the designation, management
183 and enforcement of PAs has been constantly emphasized, international and national practice on these
184 issues appears fragmented and highly heterogeneous (Bennett & Satterfield, 2018; Barnhart & Ferse,
185 2023). Public participation is a complex and dynamic concept that evolves following political, social
186 and technological developments, and can be achieved through different rules, procedures and
187 implementing instruments (Arnstein, 1969). A good example of a very structured public participation
188 process is the extensive stakeholder engagement in the planning and implementation of the MPA
189 network along the California coast that followed the California Marine Life Protection Act Initiative
190 (Sayce et al., 2013). However, participatory processes are often implemented in flexible ways and
191 through open informal experiences that are not sufficient to sustain the desired political and social
192 transformation in PA governance (Jones, 2009).

193 The role that the Aarhus Convention may play in fostering and enhancing public participation in the
194 specific context of PAs is recognised by CBD's bodies as well as in several documents adopted by
195 the United Nations Environment Programme, the Food and Agriculture Organization and the
196 International Union for Conservation of Nature. The fact that all EU Member States and the EU itself
197 are parties to the Convention adds further value: its provisions represent common binding minimum
198 standards for public participation in environmental matters in the EU. As a matter of fact, all EU
199 Member States are legally bound to put its provisions into practice in the environmental domain,
200 including the specific case of PAs management.

201 In this context, an important role has been gained by information and communications technologies
202 (ICTs), increasingly recognized as efficient and effective tools to enhance and support the
203 implementation of the Convention standards (UNECE, 2005) and more generally, to promote
204 democratic environmental governance in initiatives of nature conservation. This is highlighted in
205 several documents adopted by the Aarhus Convention bodies, such as the Recommendation on
206 Electronic Information Tools (REIT)⁹ to provide public access to environmental information
207 (UNECE, 2005), as well as in reports and recommendations of the Task Forces on Electronic
208 Information Tools, on Public Participation in Decision-making and on Access to Information.
209 Similarly, in recent years, EU environmental regulations have constantly stressed the crucial role of
210 ICTs in the implementation of environmental standards, also in the specific frame of nature
211 conservation, as for instance in the Action Plan for nature, people and the economy (EC, 2017a; Peters
212 et al., 2014).

213 The present paper is based on the internationally agreed legal standards on public participation in
214 environmental matters, as provided by the Aarhus Convention¹⁰, focusing on one of the instruments
215 available to that purpose i.e., MPAs' public authorities' websites. In fact, websites are among the
216 most widely used and easily accessible sources of information and means for interaction for the
217 general public (EC, 2017a; Peters et al., 2014). According to several documents adopted by the
218 Aarhus Convention bodies (see *infra*), many instruments can be used, such as government
219 publications, radio and tv broadcasts, newspapers, environmental information centres with accessible
220 catalogues and databases. However, all these instruments need to be used together, in a systematic
221 and coherent way, playing each one its own role; and this is especially true for on-line instruments,

⁹ Un Doc. ECE/MP.PP/2005/2/Add.4:

<https://unece.org/DAM/env/documents/2005/pp/ece/ece.mp.pp.2005.2.add.4.e.pdf> An updated version of the Recommendation was adopted in 2021, UN Doc. ECE/MP.PP/2021/2/Add.2: https://unece.org/sites/default/files/2022-08/ECE_MP.PP_2021_2_Add.2_E_0.pdf

¹⁰ Pursuant article 10 of the Aarhus Convention, the Parties keep under continuous review the implementation of the Convention on the basis of regular reporting. National reports are available at <https://unece.org/environment-policy/public-participation/reporting-mechanism-1>. Further, reports providing an overview of the implementation of the Convention are prepared by its bodies for the periodical Meeting of the Parties; they are available at <https://unece.org/env/pp/aarhus-convention/mop-introductory-page>. For further information, see also the website of the Aarhus Clearinghouse, which provides information relevant to the implementation of Principle 10 of the Rio Declaration at the global, regional and national levels: <https://aarhusclearinghouse.unece.org>

222 like websites. The main objective of this study is to investigate to what extent such instruments,
223 widely recognized as potentially highly valuable and cost-effective tools, are actually used to
224 implement the Aarhus Convention participatory standards in the specific case of MPAs in EU seas.
225 In other words, based on the legal standards of the Convention, the paper aims at evaluating the role
226 played by public authorities' websites in conveying ecological, administrative, and legal information
227 regarding MPAs, and in fostering public participation in decision making and access to environmental
228 justice in the context of MPAs in European seas.

230 **2. Methods**

231
232 In line with the definition of "public authority" adopted by the Aarhus Convention, which is based
233 on a functional approach, the concept of public authorities' websites embraces websites (including
234 pages/sections inside broader-focused websites) published and managed by a national or local
235 government body or by a private entity performing public administrative functions (e.g. NGO,
236 institution or consortium) that is responsible for the MPA management. When there was more than
237 one website for a single MPA, the one providing the most detailed information has been chosen for
238 inclusion in the study. This was for example the common case in Italy, where the web portal dedicated
239 to national MPAs by the competent ministry delivered very poor information while the websites run
240 by the MPA management bodies were always much more informative.

241 The MPAs included in the study are all located in European seas, which means that they are subject
242 to the same common binding (minimum) standards for public participation in environmental matters
243 set by the Aarhus Convention and transposed in EU law. In order to obtain a homogeneous sample
244 among the wide variety of MPA typologies, the MPAs included in the study were only those
245 designated under the national legislation of an EU member State (Fraschetti et al., 2018) that
246 corresponded to (or included) a Natura 2000 site according to the EC Habitat Directive¹¹.

247 A total of sixty-one websites - one for each selected MPA - from thirteen countries was analysed. Co-
248 authors selected a minimum of one and a maximum of three MPAs from their own country, with the
249 aim of including all the regional seas around Europe as defined by the EC Marine Strategy Framework
250 Directive¹². The full list of selected MPAs is provided in the supplementary material (Table SM1).

251 The analysis of public authorities' websites was conducted through a questionnaire (supplementary
252 material, Table SM2) that was filled between April and October 2018 by all co-authors after careful
253 inspection of the websites. The questionnaire was based on the three pillars of the Aarhus Convention:
254 (1) access to information, (2) participation in decision-making, and (3) access to justice, and
255 comprised five questions each with a number of information parameters. Each parameter was allowed
256 either a "1" (when the required parameter was directly or indirectly - i.e., through a link to an external
257 website - present in the MPA website) or a "0" score. The sum of scores for each information
258 parameter was used to calculate the percent frequency of occurrence for each question across the 61
259 websites. The five questions were elaborated starting from the Convention principles and provisions,
260 as clarified and developed in the practice of the Convention bodies; such principles and provisions
261 were adapted to the specific context of MPAs, in order to translate them into concise information
262 parameters.

264 **3. Results and discussion**

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266 The results are divided into three sections corresponding to the three pillars of the Convention. Within
267 each section, summary tables provide an overview of the availability of the different types of
268 information found on MPAs' websites.

¹¹ Council Directive 92/43/EEC:

<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN>

¹² Directive 2008/56/EC: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0056&from=EN>

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3.1. Access to environmental information

According to the Aarhus Convention, environmental information has to be made available to the public with two complementary approaches: in response to a request (passive approach) and through active dissemination (proactive approach). The object of these obligations i.e., “environmental information”, is defined in very broad terms (art. 2): it embraces information on the state of elements of the environment, which explicitly include biological diversity, but also information on factors, activities and measures (e.g., legislation, policies and plans) suitable to affect the environment as well as cost/benefit and other economic analyses and assumptions used in environmental decision making. Our study shows that MPA management authorities commonly use ICT tools to provide a range of information on MPAs, suggesting that such authorities are increasingly aware that public participation is a well-established principle of democratic governance and that websites are crucial in this perspective. However, the results obtained from our survey show that MPAs’ websites are predominantly used to disseminate limited typologies of information; further, they show that the information they provide is often inconsistent and incomplete in terms of the standards set out by the Convention bodies.

3.1.1. Environmental information available on the websites

The first question is articulated in parameters corresponding to different typologies of environmental information, taking into account the priority categories of information to be made progressively publicly accessible through the internet, according to the REIT (UNECE, 2005), and bearing in mind the specificities of MPAs (Table 1).

Q1. What ENVIRONMENTAL INFORMATION is publicly available on the website?	% occurrence
1.1 Generic information on the state of the environment in the MPA	75.4
1.2 Detailed/ analytical information on the state of the environment in the MPA	42.6
1.3 Text of environmental legislation, regulations and policies	83.6
1.4 Act of formal designation of the MPA	80.3
1.5 Information on the MPA conservation objectives	91.8
1.6 MPA Management plan	52.5
1.7 MPA zoning and activities prohibited /restricted in each zone	73.8
1.8 MPA educational activities and awareness campaigns/events for the public	62.3
1.9 MPA management bodies	82.0
1.10 Proposed and existing activities and plans that may significantly affect the environment in the MPA	36.1
1.11 Progress in the achievement of nature conservation objectives and/or on implementation of the Management plan	45.9
1.12 Processes, methods and standards of environmental data collection	34.4
1.13 Type and scope of environmental information accessible to the public	39.3
1.14 Procedures and conditions to request environmental information not available on the website	26.2
1.15 Contact details to whom the public can ask further information and clarifications	80.3
Total of Environmental Information	60.4

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Table 1. Information parameters from Question 1 of the questionnaire. % occurrence refers to the number of websites where the parameter was directly or indirectly available among the 61 European MPAs websites analysed.

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The analysis of the websites has shown that only a few typologies of environmental information are widely available, either directly or indirectly. This is especially true for the information on the environmental legislation, on formal designation, on conservation objectives, on management bodies, and on contact details (parameters 1.3, 1.4, 1.5, 1.9, 1.15). Notably, the available information on the legislative and institutional framework occurs in general with the highest frequencies and covers environmental legislation, regulations and policies (including the act of formal MPA designation), MPA's management bodies, zoning and prohibited or restricted activities and contact details. Much less common is the information on management plans, which are the necessary tool to manage MPAs and to allow the fulfilment of conservation objectives. The available information also decreases noticeably with respect to other categories of information such as, detailed information on the state of the ecosystem (e.g., reports or environmental monitoring data) and information on the progress in the achievement of nature conservation objectives and/or on the implementation of the management plan. Further, the information became very limited when dealing with relevant and sensitive issues such as proposed or existing activities and plans that may affect the environment in the MPA. Yet, the Convention principles and provisions are intended to promote environmental awareness and information, in order to allow the public to exercise a widespread control over the activities of public authorities. It aims to create the conditions to enable every person to play an active role in the achievement of environmental objectives and to defend their right to live in an environment adequate to human health and wellbeing. From this perspective, the Convention stipulates that each State Party shall provide information on the performance of public functions relating to the environment by governments at all levels (art. 5.7). In particular, active dissemination of plans and progress reports on their implementation is expressly provided for (art. 5.5.a). Further, in order to ensure that the environmental information is effectively accessible, the Convention emphasizes the importance of the type and scope of environmental information publicly accessible and of that concerning procedures and conditions to request the information that is not available on the website.

Finally, an important topic is the availability of information on methods and standards of data collection (parameter 1.12). This typology of information is crucial to make data comparable for future data users, whether they are citizens, researchers or policy makers. Lack of access to this information means that the assets created and held by public authorities with public money, cannot produce all the economic, social and environmental benefits they could (and should) generate for the benefit of the society. This is in contrast with the principle that public authorities hold environmental information not for themselves but in the public interest (preamble 17 of the Convention), and with the final aim of fostering public active engagement in MPA management.

Our results show that accessible environmental information is still incomplete and scattered to a large extent. We acknowledge that widespread recognition of transparency as a fundamental element of democratic governance and rapid development of ICT has radically changed the way public authorities communicate with the public. Biodiversity conservation is no longer only a matter for specialists or an attraction for tourists; public authorities widely use websites to disseminate information on MPAs to the public as regards their institutional role and MPA objectives and organization. Nonetheless, only limited information is available on activities, projects and results of MPAs' management i.e., the sort of information that would allow the public to evaluate the performance of environment-related public functions. In particular, the lack of results from monitoring activities normally included in the management plans prevent the public to evaluate the MPA efficiency and to contribute to possible adjustments. In most cases, with only a few exceptions, it seems that websites are still considered an instrument that MPA management authorities are required to adopt and that, behind institutional information, are used as showcases to publish only the information they decide to make available, such as public events or educational activities.

3.1.2. Sources of the information available on the websites

349 The second question is articulated in parameters corresponding to different typologies of information
 350 sources identified as useful and relevant in international practice (Table 2).
 351

Q2. What INFORMATION SOURCES are available on the website?	% occurrence
2.1 Official documents (legislation, plans, manuals, reports, studies)	91.8
2.2 Instruments for dissemination of information (e.g., press releases, non-technical summaries)	77.0
2.3 Regular information or reporting instruments (newsletters, journals, periodical reports)	41.0
2.4 Link to pages/profiles on social networks (e.g., Twitter, Facebook, Google plus)	41.0
2.5 Instruments providing spatial attributes of information (e.g., geo-referenced data, interactive maps)	52.5
Total of Information Sources	60.7

352
 353 Table 2. Information parameters from Question 2 of the questionnaire. % occurrence refers to the
 354 number of websites where the parameter was directly or indirectly available among the 61 European
 355 MPAs websites analysed.
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357 Besides official documents and the instruments for dissemination of information of occasional nature
 358 (parameters 2.1, 2.2), which are widely available, regular information or reporting instruments
 359 (periodical reports, newsletters) are quite limited as well as the instruments providing spatial
 360 attributes of information (e.g., interactive maps on the distribution of habitats and human uses). Still
 361 the importance of periodical reporting instruments is stressed in several international guidelines in
 362 order to allow the general public and the relevant stakeholders to monitor the achievement of
 363 environmental objectives and evaluate policies and actions put in place. Even the use of social
 364 networks, which have a huge diffusion among the global population is limited, although they could
 365 be a useful and inexpensive tool to establish a dialogue with potentially interested stakeholders. Points
 366 2.3 to 2.5 need dedicated staff with specific expertise and relevant funds (more so for point 2.5) to be
 367 implemented, which can surely be a critical issue for many MPA management bodies.
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369 3.1.3. Quality and effective accessibility of information available on the websites

370
 371 According to the Convention, environmental information made available to the public has to comply
 372 with a few fundamental requirements: it has to be updated (art. 5.1, 5.4), comprehensible (art. 5.7(b,
 373 6.6(d), and effectively accessible (art. 4.1(b, 4.8, 5.2) (UNECE, 2014; Andrusyevych & Kern, 2016).
 374 Table 3 deals with these requirements.
 375
 376

Q3. What is the QUALITY and EFFECTIVE ACCESSIBILITY of the information available on the website?	% occurrence
3.1 The last update is less than 90 days old (since the date of access to the website)	39.3
3.2 Basic information available in English	50.8
3.3 Availability of data, information and documents provided in an easy-transferable format (e.g., word, PDF)	82.0
3.4 Availability of a “search” option to search for specific information	62.3
3.5 Availability of instruments to make the website user friendly (e.g., FAQ, glossary, site map)	47.5
3.6 Opportunity to request access to information not available on the website by electronic means (e.g., emails addresses, online format)	73.8
3.7 Availability of mechanisms for the assessment of user-needs (e.g., opportunity to provide feedback, surveys, number of accesses)	16.4
Total of Quality and Accessibility of Information	53.2

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Table 3. Information parameters from Question 3 of the questionnaire. % occurrence refers to the number of websites where the parameter was directly or indirectly available among the 61 European MPAs websites analysed.

Our survey has shown that the information available is often out-of-date (parameter 3.1). This could be due to several reasons, including the lack of relevant environmental information to communicate (e.g., no new monitoring data, events, licensing, etc.), of funding, of staff, of human capacity or expertise in website management, or simply lack of interest in providing information. However, it is important to point out that according to the Convention (article 5.1.a), public authorities are required to possess and update environmental information which is relevant to their functions, and the Convention Implementation Guide urges Parties to establish systems that ensure a regular flow of information from operators, monitoring systems, researchers and others to the public authorities in charge (UNECE, 2014). In brief, public authorities cannot simply abstain from collecting and providing to the public information that could turn out to be thorny.

From the same perspective, the Convention bodies have emphasized that environment-related information should be made available in an easily accessible (UNECE, 2014, Implementation Guide p. 81 and 105) and user-friendly manner (*ibidem*, p. 63 and 65). Actually, such tools as documents in easy-transferable format and ‘search’ options (parameters 3.3, 3.4) are often available, whereas basic information in English and other user-friendly instruments are available to a rather limited extent. Nonetheless, these tools are expressly recommended by the REIT (UNECE, 2005) and by the Convention Implementation Guide (UNECE, 2014). Further, the number of websites that contained mechanisms for the assessment of user needs (like the possibility to provide feedback, surveys on information demand, and number of accesses to pages or content: parameter 3.7) is extremely small, although such mechanisms are crucial to identify and meet the demand of information requested by the public and to improve the provision of information over time.

3.2. Participation in decision-making

The participation of the public concerned in environmental decision-making is regulated in the Convention, which provides different levels of public involvement for different kinds of environment-related decisions, such as authorization of specific activities, preparation of plans, programmes and policies, preparation of executive regulations and legally binding normative instruments. According to the Convention, public participation in environmental matters must be *informed, early* (i.e., when all options are still open) and *effective*. Less than half of analysed MPAs use the websites as an instrument for the involvement of the public. On the basis of the degrees of participation identified by the Organisation for Economic Co-Operation and Development, the analysed websites are currently instruments for ‘dissemination of information’ but for the most part, not yet for ‘consultation’, which implies the opportunity to provide feedback on analysis, alternatives or decisions, nor are they instruments for ‘active participation’ in decisions, which would require participation in development of alternatives and identification of possible solutions (OECD, 2001).

Q4. Does the website provide information on MODALITIES OF PUBLIC PARTICIPATION in the decision-making processes affecting the MPA (e.g., projects authorization, approval of plans, licensing, ...) and opportunities and/or instruments for effective participation?

4.1 Specific entry/area dedicated to public participation in decision-making processes	16.4
4.2 Information concerning specific decisions to be adopted (e.g., approval of projects, adoption of plans, licensing)	50.8

4.3 Information on environmental impacts of proposed projects/activities or draft plans/policies/regulations	24.6
4.4 Alerts to the public about opportunities for participation in decisions on proposed projects, plans, or regulations	24.6
4.5 Information on public hearings, roundtable discussions, stakeholder committees, aimed at public participation in decisions concerning projects, plans or regulations	31.1
4.6 Opportunity to provide feedback on proposed projects, plans or regulations that affect / are suitable to affect the MPA	24.6
4.7 Information on the outcomes of public participation	18.0
4.8 Information on the final decision	44.3
Total of Information/Opportunities/Instruments for Public Participation	29.3

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Table 4. Information parameters from Question 4 of the questionnaire. % occurrence refers to the number of websites where the parameter was directly or indirectly available among the 61 European MPAs websites analysed.

Table 4 shows that very few websites have a specific area dedicated to public participation in decision-making processes (parameter 4.1) and only half of them provide information concerning specific decisions that affect or are likely to affect the MPA (parameter 4.2). The number of websites providing information on the environmental impacts of proposed projects and activities or draft plans, policies and regulations (i.e., environmental impact assessments, strategic impact assessments, habitat appropriate assessment documentation, and the like: parameter 4.3) is even lower, as is the percentage of websites providing notice to the public about opportunities for participation in decisions (parameter 4.4). These results are not in line with the Convention, which states that “the necessary information” must be provided to the public and, with reference to some types of decision, it identifies in detail such information. Effective involvement in the decision-making processes concerning the MPA obviously requires that the information needed to evaluate the possible effects of the decision itself is made available to the public. The Convention Implementation Guide (UNECE, 2005) clarifies that the word “necessary” should be understood in the frame of effective participation, in keeping with the objective of the Convention to encourage widespread public awareness and to ensure public participation in environment-related decisions.

Information concerning public hearings, roundtable discussions, stakeholders’ committees aimed at public involvement in decisions concerning the MPA (parameter 4.5) while still with a low percentage, is ranked relatively high if compared with other parameters under Q4. This suggests that public participation is still based on non-structured processes, often of occasional nature. Importantly, such information is only sparingly accompanied by opportunities to provide feedback by electronic means (e.g., with e-mails, online forms, or surveys: parameter 4.6). Yet it is widely recognized and stressed by the Implementation Guide (UNECE, 2005), that one of the functions of public participation is to assist public authorities in gathering high-quality information and to widen the range of choices considered. Critics of stakeholder participation have argued that it can hamper governance and prolong planning processes, as well as make them more cumbersome and expensive (Kusters et al., 2018). Additionally, in cases where experts are consulted, the information provided by stakeholders and the general public may be seen by some as less valuable, with experts perceived as more objective than stakeholders, the latter by definition non-objective (Gleason et al, 2010; Gopnik et al., 2012; Olsen et al., 2014). Nevertheless, while scientists supply a large amount of data and knowledge, they may lack the access stakeholders have to the local situation (Bingham et al., 2005). Moreover, stakeholder participation increases chances that plans and policies will be accepted and upheld by them, as long as they feel that their feedback is taken into consideration (Arnstein, 1969; Aronson, 1994; Barbaro & Bagajewicz, 2004; Yates, 2018). In this perspective, it is worth pointing out that information on the outcomes of public participation is extremely scarce in websites. Even the information on the final decision (the plan adopted or the project approved: parameter 4.8)

460 is available in only 44.3% of cases. Such small numbers are indicators of lack of effectiveness of
 461 public involvement in decision making. However, the Convention provisions require public
 462 authorities to disseminate the information concerning the outcomes of the participatory process and
 463 the final decisions, in order to enable the public involved to assess if the outcomes of the process have
 464 been taken into due consideration. The final aim is clearly to call public authorities to account for
 465 their decisions and to discourage purely formal participation.

466
 467 **3.3. Access to justice**

468
 469 The third pillar of the Aarhus Convention is access to justice, which is also supposed to ensure the
 470 proper functioning of the previous two pillars. As shown in Table 5, the websites devote very little
 471 attention to this topic.

Q5. Is information on PUBLIC ACCESS TO JUSTICE in environmental matters available on the website?	% occurrence
5.1 Information on appeal procedures against refusal of access to information	18.0
5.2 Information on means to challenge project level decisions requiring public participation	13.1
5.3 Information on procedures available to the public to challenge unlawful acts and omissions prejudicial to the objectives of the MPA	18.0
5.4 Information on ongoing and/or past legal proceedings involving the MPA	23.0
Total of Information on Access to Justice	18.0

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 474 Table 5. Information parameters from Question 5 of the questionnaire. % occurrence refers to the
 475 number of websites where the parameter was directly or indirectly available among the 61 European
 476 MPAs websites analysed.

477 According to the Convention, Parties are required to ensure access to different kinds of review
 478 procedures, such as appeal procedures relating to information requests, and should enable the public
 479 to challenge the legality of project-level decisions requiring public participation as well as the general
 480 violations of national environmental laws. To make these appeal instruments effective it is crucial
 481 that the public is informed about the means at its disposal to challenge public authorities' decisions.
 482 Our findings indicate that the information concerning review procedures was very rarely available
 483 for all of the three components of access to justice (parameters 5.1 to 5.3). Only 18% of the analysed
 484 websites provide information on available means to challenge unlawful acts and omissions that may
 485 be prejudicial to the objectives of the MPA, whereas this could be a powerful instrument to scrutinize
 486 the exercise of public functions. Even the information on ongoing and/or past legal proceedings
 487 involving the MPA is extremely scarce. The results show that provisions on information concerning
 488 access to justice in the case of MPAs are rarely implemented. It is worth noting that this is the only
 489 pillar of the Convention for which the EU has not adopted a directive to support uniform
 490 implementation in member States, because these are very reluctant to accept a European regulation
 491 that would directly affect their judicial systems (EC, 2017b).

492
 493 **4. Conclusions**

494
 495 The Aarhus Convention has triggered a global process of change towards environmental democratic
 496 governance which includes biodiversity protection and MPA management. In this specific context,
 497 the Convention is widely recognized as the reference legal standard for public participation and
 498 environmental justice in many international regulations and guidelines. The main purpose of the
 499 Convention was to oppose the top-down approach adopted in most environmental decisions.
 500 Encouraging public participation in environmental decisions and processes - like the creation of a
 501 protected area - was a step forward towards people's awareness, but also a way to have their say on

502 the creation and management of MPAs. The fact that in most of the MPA websites examined, the
503 Aarhus Convention is only partially - sometimes very poorly - implemented should push politicians,
504 government institutions, research organizations and the media to promote the Convention and
505 encourage MPA management bodies to implement it.

506 The present study shows that there is still a long path to travel. Specifically, as regards MPA
507 management, the implementation of the Convention principles and rules seems to be lagging behind
508 when it comes to the recommended use of ICTs - e.g., MPAs official websites - as crucial tools to
509 enhance public awareness and public involvement in decisions that may affect the environment. ICTs
510 have dramatically simplified the availability of information and the involvement of the public, and in
511 modern society, the digital connection between people and nature should become an integral part of
512 improving ecosystem management and promoting participation (Ives et al., 2017). Our analysis
513 clearly shows some positive results in terms of meeting the Convention standards in this respect, yet
514 there are still a number of critical issues.

515 Overall, it appears that websites are still conceived as a legal obligation and not yet as effective
516 participatory instruments. In other words, their potential as one of the most widely used, easily
517 accessible, cost-effective sources of information and means for interaction for the general public is
518 far from being fully exploited. The limited availability of information does not allow the public to
519 exert a widespread control over the activities of public authorities, and makes it very difficult to
520 establish a dialogue with stakeholders that are directly involved in the MPA. Mechanisms for
521 participation are crucial to identify and meet stakeholder demands in terms of information, although
522 deficiencies in the effectiveness of this process may be a symptom of major problems in MPA
523 management related to funding, staff, managerial capacity and expertise. Against this background,
524 the legal standards provided by the Aarhus Convention can play a decisive role.

525 In our opinion, two complementary perspectives need to be considered. Firstly, it is crucial to promote
526 public authorities' awareness that making information on MPA management available to the public,
527 and actively disseminating it, is a legal obligation. In addition, it is crucial to enhance public
528 awareness of 'environmental procedural rights'.

529 It is widely recognized that public participation in biodiversity conservation must go beyond local
530 communities and vulnerable groups, such as indigenous peoples. True participation requires input
531 from industry and other stakeholder groups, individuals and civil society organisations. Each of these
532 sectors are entitled to the protection and sustainable use of biodiversity which should be considered
533 as a universal public good, relevant for all humankind, regardless of where it is endangered or
534 damaged (Díaz-Reviriego et al., 2019).

535 The 'environmental procedural rights' provided by the Convention enable individuals, sectors, and
536 communities to play an active role in the pursuit of the objectives of nature conservation as set by the
537 international community. A confirmation of the role that non-State actors have gained thanks to the
538 Aarhus Convention in environmental protection, is the practice of the Compliance Committee
539 established by the Convention. This is confirmed by data released by the Convention bodies: as of
540 October 2021, out of 193 cases received by the Committee, 188 (97%) were Communications
541 submitted by members of the public, in most cases environmental NGOs (States are very reluctant to
542 point the finger against each other). Further, 67% of the submission were admissible or preliminarily
543 admissible. In such cases, the Committee adopts findings and, if non-compliance is found, it may
544 make recommendations either to the MOP or, with the Party's agreement, directly to the Party
545 concerned. As of October 2021, 98% of the findings and recommendations were issued in relation to
546 communications from the public¹³. The effectiveness of the mechanism has increased its success: the
547 number of communications received between each MOP has continuously increased. Unfortunately,
548 nature conservation and biodiversity are not included in the main sectors addressed by the

¹³ <https://unece.org/env/pp/cc/communications-from-the-public>

549 communications, confirming that the rights base approach, the environmental procedural rights and
550 the existing instruments are not yet sufficiently known and exploited in this domain. As regards
551 official websites, they are often mentioned by the Committee among the instruments to be used to
552 inform and involve the public. As an example, in its Findings and Recommendations adopted on 23
553 July 2021, the Committee dealing with a case of public participation in a transboundary EIA, stated
554 that the notification of a hearing to the public concerned (only) on a governmental website, may be
555 sufficient in some contexts to respect the requirement of “an adequate, timely and effective notice”
556 (art. 6.2) but it may not in other contexts (para 62)¹⁴ (UNECE, CC, 2021). In addition, the relevance
557 of websites, and electronic tools in general, has gained great attention during the pandemic. In such
558 context, as regards carrying out public participation procedures, the Committee has highlighted
559 several matters as worthy of particular attention (UNECE, CC, 2020), making reference to “the
560 websites of the relevant public authorities, radio, television and social media”, as well as to the “good
561 practice” to establish user-friendly online portals where the public concerned can easily access all the
562 relevant information¹⁵ (paras. 22 - 69).

563 This means that non-State actors, being allowed to bring their public authorities before an
564 international compliance mechanism, are playing a crucial role in monitoring and promoting the
565 Convention implementation. In the EU, this role has been enhanced by the direct applicability, and
566 justiciability by the EU Court of Justice (EUCJ), of the provisions of the Convention that have become
567 an integral part of the EU legal order. While, on the one hand, this has facilitated (and still is
568 enhancing) the Convention implementation, on the other hand, in a game of reciprocal influences, it
569 has pushed the EUCJ to broaden the criteria for the legal standing of NGOs according to the
570 Convention requirements (Pallemaerts, 2011). It is clear by now that the recognition of these rights,
571 that enable and protect an informed and effective participation in decision-making processes at all
572 government levels, allows individuals, NGOs, sectors and communities to exert an element of control
573 over the implementation of environmental regulations by the national authorities. Thus, making these
574 authorities not only responsible for the protection of the general interest to nature conservation but
575 also to the citizens they serve.

576 577 **CRedit authorship contribution statement**

578
579 V. Rossi: conceptualization, writing - original draft. C. Pita: questionnaire design. F. Badalamenti, G.
580 D’Anna, C. Pita: data curation, formal analysis. J.E. Argente-Garcia, J. Claudet, G. D’Anna, D.
581 Goldsborough, P. Mackelworth, C. Pipitone, C. Pita, V. Rossi, M. Semitiel Garcia, Y. Teff-Seker K.
582 L. Yates: writing - review & editing. All co-authors: data collection from case studies, final draft
583 acceptance.

584 585 **Acknowledgements**

586
587 The authors thank the MarCons CA15121 COST Action for funding the meetings and workshops that
588 led to the preparation of this paper.

589 590 **Competing interests**

591
592 The authors declare no competing interests.

593 594 **Declaration of interest**

¹⁴ ECE/MP.PP/C.1/2021/13

¹⁵ ECE/MP.PP/C.1/2021/6

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Declaration of interest: none.

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